



# GOLDSBORO MPO BICYCLE, PEDESTRIAN and GREENWAY PLAN

*January 2015*

Prepared for the Goldsboro MPO  
Prepared by Alta/Greenways





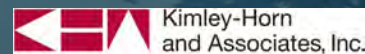
### ACKNOWLEDGEMENTS

Thanks to the local residents, business leaders, community leaders, and government staff that participated in the development of this plan through meetings, events, volunteering, interviews, comment forms, and plan review. Special thanks to those who participated as steering committee members, listed below.

### PROJECT STEERING COMMITTEE

The Steering Committee is made up of local residents, municipal and county government staff, NCDOT staff, Seymour Johnson AFB representatives, and other local community and business representatives.

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Scott Barnard	City of Goldsboro Parks and Recreation Director
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Prepared for the Goldsboro MPO

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## ***VISION STATEMENT***

Goldsboro's convenient network of sidewalks, bikeways, and greenways is a regional attraction that brings people of all ages and abilities together; safely connects them to where they want to go; encourages a healthy, active lifestyle; highlights the local history, culture, and environment; and promotes the local economy.



# Chapter 1: Introduction

## *Chapter Contents:*

*Planning Process  
and Timeline*

*Study Area*

*Why this is Important*

*Vision & Goals*

## INTRODUCTION

The Goldsboro MPO Bicycle, Pedestrian, and Greenway Plan communicates a vision and a clear path towards making the Goldsboro region more walkable and bikable. Funded by the Goldsboro Metropolitan Planning Organization (MPO), the Plan advances an agenda of better mobility, improved health, economic development, environmental stewardship, and improved safety impacts by recommending connected infrastructure, policies, and programs for bicycle and pedestrian transportation and recreation.

## PLANNING PROCESS AND TIMELINE

The planning process began in February 2014 and lasted nine months, featuring robust stakeholder and public engagement. A Steering Committee was formed of key stakeholders and guided the planning process, meeting every two months. A series of targeted public outreach efforts took place to reach all communities within the MPO. A Draft Plan was completed in July 2014 and was reviewed by local government staff, stakeholders, and the general public. The Final Plan was adopted by the City of Goldsboro, Wayne County, and the MPO TCC and TAC by January 2015. Over 500 residents participated and contributed to the recommendations in this plan.

Concurrent with this effort, the Metropolitan Transportation Plan (MTP) underwent its regular five-year update process. Planning efforts were integrated together to ensure appropriate sharing of information and compatibility in recommendations to reach shared goals. This Bicycle, Pedestrian, and Greenway Plan serves as the official bicycle and pedestrian component of the MTP. The MTP also features roadway recommendations that include bicycle/pedestrian accommodations identified in this Plan.

## STUDY AREA

The study area includes everything within the boundaries of the Goldsboro MPO which includes a large portion of Wayne County, City of Goldsboro, Village of Walnut Creek, and Town of Pikeville. A variety of landscapes can be found ranging from urban to rural and from developed to agricultural to riverways and wetlands. The Plan provides specific, appropriate, and context-sensitive infrastructure, policy, and programmatic recommendations for each land use type, roadway, and corridor.



## WHY THIS PLAN IS IMPORTANT

Coming at the heels of the successful statewide bicycle and pedestrian planning initiative, WalkBikeNC, this Plan addresses the specific needs and interests of the Goldsboro region. The WalkBikeNC Plan emphasized the importance of providing North Carolina customers with multi-modal transportation options and identified the positive impacts of active transportation to statewide economic, health, and safety issues. The Goldsboro region faces many of the same challenges as the rest of the state. This Plan builds upon the WalkBikeNC effort and is tailored to the specific, and unique needs of the Goldsboro region.

The health and economic benefits of walkable and bikable communities are well-documented and serve to inform the importance of implementing this Plan. People and businesses are choosing to live and relocate in communities that offer high quality of life amenities including greenways and bikeways. Changes in the built environment offer more opportunities to increase physical activity. An economic impact analysis and health impact assessment (HIA) were conducted as part of the WalkBikeNC Plan and predicted significant positive impacts to the economy and resident and community health with the implementation of bicycle and pedestrian infrastructure such as greenways and sidewalks.

Appendix C includes a full report on current findings related to the many benefits related to creating more bikable and walkable communities.

## VISION & GOALS

The Plan vision and goals were established through a visioning input session with the Steering Committee at the February 27, 2014 Kickoff Meeting and were confirmed and refined through the public input process. The vision and goals serve as the common thread and pulse for the analysis and recommendations found in this Plan.

### ***GOLDSBORO VISION STATEMENT***

Goldsboro's convenient network of sidewalks, bikeways, and greenways is a regional attraction that brings people of all ages and abilities together; safely connects them to where they want to go; encourages a healthy, active lifestyle; highlights the local history, culture, and environment; and promotes the local economy.



Cyclist on Center St.

### Goal: Mobility (Increase Community Active Mobility and Accessibility)

- Identify and fill in gaps in the pedestrian and bicycle network to better connect neighborhoods to central business districts, commercial centers, public spaces, services, and schools.
- Reduce existing foot trails and dirt paths in the pedestrian network by providing new sidewalks and trails.
- Work with regional and state partners to develop a regionally connected network of bikeways and trails.
- Complete top priority pedestrian and bicycle projects by 2020.



Shops in Downtown Goldsboro.

### Goal: Economy (Expand the local economy by making Goldsboro a better place to live, recreate, and explore)

- Develop and promote the bicycle and pedestrian network as a regional attraction for residents and visitors to the area, linking facilities to local businesses, historical sites, parks, and other attractions.
- Work with downtown businesses and business organizations to develop regional walking and bicycling events, such as fun runs and bicycle races, that attract visitors to Goldsboro.
- Draw visitors and new residents to the area by making the pedestrian and bicycle network attractive, fun, and easy to use.
- Expand and improve the Mountains-to-Sea Trail through Goldsboro including marketing and visibility efforts.



Pedestrian crossing signage.

### Goal: Safety (Make Goldsboro a safer place for pedestrians and bicyclists).

- Start a pedestrian and bicycle safety education program in all elementary and middle schools for children in grades K-8.
- Develop a regional pedestrian and bicycle safety campaign that educates motorists, bicyclists, and pedestrians on traffic laws and how to safely share the road.
- Raise awareness and educate decision-makers, stakeholders, interest groups, and the public on the safety benefits of sidewalks, bikeways, improved crossings, and greenway trails.
- Increase traffic enforcement through ticketing, speed feedback trailers, crosswalk stings, and other methods to reduce unsafe driving behavior.
- Through improved infrastructure, education, and enforcement, reduce the number of pedestrian- and bicycle-related crashes by 50% by 2025.

### Goal: Health (Improve the health of the community by promoting and encouraging active lifestyles).

- Partner with health organizations, hospitals, and the military to create recurring annual community events that use sidewalks, bikeways, and trails to promote physical activity, such as a walk/run event, a community fun day at local parks, or an “Open Streets” festival downtown.
- Educate decision-makers, stakeholders, interest groups, and the public on the health benefits of walking, bicycling, and an active lifestyle.
- Use the bicycle and pedestrian network and programs to promote healthy living and address high rates of obesity, diabetes, and other diseases linked to low physical activity rates.
- Reach out to diverse populations throughout Goldsboro to raise awareness of local walking and bicycling opportunities through education and encouragement programs.



Open Streets Festival in NC.

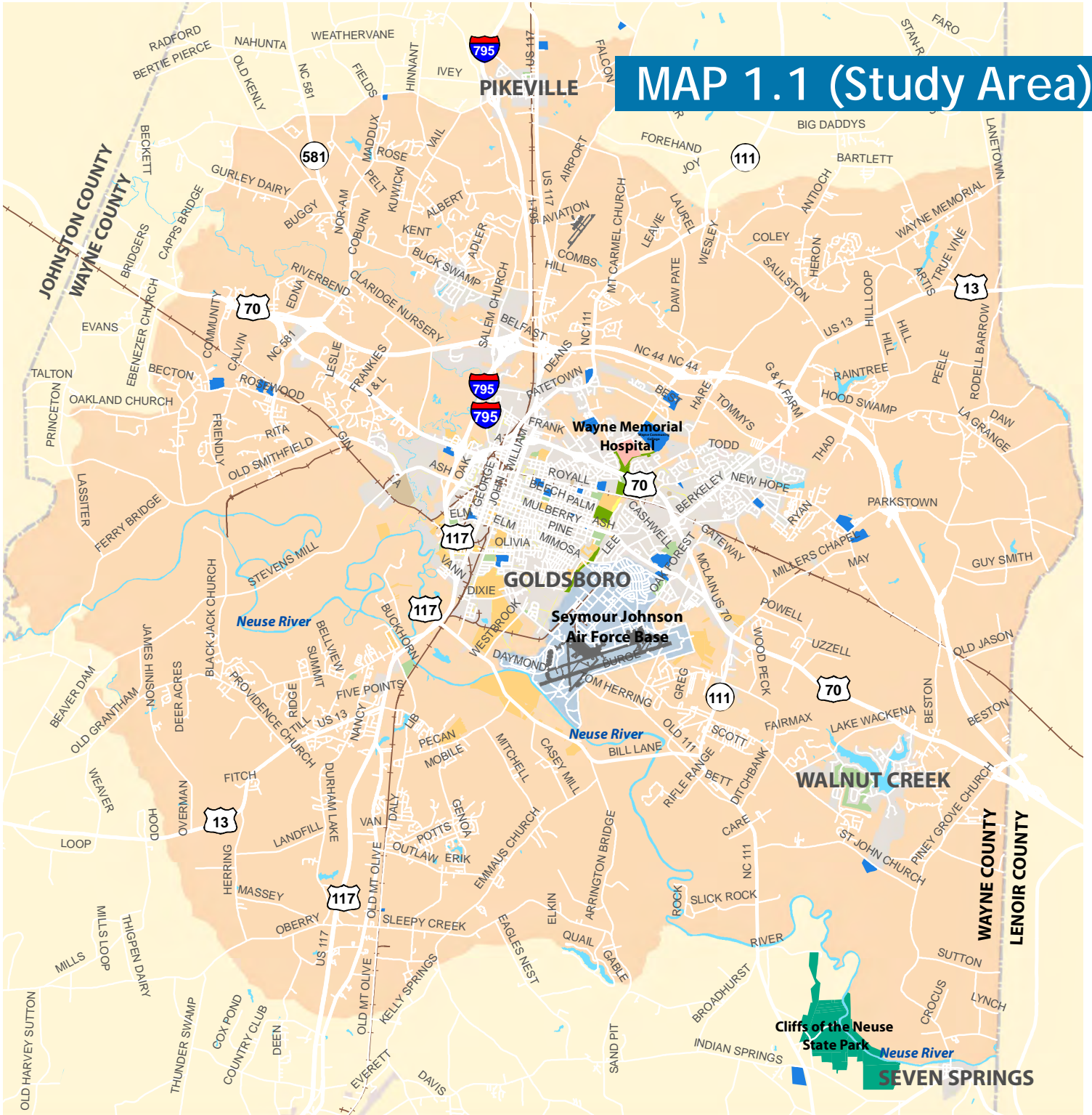
### Goal: Environment/Stewardship (Maintain and promote Goldsboro’s beautiful, natural environment)

- Educate decision-makers, stakeholders, interest groups, and the public on the environmental benefits of greenway trails.
- Integrate the regional trail network with local agricultural tourism and education opportunities.
- Use the regional pedestrian and bicycle network to promote local environmental stewardship through neighborhood cleanup days, nature walks, hike and paddle events, or similar events.
- Work with Friends of Wayne County Greenways and other local advocacy groups to develop strong community participation with the greenway network through local events, volunteering, and media promotions.



Goldsborough Bridge Battlefield.





# MAP 1.1 (Study Area)

Overview Map



**Legend**

- Lands of Interest**
- City Greenway Lands
  - Park
  - State Park
  - Schools
  - Hospital
  - Other Destinations
  - City Easements
  - Other City/County Property

**Existing Infrastructure**

- Roadway
- Railroad

**Additional Context**

- Water Bodies
- Seymour Johnson Air Force Base
- City Limits
- MPO Limits
- Wayne County Border







# Chapter 2: Existing Conditions

*Chapter Contents:*

*Photographic Summary of Existing Conditions*

*Existing Conditions Maps and Analyses*

## OVERVIEW

Goldsboro, Pikeville, Walnut Creek, and the Goldsboro MPO as a whole have a number of features to attract people to walk and bike in the area. A large portion of the population already walks or bikes at least some of the time for recreation, exercise, or utilitarian trips. This chapter discusses the current bicycle and pedestrian network, the many opportunities that exist as starting points for improvement, the constraints that the region must address to become more walk- and bike-friendly, and the demand for safer, better connected facilities throughout the region. The observations presented in this chapter help to inform this plan’s recommendations and implementation strategy.

## PHOTOGRAPHIC SUMMARY OF EXISTING CONDITIONS

### Opportunities

#### *Downtown Core*

Downtown Goldsboro is made up of a large grid network with shops, restaurants, and services that attract pedestrians and bicyclists to the area.

From left to right:  
Streetscape signage on Center Street, Center Street near Mulberry, and North John Street



### Popular Destinations

Examples include schools, shopping centers, restaurants, places of worship, the Neuse River, Wayne Community College, Downtown Pikeville, and parks such as Herman Park.



From left to right: Canoes at the Neuse River, bicycle shop on Ash Street, and Herman Park

### Existing Sidewalks

Many streets in central Goldsboro have sidewalks on at least one side of the street. Sidewalks downtown are wide and some have attractive street furniture and restaurant seating. A recent streetscape project along Center Street included reconstructed sidewalks with attractive pavers, ADA ramps, and high-visibility crossings.



From left to right: Center Streetsidewalk at Mulberry Street, mid-block crossing on Center Street, and William Street sidewalk



### *Existing On-Road Bicycle Facilities*

On-road bicycle facilities are limited to a few roads in Goldsboro and vary in quality and consistency. Parkway Drive, Harding Drive, and one block of Center Street have bike lanes. A wide paved shoulder exists on one side of North Park Road and a portion of New Hope Road. Bill Lane Road, south of Wayne County, has 4-foot paved shoulders on both sides. There are no on-road bicycle facilities in Pikeville or Walnut Creek.

From left to right: Harding Drive bikelane, Parkway Drive bike lane, and Center Street bike lane



### *Existing Shared-Use Trails & Walking Paths*

Some trails and walking paths have been developed in Goldsboro, primarily in parks. Examples include paths in Herman Park, Fairview Park, and Stoney Creek Park. Dees Memorial Park in Pikeville and village-owned park land in Walnut Creek both have walking paths. A paved sidepath also exists in Goldsboro on the south side of New Hope Road from Hare Road to Harding Drive.

From left to right: New Hope Road sidepath, Stoney Creek Park, and Dees Memorial Park walking path in Pikeville



### *Greenway Lands and Easements*

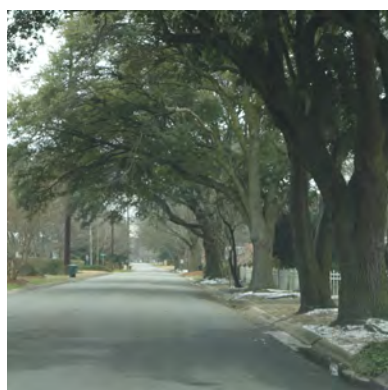
The City of Goldsboro has already obtained and designated several parcels as city greenway lands, which can be used for routing trails. Sewer easements throughout the city also serve as ideal corridors for future trails because they are flat, regularly maintained, and publicly owned.



From left to right: Easement at Chestnut Street and railroad crossing, sewer easement, and Willow Dale Cemetery

### *Quiet Neighborhood Streets*

Neighborhood streets are favorable for walking and bicycling because they have low automobile traffic volumes and speeds. In Goldsboro, neighborhood streets often parallel busier roads and provide access to downtown and other popular destinations, giving pedestrians and bicyclists safer, quieter alternatives to busy streets.



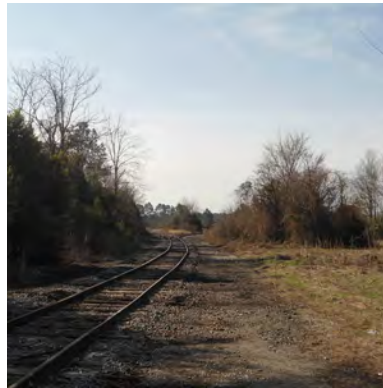
From left to right: Mulberry Street at George Street, Madison Avenue at Palm Street, and Holly Street at Audubon Avenue



### *Inactive Rail Lines*

Some rail lines in Goldsboro are no longer active and show signs of their lack of use. In the future, these inactive lines could be pursued for rails-to-trails projects.

From left to right: US 117 at railroad crossing, railroad near Center Street at Elm Street, and George Street at railroad crossing



### *Neuse River and Paddle Access Points*

The Neuse River is a major natural feature and attraction for campers, paddlers, hikers, and other outdoor enthusiasts. Several paddle access points exist along the river as part of the Wayne County Paddle Trails network.

From left to right: Cliffs of the Neuse State Park, canoes at the Neuse River, and Seven Springs canoe launch at the Neuse River



## Constraints

### *Sidewalk Gaps*

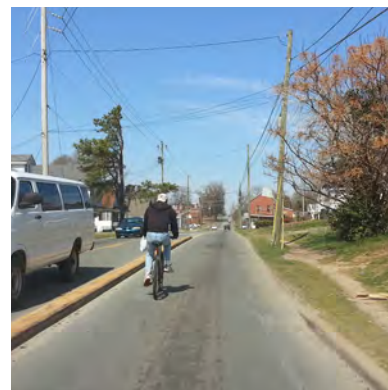
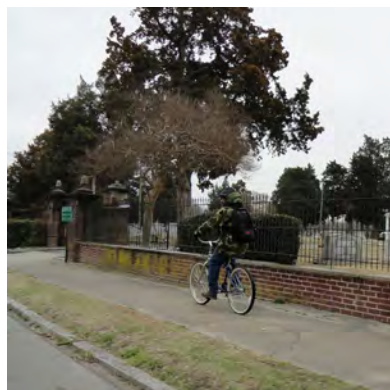
The sidewalk network in Goldsboro and Pikeville contains a number of key gaps that make it difficult to walk to many destinations. Walnut Creek does not feature sidewalks. While sidewalks exist along many streets in central Goldsboro, the network becomes more and more disconnected the further one gets from downtown. Many schools and parks in town lack convenient sidewalk access from surrounding neighborhoods. Some major streets lack sidewalks altogether, requiring pedestrians to walk in the road or through private property to reach a destination.



From left to right: Wayne Memorial Drive, Spence Avenue, and Pinewood Plaza bus stop

### *Lack of a Bicycle Network*

Goldsboro lacks on-road bicycle facilities on most of its streets, and Pikeville and Walnut Creek do not currently have any on-road bicycle facilities in town. Many bicyclists choose to ride on the sidewalk to avoid sharing the road with cars. In Pikeville, Walnut Creek, and rural areas of Wayne County, there is a lack of shoulders or signage to direct bicyclists. Those who choose to ride must share the lane with cars, even on high volume and high speed roads.



From left to right: Ash Street at Glenwood Trail, Elm Street at Willow Dale Cemetery, and George Street near Pine Street





### *Railroad Crossings*

Railroad crossings are often a physical barrier for bicyclists and pedestrians. Uneven crossings, gaps between the pavement and the rail, and collected debris all make it difficult for pedestrians and bicyclists to safely cross, especially those individuals with disabilities who may be using a wheelchair or a walker for mobility.

From left to right: Beech Street at Center Street, Holly Street, and Downtown Pikeville



### *Major Roads and Highways*

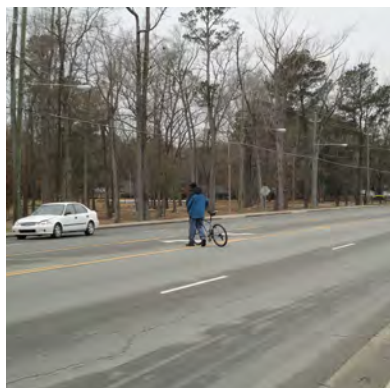
Highways and other major roads with high posted speeds and traffic volumes are especially uncomfortable for pedestrians and bicyclists. Roads such as Ash, Berkeley, Spence, US 117, and Highway 70 have many driveway cuts, disconnected sidewalks, and a lack of dedicated bicycle facilities that make it impractical and uncomfortable to walk or bike these corridors. These roads have major implications for pedestrian and bicycle accessibility: because many shopping centers, services, and other destinations are located along Goldsboro's major roads and highways, pedestrians and bicyclists are often cut off from accessing these areas.

From left to right: Ash Street at Audubon Avenue, Ash Street at Berkeley Boulevard, and Royall Avenue at Spence Avenue



### *Lack of Safe Pedestrian Crossings*

Crossings that are too far apart or without sufficient pedestrian safety elements are a significant barrier to walking and bicycling. Wide roads with heavy traffic, high speeds, and few protected crossings make it difficult for pedestrians and bicyclists to safely and comfortably walk or bike, even if the conditions on either side of the corridor are acceptable. During the fieldwork phase of this plan, many pedestrians and bicyclists were observed crossing the road mid-block or at intersections that lacked a marked crosswalk or signal.



From left to right: Cyclist crossing Ash Street, William Street at Royall Avenue, and pedestrians at Mulberry Street and Daisy Street

### *Maintenance Issues*

Some sidewalks, bike lanes, and marked crossings are in need of more regular maintenance and repair. Examples include debris in bike lanes, heavily worn crosswalk markings, and cracked and overgrown sidewalks.



From left to right: Overgrown sidewalk on John Street, debris on New Hope Road, and worn crosswalks at Herman Street and Holly Street



## EXISTING CONDITIONS MAPS AND ANALYSES

This section presents a series of maps that showcase existing bicycle and pedestrian conditions, and the demand for improved conditions, in the Goldsboro MPO. It is important to analyze the existing network, its gaps, and the diverse needs of the community to determine how future investments in the region can best be prioritized. The following maps and analyses provide a summary of existing conditions in the Goldsboro MPO that help to guide the recommendations made in Chapters 3, 4, and 5:

- Overview Map
- Existing Facilities
- Low-Stress Streets for Bicycling
- Destinations
- Safety Challenges
- Equity Analysis
- Bike and Walk Commute Rates
- Live/Work/Play Analysis
- Footpaths

### Overview Map

Map 2.1 features municipalities in the Goldsboro MPO, roadways, railroads, parks, schools, publicly-owned land, and water features in the MPO. Map 2.2 features a focus on the City of Goldsboro.

## Bicycle and Pedestrian Facility Supply

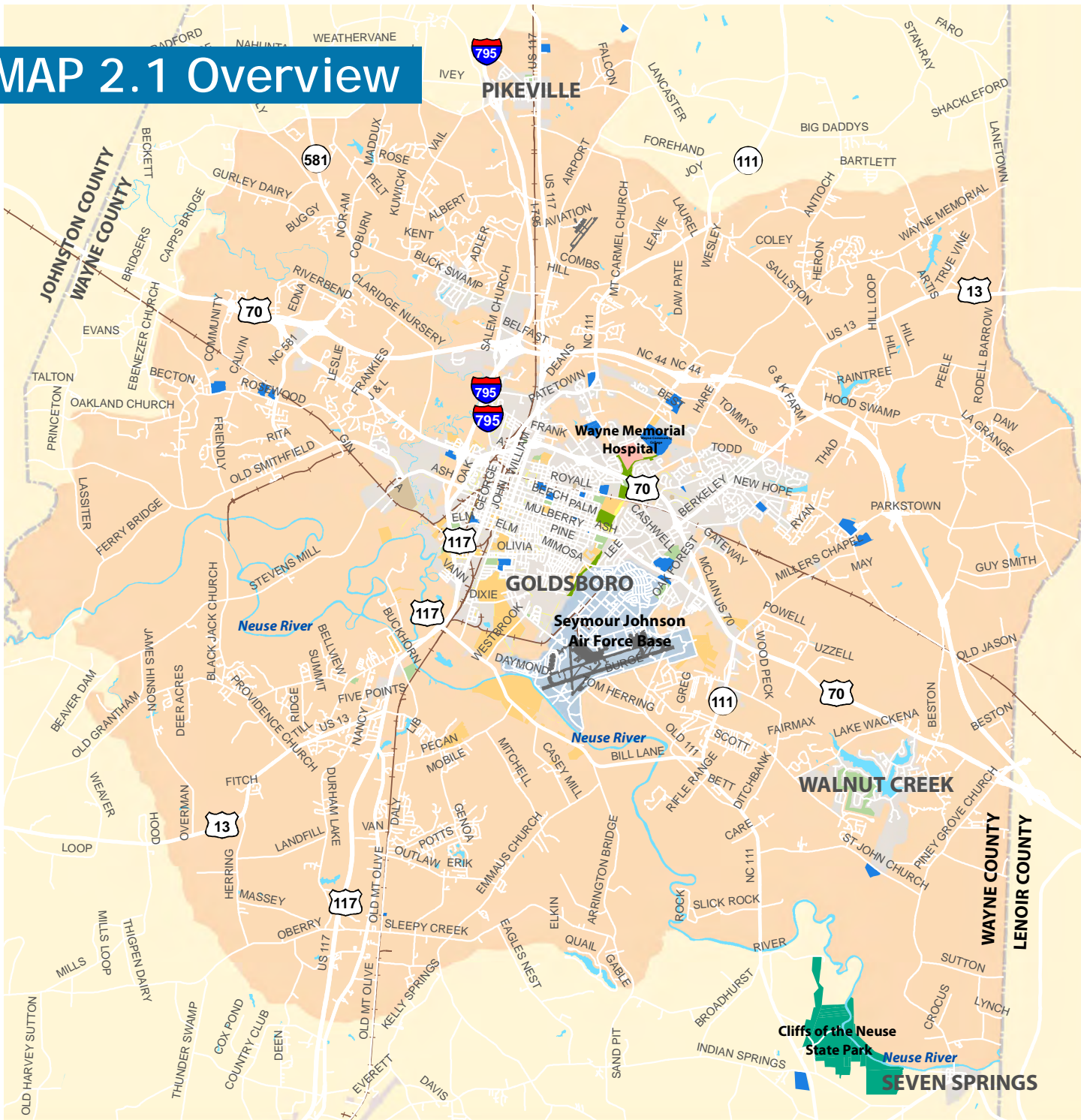
### *Existing Facilities*

Maps 2.3 and 2.4 show existing sidewalks, bike lanes, and paved shared-use trails in the Goldsboro MPO. A dense network of sidewalk exists in sections of central Goldsboro, including downtown, but many areas still remain unconnected. Small segments of bike lanes and shared-use trails have been constructed in parts of town, but do not yet form a network.

<u><i>Facility Type</i></u>	<u><i>Mileage</i></u>
<u>Sidewalk</u>	<u>61</u>
<u>Bike Lanes</u>	<u>2</u>
<u>Paved Shared-Use Trails</u>	<u>3</u>



# MAP 2.1 Overview



Overview Map



### Legend

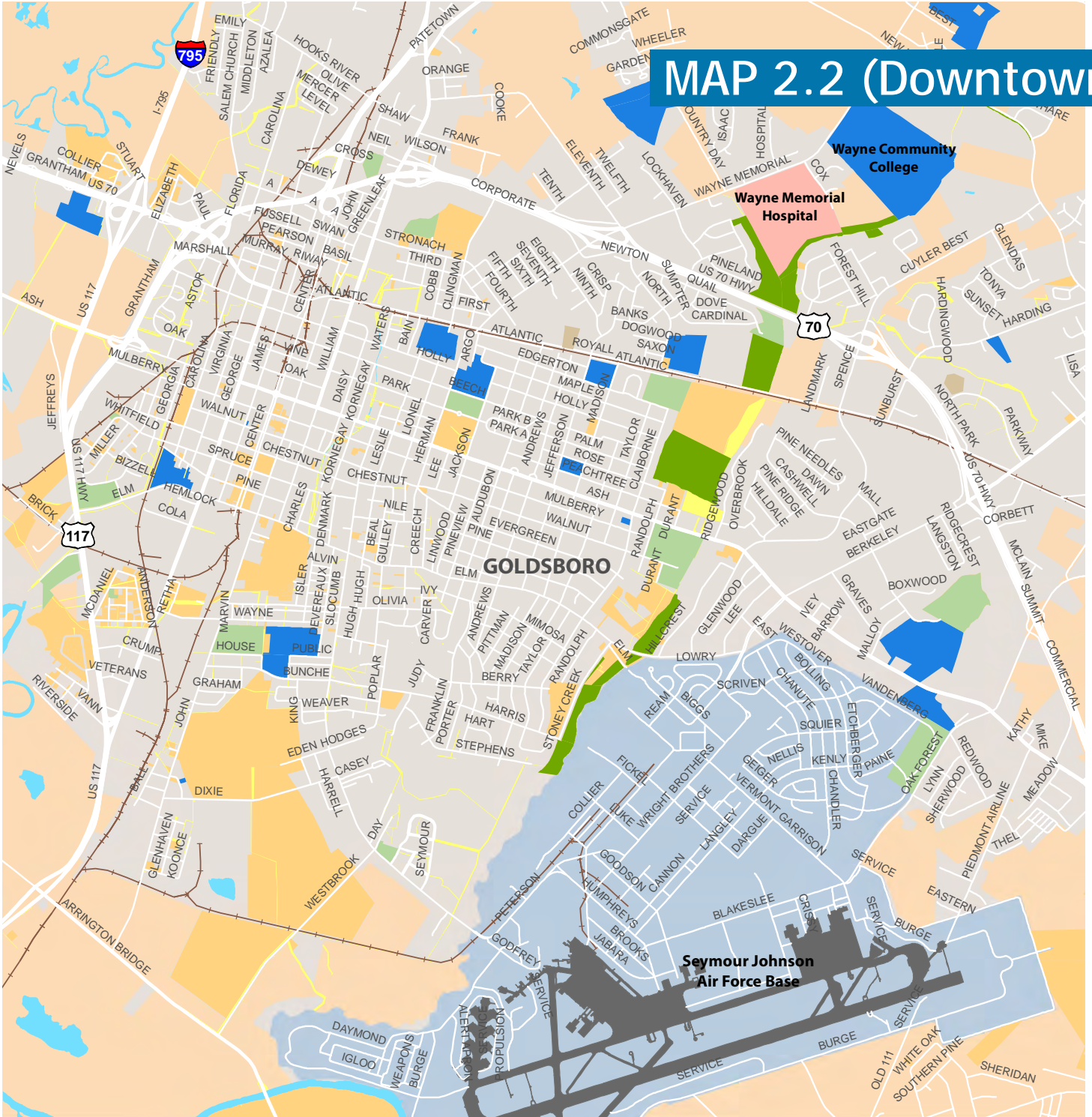
- Lands of Interest**
  - City Greenway Lands
  - Park
  - State Park
  - Schools
  - Hospital
  - Other Destinations
  - City Easements
  - Other City/County Property

- Existing Infrastructure**
  - Roadway
  - Railroad
- Additional Context**
  - Water Bodies
  - Seymour Johnson Air Force Base
  - City Limits
  - MPO Limits
  - Wayne County Border





# MAP 2.2 (Downtown)



Overview Map - Downtown



### Legend

- City Greenway Lands
- Park
- State Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

### Existing Infrastructure

- Roadway
- Railroad

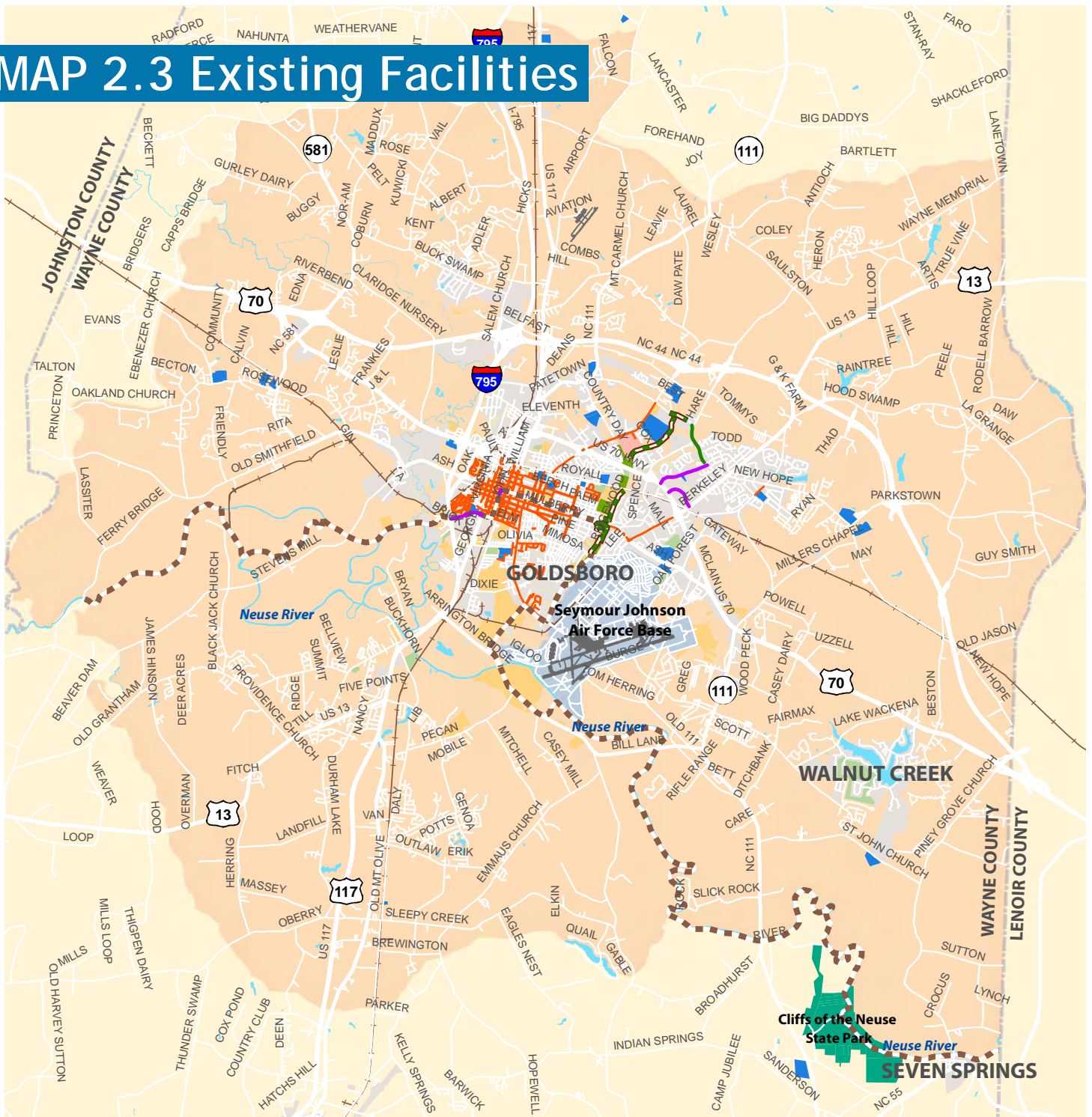
### Additional Context

- Water Features
- Seymour Johnson Air Force Base
- City Limits
- MPO Limits





# MAP 2.3 Existing Facilities



## Existing Facilities



### Legend

#### Existing Infrastructure

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Existing Sidewalk
- Roadway
- Railroad

#### Lands of Interest

- City Greenway Lands
- Park
- State Park
- Schools
- Hospital
- City Easements
- Other City/County Property

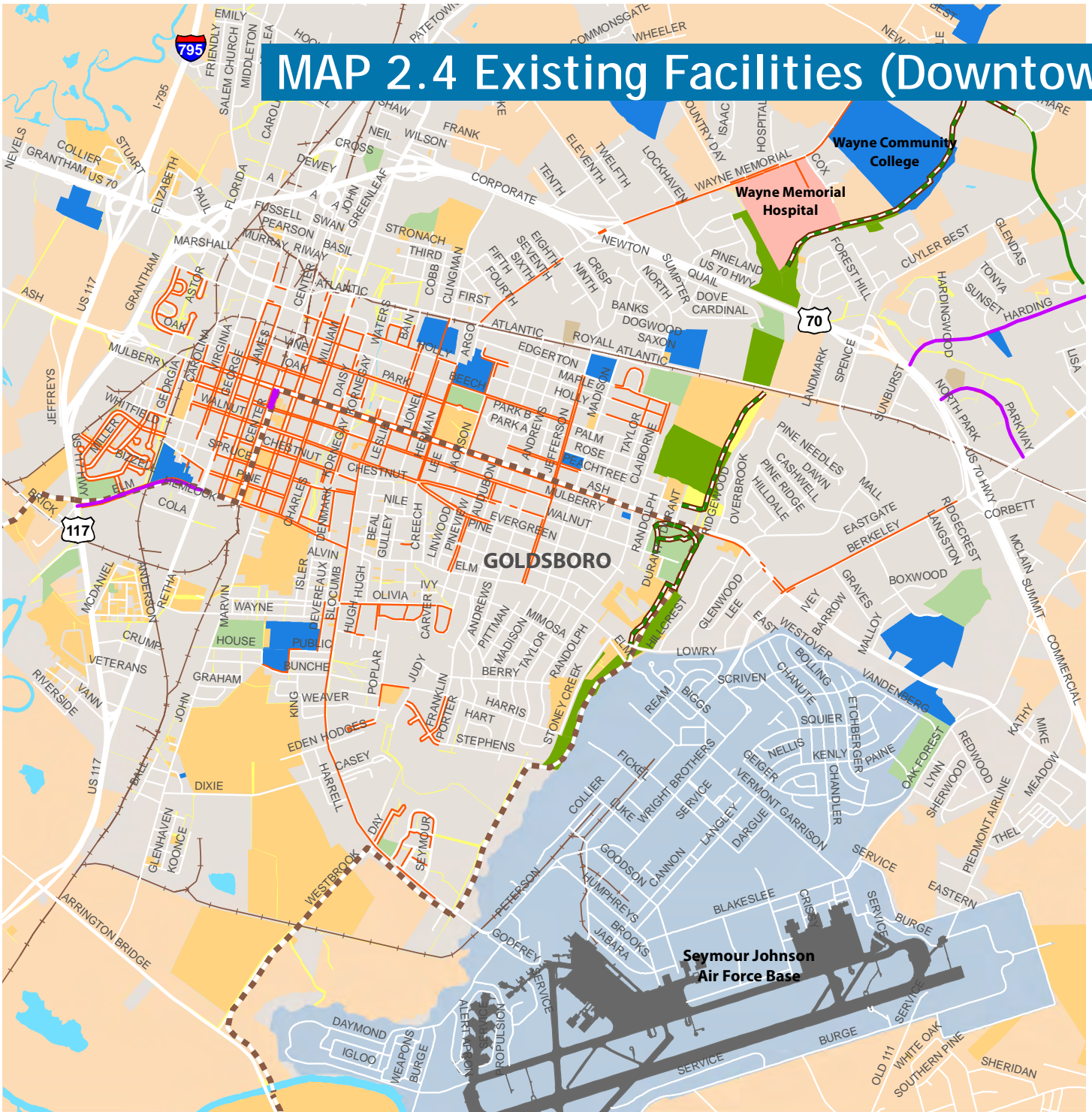
#### Additional Context

- Proposed Mountains-to-Sea
- Trail Alignment
- Water Bodies
- Seymour Johnson Air Force Base
- City Limits
- MPO Limits
- Wayne County Border





# MAP 2.4 Existing Facilities (Downtown)



## Existing Facilities - Downtown



### Legend

- |                                |                            |   |
|--------------------------------|----------------------------|---|
| <b>Existing Infrastructure</b> | <b>Lands of Interest</b>   | <b>Additional Context</b>                 |
| Existing Bike Lane             | City Greenway Lands        | Proposed Mountains-to-Sea Trail Alignment |
| Existing Shared-Use Path       | Park                       | Water Features                            |
| Funded Shared-Use Path         | Schools                    | Seymour Johnson Air Force Base            |
| Existing Sidewalk              | Hospital                   | City Limits                               |
| Roadway                        | Other Destinations         | MPO Limits                                |
| Railroad                       | City Easements             |   |
|                                | Other City/County Property |   |





### Low-Stress Streets for Bicycling (Level of Traffic Stress Analysis)

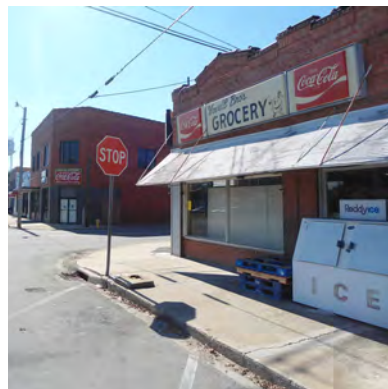
Bicyclists come in all ages, abilities, and comfort levels. Studies on the bicycling population show that most people, approximately 60% of the population, feel “Interested but Concerned” about bicycling opportunities. These people enjoy bicycling, but primarily feel comfortable doing so on trails, physically separated bikeways, or quiet neighborhood streets where they will experience a low level of stress with automobile traffic.

A Level of Traffic Stress (LTS) Analysis is one way of categorizing streets into different levels of bicycling “stress” based on roadway characteristics such as traffic speed and number of lanes. Map 2.5, right, shows low stress bicycle corridors in Goldsboro based on LTS analysis. Many neighborhood streets in Goldsboro are low stress and provide some connectivity, but many parts of town are cut off from one another because of a lack of low-stress bicycle connections. Seymour Johnson Air Force Base is completely isolated from the city due to a lack of low-stress links to the base, and very few corridors offer an uninterrupted, low-stress north-south or east-west route across town. Outside of central Goldsboro, low-stress bicycle routes are sparse and are limited to a few isolated neighborhood streets, making comfortable cross-city travel by bike impossible. For the full LTS Analysis report, please see Appendix H.

### Bicycle and Pedestrian Facility Demand

#### Destinations

Map 2.6 shows the density of destinations in Goldsboro, including schools, parks, shops, medical facilities, banks, and other businesses and services. Downtown Goldsboro has the highest density of destinations, followed by the Berkeley, Spence, and Wayne Memorial corridors. Other clusters of destinations

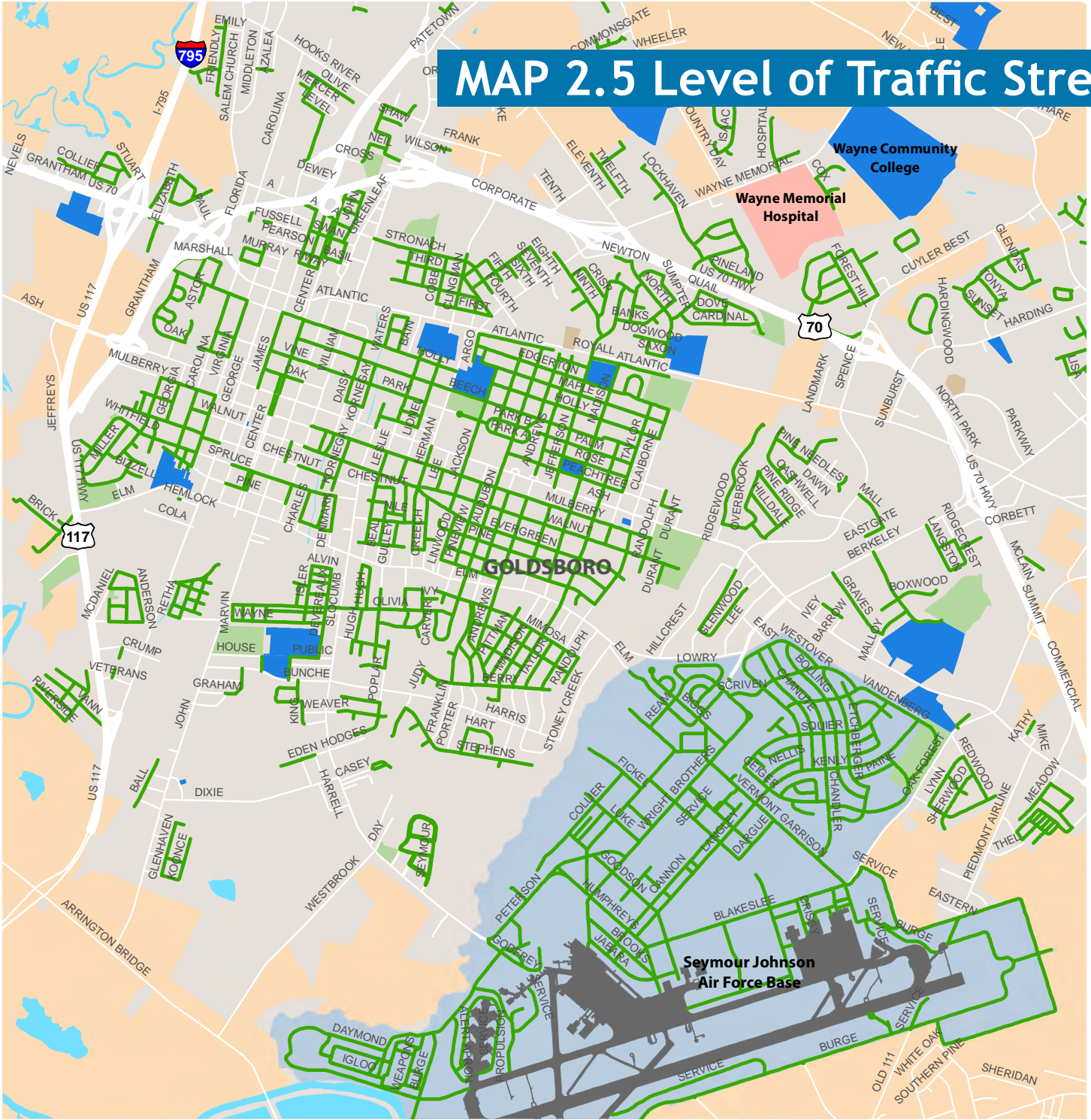


Clockwise from top left: Eastern Wayne Middle School, tennis courts at Herman Park, Downtown Goldsboro, Spring Lake in Walnut Creek, Downtown Pikeville, and Stoney Creek Park





# MAP 2.5 Level of Traffic Stress



## Low Stress Bicycle Corridors - Downtown



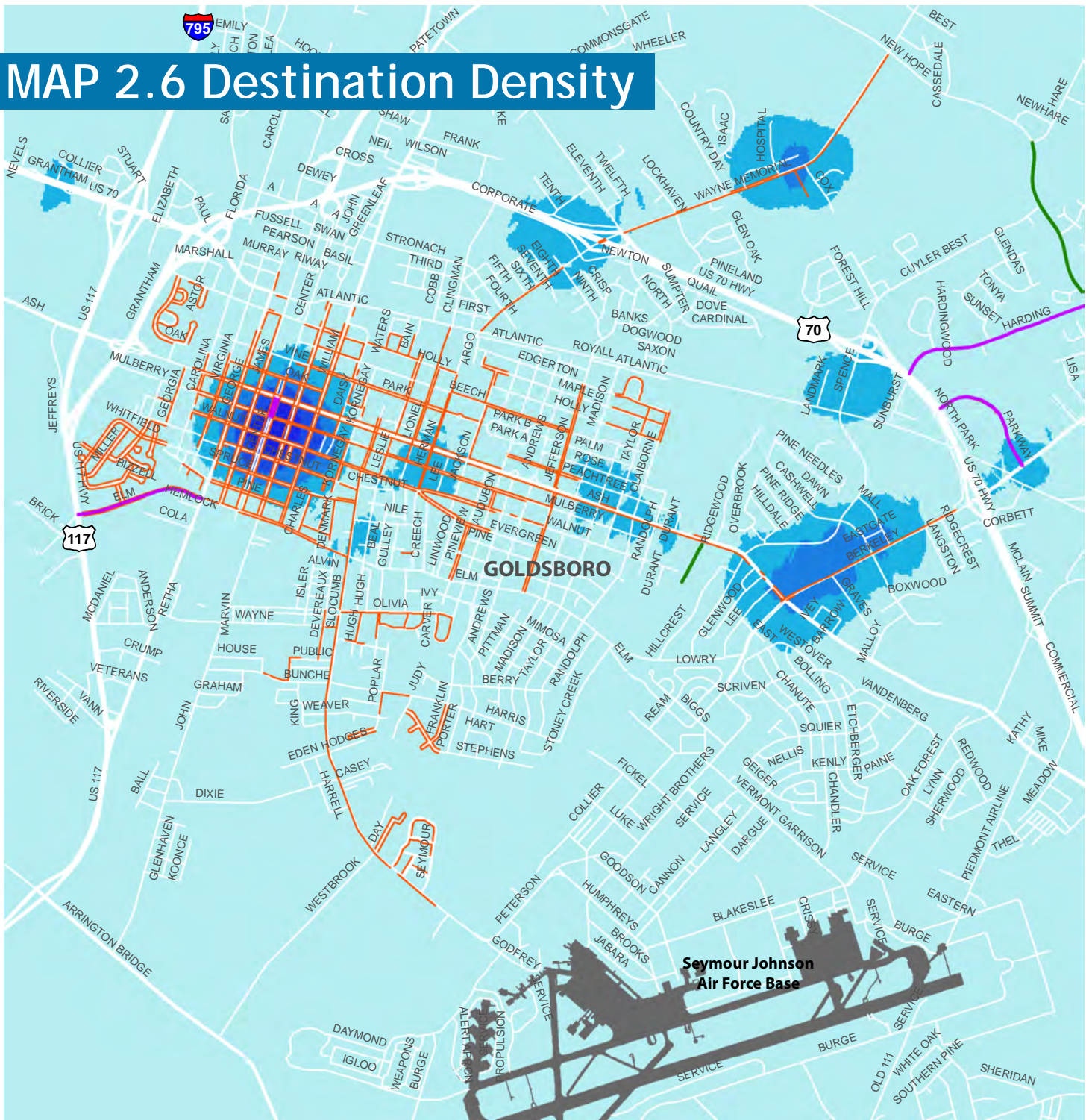
### Legend

Level of Traffic Stress	Lands of Interest	Additional Context
<span style="color: green;">—</span> 1 - Low Stress	<span style="color: green;">■</span> Park	<span style="color: lightblue;">■</span> Water Features
	<span style="color: blue;">■</span> Schools	<span style="color: lightgrey;">■</span> Seymour Johnson Air Force Base
	<span style="color: red;">■</span> Hospital	<span style="color: tan;">■</span> City Limits
		<span style="color: orange;">■</span> MPO Limits





# MAP 2.6 Destination Density



### Destination Density - Downtown



#### Legend

- |                     |                                |
|---------------------|--------------------------------|
| Destination Density | Existing Infrastructure        |
| High Density        | Existing Bike Lane             |
| Medium Density      | Existing/Funded Multi-Use Path |
| Low Density         | Existing Sidewalk              |
|                     | Roadway                        |





exist along Ash Street and the US 70 Bypass. These “activity clusters” attract people traveling by foot or by bike, yet many of these areas are not safely or comfortably accessible by the existing pedestrian and bicycle infrastructure, particularly those clusters to the north and east of downtown.

### *Safety Challenges*

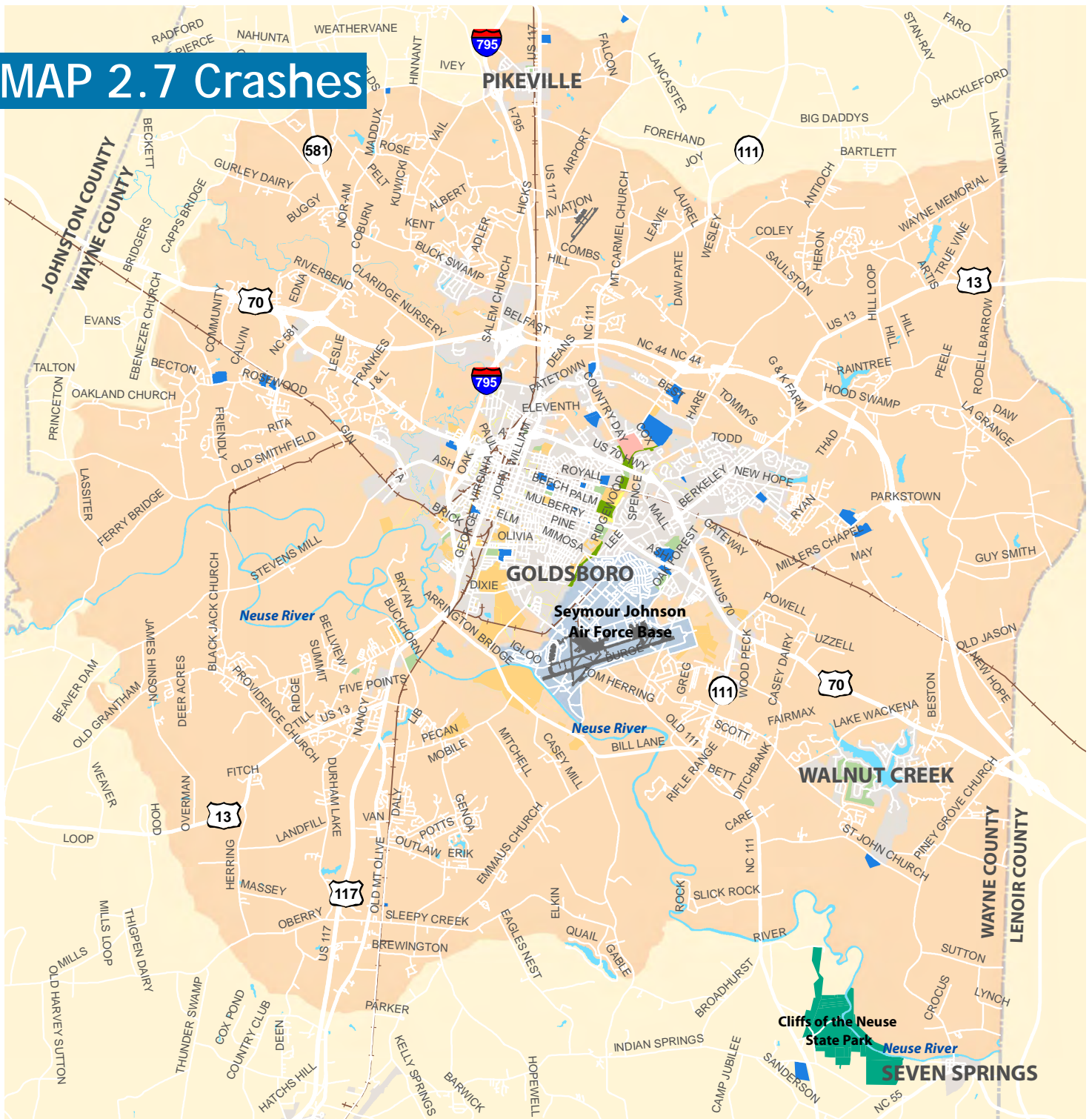
From 2007-2011, NCDOT and its partners recorded 188 crashes involving a bicyclist or pedestrian in the Goldsboro MPO. Of these, 51 were bicycle-automobile crashes, including 1 fatality, and 137 were pedestrian-automobile crashes with 11 fatalities. Maps 2.7 and 2.8 show the locations of these crashes. The tables below list the corridors and intersections with the highest number of reported bicycle and pedestrian crashes. These are areas where there is likely a high level of walking and bicycling and a need for safety countermeasures, such as sidewalks, bike lanes, or crossing improvements.

<b><i>Corridor</i></b>	<b><i>Bike Crashes</i></b>	<b><i>Ped Crashes</i></b>	<b><i>Total</i></b>
US 70 Highway/Bypass	8	13	21
Ash Street	8	9	17
US 117 Highway/Bypass	2	12	14
William Street	6	8	14
Wayne Memorial Drive	2	8	10
Slocumb Street	4	4	8
Elm Street	4	4	8
Olivia Lane	2	5	7
Mulberry Street	2	3	5
Berkeley Blvd	3	2	5
Royall Avenue	0	5	5

<b><i>Location</i></b>	<b><i>Bike Crashes</i></b>	<b><i>Ped Crashes</i></b>	<b><i>Total</i></b>
Pinewood Square Shopping Ctr Parking Lot	1	6	7
William St and East Hooks River Road	1	3	4
Olivia Lane and Poplar Street	1	3	4
US 70 Bypass and Wayne Memorial Drive	2	1	3
Wayne Memorial Drive and Lockhaven Drive	0	3	3
S Slocumb Street and E Elm Street	2	1	3



# MAP 2.7 Crashes



## Bicycle and Pedestrian Collisions



### Legend

#### Collisions 2007-2011

- Bicycle Collision
- Pedestrian Collision

#### Existing Infrastructure

- Roadway
- Railroad

#### Lands of Interest

- City Greenway Lands
- Park
- State Park
- Schools
- Hospital
- City Easements
- Other City/County Property

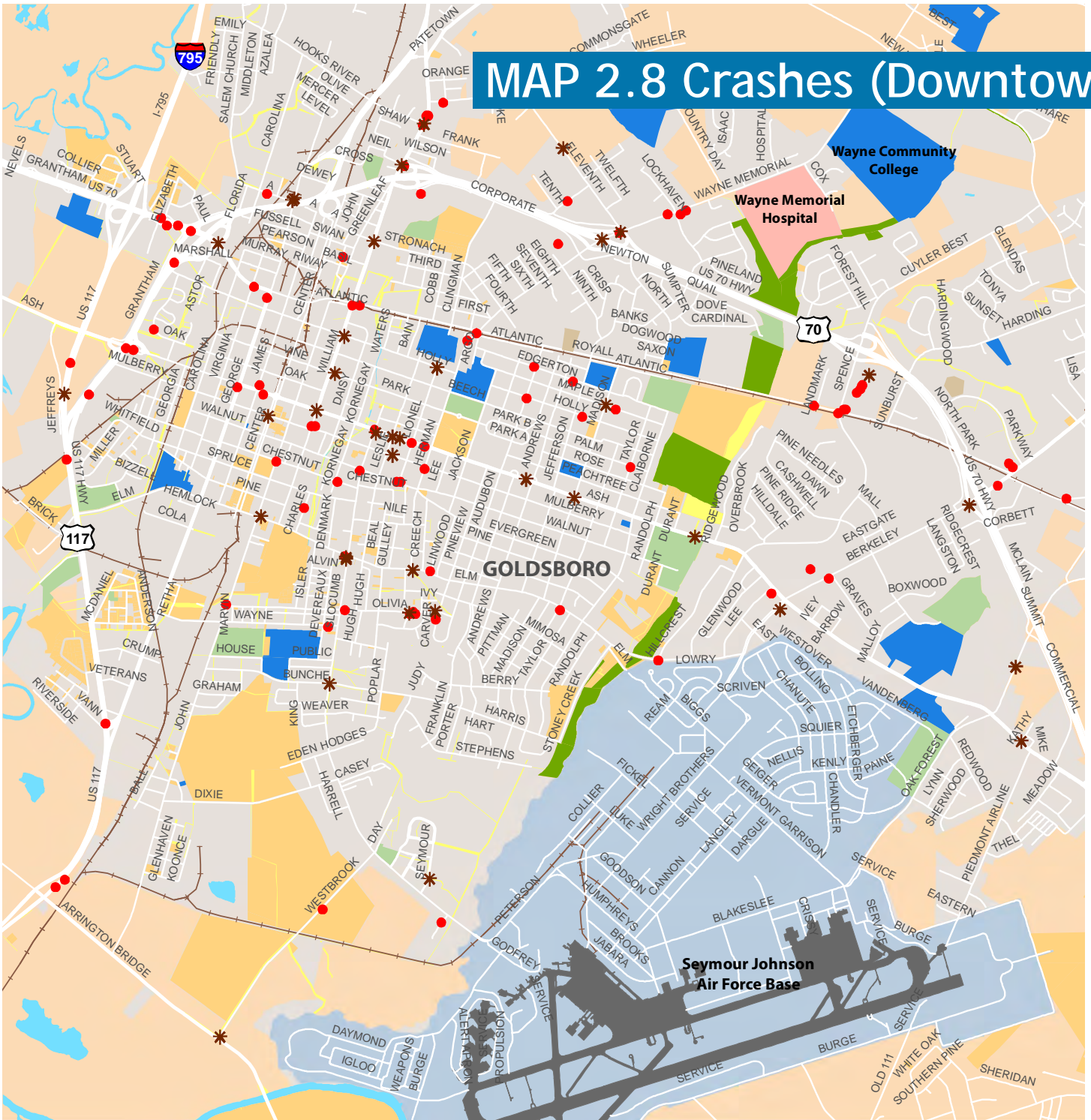
#### Additional Context

- Water Bodies
- Seymour Johnson Air Force Base
- City Limits
- MPO Limits
- Wayne County Border





# MAP 2.8 Crashes (Downtown)



**Bicycle and Pedestrian Collisions - Downtown**



**Legend**

**Collisions 2007-2011**

- Bicycle Collision
- Pedestrian Collision

**Existing Infrastructure**

- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- State Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

**Additional Context**

- Water Features
- Seymour Johnson Air Force Base
- City Limits
- MPO Limits
- Wayne County Border





### Crash Type

The tables to the right show a breakdown of pedestrian and bicycle crashes by crash type, count, and percentage of total crashes for the Goldsboro MPO, 2007-2011. These frequencies are compared to the statewide percentages for each crash type, which were gathered from NCDOT 2008-2012 statewide crash reports. **The most common pedestrian crash type, “Pedestrian Failed to Yield,” includes instances where a pedestrian was crossing the street and did not yield the right-of-way to a motorist traveling straight (not turning). Of these cases, 88% occurred when the pedestrian was crossing mid-block.** This may occur when a pedestrian is not near an intersection or marked crosswalk and is trying to cross in between heavy traffic, does not see an oncoming vehicle, or misjudges a vehicle’s speed (which may be speeding).

**The most common bicycle crash type, “Motorist Overtaking - Other/Unknown,” applies when a crash occurs as a motorist is passing a bicyclist traveling the same direction.** “Other/Unknown” means that it was not clear whether the motorist misjudged the space needed to pass, the bicyclist swerved, or the motorist did not see the bicyclist. Of all of the “Motorist Overtaking Bicyclist” crashes (12 total), 91.7% occurred in a travel lane, as opposed to a bike lane or shoulder. Improved street lighting and better separation between bicyclists and motor vehicles with bike lanes and paved shoulders could help to reduce the frequency of this type of crash. Where there is not roadway space for a bicycle facility, lower posted speed limits and traffic calming measures can help to reduce motor vehicle speeds and the frequency and severity of crashes.

### Age Distribution

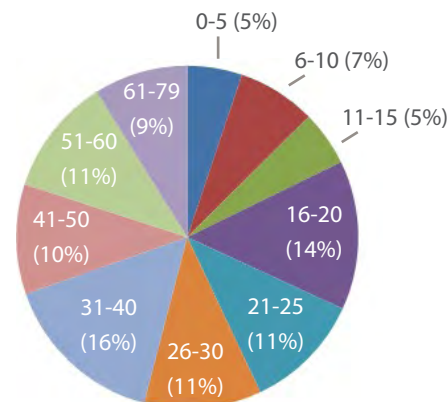
Bicyclists involved in a collision from 2007-2011 ranged from 8 to 66 years old, and pedestrians ranged from 1 to over 70 years old. The top two charts to the right show crashes by age group. **The 16 to 19 age group accounted for the greatest proportion of bicycle crashes (20%),** though the majority of crashes involved adults age 25 or older (58%). Pedestrian crashes were similarly spread across age groups, with 44% of crashes involving a child, teen, or young adult up through age 25, and 56% of crashes involving a pedestrian age 26 or older.

### Bicyclist Position

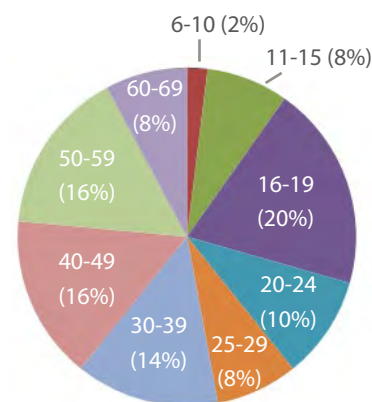
**At the time of the crash, 60.8% of bicyclists were in the travel lane and 13.7% were on a sidewalk/crosswalk/driveway.** Few roads in the Goldsboro MPO currently have a bike lane or other bicycle facility. Adding these facilities to roads would help to address the top two crash positions by increasing the separation between bicyclists and passing motorists, and by reducing the frequency of sidewalk riding.

### Built Environment

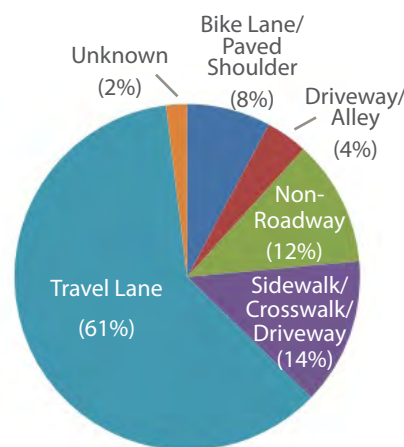
Bicycle and pedestrian crashes in the Goldsboro MPO primarily occur in urban environments where population densities and traffic volumes are higher: **From 2007-2011, 78% of all bicycle crashes and 62% of all pedestrian crashes were in urban areas.** However, a relatively high percentage of pedestrian crashes were also in rural areas, accounting for 23% of the total. This suggests that a number of people are also walking in rural environments in the MPO, where pedestrian facilities such as sidewalks, wide shoulders, and crosswalks are typically lacking.



Pedestrian crash age distribution



Bicycle crash age distribution



Bicyclist position at time of crash



<b>Rank</b>	<b>Pedestrian Crash Type</b>	<b>Count</b>	<b>Percentage</b>	<b>% Statewide</b>
1	Pedestrian Failed to Yield	26	19.0%	14.8%
2	Walking Along Roadway with Traffic - From Behind	13	9.5%	6.8%
3	Dash	12	8.8%	5.6%
4	Backing Vehicle - Parking Lot	10	7.3%	7.4%
5	Off Roadway - Parking Lot	9	6.6%	9.4%
5	Walking in Roadway	9	6.6%	3.9%
7	Off Roadway - Other/Unknown	7	5.1%	3.7%
8	Motorist Left Turn - Parallel Paths	6	4.4%	4.8%
9	Motor Vehicle Loss of Control	5	3.6%	4.4%
9	Standing in Roadway	5	3.6%	2.1%
11	Motorist Failed to Yield	4	2.9%	3.0%
Subtotal for Top 11 Types		106	77.4%	65.9%

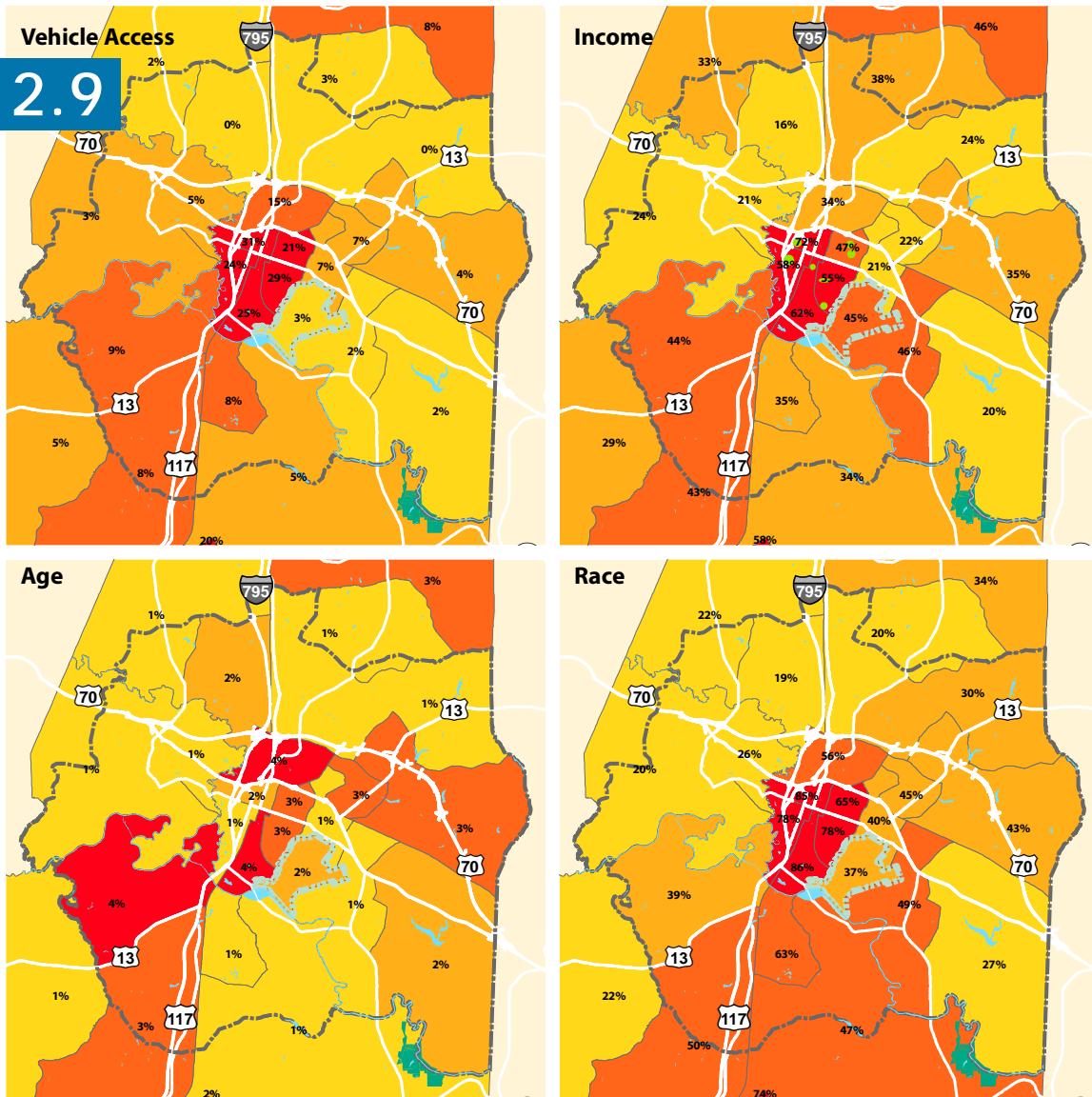
<b>Rank</b>	<b>Bicyclist Crash Type</b>	<b>Count</b>	<b>Percentage</b>	<b>% Statewide</b>
1	Motorist Overtaking - Other/Unknown	6	11.8%	9.0%
2	Non-Roadway	4	7.8%	4.2%
3	Bicyclist Ride Out - Commercial Driveway/Alley	3	5.9%	0.8%
3	Bicyclist Ride Through - Signalized Intersection	3	5.9%	2.2%
3	Motorist Overtaking - Undetected Bicyclist	3	5.9%	2.9%
4	Bicyclist Left Turn - Same Direction	2	3.9%	4.8%
4	Bicyclist Ride Out - Midblock - Unknown	2	3.9%	1.4%
4	Bicyclist Ride Out - Parallel Path	2	3.9%	1.0%
4	Motorist Drive Out - Commercial Driveway/Alley	2	3.9%	5.0%
4	Motorist Drive Out - Sign-Controlled Intersection	2	3.9%	9.8%
4	Motorist Overtaking - Bicyclist Swerved	2	3.9%	2.5%
4	Motorist Turning Error - Left Turn	2	3.9%	0.5%
4	Signalized Intersection - Other/Unknown	2	3.9%	2.5%
Subtotal for Top 13 Types		35	68.6%	46.6%



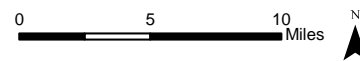
### Equity Analysis Maps

An important goal of this plan is to recommend bicycle and pedestrian improvements in the Goldsboro MPO that will benefit all residents, including those who are typically underserved or underrepresented. An equity analysis was completed during the planning process to identify the locations where such residents are located in order to target public outreach to those areas and ensure that recommendations meet the needs of those residents. Maps 2.9 and 2.10 show the areas of the Goldsboro MPO that have the greatest need for bicycle and pedestrian facilities based on a high concentration of the following demographics: populations of color, households with no vehicle, populations

MAP 2.9



Composite Equity Analysis Inputs



Vehicle Access

Percent of occupied households with no vehicle available

Age

Percent of the population below age 15 or above age 65

Income

Percent of families with an income below 200% of the poverty line

Race

Percent of the population that identifies with a race other than white alone

Equity Tier

- Highest
- High
- Medium
- Low

Legend

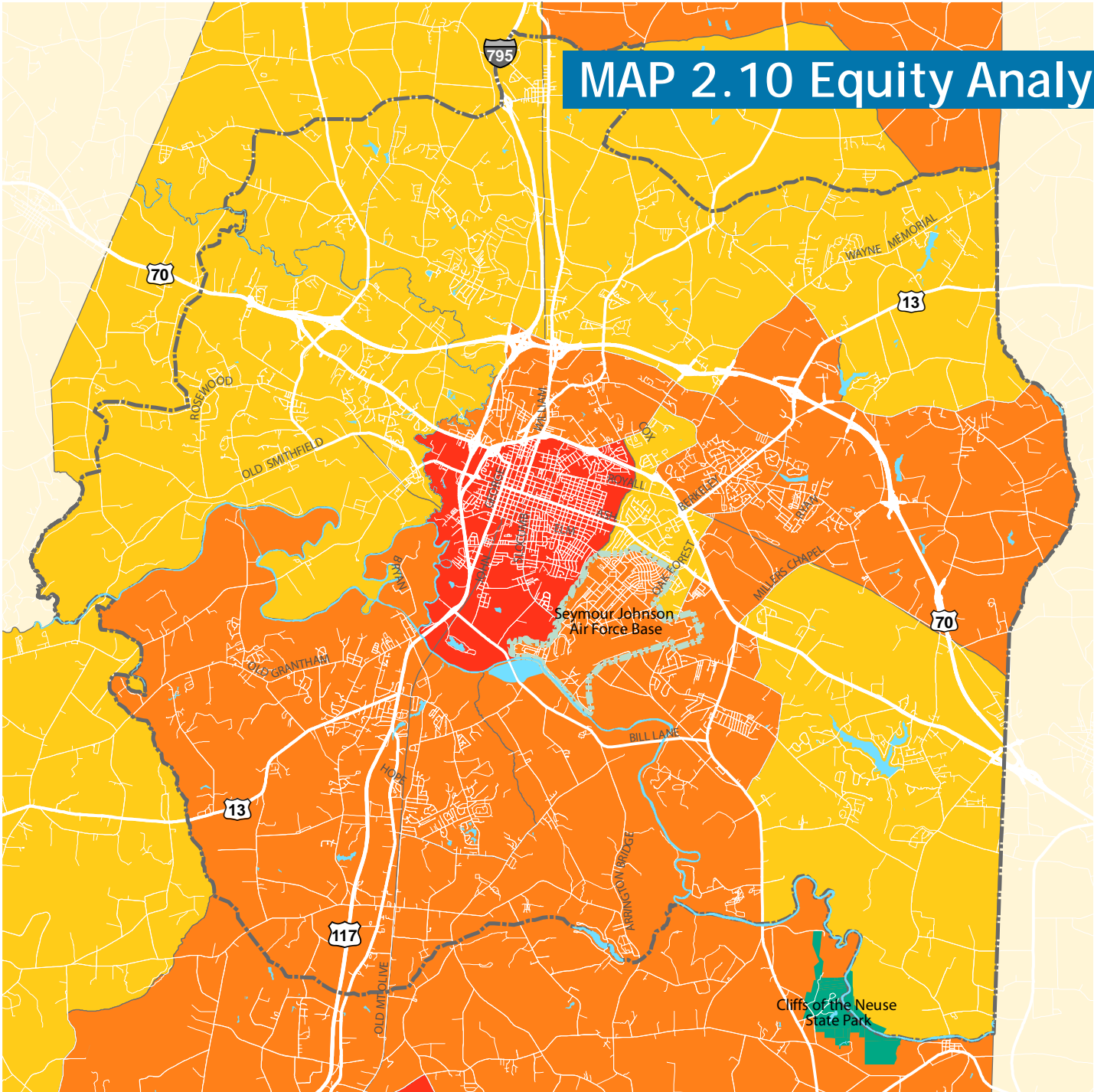
- MPO Boundary
- SJ Air Force Base
- State Park
- Public Housing Areas







# MAP 2.10 Equity Analysis



## Composite Equity Analysis

The Composite Social Equity Tiers reflect the average of four social groups with higher concentrations of:

- 1) Families living below or near the poverty line
- 2) Households with no vehicle available
- 3) Households with a limitation on English speaking ability
- 4) Population below age of 15 or above age 65

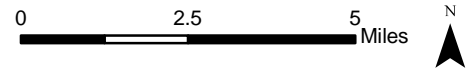
A higher tier represents a higher relative concentration of these groups.

### Equity Tier

- Low
- Medium
- High

### Legend

- MPO Boundary
- Seymour Johnson Air Force Base
- State Park





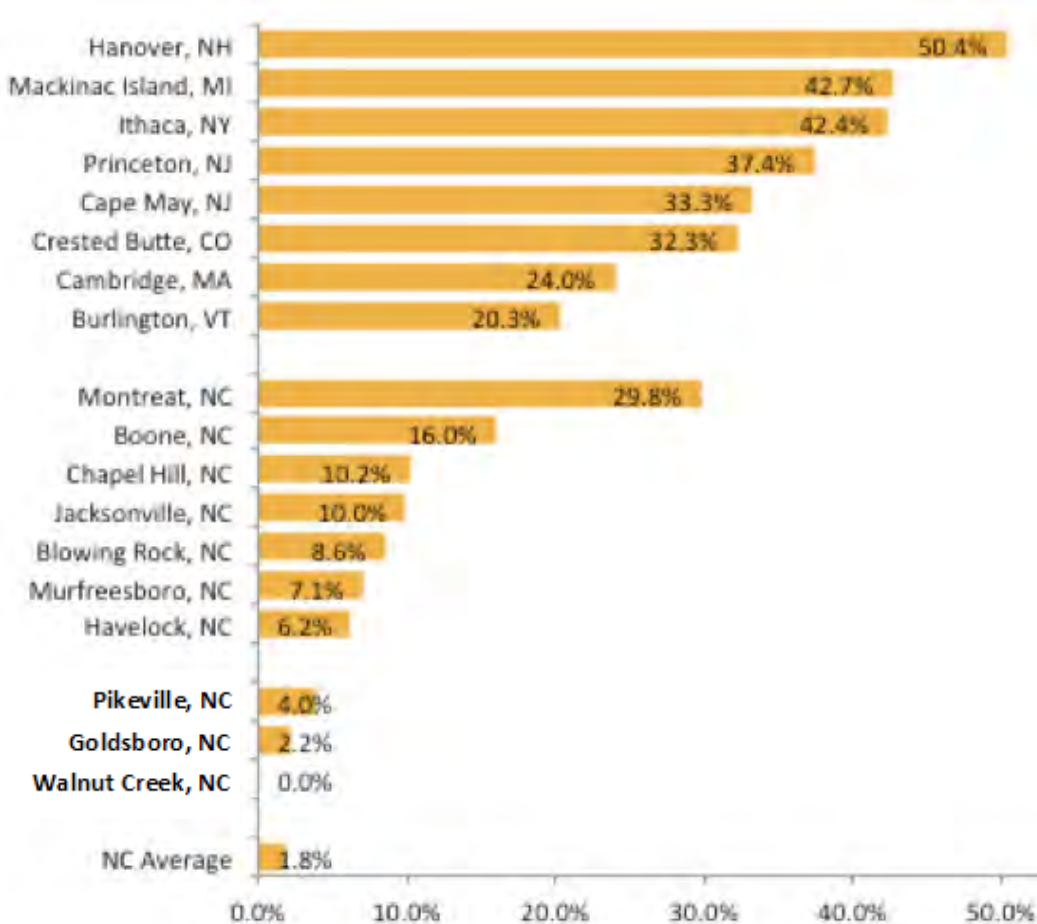
below 200% of the poverty line, populations in public housing, and populations below age 15 or above age 65. **All of central Goldsboro received a high equity score, indicating that this area likely has the highest dependence on walking and bicycling and therefore the highest need for safe and accessible facilities.** To read the full Equity Analysis Report for Goldsboro, please see the plan appendix.

### *Bike and Walk Commute Rates*

Maps 2.11 and 2.12 show the proportion of working commuters in each block group who walk or bike to work. Overall, Goldsboro has a walk to work rate of 2.2% and a bike to work rate of 0.6%, Pikeville has a walk to work rate of 4.0% and a bike to work rate of 0.0%, and Walnut Creek has a 0.0% rate for both. The charts below show how walk and bike to work rates for the Goldsboro

## WALK to WORK RATES

Model cities in the US and NC, as compared to the Goldsboro MPO



Source: US Census 5-year ACS (2008-2012).

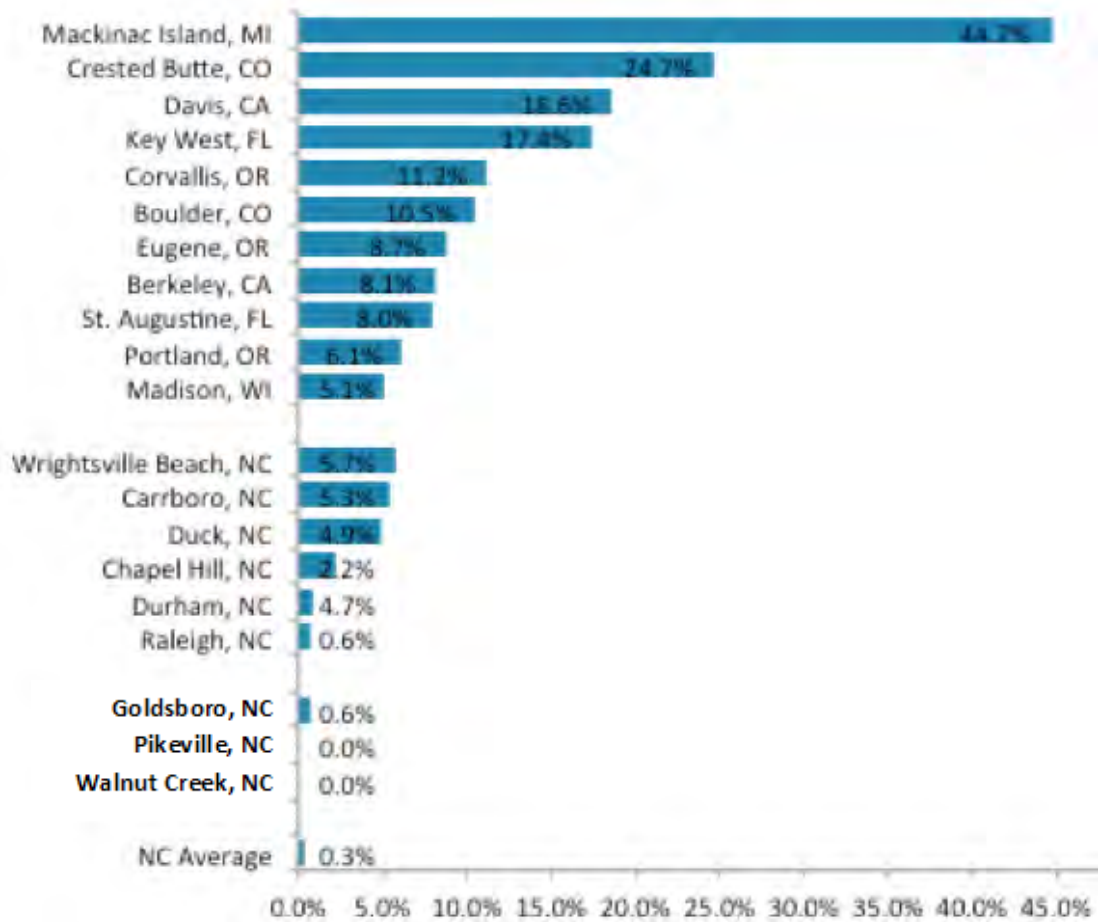


**Commuter rates under-represent the total amount of walk and bike trips but give an order of magnitude for the area; the goal is to increase all walking and biking trips, not just the commute to work trips (which only account for 20% of all trips).**

MPO compare to model cities across the country and in North Carolina. Maps 2.8 and 2.9 show how the proportion of workers biking and walking to work varies greatly across Goldsboro and the MPO. The highest share of pedestrian commuters is located on Seymour Johnson Air Force Base (8.5%) and in west and northwest Goldsboro along US 117 and US 70 (5.3% and 6.2%, respectively), all of which have rates far above the city average. Areas with a high share of bicycle commuters include west Goldsboro along US 117 (6.6%), south-central and downtown Goldsboro (2.9%), and Seymour Johnson Air Force Base (1.5%). These rates are important for understanding where people are already walking and biking, the conditions that they face on their commute, and how conditions can be improved to encourage more people to walk and bike, particularly in dense, mixed-use portions of town.

### BIKE to WORK RATES

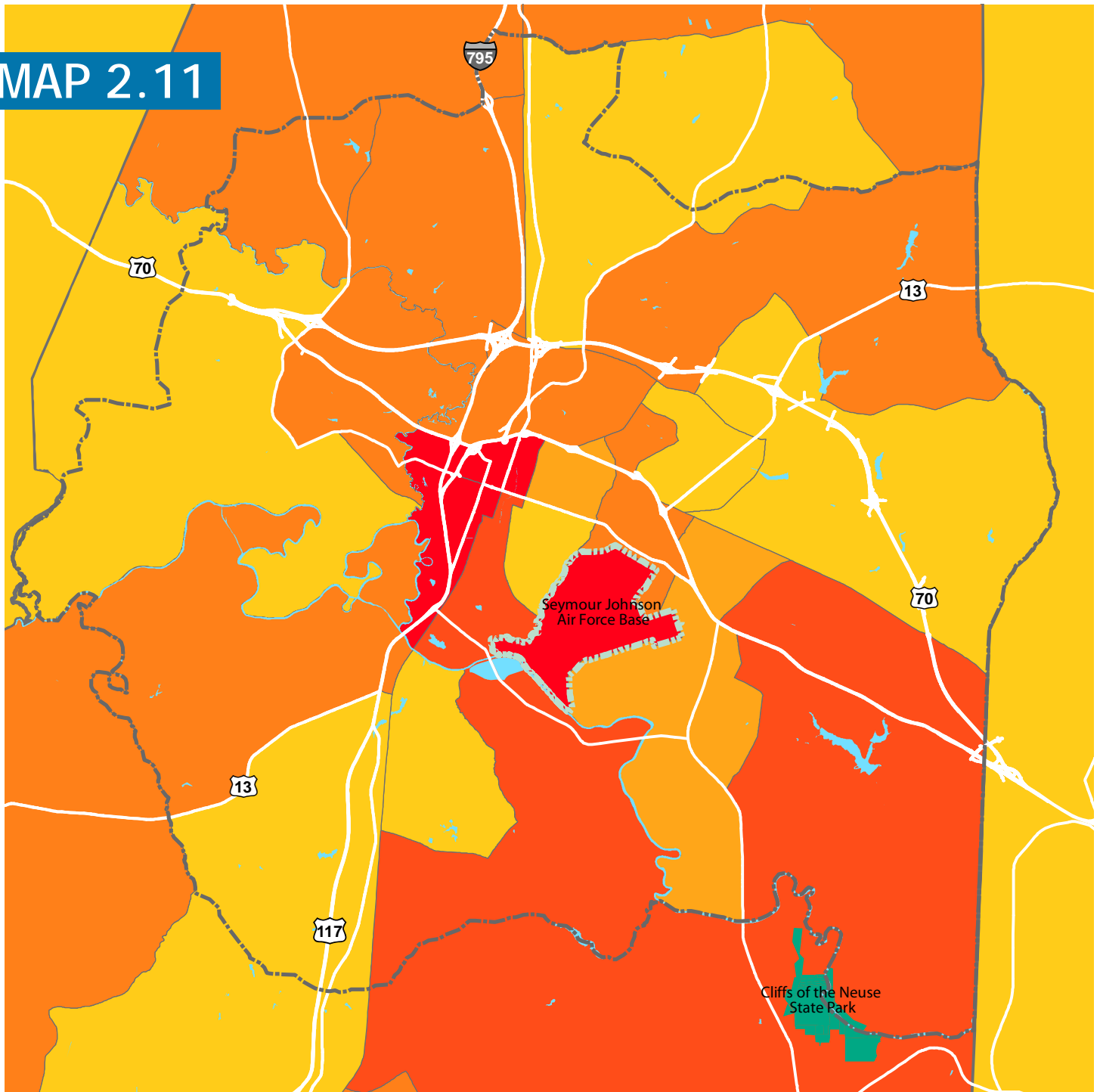
Model cities in the US and NC, as compared to the Goldsboro MPO



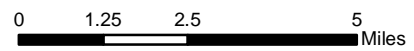
Source: US Census 5-year ACS (2008-2012).



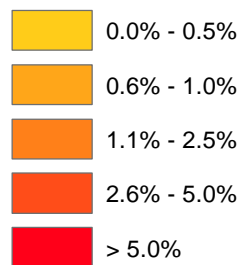
# MAP 2.11



### Walk to Work Mode Share



#### Percent Walk to Work

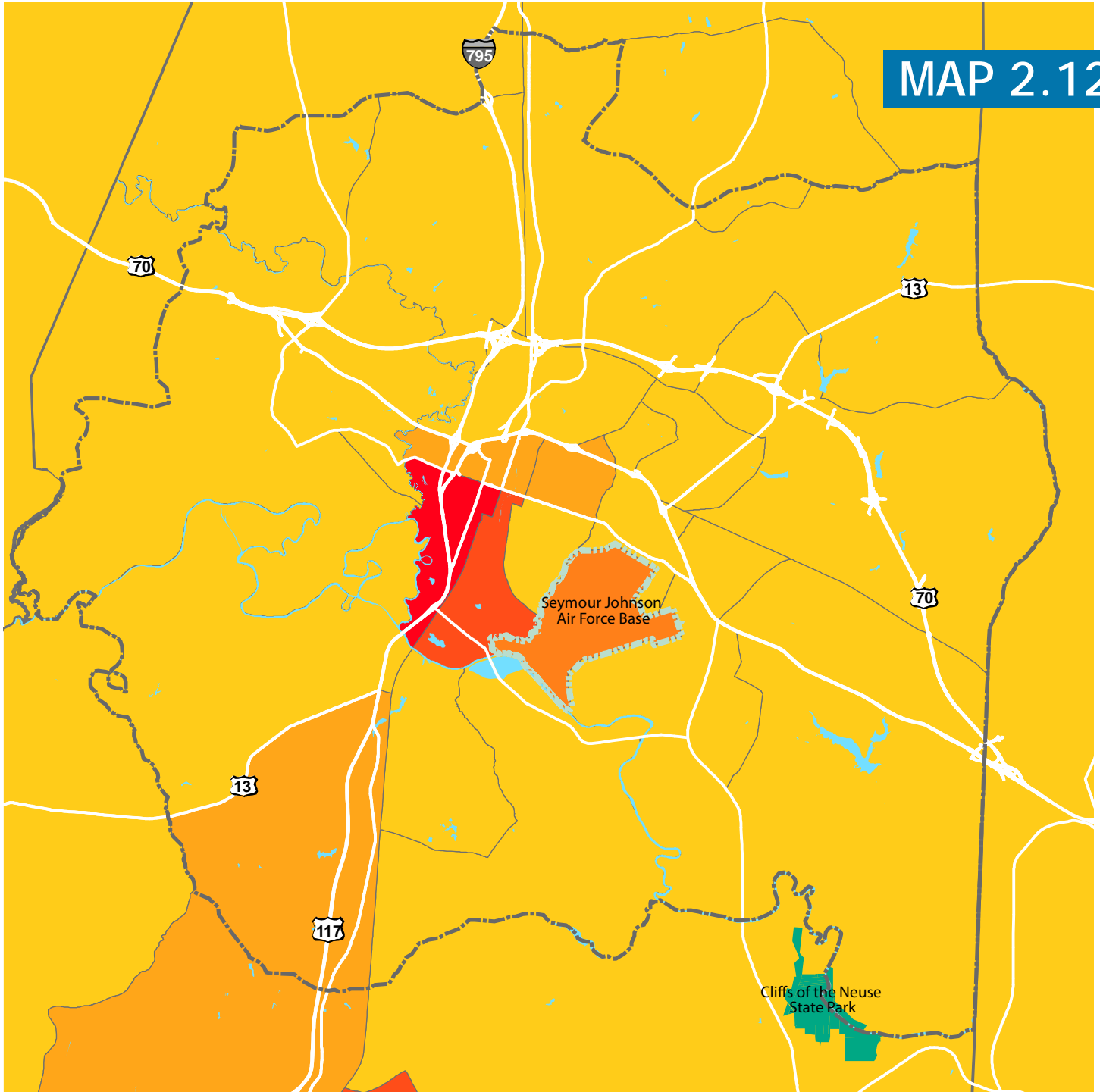


#### Legend





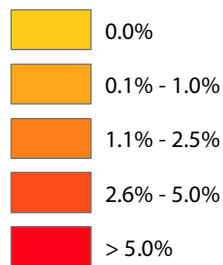
MAP 2.12



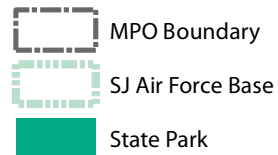
Bike to Work Mode Share



Percent Bike to Work



Legend



### *Live/Work/Play Analysis map*

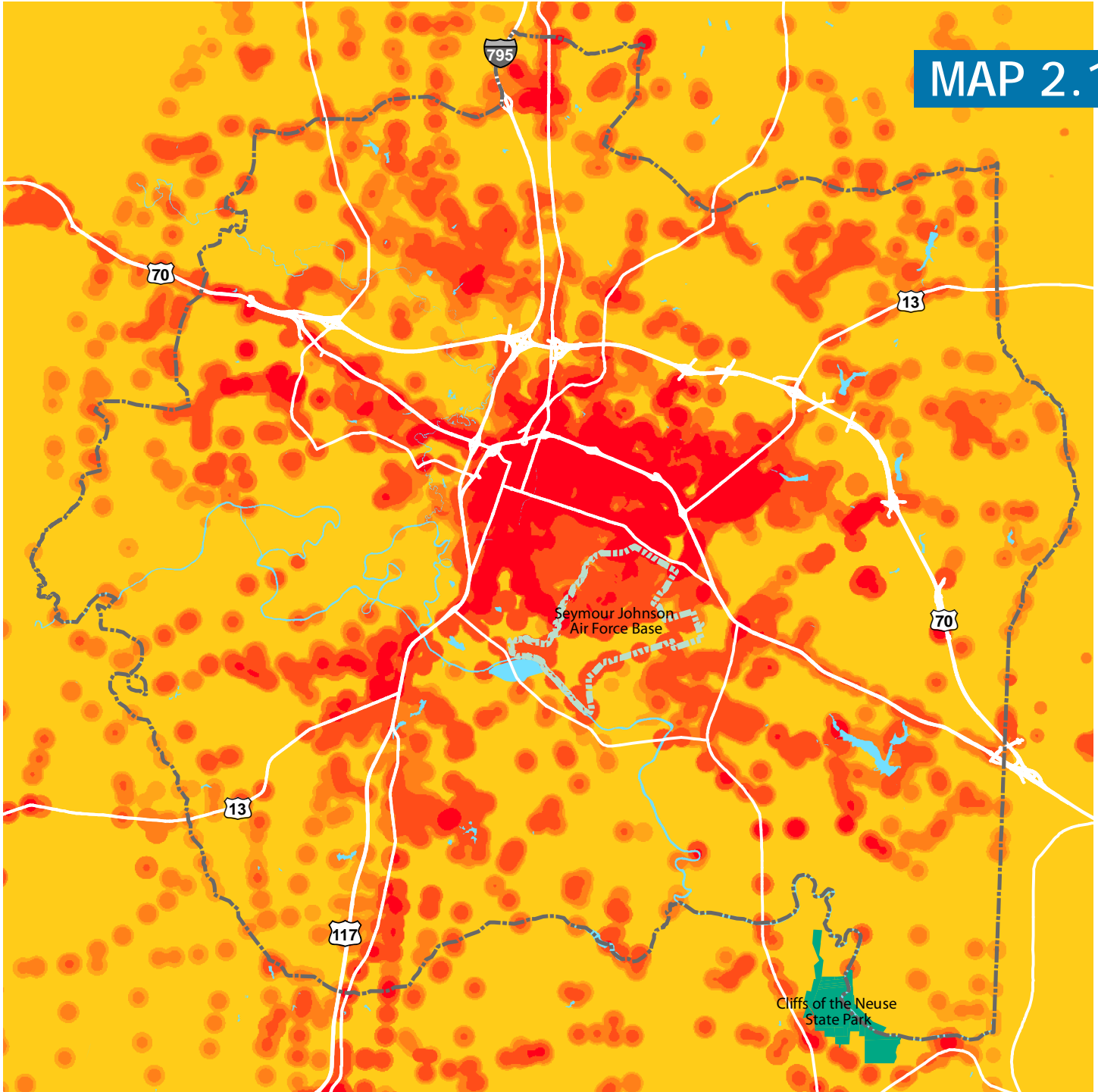
One way to evaluate pedestrian and bicycle demand in a given area is to examine the many places to which people travel and how they get there. A Live/Work/Play Analysis does just that by aggregating information on where people live (population density), work (employment density), access transit (location of bus stops), learn (location of schools and colleges), and play (location of popular destinations such as parks, shopping centers, restaurants, hotels, historic destinations, and others). Where there is a high density of all of these factors, we can expect that there will be a greater demand for walking and bicycling. The composite Live/Work/Play map (Map 2.13) shows where in the Goldsboro MPO bicycle and pedestrian demand is expected to be highest. **The greatest levels of demand for bicycling and walking are in central Goldsboro, including downtown, as well as northern Goldsboro, Pikeville, and along Highway 70 and Highway 13/Berkeley Boulevard.** To read the complete Live/Work/Play analysis report, please see Appendix H.



Children walking at intersection of Mulberry Street and Daisy Street. This is an area of high demand for walking and bicycling.



MAP 2.13



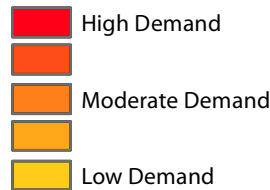
### Composite Demand Analysis

The Composite Demand Map incorporates the following drivers of bicycle and pedestrian activity:

- 1) Where People Live
- 2) Where People Work
- 3) Where People Play
- 4) Where People Access Transit

#### Composite Demand

**Live + Work + Learn + Play + Transit**



#### Legend



### Footpaths Map

Footpaths provide an effective way to observe pedestrian demand because they are visible, on the ground indicators of where people walk on a regular basis. Footpaths exist in places where there is no sidewalk or trail, yet people walk frequently anyway, creating worn paths. During the fieldwork phase of this project, the fieldwork team took notes and pictures of visible footpaths throughout Goldsboro and then mapped the results to show where people are currently walking without a paved sidewalk or trail. Map 2.14 shows the locations of these footpaths. **Over 11 miles of footpaths were observed in Goldsboro during fieldwork and through remote analysis.** These dirt paths indicate that many people are likely walking out of necessity in these areas to reach important destinations. These gaps in the pedestrian network provide clues as to where safer and more comfortable pedestrian connections are needed throughout town.



From left to right: Wayne Memorial Drive at Royall Avenue, George Street, Royall Avenue at Carolina Street

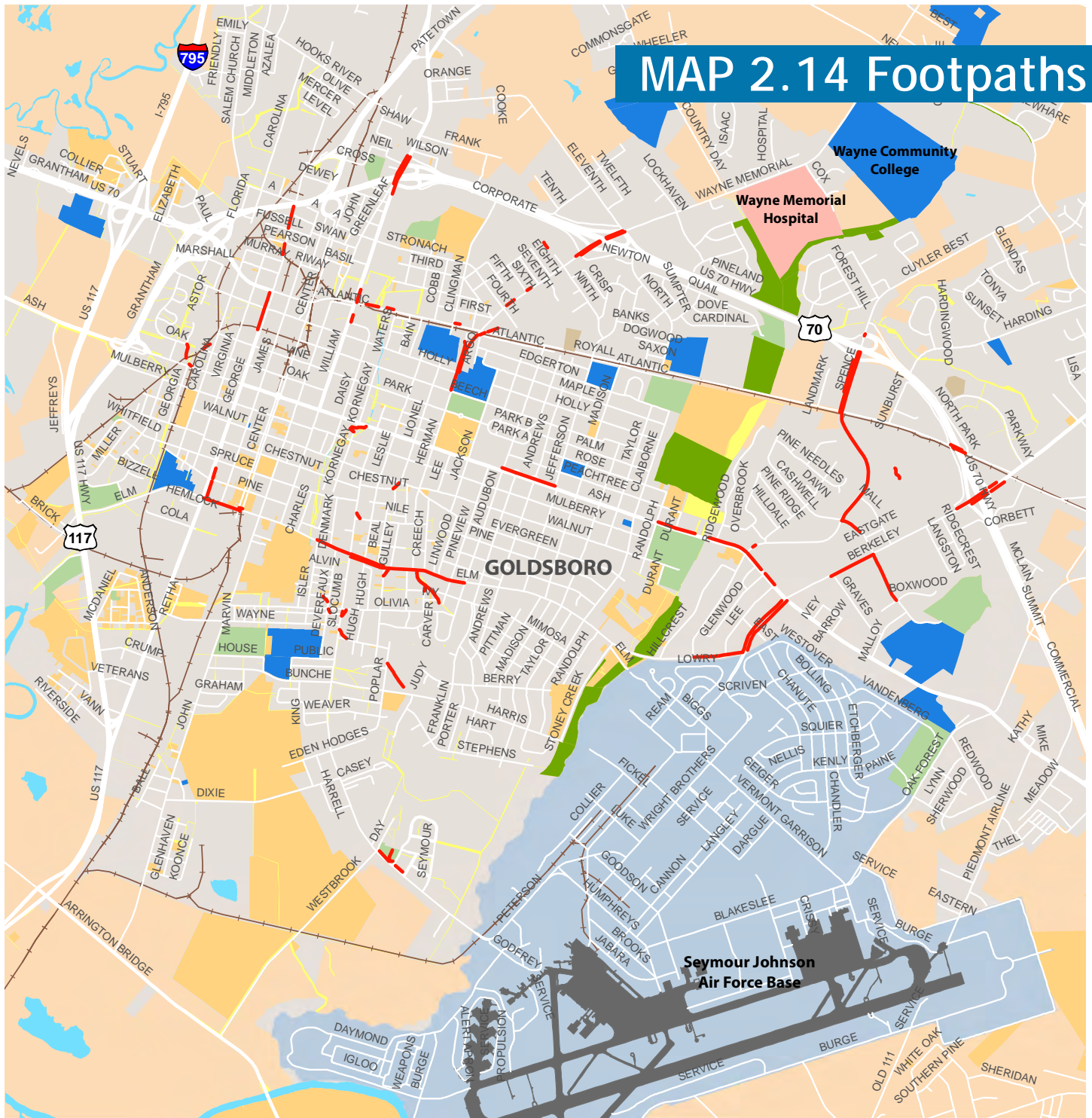


Footpath being used at Slocumb and Olivia (courtesy: Google Streetview).





# MAP 2.14 Footpaths



## Footpaths - Downtown



### Legend

#### Observed Footpaths

— Footpaths

#### Existing Infrastructure

— Roadway

— Railroad

#### Lands of Interest

— City Greenway Lands

— Park

— State Park

— Schools

— Hospital

— Other Destinations

— City Easements

— Other City/County Property

#### Additional Context

— Water Features

— Seymour Johnson Air Force Base

— City Limits

— MPO Limits

— Wayne County Border







# Chapter 3: Greenway Network

## Chapter Contents:

*Overview*

*Methodology for  
Greenway Network Design*

*Greenway Types*

*Recommended  
Greenway Network*

*The Stoney Creek  
Greenway*

*The 'Ditch' Greenway*

*The Mountains-to-Sea Trail*

*The Little River Trail*

## OVERVIEW

For the purposes of this Plan, the greenway network refers to natural areas containing walkways and bikeways that are separated from the roadway. It does include sidepaths which may, at times, be within the roadway right-of-way. The greenway network types are woodland/natural surface hiking trails, unpaved improved trails, shared-use, paved greenways, and mountain bike trails largely determined by existing land use and anticipated human use. The four key greenway spines identified in this Plan are the Mountains-to-Sea Trail (MST), Stoney Creek Greenway, Little River Trail, and the "Ditch" greenway. Greenways are an essential part of a comprehensive walking and biking network due to their attractiveness and desirability to a wide range of users, safety, and ease of use. This chapter describes the greenway types, includes the greenway network maps, and features individual greenway sections with additional mapping and cost estimates.



Older Mountains-to-Sea Trail (MST) signage along Stoney Creek. The MST was designated along the Stoney Creek in the 1991.

## METHODOLOGY FOR GREENWAY NETWORK DESIGN

The recommended greenway network was designed for all types of trail users with a special focus on providing a connected network of hiking trails, unpaved greenway trails, and shared-use paved greenways. The network was developed based on Steering Committee input, public input, NCDOT Division input, recommendations from previous studies, noted destinations, presence of existing local and regional greenway projects, and field analyses.



### The Hub + Spokes Model

The image at left shows some of the key components for the overall bicycle, pedestrian and trail network based on a model of hubs (destinations) and spokes (walking and bicycling corridors).

The image below *conceptually* shows how this model of hubs and spokes could be applied in Goldsboro, NC, with a network of complete streets (in grey) and greenways (in green) connecting key destinations throughout the city. **Keep in mind the map below only conceptually shows these linkages. See maps on the following pages for actual greenway network recommendations.**





## GREENWAY TYPES

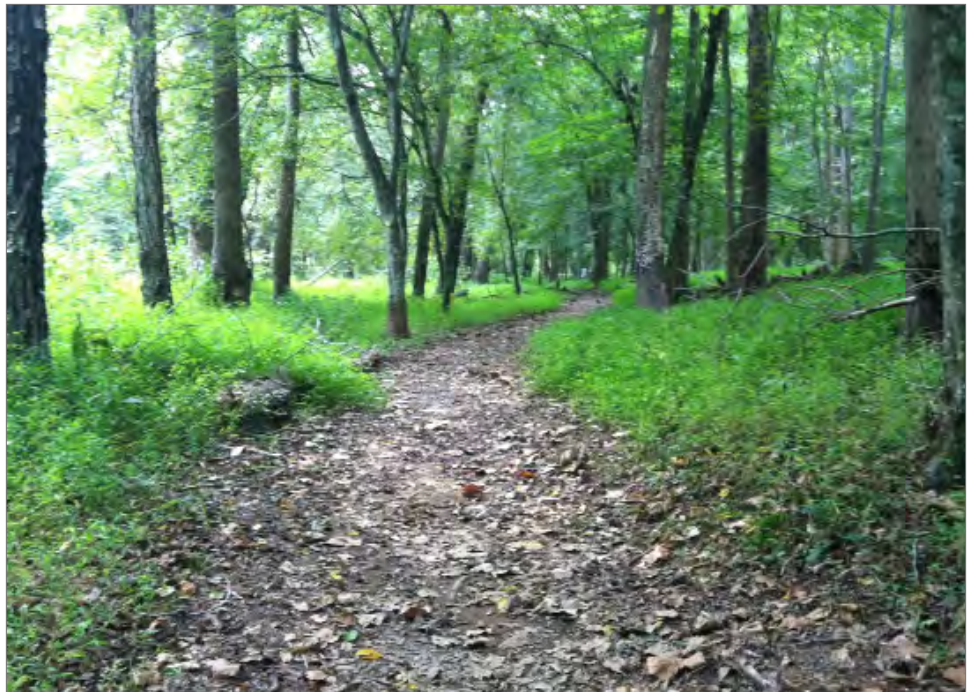
### Type I: Hiking Trails

For this study, hiking trails are defined as natural surface trails generally with soft surface and minimal improvements. The width is typically 1.5-4 feet. Examples in this study include the rural sections of the Mountains-to-Sea Trail.

Hiking trail in Greensboro, NC.



Mountains-to-Sea Trail at Eno River State Park in Durham, NC



## Type II: Unpaved, Improved Greenway Trails

For this study, Improved Greenway Trails refer to improved, unpaved trails generally with gravel composite. The width is typically 8-12 feet. Examples in this study include sections of the Stoney Creek Greenway and the Mountains-to-Sea Trail.



The Wake County, NC section of the American Tobacco Trail



The Virginia Creeper Trail near Damascus, VA



### Type III: Shared-use Paved Greenways

For this study, Shared-use Paved Greenways refer to paved pathways meant for a mix of bicycle and pedestrian traffic. These greenways can be used effectively for both recreation and transportation. The width is typically 10-14 feet. Examples in this study include sections of the Stoney Creek Greenway, the “Ditch” greenway, and other urban/suburban sections.

The Tar River  
Greenway in  
Greenville, NC



The City of  
Durham  
section of the  
American  
Tobacco Trail





### Type IV: Mountain Bike Trails

Mountain bike trails are trails specially constructed for mountain biking. Trails may be single track or wider. The existing Goldsboro mountain bike trails can be found in Stoney Creek Park North.



Blue Clay Mountain Bike Park in Wilmington, NC (Photocourtesyof <http://sirbikesalot.com/>).

## RECOMMENDED GREENWAY NETWORK

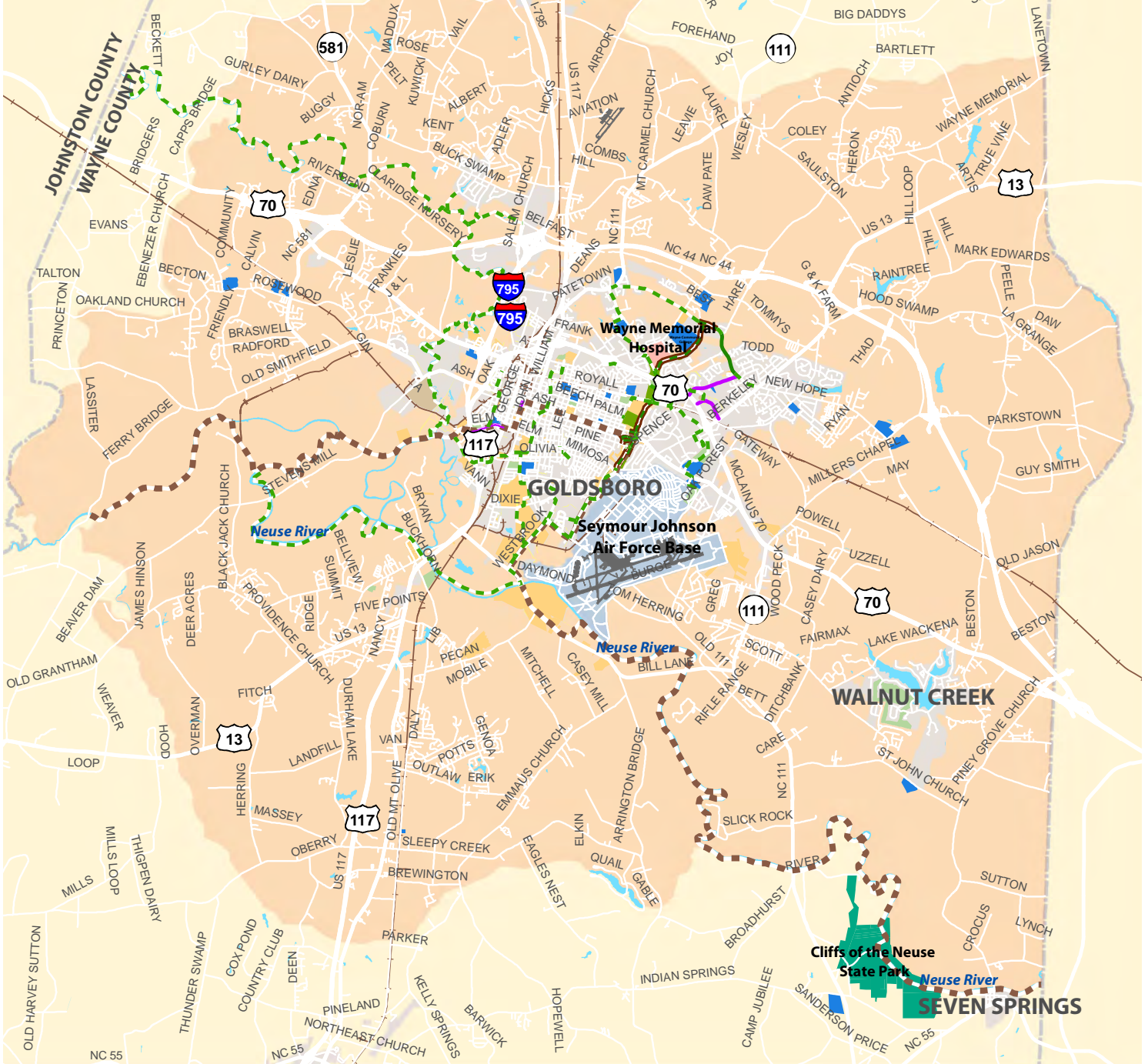
The recommended greenway network connects existing greenways, schools, parks, neighborhoods, and other destinations while also linking to existing and recommended bikeways and walkways (described in Chapters 4 and 5). Some greenways are short but make key connections between communities. The Stoney Creek Greenway traverses Goldsboro as a regional destination while the Mountains-to-Sea Trail is a statewide trail that connects the Appalachians to the Outer Banks. The total mileage of recommended greenways is featured in the table below. The major spine and priority greenways are described by cutsheet and segment map starting on page 3-10. Maps of the recommended greenway network are portrayed in Maps 3.1 and 3.2.

<i>Greenway Type</i>	<i>Mileage</i>
Type I: Hiking Trails	41.3
Type II: Improved, Unpaved Trails	14.3
Type III: Paved Shared-use Trails	26.2
Type IV: Mountain Bike Trails	(Maintain/expand)





# MAP 3.1 RECOMMENDED GREENWAY NETWORK



## Recommended Greenway Facilities - MPO



### Legend

#### Recommended Greenways

- Shared-Use Path

#### Existing Infrastructure

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

#### Lands of Interest

- City Greenway Lands
- Park
- State Park
- Schools
- Hospital
- Other Destinations
- City Easements

#### Additional Context

- Water Bodies
- Proposed Mountains-to-Sea Trail Alignment
- Seymour Johnson Air Force Base
- City Limits
- MPO Limits
- Wayne County Border





# MAP 3.2 RECOMMENDED GREENWAY NETWORK (DOWNTOWN)



### Recommended Greenway Facilities - Downtown



#### Legend

##### Recommended Greenways

- HAWK Signal
- Shared-Use Path

##### Existing Infrastructure

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

##### Lands of Interest

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

##### Additional Context

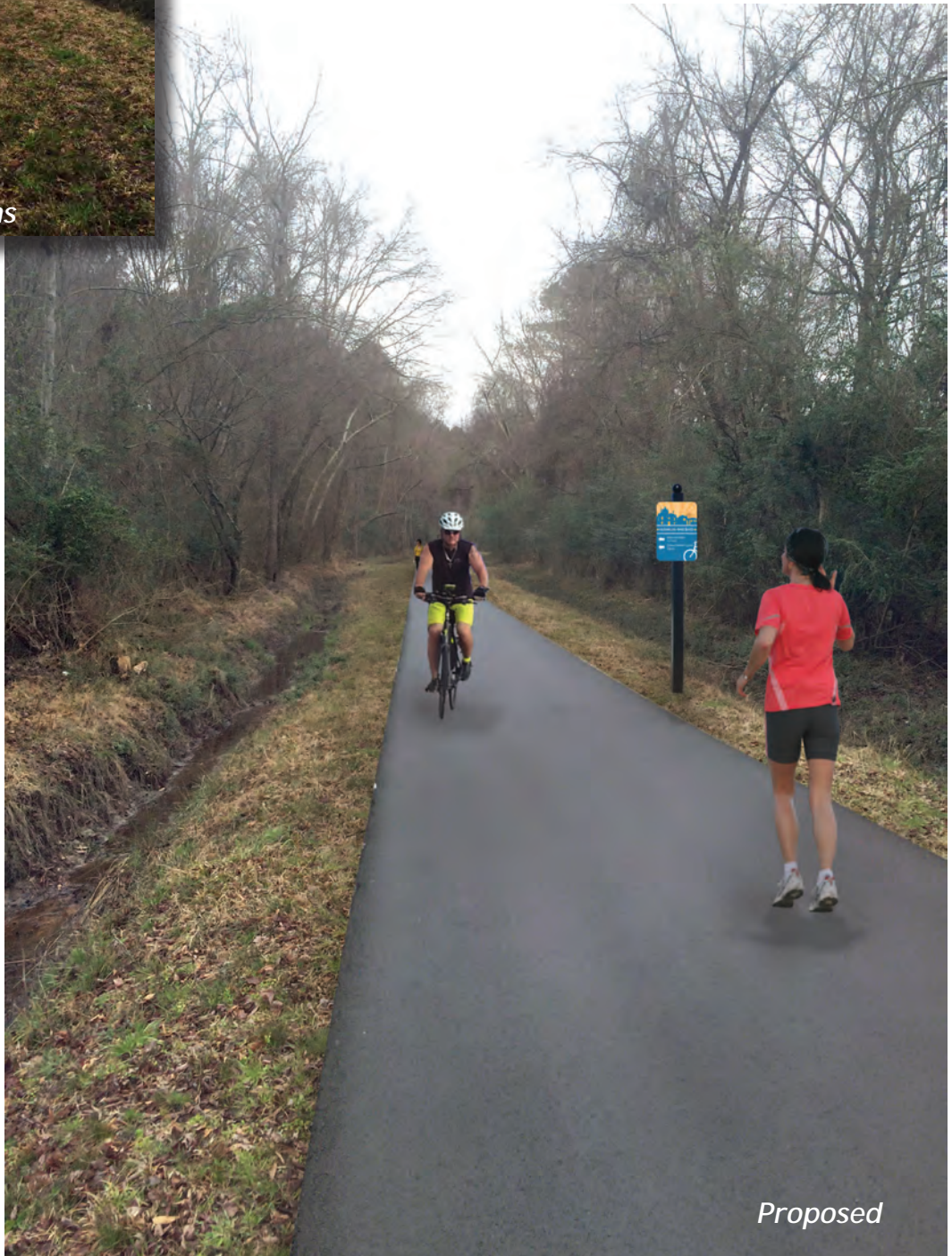
- Proposed Mountains-to-Sea Trail Alignment
- Water Features
- Seymour Johnson AFB
- City Limits
- MPO Limits





*Existing Conditions*

A photo visualization of a section of the Stoney Creek Greenway south of Elm Street. See Stoney Creek Segment 3 on page 3-14 for more information on this section.



*Proposed*



## STONEY CREEK GREENWAY SECTION 1

**Trail Distance:** 1.31 miles/6,916 feet

**Trail Type/Surface:** Type III. This section of trail will be predominantly asphalt with the potential of boardwalk and/or concrete as the trail nears the hospital. The material surface will be dictated by the floodway/floodplain and subsurface conditions.

### Overview

The Stoney Creek Greenway was identified as number one priority in the 2012 Goldsboro Parks and Recreation Master Plan Update. Section One is the northernmost section of the proposed Stoney Creek trail and is located along Reedy Branch; it begins at New Hope Road continuing south to Highway 70 along Reedy Branch where it intersects Stoney Creek south of the Hospital. This is a critical connection as it links several neighborhoods, churches, the Wayne County Community College, and Wayne Memorial Hospital to each other and the trail. A direct connection should be formalized from this section of greenway to the Wayne Community College trails and Wayne Memorial Hospital.

### Planning-Level Cost Estimate

The cost for trail construction only (based on an average cost of \$500K/mile) comes to \$655,000. Other major costs related to this project could include substantial sections of boardwalk in wetter areas. This could raise cost dramatically.

### Recommended Next Steps

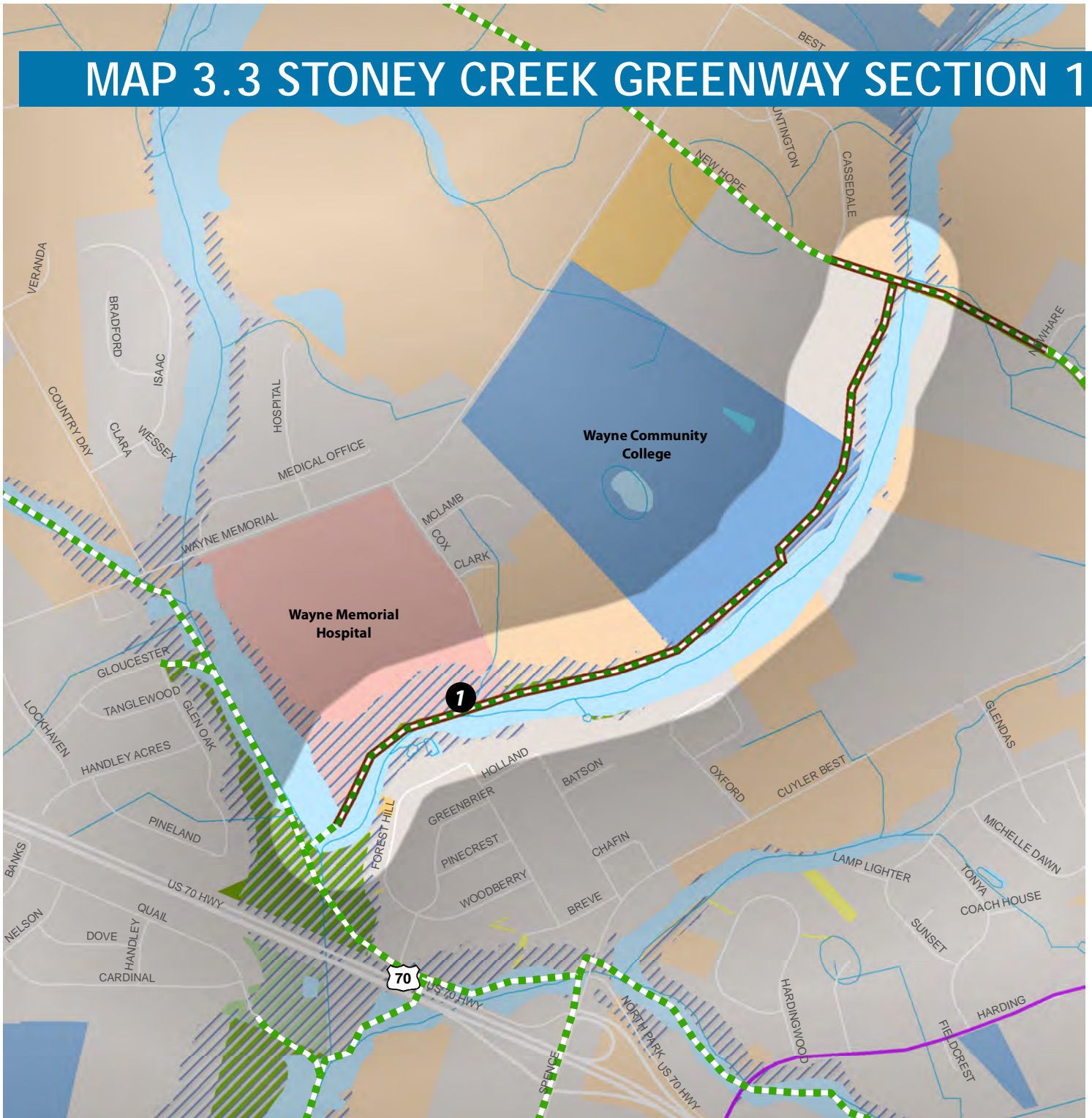
- Conduct delineation of floodway and floodplain to determine permit requirements
- Conduct geotechnical investigation to determine material needs and trail cross-section
- Secure partnerships from adjacent landowners for funding and grant application (the Community College and the Hospital).



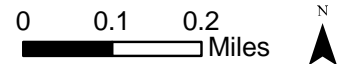
Cleared easement behind Hospital on wet, winter day. After further analysis and delineation, boardwalk may be the best, sustainable surface for portions of this trail.



# MAP 3.3 STONEY CREEK GREENWAY SECTION 1



Stoney Creek Greenway - Section 1



**Legend**

**Recommended Greenways**

- Shared-Use Path

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

**Additional Context**

- Water Features
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits
- MPO Limits





## STONEY CREEK GREENWAY SECTION 2

**Trail Distance:** 1.29 miles/6,811 feet

**Trail Type/Surface:** Type III. Asphalt with a Pedestrian Bridge Crossing over Stoney Creek (Phase 1); Phase 2 would include a Pedestrian Bridge of Highway 70

### Overview

Section Two begins at Highway 70 and continues south to Ash Street. This section has several challenges, including the crossing of Highway 70, Royall Street, and an existing railroad bridge. Once south of the railroad, there is a clear connection established to Ash Street that will link to existing neighborhoods, parks, and the mountain biking trails accessed from East Peachtree Street. These connections were identified in the Parks and Recreation Master Plan Update as an integral link to making recreation accessible to all users. It is proposed that the crossing of Highway 70 be developed in phases, first using either the existing Spence Street Bridge (and creating a sidepath along Spence to Royall) or connecting to Wayne Memorial Drive, using the Wayne Memorial/US 70 Bridge, and connecting back along Quail Drive. Not only will this provide a temporary connection, but it will improve access to existing commercial destinations where pedestrian, bike, and vehicular conflict currently exists. A controlled intersection at Spence and Royall would also be needed. The proposed trail is located within exiting utility easements south of Royall and the railroad bridge. A pedestrian bridge is needed to cross Stoney Creek. Phase 2 of this connection would be planning for a bridge crossing over Highway 70, under the existing railroad, and completing a study to provide a controlled crossing at Stoney Creek and Royall Street.

### Planning-Level Cost Estimate

The cost for trail construction only (based on an average cost of \$500K/mile) comes to \$645,000 (alignment along creek not including bridge). An overpass over US70 would likely cost \$2-4 million. Other major costs related to this project would include alternative routing as described above.

### Recommended Next Steps

- Coordinate with NCDOT on future Pedestrian Crossing over Highway 70.
- Begin discussions and coordination efforts with the railroad on future rail line improvements to accommodate a trail under the bridge.
- Complete a study on the best alternative routing to US 70 Bike/Ped-Only Overpass.



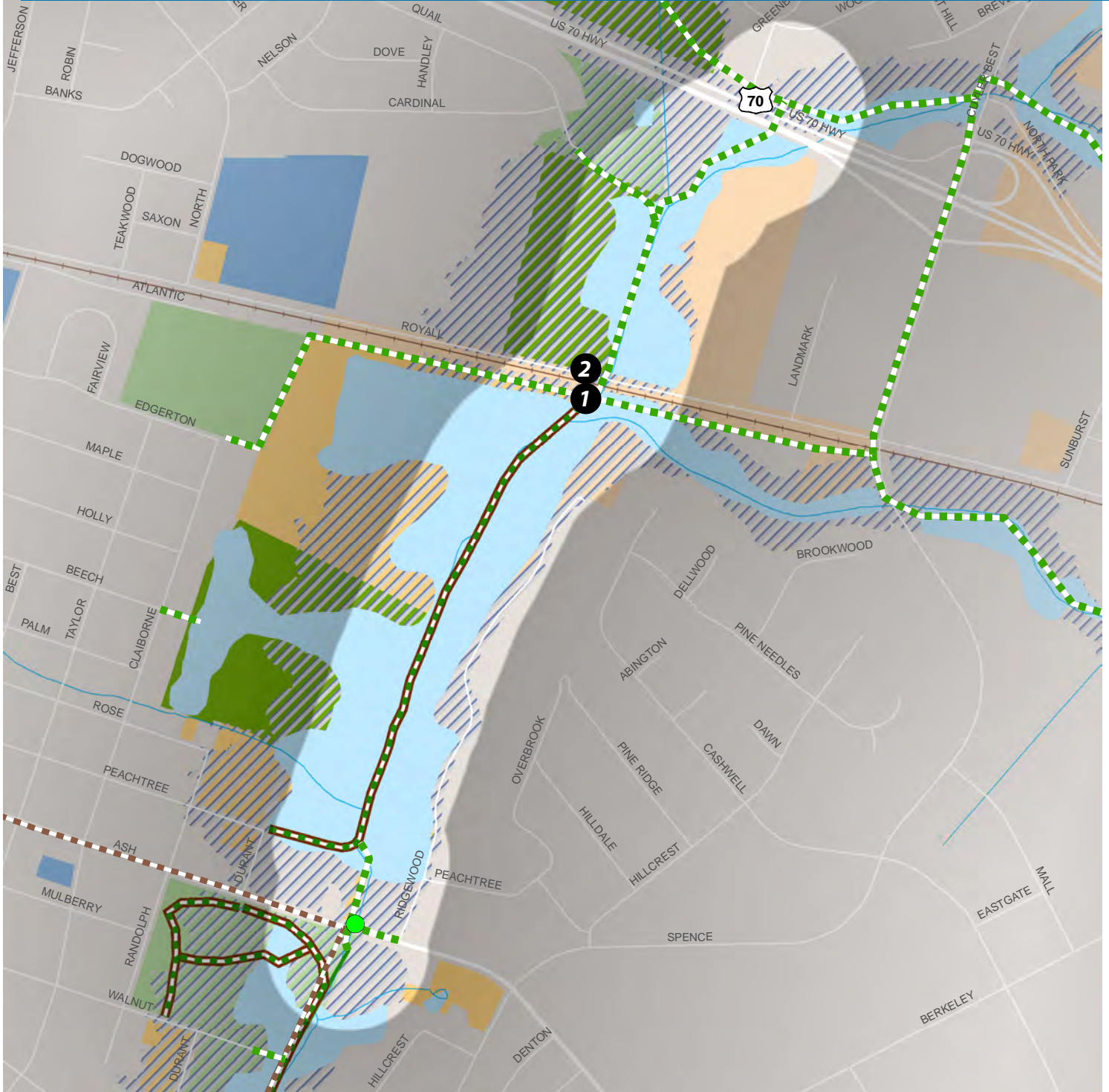
Left: One of the major obstacles for the Stoney Creek Greenway are the Royall Avenue and Railroad bridge crossings of the creek. The crossing will require further study or should be improved with any upgrades to the railroad bridge or roadway.

Right: These sewer easement north of Royall is ideal for the greenway.

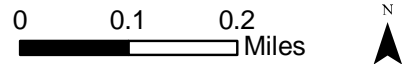




# MAP 3.4 STONEY CREEK GREENWAY SECTION 2



Stoney Creek Greenway - Section 2



**Legend**

**Recommended Greenways**

- Shared-Use Path
- HAWK Signal

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- Other City/County Property

**Additional Context**

- Proposed Mountains-to-Sea
- Trail Alignment
- Water Features
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits
- MPO





## STONEY CREEK GREENWAY SECTION 3

**Trail Distance:** 0.76 miles/4,013 feet

**Trail Type/Surface:** Type III. Asphalt

### Overview

Section three begins at Ash Street and runs south through Stoney Creek Park (a portion of this trail has already been constructed) to Elm Street. A HAWK signal is recommended as the at-grade crossing of Ash Street which would provide a major connection along Stoney Creek connecting parks and neighborhoods. The paved park trail should continue south to Elm Street. A HAWK signal crossing is also recommended at Elm, east of Stoney Creek Parkway. There are multiple east-west connections that can be made for improved neighborhood access to the park and trail such as E. Evergreen Avenue and E. Pine Street.

### Planning-Level Cost Estimate

The cost for trail construction only (based on an average cost of \$500K/mile) comes to \$200,000 given that portions of this trail have been completed. Other major costs related to this project would include the HAWK signals (\$125,000 per signal).

### Recommended Next Steps

- Secure funding to pave this section as the majority of the easements are already in place.
- Provide neighborhood links to the greenway trail from the dead end roads that exist west to east along this portion of trail.
- Secure any necessary easements that may be needed to provide an at grade crossing (HAWK signal) at Elm Street near Stoney Creek Parkway.
- Coordinate with Public Works regarding any sewer line work in this section.



The recommended HAWK signal at Ash Street would provide a well-defined and safe crossing for the Stoney Creek Greenway







# MAP 3.5 STONEY CREEK GREENWAY SECTION 3



Stoney Creek Greenway - Section 3

**Legend**

**Recommended Greenways**

- Shared-Use Path
- HAWK Signal

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- Other City/County Property

**Additional Context**

- Proposed Mountains-to-Sea
- Trail Alignment
- Water Features
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits
- MPO Limits





## STONEY CREEK GREENWAY SECTION 4

**Trail Distance:** 1.71 miles/9,029 feet

**Trail Type/Surface:** Type III. Asphalt and/or concrete depending on floodway/floodplain and subsurface conditions.

### Overview

Section 4 Starts at Elm Street which will require an at-grade crossing (HAWK signal mentioned in Section 3 Overview). The proposed corridor continues south to Slocumb Street along publicly-owned land and sewer easement. The City owns a tract of land at Elm and Stoney Creek and it is recommended this be utilized as a trail head for the Stoney Creek Greenway. This section was previously designated as a Mountains-to -Sea Trail (MST) route and remains a priority. It will connect several neighborhoods, has historic tobacco barn structures west of the trail, and falls almost entirely within designated utility easements. Additionally, this section is slated for sewer improvements. It is recommended this improvement project partners to obtain access easements where needed and potentially include trail improvements should funding allow. This portion of the trail can help provide a connection between to entrances to Seymour Johnston Air Force Base, Public Housing neighborhoods, and parks.

### Planning-Level Cost Estimate

The cost for trail construction only (based on an average cost of \$500K/mile) comes to \$855,000. Other major costs related to this project could include trailhead development and any sections of trail that may require boardwalk.

### Recommended Next Steps

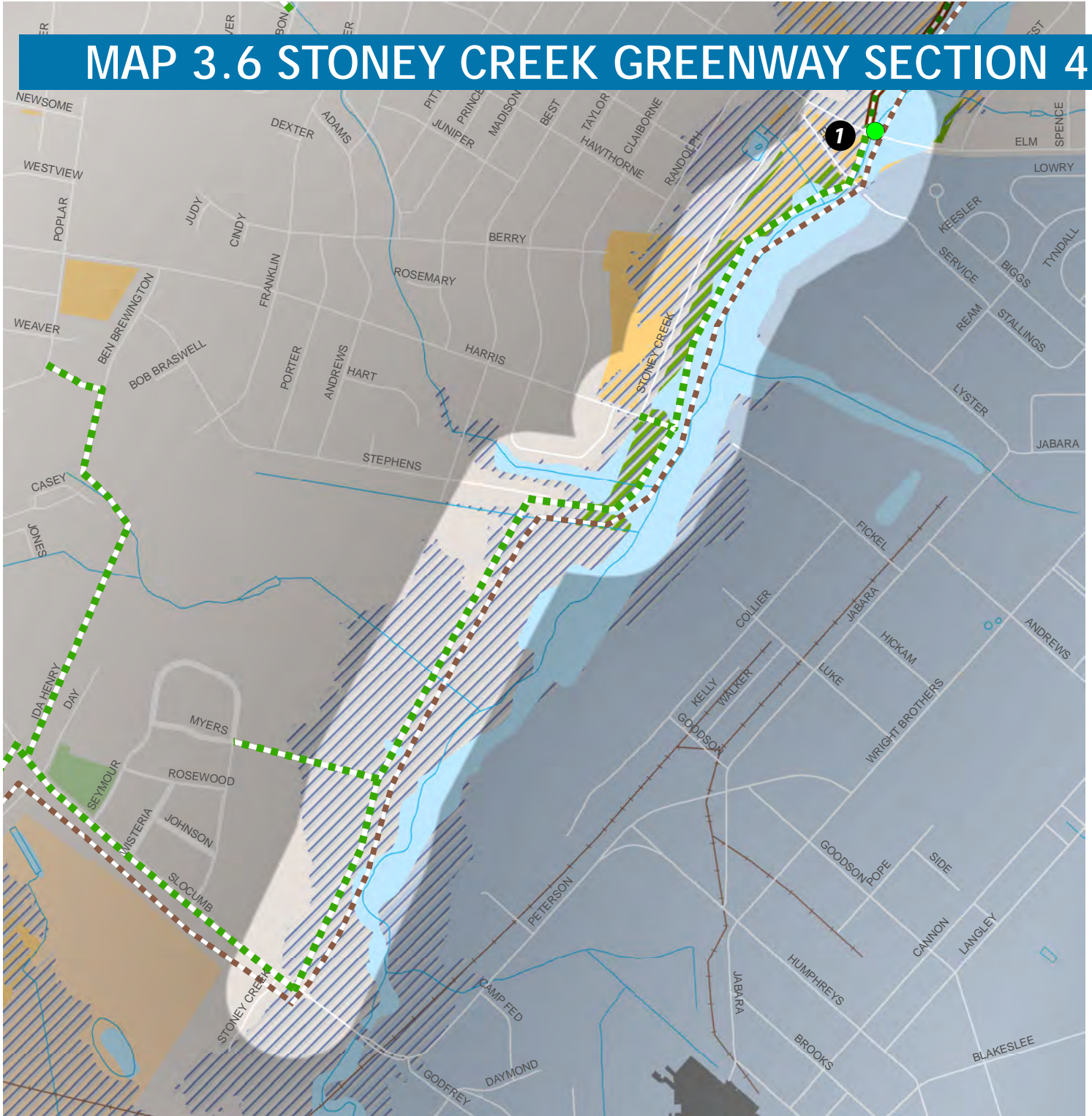
- Coordinate with Public Works on access easements and upcoming trail sewer line projects.
- Work on HAWK signal at Elm and begin planning for trail head at this location.



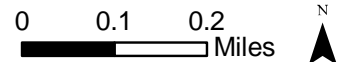
The City-owned parcel on south side of Elm is an ideal location for the trailhead. The HAWK signal would be located near this location across Elm Street.



# MAP 3.6 STONEY CREEK GREENWAY SECTION 4



Stoney Creek Greenway - Section 4



**Legend**

**Recommended Greenways**

- Shared-Use Path
- HAWK Signal

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- Other City/County Property

**Additional Context**

- Proposed Mountains-to-Sea Trail Alignment
- Water Features
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits





## STONEY CREEK GREENWAY SECTION 5

**Trail Distance:** 2.16 miles/11,405 feet

**Trail Type/Surface:** Type III. This section of trail will be asphalt surface using a variety of trail types including multi-use trail and sidepath.

### Overview

The last section is critical as the final link to the future Statewide Mountains-to-Sea Trail (MST) to be located along the Neuse River. This was identified as one of the highest greenway priorities in the 2012 Parks and Recreation Master Plan update. Residents not only wanted to see more connections to the Stoney Creek Greenway, but better access to the greenway, specifically the MST. There are several opportunities to connect to the future MST using publicly owned land along Slocumb, and continuing south along Westbrook Road. The City-constructed wetland and Cherry Farm property located along Westbrook can serve as environmental education opportunities for users.

### Planning-Level Cost Estimate

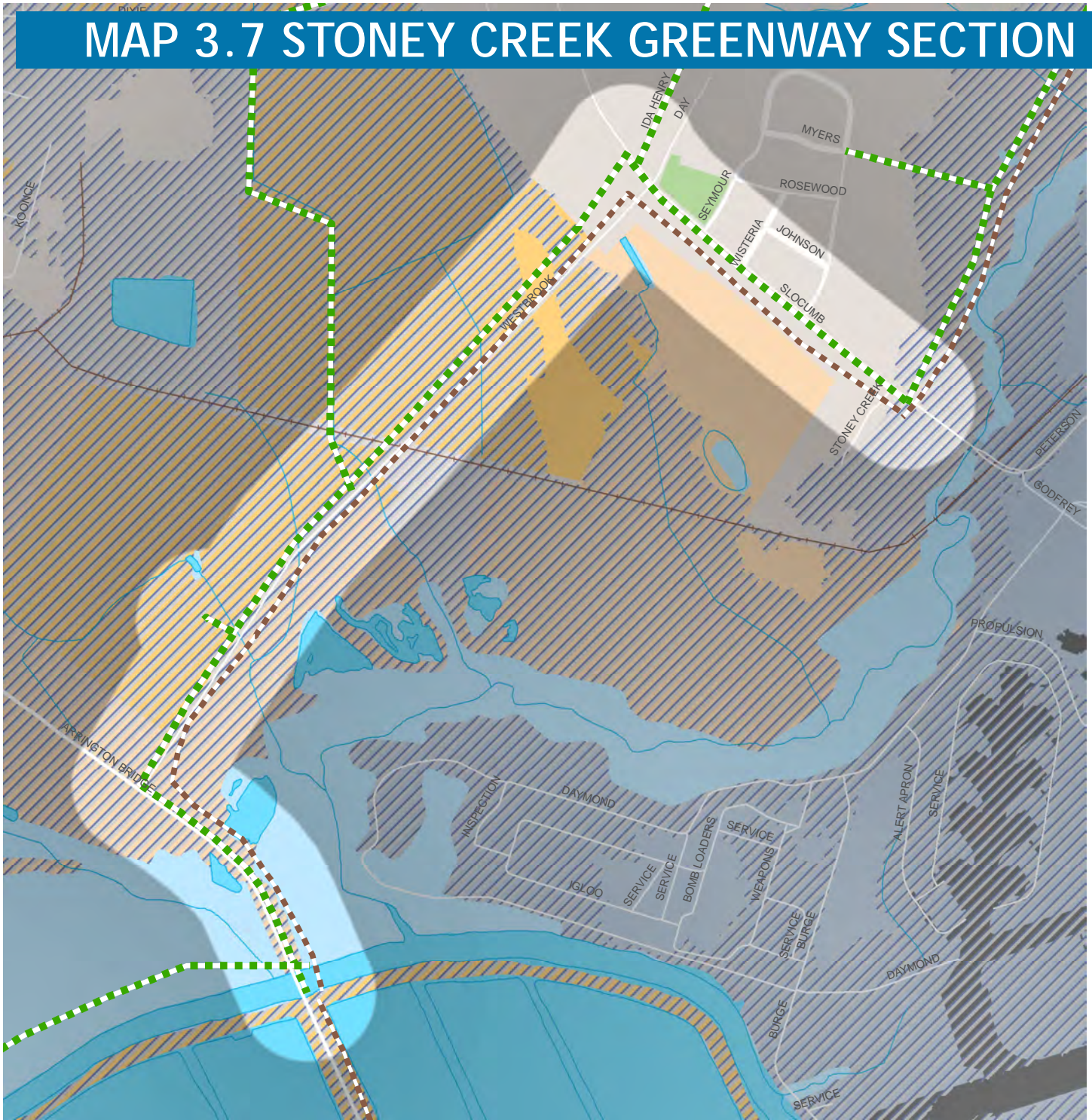
The cost for trail construction only (based on an average cost of \$500K/mile) comes to \$1.08 million. Other major costs related to this project could include some easement acquisition and greenway crossing of Slocumb.

### Recommended Next Steps

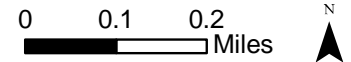
- Obtain easements and determine ROW for sidepath to be located along Slocumb.
- Provide pedestrian crossing improvements at Slocumb and Westbrook.
- Obtain easements and determine ROW for sidepath to be located along Westbrook.
- Provide educational signage and interpretive opportunities at the Cherry Farm site and Constructed Wetland.



# MAP 3.7 STONEY CREEK GREENWAY SECTION 5



Stoney Creek Greenway - Section 5



**Legend**

**Recommended Greenways**

- Shared-Use Path

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- Other City/County Property

**Additional Context**

- Proposed Mountains-to-Sea Trail Alignment
- Water Features
- Water Bodies
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits





## THE “DITCH” GREENWAY SECTION 1

**Trail Distance:** 1.11 miles/5,860 feet

**Trail Type/Surface:** Type III. This section of trail will be asphalt surface using a variety trail types including multi-use trail and possibly on-road sections.

### Overview

The “Ditch” is an existing drainage ditch that runs north-south just east of the core Goldsboro Downtown. A portion of the ditch remains paved and controlled with stormwater conveyed through a concrete channel; a portion of ditch to the south of Elm Street has been restored through Clean Water Management Trust Fund dollars (CWMTF), and another remains open natural channel and not restored. The majority of this channel falls along a sewer easement, public property, or within public housing and can serve as an important, practical, greenway connection. Section One includes the “Ditch” from Peacock Park located along Stronach Avenue south to Ash Street. This section remains an open unimproved channel with opportunity to provide greenway trail in partnership with stream improvements.

### Planning-Level Cost Estimate

The cost for trail construction only (based on an average cost of \$500K/mile) comes to \$550,000. Other major costs related to this project could include roadway crossing improvements, some minor acquisition, and stream restoration efforts.

### Recommended Next Steps

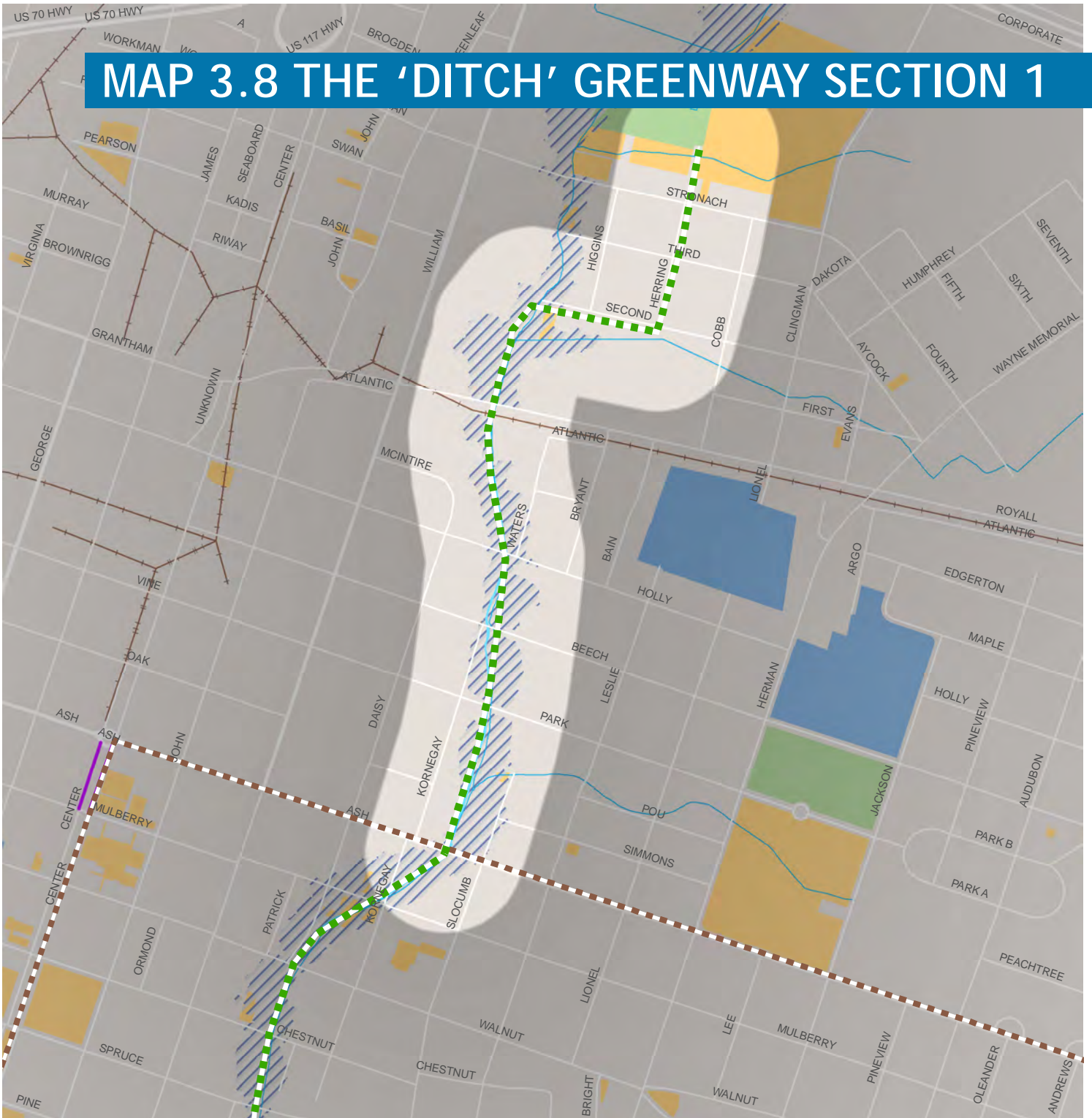
- Examine interdepartmental partnerships for: Stream restoration, Sewer line and utility repair, and greenway trail.
- Obtain any access easements where needed.
- Study best methods for crossing east-west roadways including pedestrian crossing improvements at Royall.
- Determine portions of trail that may need to utilize roadway for one or multiple blocks due to constraints or space issues directly along creek.



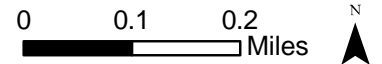
Portion of the “Ditch” with concrete channel through a public housing area at Elm Street.



# MAP 3.8 THE 'DITCH' GREENWAY SECTION 1



The "Ditch" Greenway - Section 1



**Legend**

**Recommended Greenways**

- Shared-Use Path

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- Other City/County Property

**Additional Context**

- Proposed Mountains-to-Sea Trail Alignment
- Water Features
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits
- MPO Limits



## THE “DITCH” GREENWAY SECTION 2

**Trail Distance:** 1.65 miles/8,712 feet

**Trail Type/Surface:** Type III and II. This section of trail will be asphalt surface through cemetery and possibly crushed gravel (Type II) west of cemetery.

### Overview

This section of trail runs from Ash Street south to Highway 117 with several opportunities to provide park improvements and greenway trails connecting neighborhoods, commercial areas, public housing, and parks. The ditch is channelized from Ash to Elm and is situated along roads, behind homes, and within public housing communities. There is an opportunity to connect along the channel and to study opportunities for restoration of the channel to a natural state, in partnership with providing public access. From Elm to Highway 117, the channel has been partially restored and has adjacent open space perfect for providing greenway trail. There is an adjacent cemetery that could be utilized for historic interpretation and two FEMA buyout neighborhoods with the potential for public park space (one site is currently being used as a community garden). In addition, a greenway spur is recommended from the cemetery to Mina Weil Park and Dillard Middle School utilizing Sycamore Street and possibly requiring an easement.

### Planning-Level Cost Estimate

The cost for trail construction only (based on an average cost of \$500K/mile) comes to \$825,000.

### Recommended Next Steps

- Create a detailed map of existing public easements and public land.
- Evaluate opportunities for stream restoration and grants for completing these studies and restoration work.
- Evaluate land use potential for current publicly owned land from Elm to Highway 117.
- Determine appropriate crossing facility for crossing George and John.

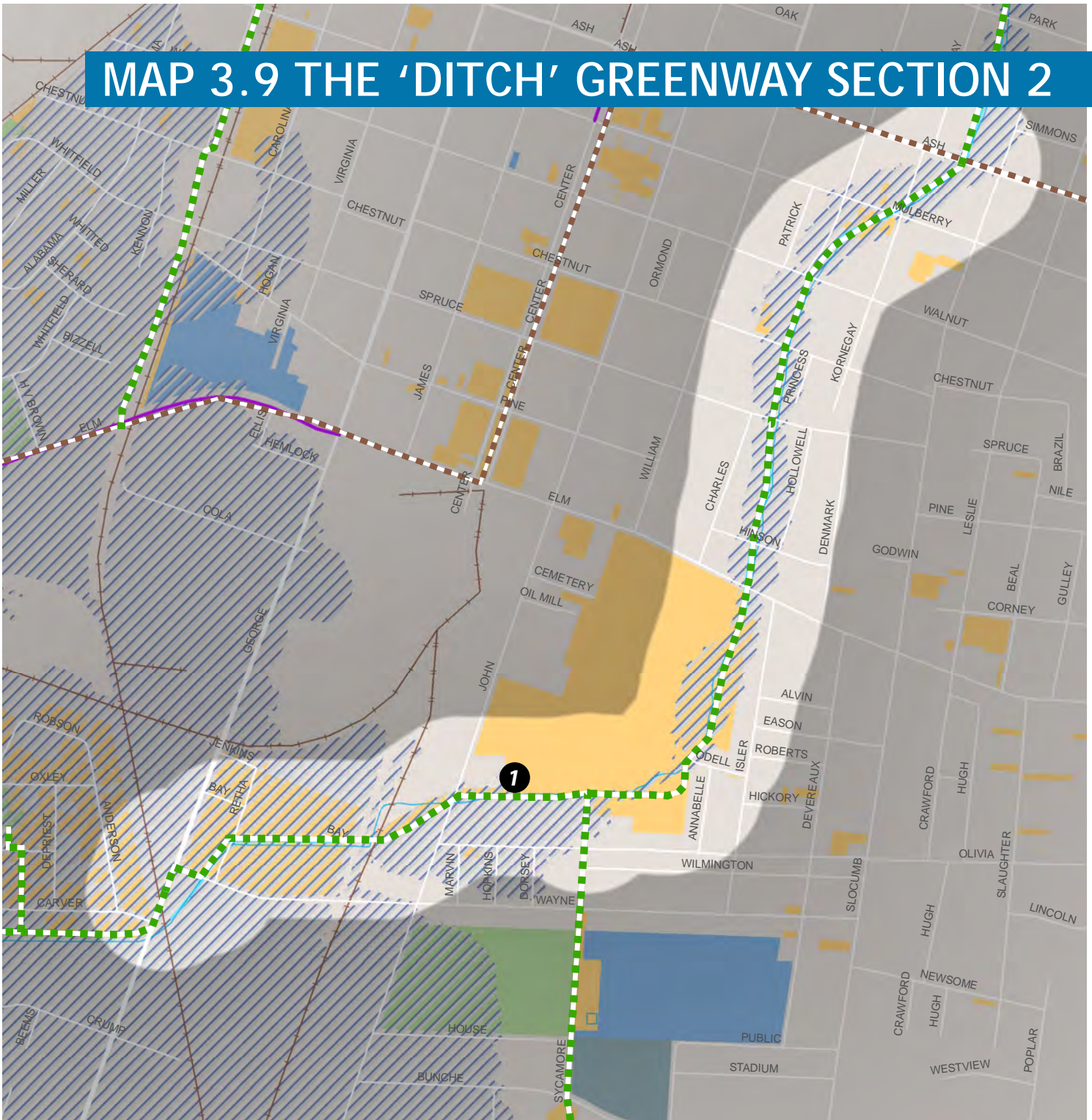


The archway of crape myrtles provides an opportunity for a scenic stretch of this greenway on the south side of the cemetery.

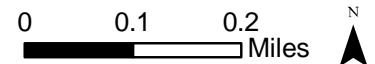




# MAP 3.9 THE 'DITCH' GREENWAY SECTION 2



The "Ditch" Greenway - Section 2



**Legend**

**Recommended Greenways**

- Shared-Use Path

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- Other City/County Property

**Additional Context**

- Proposed Mountains-to-Sea Trail Alignment
- Water Features
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits
- MPO Limits





## MOUNTAINS-TO-SEA TRAIL SECTION 1

**Trail Distance:** 9.95 miles/52,536 feet

**Trail Type/Surface:** Type I and II.

### Overview

This Statewide trail can become a valuable tourism asset to Goldsboro. Goldsboro is fortunate to have several boating access locations along the Neuse, as well as publicly owned land that can serve as future blueway support. These features, along with connectivity to Johnston County’s Bentonville Battlefield, will help connect natural, cultural, and historic resources (which was identified as a high priority in the 2012 Parks and Recreation Master Plan Update). The first phase would leave Johnston County on the south side of the Neuse and the Bentonville Battlefield and continue east along the Neuse through Duke Energy property, with the opportunity to link directly into Goldsboro via Waynesborough Historic Village near Highway 117. East of Section 1, the trail would continue east into Goldsboro via on-road bicycle and sidewalk facilities. From Quaker Neck Lake, MST users would have the option of taking a trail spur south and east along the Neuse River.

### Planning-Level Cost Estimate

The cost for trail construction only (based on an average cost of \$100K/mile) comes to \$995,000. Other major costs related to this project would include easement acquisition, bridge crossings, and any sections where boardwalk may be necessary. ***If built on the southern side, the number of privately owned properties it crosses is 76 (six are public).***

### Recommended Next Steps

- Begin a detailed landowner study for acquisition of necessary easements for trail completion.
- Coordinate with large landowners including Duke Energy and the State of North Carolina near Cherry Hospital to begin easement acquisition.
- Look for funding partners for easement acquisition, design, and construction of this section of trail.

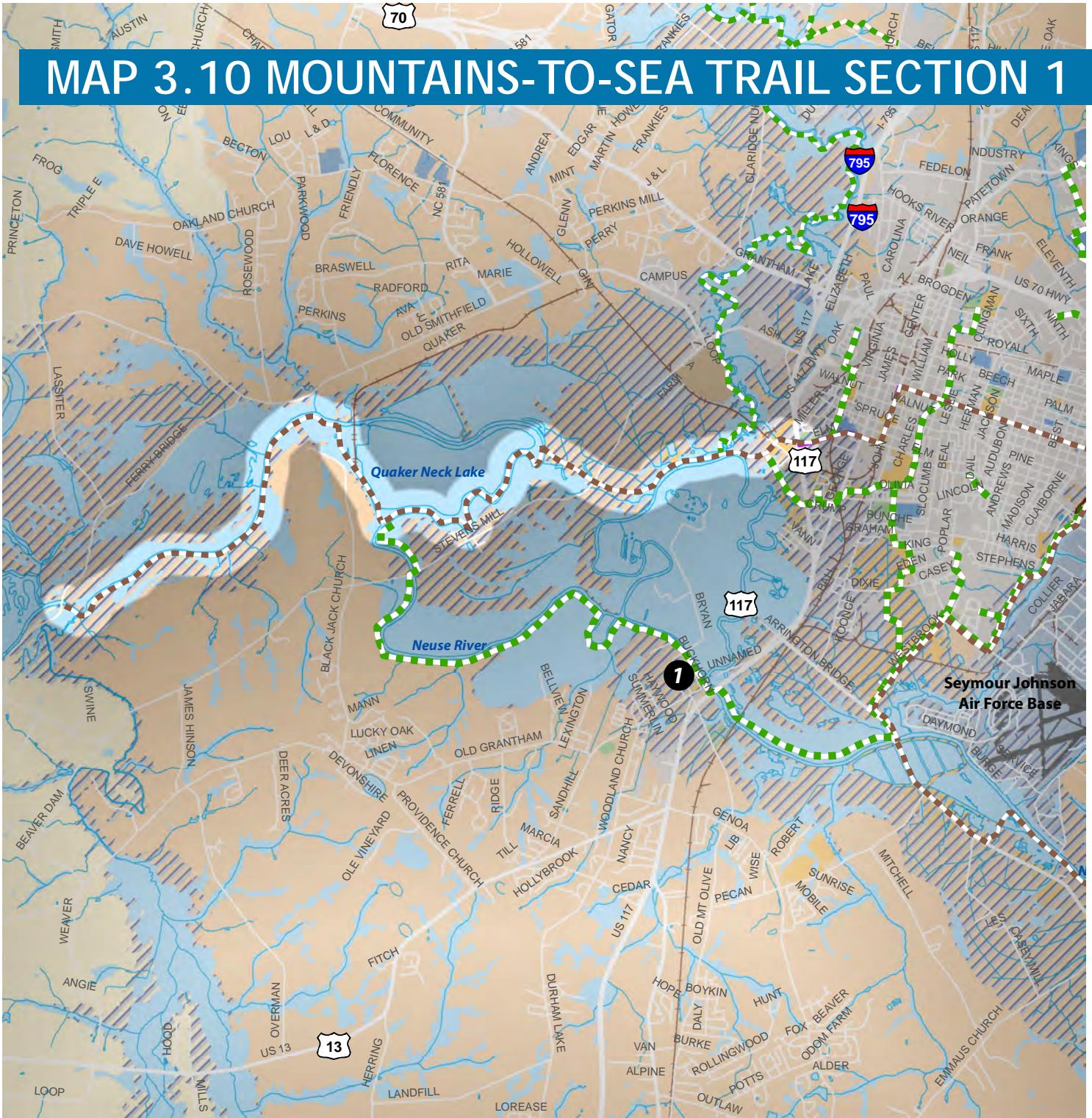


The FEMA floodplain buyout property near the Neuse River offers a tremendous opportunity for the Mountains-to-Sea Trail along with a campground and full canoe/kayak launch site.





# MAP 3.10 MOUNTAINS-TO-SEA TRAIL SECTION 1



## Mountains to Sea Trail - Section 1

### Legend

#### Recommended Greenways

- Shared-Use Path

#### Existing Infrastructure

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

#### Lands of Interest

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- Other City/County Property

#### Additional Context

- Proposed Mountains-to-Sea Trail Alignment
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits
- MPO Limits





## MOUNTAINS-TO-SEA TRAIL - SECTION 2

**Trail Distance:** 8.43 miles (4.9 miles shared-use path; 3.5 miles on-road)

**Trail Type/Surface:** Type III and on-road facilities

### Overview

This section of the MST would connect Waynesborough Village into Downtown Goldsboro and eventually the Stoney Creek Greenway via a combination of on-road bicycle facilities, sidewalks, and shared-use paths. The trail would utilize newly-striped buffered bike lanes on Elm Street from US 117 to George Street, then continue along Elm Street to Center. The alignment would follow Center Street north into the Downtown streetscape which will include bike lanes. The route would then turn east on Ash Street to Stoney Creek Park. The Mulberry Street Bike Boulevard would provide a parallel route for bicyclists who do not wish to ride on Ash Street. From Ash Street, the spur would utilize the Stoney Creek Greenway and sidepaths southward to the Neuse River. This section would provide considerable benefit to Goldsboro by connecting visitors to downtown and linking Goldsboro residents to the MST.

### Planning-Level Cost Estimate

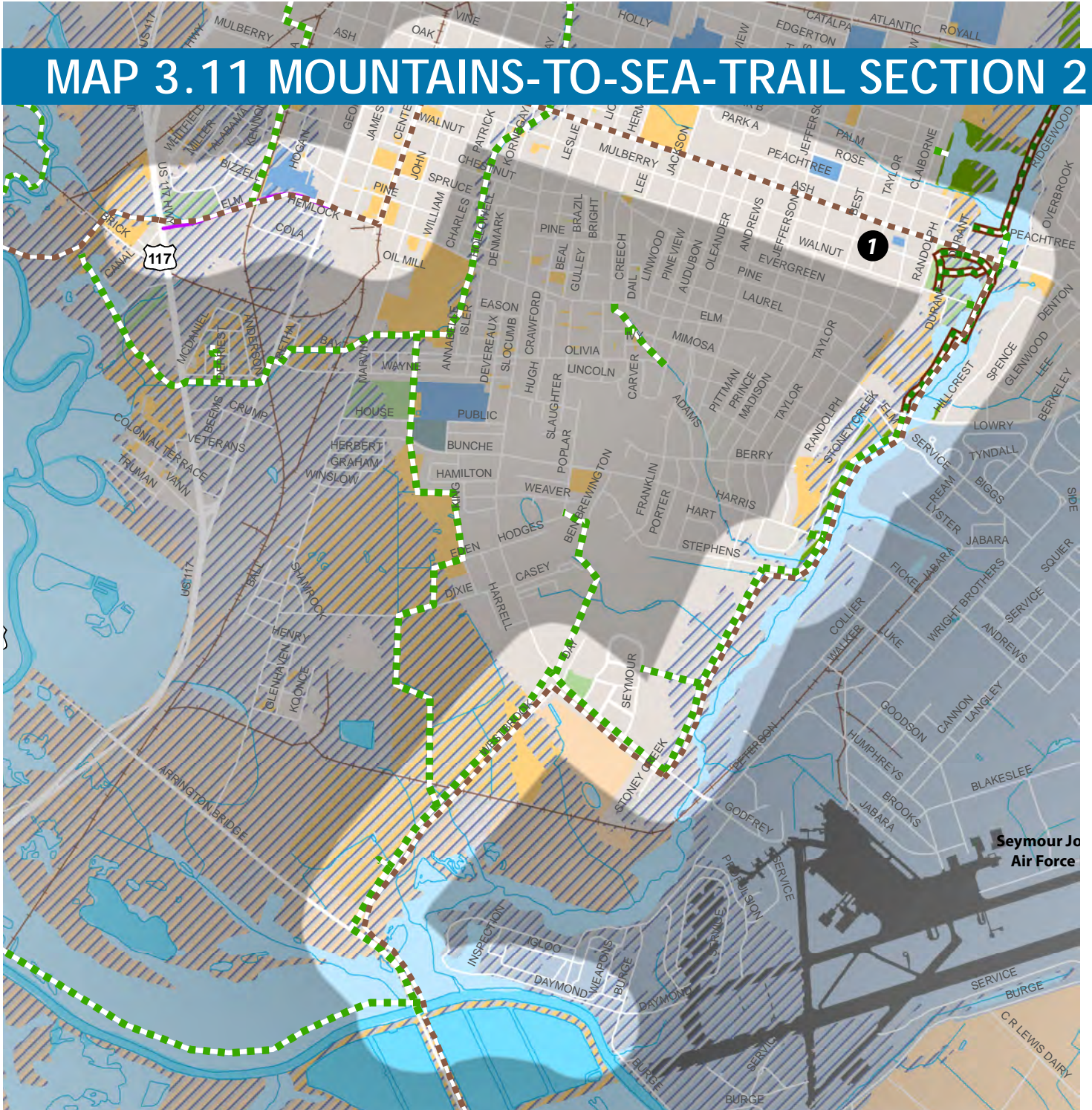
The cost for this section contains costs already outlined in other portions of the Plan (such as Stoney Creek Greenway enhancements).

### Recommended Next Steps

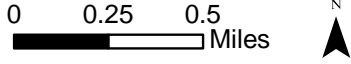
- Begin development of Mulberry Bike Boulevard.
- Stripe bike lanes on southern portions of Center Street.
- Evaluate US 117/Elm crossing for bicycle and pedestrian crossing treatments such as marked crosswalks and countdown signals.



Mulberry Street is a recommended bike boulevard/ neighborhood greenway (see Chapter 4 for more information). With the addition of traffic calming and landscaping, this would provide MST access for bicyclists.



**Mountains to Sea Trail - Section 2**



**Legend**

**Recommended Greenways**

- Shared-Use Path

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- Other City/County Property

**Additional Context**

- Proposed Mountains-to-Sea Trail Alignment
- Water Features
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits
- MPO Limits





## MOUNTAINS-TO-SEA TRAIL SECTION 3

**Trail Distance:** 19.6 miles/103,488 feet

**Trail Type/Surface:** Type I and II.

### Overview

This section of the MST will continue east from the municipally owned land near the Neuse and Westbrook Road, along the south side of the Neuse, ultimately connecting to the Cliffs of the Neuse State Park and the Town of Seven Springs. Both of these destinations can serve as key support stops for blueway and greenway users along the Mountains-to Sea Trail corridor. The Cliffs of the Neuse offers camping, water access, bathrooms, additional hiking, freshwater lake facilities and host of other opportunities. Seven Springs has an existing boating access, outfitter store, convenience shop, and potential for future trail-supported business.

### Planning-Level Cost Estimate

The cost for trail construction only (based on an average cost of \$100K/mile) comes to \$1.96 million. Other major costs related to this project would include easement acquisition. ***If built on the southern side, the number of privately owned properties it crosses is 177 (16 of which are publicly-owned).***

### Recommended Next Steps

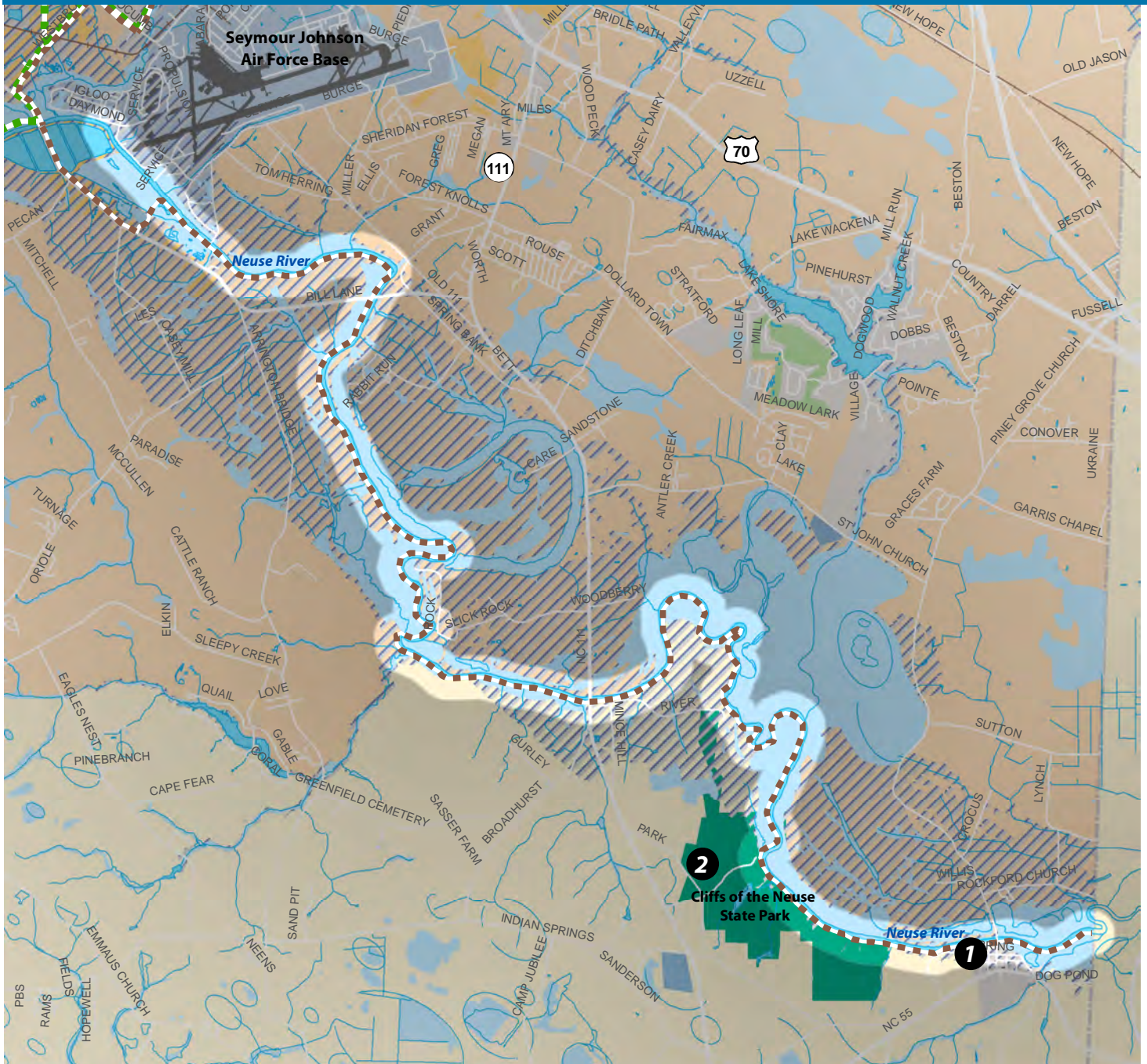
- Begin a detailed landowner study for trail easement acquisition.
- Coordinate with large landowners including the State of North Carolina and Cliffs of the Neuse State Park.
- Look for funding partners for easement acquisition, design, and construction of this section of trail.



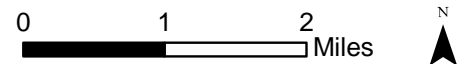
During the planning process, residents and stakeholders indicated a strong desire to connect Goldsboro to Cliffs of the Neuse State Park (top) and Seven Springs (left).



# MAP 3.12 MOUNTAINS-TO-SEA TRAIL SECTION 3



**Mountains to Sea Trail - Section 3**



**Legend**

<p><b>Recommended Greenways</b></p> <ul style="list-style-type: none"> <li>■ Shared-Use Path</li> </ul>	<p><b>Existing Infrastructure</b></p> <ul style="list-style-type: none"> <li>— Existing Bike Lane</li> <li>— Existing Shared-Use Path</li> <li>— Funded Shared-Use Path</li> <li>— Roadway</li> <li>— Railroad</li> </ul>	<p><b>Lands of Interest</b></p> <ul style="list-style-type: none"> <li>■ City Greenway Lands</li> <li>■ Park</li> <li>■ Schools</li> <li>■ Hospital</li> <li>■ Other Destinations</li> <li>■ Other City/County Property</li> </ul>	<p><b>Additional Context</b></p> <ul style="list-style-type: none"> <li>— Proposed Mountains-to-Sea Trail Alignment</li> <li>■ Water Features</li> <li>■ Wetlands</li> <li>■ 100-Year Floodplain</li> <li>■ Seymour Johnson AFB</li> <li>■ City Limits</li> <li>■ MPO Limits</li> </ul>
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## LITTLE RIVER TRAIL SECTION 1

**Trail Distance:** 8.4 miles/44,300 feet (additional spurs on northern end total 1.6 miles)

**Trail Type/Surface:** Type II. This section of trail will be predominantly natural surface/crushed gravel with the potential of boardwalk in places through wetter locations. The material surface will be dictated by the floodway/floodplain and subsurface conditions.

### Overview

Section One is the southernmost section of the proposed Little River Trail and is located along Little River; it begins at the Neuse River confluence and continues north to the Fallingbrook and Ashby Hills subdivisions off Buck Swamp Road. It crosses three highways (W. Ash, US 70, and future US 70 Bypass) with opportunity for underpasses in each situation. This is an important connection to connect the City of Goldsboro with neighborhoods to the northwest of town. This section of trail would only require easements along two properties, with an additional three properties to access Buck Swamp Road neighborhoods via trail spur.

### Planning-Level Cost Estimate

The cost for trail construction only (based on an average cost of \$100K/mile (for unpaved plus two river bridges) comes to \$1.34 million. Other major costs related to this project would include underpass improvements along with property acquisition.

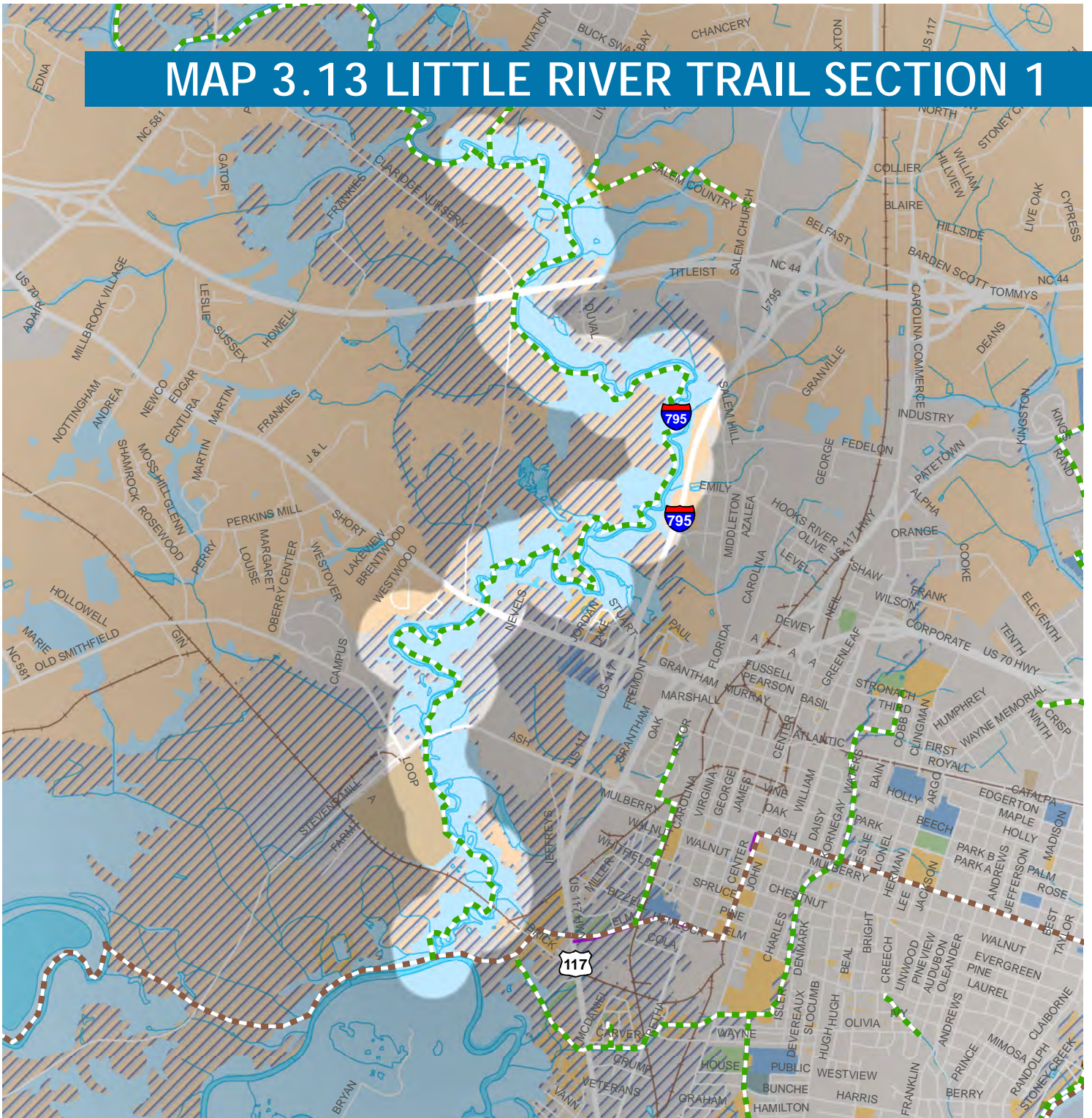
### Recommended Next Steps

- Evaluate roadway crossings for underpass potential.
- Evaluate railroad crossing at southern end of this corridor for underpass opportunity.
- Begin the process of identifying properties where easements are needed.

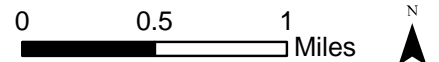




# MAP 3.13 LITTLE RIVER TRAIL SECTION 1



Little River Greenway - Section 1



**Legend**

**Recommended Greenways**

- Shared-Use Path

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- Other City/County Property

**Additional Context**

- Proposed Mountains-to-Sea Trail Alignment
- Water Features
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits
- MPO Limits





## LITTLE RIVER TRAIL SECTION 2

**Trail Distance:** 11.3 miles/59,800 feet

**Trail Type/Surface:** Trail Type/Surface: Type I and II.

### Overview

This section of Trail runs from the end of Section 1 (Fallingbrook and Ashby Hills subdivisions off Buck Swamp Road) to the Wayne County and project study area border. This is a longer term project that would connect to greenway planning efforts ongoing in Johnston County. A total of approximately 50 parcels were counted during this study where trail easements would be required.

### Planning-Level Cost Estimate

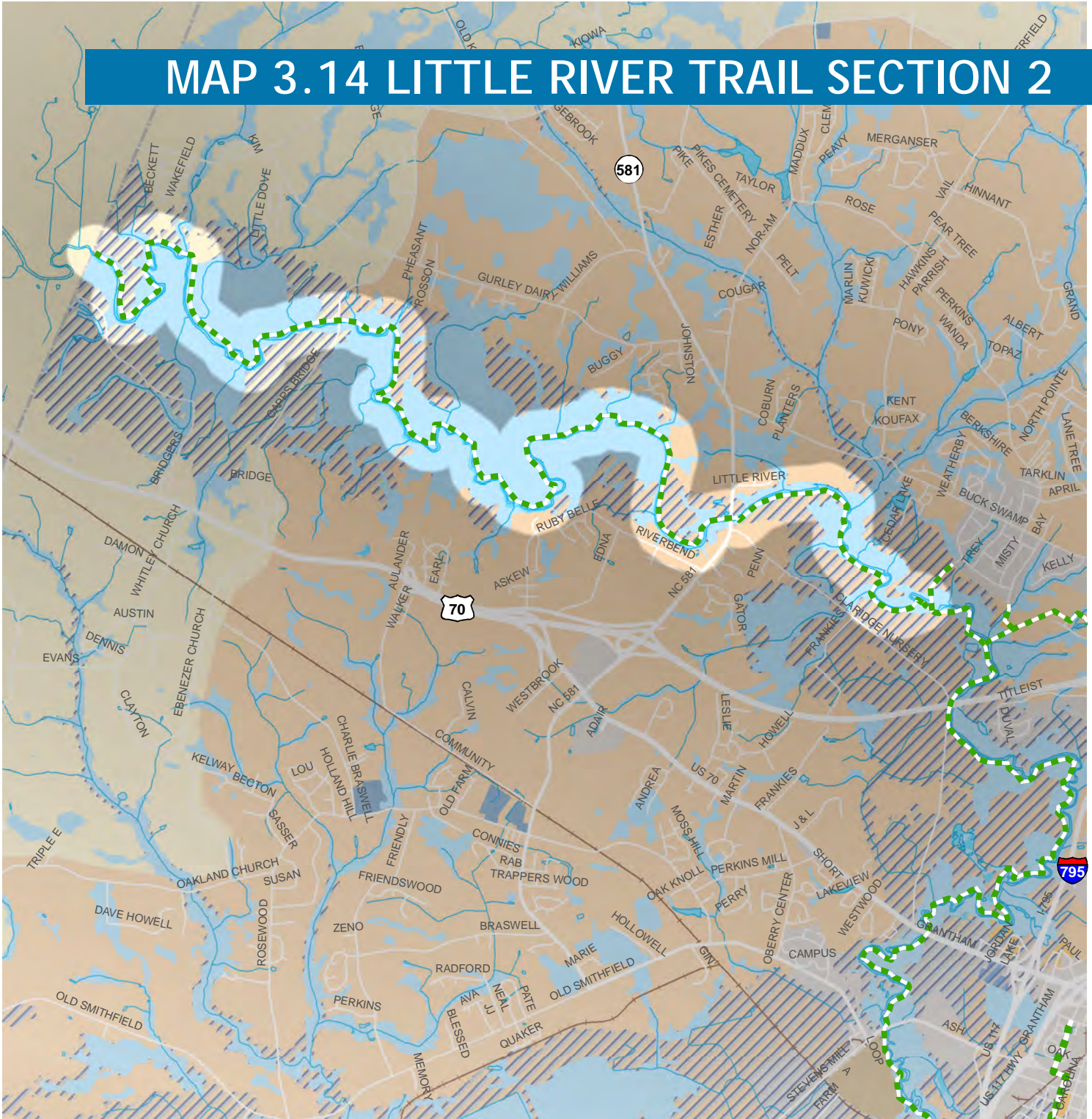
The cost for trail construction only (based on an average cost of \$100K/mile (for unpaved) comes to \$1.13million. Other major costs related to this project will include acquisition costs.

### Recommended Next Steps (Long-term)

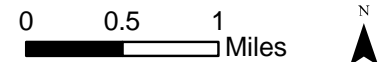
- Create a detailed map of existing public easements and public land.



# MAP 3.14 LITTLE RIVER TRAIL SECTION 2



Little River Greenway - Section 2



**Legend**

**Recommended Greenways**

- Shared-Use Path

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- Other City/County Property

**Additional Context**

- Water Features
- Wetlands
- 100-Year Floodplain
- Seymour Johnson AFB
- City Limits
- MPO Limits



## GOLDSBORO PHOTO VISUALIZATION: MOUNTAINS-TO-SEA TRAIL AT BRYAN BLVD AND NEUSE



FEMA floodplain buyout property near the Neuse River offers a tremendous opportunity for the Mountains-to-Sea Trail along with a campground and full canoe/kayak launch site.



# Chapter 4: Bicycle Network

## *Chapter Contents:*

*Bicyclist Types*

*Bicycle Facility Types*

*Bicycle Network Maps*

*Bicycle Network Segment  
Table*

## OVERVIEW

For the purposes of this Plan, the bicycle network refers to on-road and within roadway right-of-way recommendations. Of course, the greenway network (described in Chapter 3) is an important component of a comprehensive bicycle network. The bicycle network types include cycle tracks, buffered bicycle lanes, bicycle lanes, sharrows, paved shoulders, and bicycle boulevards. This chapter describes the bicyclist types and bike facility types, includes bike network maps, and features project cutsheets with maps, photo renderings, and cost estimates.

## BICYCLIST TYPES

It is important to consider bicyclists of all skill levels when creating a city-wide bikeway network. Bicyclist skill and comfort level greatly influences expected speeds and behavior, both in separated bikeways and on shared roadways. Bicycle infrastructure should accommodate as many user types as possible, with decisions for separate or parallel facilities based on providing a comfortable experience for the greatest number of people. A framework for understanding the characteristics, attitudes, and infrastructure preferences of different bicyclists in the US population as a whole is illustrated on the following page.



A bicyclist on Center Street in front of City Hall.

## **HIGHLY EXPERIENCED (APPROXIMATELY 1% OF POPULATION)**

Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections -- even if shared with vehicles -- over separate bicycle facilities such as shared use paths.



## **ENTHUSED AND CONFIDENT (~ 5-10% OF POPULATION)**

This user group encompasses bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or multi-use paths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreationalists, racers and utilitarian bicyclists.



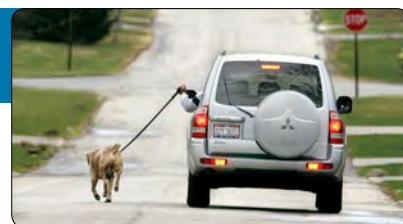
## **INTERESTED BUT CONCERNED (~ 60% OF POPULATION)**

This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or multi-use trails under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These people may become "Enthusied & Confident" with encouragement, education and experience.



## **NO WAY, NO HOW (~ 30% OF POPULATION)**

Persons in this category are not bicyclists, and perceive severe safety issues with riding in traffic. Some people in this group may eventually become more regular cyclists with time and education. A significant portion of these people will not ride a bicycle under any circumstances.



Source: Four Types of Cyclists. (2009). Roger Geller, City of Portland Bureau of Transportation. Supported by data collected nationally since 2005.



## METHODOLOGY FOR BICYCLE NETWORK DESIGN

The recommended bicycle network was designed in mind for all types of bicyclists described on the previous page, with a special focus on the “Interested but Concerned” population that makes up the majority of Goldsboro area residents. The network was developed based on Steering Committee input, public input, NCDOT Division input, recommendations from previous studies, existing conditions analysis (including the Live/Work/Play model and LTS analysis), noted destinations, presence of existing local and regional greenway projects, and field analyses.



### The Hub + Spokes Model

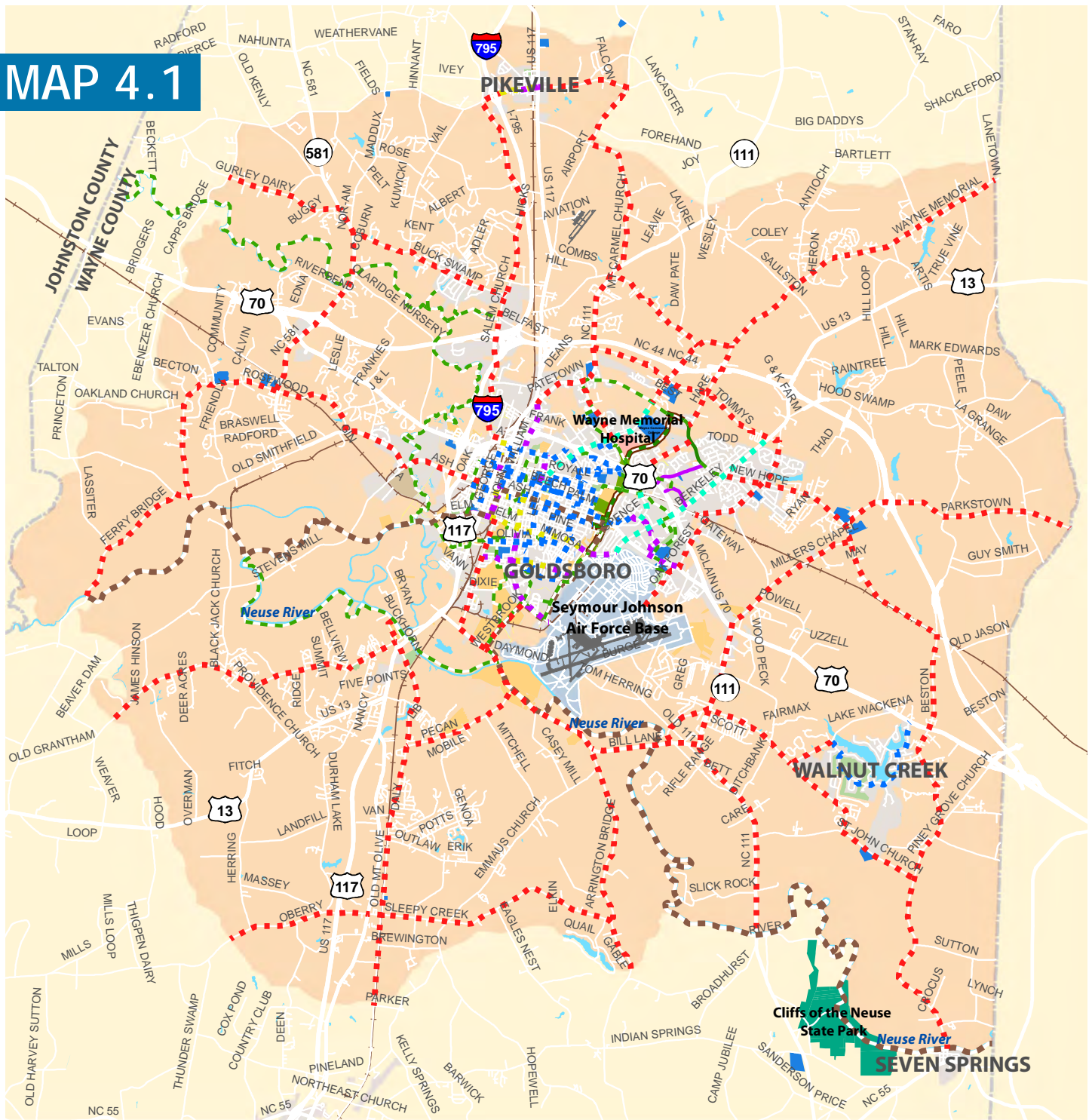
The image at left shows some of the key components for the overall bicycle, pedestrian and trail network based on a model of hubs (destinations) and spokes (walking and bicycling corridors).

The image below *conceptually* shows how this model of hubs and spokes could be applied in Goldsboro, NC, with a network of complete streets (in grey) and greenways (in green) connecting key destinations throughout the city. **Keep in mind the map below only conceptually shows these linkages. See maps on the following pages for actual bicycle network recommendations.**





# MAP 4.1



## Recommended Bike Facilities - MPO



### Legend

- Recommended Bicycle Facilities**
- Bike Lane
  - Bike Boulevard
  - Paved Shoulder
  - Shared Lane Marking (Sharrow)
  - Wide Outside Lane
  - Shared-Use Path

- Existing Infrastructure**
- Existing Bike Lane
  - Existing Shared-Use Path
  - Funded Shared-Use Path
  - Roadway
  - Railroad

- Lands of Interest**
- City Greenway Lands
  - Park
  - State Park
  - Schools
  - Hospital
  - Other Destinations
  - City Easements
  - Other City/County Property

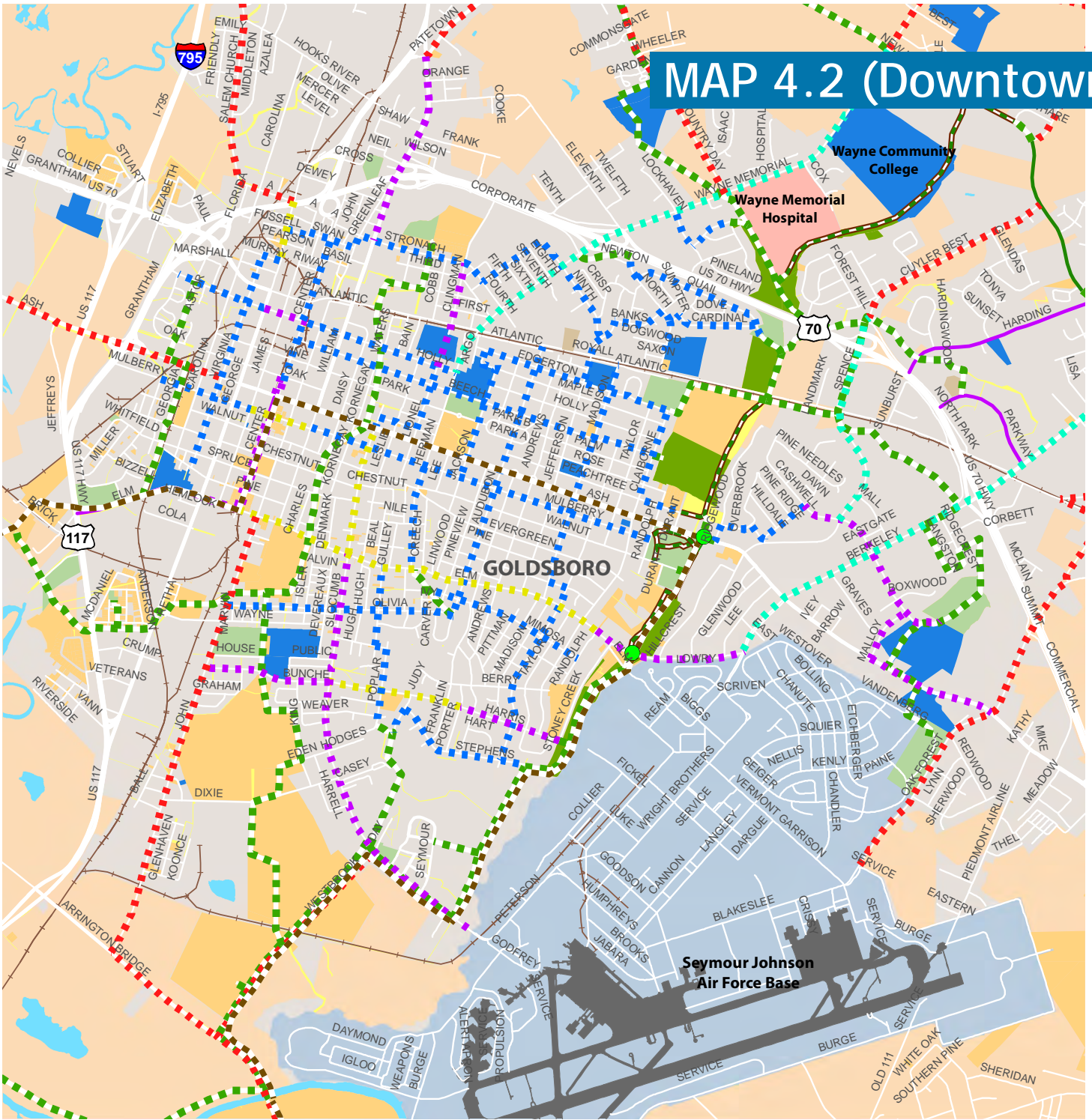
- Additional Context**
- Proposed Mountains-to-Sea Trail Alignment
  - Water Bodies
  - Seymour Johnson Air Force Base
  - City Limits
  - MPO Limits
  - Wayne County Border







# MAP 4.2 (Downtown)



## Recommended Bike Facilities - Downtown



### Legend

#### Recommended Bicycle Facilities

- HAWK Signal
- Bike Lane
- Bike Boulevard
- Paved Shoulder
- Shared Lane Marking (Sharrow)
- Wide Outside Lane
- Shared-Use Path

#### Existing Infrastructure

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

#### Lands of Interest

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

#### Additional Context

- Proposed Mountains-to-Sea Trail Alignment
- Water Features
- Seymour Johnson AFB
- City Limits
- MPO Limits



## BIKE FACILITY TYPES

### BICYCLE BOULEVARD (NEIGHBORHOOD GREENWAY)

Bicycle boulevards are streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority. Bicycle Boulevards use signs, pavement markings and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets. The Level-of-Traffic Stress (LTS) analysis performed in Chapter 2 identifies candidate roadways for bike boulevards.



Bike boulevard in Portland, Oregon. See Appendix A, page A-27 for bike boulevard design guidelines.

Concept of bike boulevard signage for Goldsboro



### Recommended Bike Boulevards (25.4 miles)

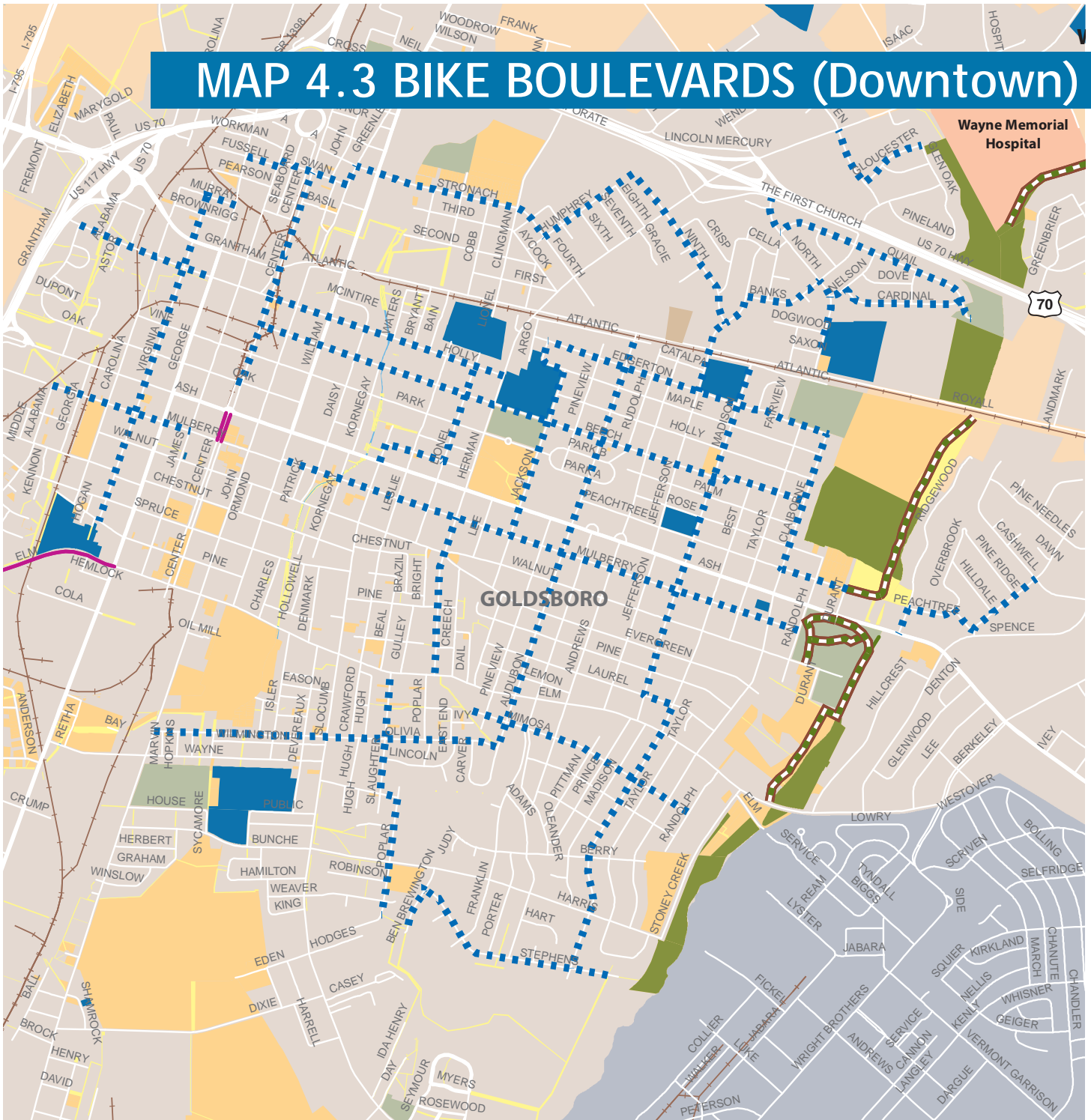
- » Beech Street (from Center Street to Claiborne Street)
- » Mulberry Street (from Downtown to Stoney Creek Park)
- » Madison Street/South Best Street (from Royall Avenue to Stephens St)
- » Olivia Lane/Mimosa Street (from John Street to Stoney Creek Greenway)
- » Holly St. (from Alabama Avenue to Herman Street) (Bike lane on portion)
- » Aububon Street (from Royall Avenue to Olivia Lane)
- » Edgerton Street (from Maple Street to Claiborne Street)
- » Virginia Street (from Pine Street to Murray Street)
- » Slaughter Street /Poplar Street (from Elm Street to Weaver Drive)
- » Ben Brewington Court/Stephens St (from Brewington to Stoney Creek Grwy)
- » Jackson Street/Maple Street (from Mulberry Street to Edgerton Street)
- » Lionel Street/Simmons Street (from Holly Street to Ash Street)
- » Swan/Stronach/Humphrey/Ninth/Jefferson/Banks/Cardinal/Quail
- » Lockhaven Drive/Gloucester Road (from Wayne Memorial to Rec. Grwy)
- » Center Street (Oak Street to Swan Street)
- » Claiborne Street (Edgerton Street to Peachtree Street)

### Comparison of Use in Portland, Oregon

- » Bicycle Boulevard: 3,000 bicycles/day (average)
- » Arterial with Bicycle Lane: 450 bicycles/day (average)



# MAP 4.3 BIKE BOULEVARDS (Downtown)



Recommended Bike Boulevards - Downtown

**Legend**

Recommended Bicycle Facilities

■ Bike Boulevard

Existing Infrastructure

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

Lands of Interest

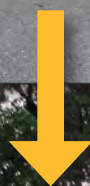
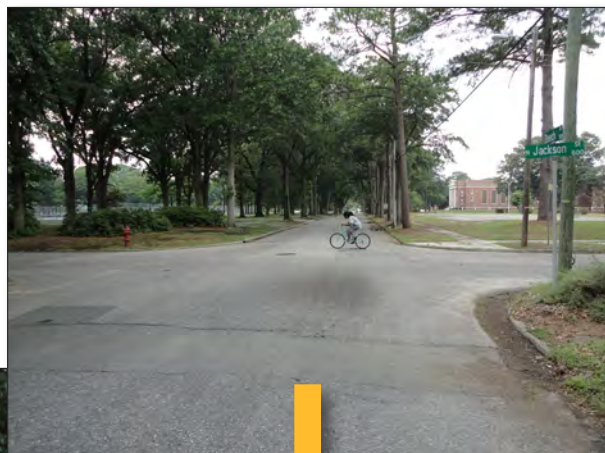
- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

Additional Context

- Seymour Johnson AFB
- City Limits
- MPO Limits



## GOLDSBORO PHOTO VISUALIZATION: BEECH AND JACKSON BICYCLE BOULEVARD



A mini-circle at Beech and Jackson is one example of a bike boulevard treatment that serves to calm traffic. In addition, high visibility marked crosswalks would improve the intersection for pedestrians as well. A raised crosswalk between the front of Goldsboro High School and Herman Park is another bike boulevard treatment.



## GOLDSBORO PHOTO VISUALIZATION: OLIVIA BICYCLE BOULEVARD



A significant number of bicyclists and pedestrians can be found along Olivia Lane. In addition, there was a cluster of bicycle and pedestrian crashes along this long, straight street. Bike boulevard treatments like chicanes and landscaping shown above will help to calm traffic, making the roads safer for all users.



## BICYCLE LANES

A bicycle lane is defined as a portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. The buffer allows for a safer and more comfortable ride for more types of bicyclists.



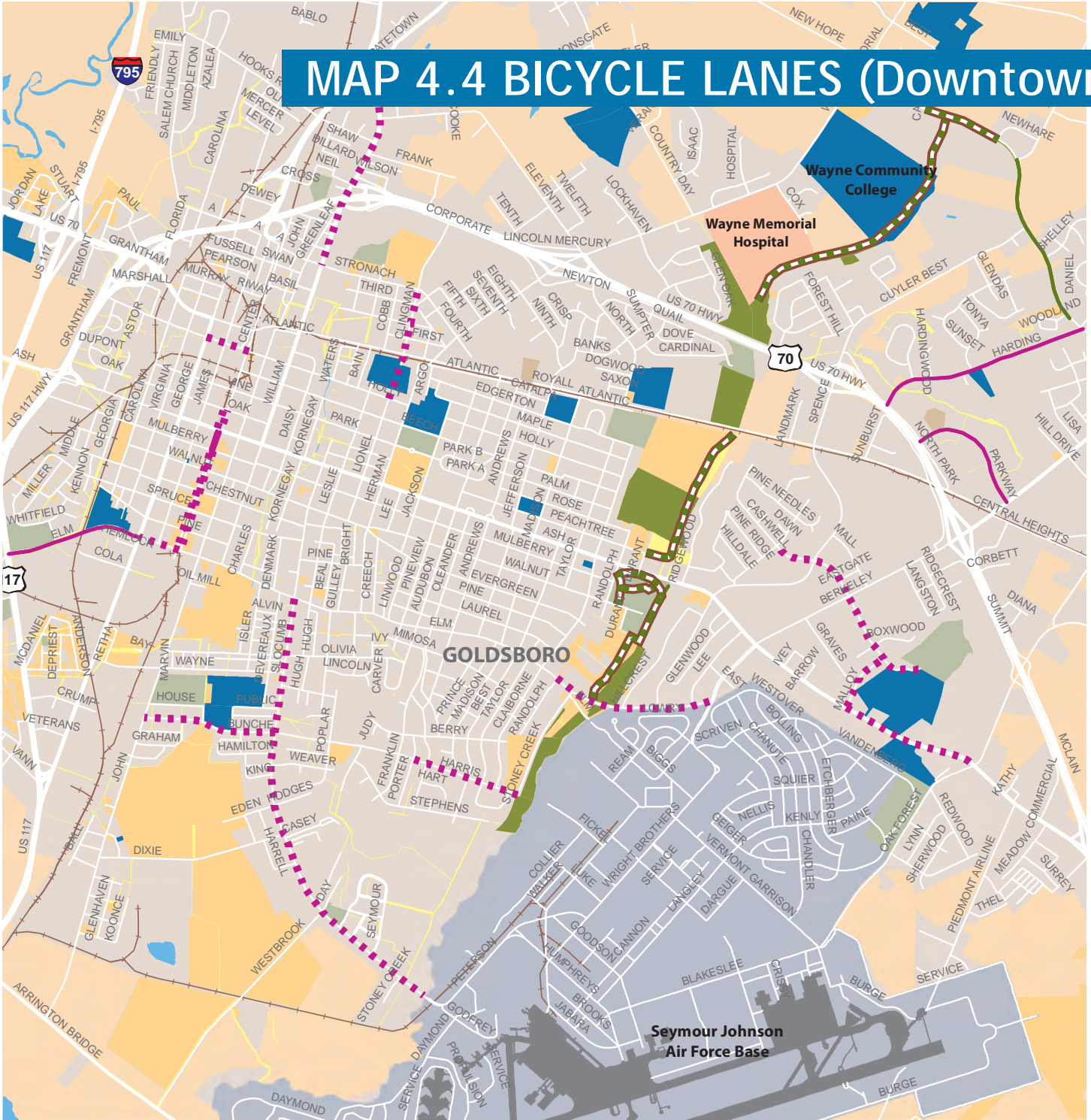
Bike lane on Harding Drive in Goldsboro. See Appendix A, page A-30 for bike lane design guidelines.

### ***Recommended Bicycle Lanes (11.4 miles-Goldsboro)***

- » Elm Street (with resurfacing)
- » Harris Street sections (restripe)
- » Slocumb Street (with resurfacing; consider bike lane one side and sharrow other side from Elm to Ash)
- » Center Street sections (Downtown streetscape and stripe)
- » Cashwell Drive
- » Clingman/Lionel (stripe)
- » Holly Street sections (stripe)
- » Malloy Street
- » Big Daddy's Road
- » William Street
- » Consideration: Ash Street (with road diet; Complete Street retrofit study needed)

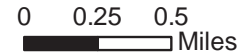
### ***Bicycle Lane Safety***

- » 36% crash reduction factor (FHWA) when adding bike lanes to a roadway
- » Road Diet: When modified from four travel lanes to two travel lanes with a two-way left-turn lane, roadways have experienced a 29 percent reduction in all roadway crashes ([http://safety.fhwa.dot.gov/provencountermeasures/fhwa\\_sa\\_12\\_013.htm](http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_013.htm)).



# MAP 4.4 BICYCLE LANES (Downtown)

## Recommended Bike Lanes - Downtown



### Legend

#### Recommended Bicycle Facilities

- Bike Lane

#### Existing Infrastructure

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

#### Lands of Interest

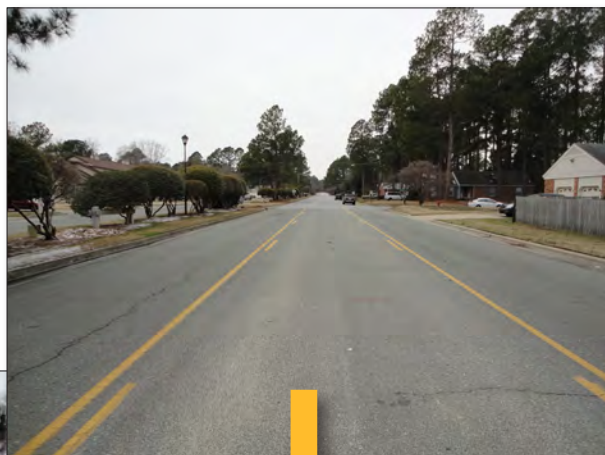
- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

#### Additional Context

- Seymour Johnson AFB
- City Limits
- MPO Limits



## GOLDSBORO PHOTO VISUALIZATION: HARRIS BIKE LANES



Harris Street, near Claiborne Street. With adequate roadway width, bicycle lanes can be added through a simple restriping that includes a narrowing of travel lanes and the center turn lane. The addition of a center median island, with turn lane pockets, would take it a step further to calm and beautify the corridor.





## GOLDSBORO PHOTO VISUALIZATION: BUNCHE BIKE LANES AT DILLARD MIDDLE SCHOOL



Bunche Street is a wide two-lane road running east-west between Slobumb and John. Bike lanes can be added here in front of Dillard Middle School by simply adding paint. The bike lane also provides a buffer between the sidewalk and the road.



## CYCLE TRACKS

A cycle track is an exclusive bicycle facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. Cycle tracks can be one-way (on each side of the road) or two-way (on one side of the road).



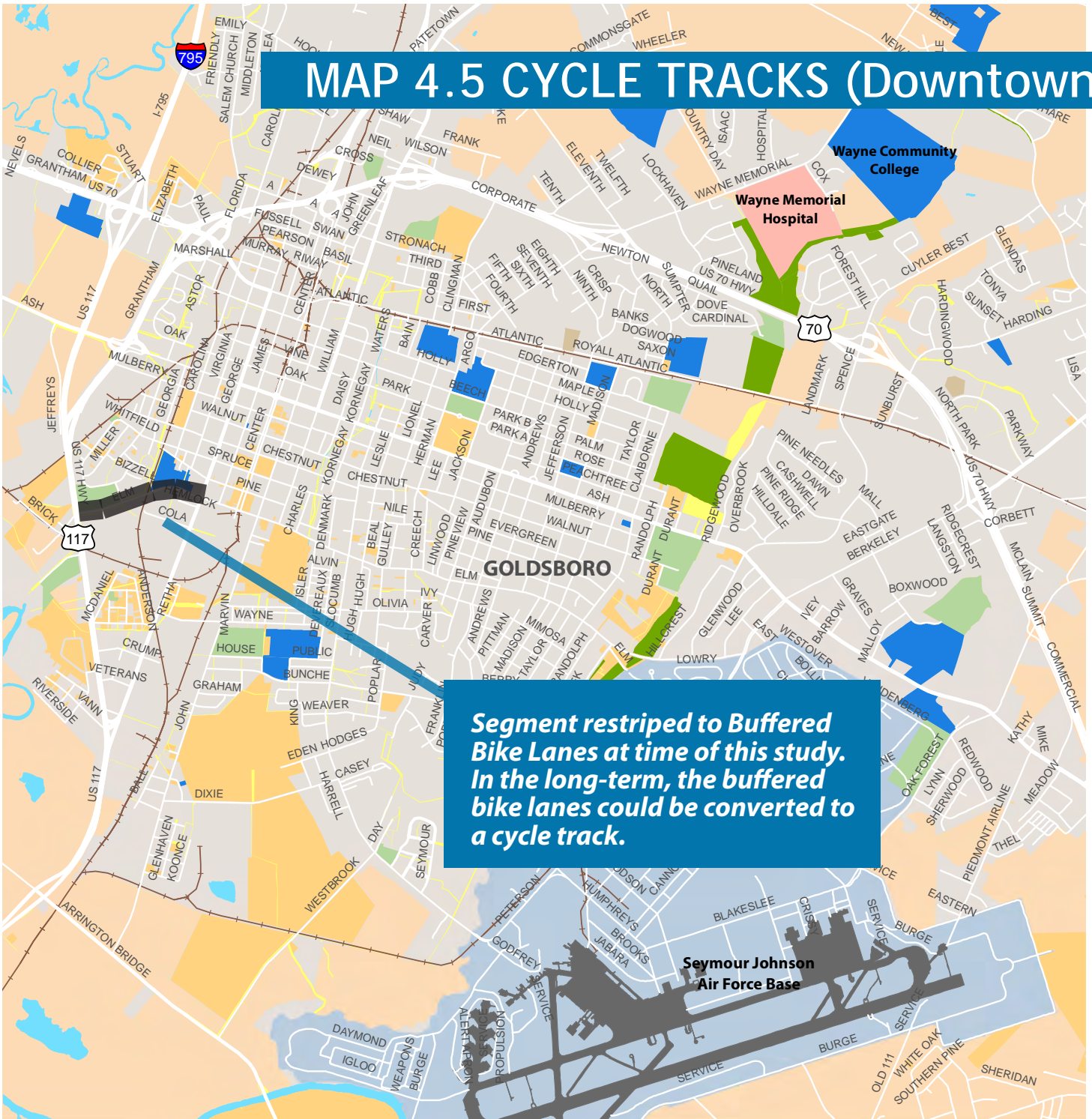
Example of a cycle track. See Appendix A, page A-33 for cycle track design guidelines.

### ***Recommended Cycle Track (0 miles)***

- » Long Term Consideration: Elm Street (from US 117 to George) was restriped for buffered bike lanes during this project; In long term, could consider conversion to cycle track.

### ***Cycle Track Facts***

- » Pre-2011, there were 80 cycle tracks in the United States; In July 2014, this number is approaching 150.
- » 84 percent of NYC bike share riders feel safest when riding in a physically separated bike lane. Transportation Alternatives, 2013
- » After buffered green lanes were installed on Philadelphia's Spruce and Pine streets, bike traffic increased 95% and the number of bicyclists riding on the sidewalks decreased by up to 75%. Bicycle Coalition of Greater Philadelphia, 2010



Overview Map - Downtown



- Legend**
- Long-term consideration to convert buffered bike lanes to cycle track
  - City Greenway Lands
  - Park
  - State Park
  - Schools
  - Hospital
  - Other Destinations
  - City Easements
  - Other City/County Property

**Existing Infrastructure**

- Roadway
- Railroad

**Additional Context**

- Water Features
- Seymour Johnson Air Force Base
- City Limits
- MPO Limits
- Wayne County Border





## SHARROWS

Shared lane markings (also known as “sharrows”) have become more popular as a pavement marking treatment to help align cyclists properly within more complex, urban landscapes that may feature on-street parking, a variety of lane widths, and other factors.



Sharrows in Raleigh, NC. See Appendix A, page A-26 for sharrows design guidelines.

### ***Recommended Sharrows (1.2 miles - Goldsboro)***

- » Mulberry Street (James Street to William Street)
- » Harris Street (Slocumb Street to Porter Street)
- » George Street (Murray Street to A Street)
- » Elm Street (Center Street to Randolph Street)
- » Slocumb Street (Elm Street to Ash Street)

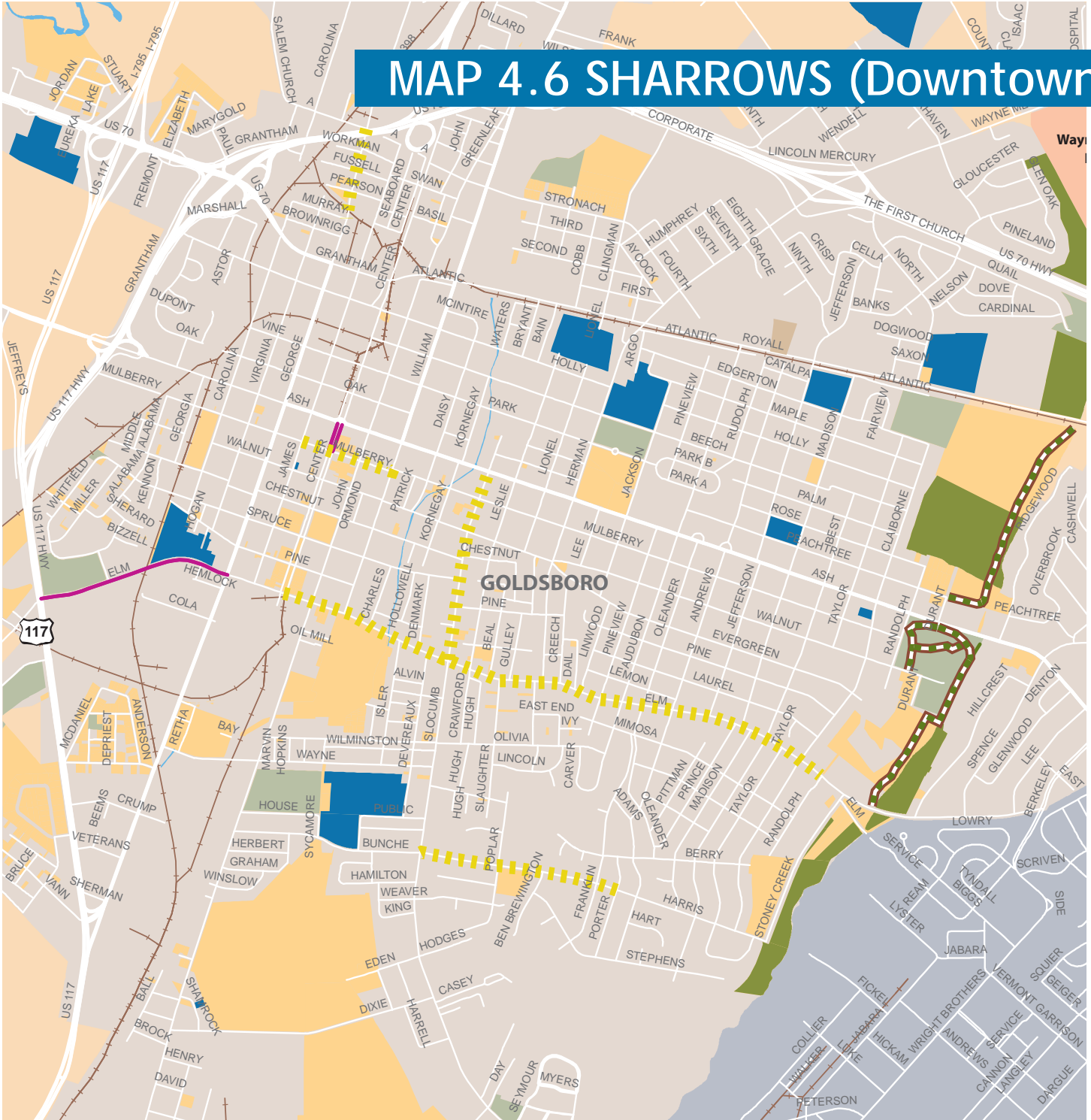
### ***Sharrows Study***

In a 2010 FHWA study, sharrows were shown to have a benefit in Chapel Hill, NC, Seattle, WA, and Cambridge, MA. Sharrows decreased sidewalk riding, increased proper positioning in roadway for bicyclists, and increased operating space for bicyclists. Sharrows may also increase safety by providing a visual cue to motorists. Sharrows are particularly beneficial along roadways with on-street parking. Sharrows help to position the bicyclists outside the open car door zone (which is the most common cause of bicycle crashes) .

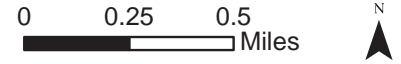
<https://www.fhwa.dot.gov/publications/research/safety/pedbike/10041/10041.pdf>



# MAP 4.6 SHARROWS (Downtown)



Recommended Sharrows - Downtown



**Legend**

**Recommended Bicycle Facilities**

▬ Shared Lane Marking (Sharrow)

**Existing Infrastructure**

▬ Existing Bike Lane  
 ▬ Roadway  
 ▬ Railroad

**Lands of Interest**

■ Park  
 ■ Schools  
 ■ Other City/County Property

**Additional Context**

■ Water Features  
 ■ Seymour Johnson AFB  
 ■ City Limits  
 ■ MPO Limits





## PAVED SHOULDERS

In many rural areas, 4-6-foot-wide paved shoulders are a typical treatment for accommodating bicyclists. Paved shoulders allow bicyclists to travel on a paved surface adjacent to through traffic, if desired. The list below includes paved shoulder recommendations in Goldsboro and Wayne County.



Paved Shoulder in Durham, NC. See Appendix A, page A-29 for paved shoulder design guidelines.

### **Recommended Paved Shoulders (132 miles - MPO)**

- » Patetown Road
- » Hare Road
- » Tommys Road
- » Salem Church Road
- » Ash Road (west of Downtown)
- » Old Smithfield Road
- » Old Mt Olive Road
- » Arrington Bridge Road
- » Oak Forest Drive
- » NC 111
- » New Hope Road
- » Agave Road
- » Cuyler Best Road
- » Central Heights Rd.
- » Westbrook Road
- » Wayne Memorial Dr.
- » Oberry Road
- » Dollard Town Road
- » Spring Bank Road
- » Rosewood Road
- » Ferry Bridge Road
- » Pikeville-Princeton Road
- » Gurley Dairy Road
- » Buck Swamp Road
- » NC 581
- » Stoney Creek Ch. Ro.
- » Big Daddy's Road
- » Airport Road
- » Mt. Carmel Ch. Rd
- » Parkstown Road
- » Bill Lane Blvd
- » Sleepy Creek Road
- » Old Grantham Road
- » Peacan Road
- » John Street
- » Bryan Blvd
- » Country Day Road

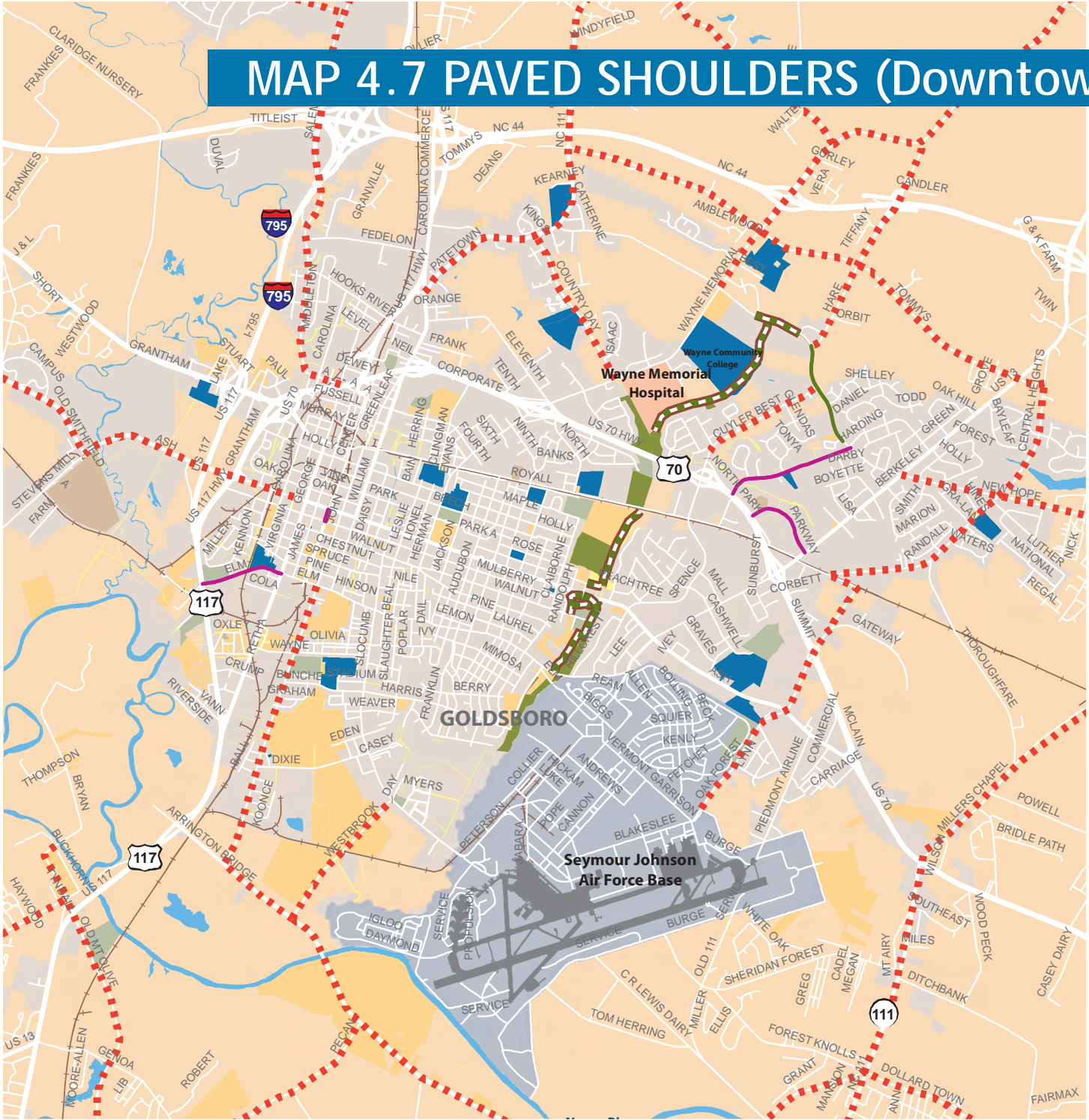
### **Paved Shoulder Safety Benefits**

According to the 2008 FHWA Desktop Reference for Crash Reduction Factors, paved shoulders also provide a benefit to pedestrians. Providing a paved shoulder of at least four feet to avoid walking in the roadway resulted in a 71% crash reduction factor.

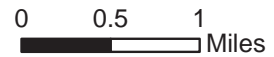
See the "22 reasons for paved shoulder" - <http://www.bicyclinglife.com/EffectiveAdvocacy/22reasons.htm>



# MAP 4.7 PAVED SHOULDERS (Downtown)



Recommended Paved Shoulders - Downtown



**Legend**

Recommended Bicycle Facilities

- Paved Shoulder

Existing Infrastructure

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

Lands of Interest

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

Additional Context

- Water Features
- Seymour Johnson AFB
- City Limits
- MPO Limits





## WIDE OUTSIDE LANES

Wide outside lanes are the least favorable bicycle facility type for the majority of bicyclists and do not substitute for a more formally separated facility such as those mentioned previously in this chapter. These are recommended typically along busier roadways where bike lanes are not feasible and ridership other than “Highly Experienced” Bicyclists is not expected. They are meant to provide extra space for bicyclists allowing for motor vehicles to pass in the same lane. These can be implemented most easily with a scheduled roadway resurfacing project. Typically, wide outside lanes are 14 feet wide. When the speed limit is 35mph or below, sharrow markings can be considered as well.



Wide lane in Durham, NC. Appendix A: DesignGuidelines does not feature a section on Wide Outside Lanes.

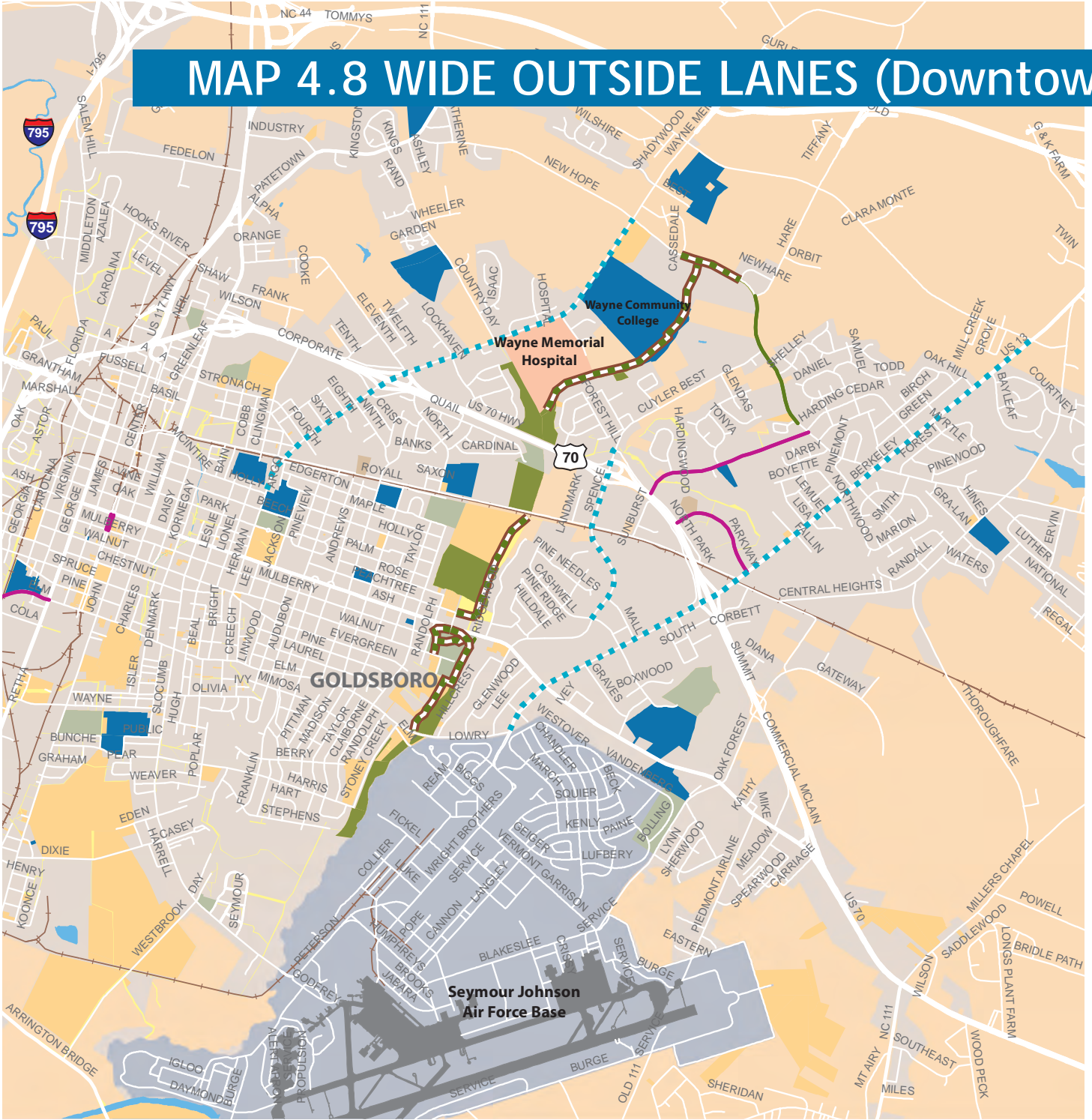
### ***Recommended Wide Outside Lanes (7.4 miles in Goldsboro)***

- » Berkeley Boulevard (from Elm Street to Tommy’s Road)
- » Spence Street (from Cashwell Drive to US 70)
- » Wayne Memorial Drive (Holly Street to New Hope Road)





# MAP 4.8 WIDE OUTSIDE LANES (Downtown)



Recommended Wide Outside Lanes - Downtown



**Legend**

**Recommended Bicycle Facilities**

- Wide Outside Lane

**Existing Infrastructure**

- Existing Bike Lane
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

**Lands of Interest**

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

**Additional Context**

- Seymour Johnson AFB
- City Limits
- MPO Limits





## PIKEVILLE BICYCLE RECOMMENDATIONS

The Town of Pikeville is compact, allowing for reasonable bicycle and pedestrian travel to destinations such as the Downtown and Dees Memorial Park. Residential roadways are generally calm allowing for bicycle travel (although some traffic calming could be considered). Main Street offers opportunities for a bike lane/sharrow combination leading into town. Outside the town limits, paved shoulders are the preferred bicycle facility treatment.



Main Street, near Fort Street is wide enough to stripe bicycle lanes today. With ~34 feet of pavement, 5' bike lanes could be striped leaving adequate room for motor vehicles.

### ***Recommended Facilities***

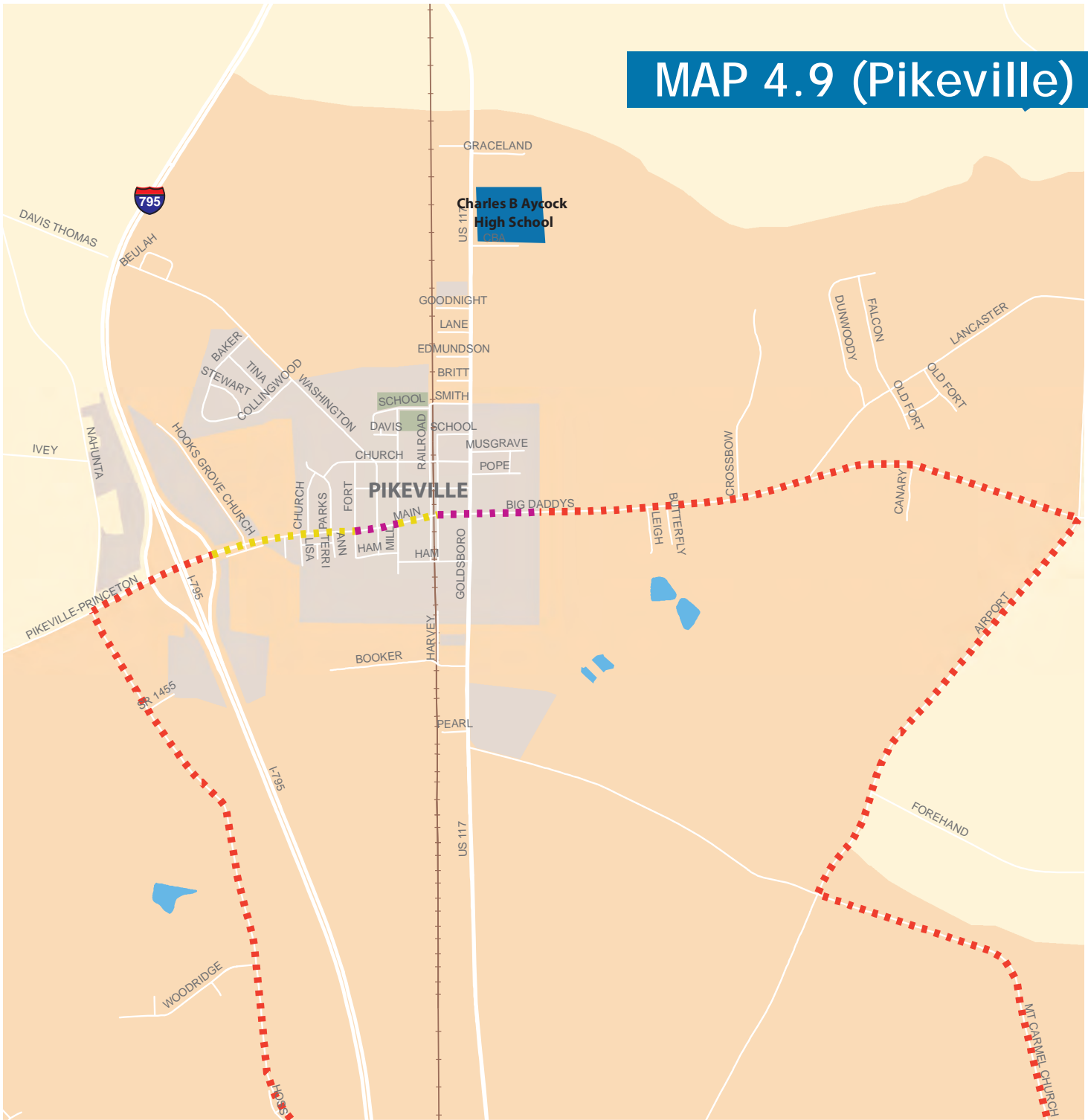
- » Main Street (Bike Lane/Sharrow) from I-795 to eastern town limit
- » Big Daddys (Paved Shoulder) from eastern town limit to Airport)
- » Airport (Paved Shoulder) from Big Daddys to Mt Carmel Church)
- » Pikeville-Princeton (Paved Shoulder) from I-795 to Nahunta)

### ***Paved Shoulder Safety Benefits***

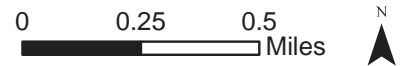
According to the 2008 FHWA Desktop Reference for Crash Reduction Factors, paved shoulders also provide a benefit to pedestrians. Providing a paved shoulder of at least four feet to avoid walking in the roadway resulted in a 71% crash reduction factor.



# MAP 4.9 (Pikeville)



## Recommended Bike Facilities - Pikeville



### Legend

Recommended Bicycle Facilities	Existing Infrastructure	Lands of Interest	Additional Context
Bike Lane	Roadway	Park	Water Features
Paved Shoulder	Railroad	Schools	City Limits
Shared Lane Marking (Sharrow)			MPO Limits





## WALNUT CREEK BICYCLE RECOMMENDATIONS

Walnut Creek and the surrounding area is an ideal community for recreational bicycling. While separated from most destinations and land uses, the area is scenic featuring roadways with relatively low traffic volumes. Rural roadways leading to and away from Walnut Creek would benefit from paved shoulders. The main roadways through Walnut Creek would benefit from the basic bike boulevard treatments of signage but could also be enhanced with landscaping, chicanes, and mini-circles.



Lake Wackena Road is a pleasant rural roadway for recreational bicycling. Bicyclists would benefit from the addition of paved shoulder.

### ***Recommended Facilities: Bike Boulevards/Signed Routes***

- » Lakeshore Drive/Mill Road (from Lake Wackena Road to Walnut Creek Dr.)
- » Walnut Creek Drive (from Mill Road to US 70)

### ***Recommended Facilities: Paved Shoulders***

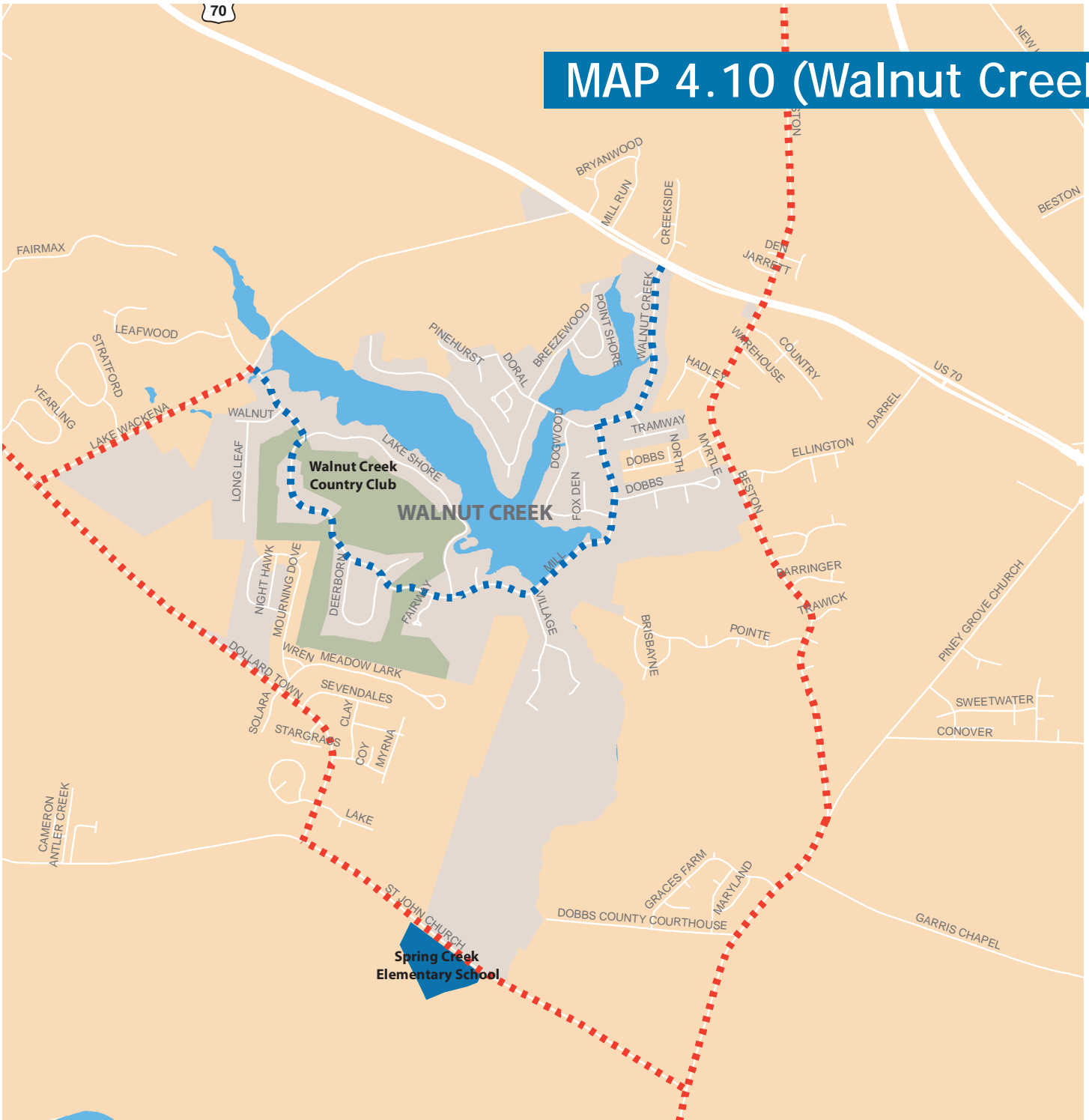
- » Lake Wackena Road (from Dollard Town Road to Lakeshore Drive)
- » Dollard Town Road (from Lake Wackena Road to St John Church Road)
- » St John Church Road (from Dollard Town Road to Piney Grove Ch. Road)
- » Piney Grove Church Road (from Seven Springs Town Limit to Beston Rd.)
- » Beston Road (from Piney Grove Church Road to New Hope Road)

### ***Paved Shoulder Safety Benefits***

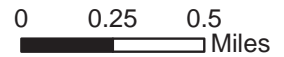
According to the 2008 FHWA Desktop Reference for Crash Reduction Factors, paved shoulders also provide a benefit to pedestrians. Providing a paved shoulder of at least four feet to avoid walking in the roadway resulted in a 71% crash reduction factor.



# MAP 4.10 (Walnut Creek)



## Recommended Bike Facilities - Walnut Creek



### Legend

#### Recommended Bicycle Facilities

- Bike Boulevard
- Paved Shoulder

#### Existing Infrastructure

- Roadway
- Railroad

#### Lands of Interest

- Park
- Schools

#### Additional Context

- Water Features
- City Limits
- MPO Limits





## BICYCLE NETWORK BY SEGMENT

Roadway	From	To	Facility Type*	Implementation Method	Length (Feet)
Holly St	Railroad	Herman St	BB	Marking, Signage, Traffic Calming	3,946
Beech St	Center St	Claiborne St	BB	Marking, Signage, Traffic Calming	9,483
Mulberry St	William St	Randolph St	BB	Marking, Signage, Traffic Calming	8,973
Audubon Ave	Olivia Lane	Atlantic Ave	BB	Marking, Signage, Traffic Calming	7,172
Holly St	Oak St	George St	BB	Marking, Signage, Traffic Calming	2,340
Holly St	George St	Railroad	BL	Restriping	1,143
Olivia Lane	John St	Audubon Ave	BB	Marking, Signage, Traffic Calming	5,700
Madison Ave	Laurel St	Atlantic Ave	BB	Marking, Signage, Traffic Calming	6,237
Best St	Stephens St	Laurel St	BB	Marking, Signage, Traffic Calming	4,791
Harris St	Porter St	Stoney Creek Pkwy	BL	Reallocate	2,643
Harris St	Slocumb St	Porter St	SLM	Marking	3,355
Harris St	John St	Slocumb St	BL	Reallocate	3,182
Slocumb St	Seymour Johnson Air Force Base	Elm St	BL	Roadway widening	10,962
Slocumb St	Elm St	Ash St	SLM	Marking	3,234
Lionel St	Simmons St	Holly St	BB	Marking, Signage, Traffic Calming	1,662
Clingman St	Holly St	Stronach Ave	BL	Restriping	2,704
Center St	Spruce St	Mulberry St	BL	Reallocate	1,510
Center St	Spruce St	Mulberry St	BL	Reallocate	1,511
Center St	Elm St	Spruce St	BL	Restriping	1,014
Center St	Elm St	Spruce St	BL	Restriping	1,014
Patetown Rd	William St	New Hope Rd	PS	Roadway widening	6,185
New Hope Rd	Berkeley Blvd	Millers Chapel Rd	PS	Roadway widening	15,386
Ash St	Malloy St	Oak Forest Rd	BL	Roadway widening	3,370
Oak Forest Dr	Central Heights Rd	Seymour Johnson AFB	PS	Roadway widening	12,155
Central Heights Rd	Oak Forest Dr	Tommy's Rd	PS	Roadway widening	12,785
Mill Rd	Lake Shore Dr	Walnut Creek Dr	BB	Marking, Signage, Traffic Calming	10,988
Walnut Creek Dr	Mill Rd	US Highway 70	BB	Marking, Signage, Traffic Calming	3,680
Lakeshore Dr	Lake Wackena Rd	Mill Rd	BB	Marking, Signage, Traffic Calming	1,721
Lake Wackena Rd	Dollard Town Rd	Lake Shore Dr	PS	Roadway widening	4,740
Dollard Town Rd	Lake Wackena Rd	St. John Church Rd	PS	Roadway widening	9,592
St. John Church Rd	Dollard Town Rd	Piney Grove Ch Rd	PS	Roadway widening	8,823
Piney Grove Ch Rd	Beston Rd	Seven Springs Limits	PS	Roadway widening	25,818
Main St	Interstate 795	Fort St	SLM	Marking	2,179
Main St	Fort St	Mill St	BL	Restriping	657
Main St	Mill St	Northeast Railroad St	SLM	Marking	609
Main St	Northeast Railroad St	Goldsboro St	BL	Restriping	479
Cuyler Best Rd	North Park Dr	New Hope Rd	PS	Roadway widening	5,270
Center St	Ash St	Oak St	BL	Restriping	481

\*BB = Bike Boulevard, BL = Bike Lane, PS = Paved Shoulders, SLM = Shared Lane Markings, WOL = Wide Outside Lanes



## BICYCLE NETWORK BY SEGMENT (CONTINUED)

Roadway	From	To	Facility Type*	Implementation Method	Length (Feet)
Center St	Ash St	Oak St	BL	Restriping	479
Center St	Oak St	Holly St	BB	Marking, Signage, Traffic Calming	1,581
Cardinal Dr	Nelson Dr	Quail Dr	BB	Marking, Signage, Traffic Calming	2,375
Nelson Dr	North Dr	Cardinal Dr	BB	Marking, Signage, Traffic Calming	288
North Dr	Banks Ave	Nelson Dr	BB	Marking, Signage, Traffic Calming	319
Banks Ave	Jefferson Ave	North Dr	BB	Marking, Signage, Traffic Calming	1,344
Jefferson Ave	Ninth St	Banks Ave	BB	Marking, Signage, Traffic Calming	575
Ninth St	Humphrey St	Jefferson Ave	BB	Marking, Signage, Traffic Calming	2,945
Humphrey St	Fourth St	Ninth St	BB	Marking, Signage, Traffic Calming	1,802
Stronach Ave	Greenleaf St	Humphrey St	BB	Marking, Signage, Traffic Calming	3,418
Greenleaf St	Swan St	Freeman St	BB	Marking, Signage, Traffic Calming	339
Swan St	James St	Greenleaf St	BB	Marking, Signage, Traffic Calming	1,202
Fussell St	George St	James St	BB	Marking, Signage, Traffic Calming	655
North Dr	Saxon St	Nelson Dr	BB	Marking, Signage, Traffic Calming	962
Hillcrest Dr	Peachtree St	Cashwell Dr	BB	Marking, Signage, Traffic Calming	1,334
Peachtree St	Ridgewood Dr	Hillcrest Dr	BB	Marking, Signage, Traffic Calming	1,294
Cashwell Dr	Berkeley Blvd	Berkeley Memorial Park	BL	Restriping	2,655
Cashwell Dr	Hillcrest Dr	Berkeley Blvd	BL	Reallocate	2,285
Malloy St	Ash St	Cashwell Dr	BL	Reallocate	1,519
Ridgewood Dr	Ash St	Peachtree St	BB	Marking, Signage, Traffic Calming	447
Beston Rd	New Hope Rd	Piney Grove Ch Rd	PS	Roadway widening	20,541
New Hope Rd	Millers Chapel Rd	Beston Rd	PS	Roadway widening	13,425
Big Daddy's Rd	Goldsboro St	Town Limits	BL	Reallocate, roadway widening	1,047
Tommy's Rd	NC Highway 111	Central Heights Rd	PS	Roadway widening	21,543
Ash St/NC 581	Old Smithfield Rd	Virginia St	PS	Roadway widening	8,953
Oberry Rd	MPO Limits	US Highway 117 Alt	PS	Roadway widening	14,443
Dollard Town Rd	NC Highway 111	Lake Wackena Rd	PS	Roadway widening	10,047
Spring Bank Rd	Bill Lane Blvd	NC Highway 111	PS	Roadway widening	6,319
Arrington Bridge Rd	Bill Lane Blvd	Sleepy Creek Rd	PS	Roadway widening	18,594
Arrington Bridge Rd	Westbrook Rd	Bill Lane Blvd	PS	Roadway widening	15,004
Old Mount Olive Rd	MPO Limits	Old Grantham Rd	PS	Roadway widening	37,965
Rosewood Rd	Old Smithfield Rd	Ash St	PS	Roadway widening	36,796
Old Smithfield Rd	Ferry Bridge Rd	Rosewood Rd	PS	Roadway widening	1,556
Ferry Bridge Rd	Old Smithfield Rd	MPO Limits	PS	Roadway widening	14,481
Salem Church Rd	George St	Pikeville-Princeton Rd	PS	Roadway widening	36,956
Pikeville-Princeton Rd	Nahunta Rd	Interstate 795	PS	Roadway widening	1,987
Gurley Dairy Rd	Capps Bridge Rd	NC Highway 581	PS	Roadway widening	11,940
Buck Swamp Rd	NC Highway 581	Salem Church Rd	PS	Roadway widening	16,901

\*BB = Bike Boulevard, BL = Bike Lane, PS = Paved Shoulders, SLM = Shared Lane Markings, WOL = Wide Outside Lanes



## BICYCLE NETWORK BY SEGMENT (CONTINUED)

Roadway	From	To	Facility Type*	Implementation Method	Length (Feet)
NC 581	Gurley Dairy Rd	Buck Swamp Rd	PS	Roadway widening	2,765
Wayne Memorial Dr	New Hope Rd	Lanetown Rd	PS	Roadway widening	43,107
Hare Rd	New Hope Rd	Wayne Memorial Dr	PS	Roadway widening	9,316
Stoney Creek Church Rd	NC Highway 111	Wayne Memorial Dr	PS	Roadway widening	11,635
Big Daddy's Rd	Pikeville Limits	Airport Rd	PS	Roadway widening	8,282
Airport Rd	Big Daddy's Rd	Mount Carmel Ch Rd	PS	Roadway widening	6,937
Mount Carmel Ch Rd	Airport Rd	NC Highway 111	PS	Roadway widening	14,589
NC Highway 111	Mount Carmel Church Rd	New Hope Rd	PS	Roadway widening	12,754
Parkstown Rd	New Hope Rd	MPO Limits	PS	Roadway widening	24,275
Mimosa St	Pineview Ave	Randolph St	BB	Marking, Signage, Traffic Calming	3,976
Elm St	Center St	Randolph St	SLM	Marking	9,643
Elm St	Randolph St	Berkeley Blvd	BL	Reallocate	3,954
Mulberry St	Alabama Ave	James St	BB	Marking, Signage, Traffic Calming	2,398
Mulberry St	James St	William St	SLM	Marking	1,635
Berkeley Blvd	Elm St	Tommy's Rd	WOL	Restriping	19,506
NC Highway 581	Rosewood Rd	Buck Swamp Rd	PS	Roadway widening	18,784
Bill Lane Blvd	Arrington Bridge Rd	NC Highway 111	PS	Roadway widening	10,944
NC Highway 111	MPO Limits	New Hope Rd	PS	Roadway widening	48,471
Spence St	Cashwell Dr	US Highway 70	WOL	Restriping	5,642
Wayne Memorial Dr	Holly St	New Hope Rd	WOL	Restriping	14,136
Elm St	George St	Center St	BL	Reallocate	997
Sleepy Creek Rd	US Highway 117 Alt	MPO Limits	PS	Roadway widening	31,673
Old Grantham Rd	MPO Limits	Old Mount Olive Hwy	PS	Roadway widening	32,128
Pecan Rd	Old Mount Olive Hwy	Arrington Bridge Rd	PS	Roadway widening	12,426
William St	Patetown Rd	Stronach Ave	BL	Reallocate	4,934
George St	Murray St	A St	SLM	Marking	1,538
Center St	Holly St	Swan St	BB	Marking, Signage, Traffic Calming	2,159
Virginia St	Pine St	Murray St	BB	Marking, Signage, Traffic Calming	5,656
Jackson St	Mulberry St	Maple St	BB	Marking, Signage, Traffic Calming	3,595
Herman St	Elm St	Mulberry St	BB	Marking, Signage, Traffic Calming	2,654
Slaughter St	Newsome St	Elm St	BB	Marking, Signage, Traffic Calming	1,984
Stephens St	Ben Brewington Ct	End of Road	BB	Marking, Signage, Traffic Calming	3,577
Jefferson Ave	Edgerton St	Ninth St	BB	Marking, Signage, Traffic Calming	1,248
Edgerton St	Maple St	Claiborne St	BB	Marking, Signage, Traffic Calming	4,892
Claiborne St	Edgerton St	Peachtree St	BB	Marking, Signage, Traffic Calming	2,357
John St	Arrington Bridge Rd	Elm St	PS	Roadway widening	11,593
Arrington Bridge Rd	John St	Westbrook Rd	PS	Roadway widening	3,467

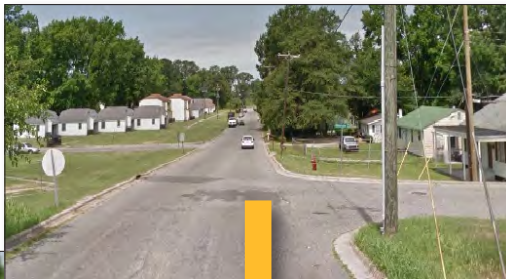
\*BB = Bike Boulevard, BL = Bike Lane, PS = Paved Shoulders, SLM = Shared Lane Markings, WOL = Wide Outside Lanes





## BICYCLE NETWORK BY SEGMENT (CONTINUED)

Roadway	From	To	Facility Type*	Implementation Method	Length (Feet)
Bryan Blvd	Old Grantham Rd	Neuse River	PS	Roadway widening	2,736
Quail Dr	North Dr	Cardinal Dr	BB	Marking, Signage, Traffic Calming	3,400
Gloucester Rd	Lockhaven Dr	Glen Oak Dr	BB	Marking, Signage, Traffic Calming	1,153
Westbrook Rd	Arrington Bridge Rd	Slocumb St	PS	Roadway widening	6,166
Slocumb St	Ash St	Simmons St	BB	Marking, Signage, Traffic Calming	315
Simmons St	Slocumb St	Lionel St	BB	Marking, Signage, Traffic Calming	985
Murray St	Virginia St	George St	BB	Marking, Signage, Traffic Calming	505
Poplar St	Newsome St	Weaver Dr	BB	Marking, Signage, Traffic Calming	1,950
Newsome St	Slaughter St	Poplar St	BB	Marking, Signage, Traffic Calming	309
Ben Brewington Ct	Stephens St	End of Road	BB	Marking, Signage, Traffic Calming	677
Peachtree St	Claiborne St	Durant St	BB	Marking, Signage, Traffic Calming	1,130
North Dr	The First Church Rd	Quail Dr	BB	Marking, Signage, Traffic Calming	615
Lockhaven Dr	Wayne Memorial Dr	Gloucester Rd	BB	Marking, Signage, Traffic Calming	982



### GOLDSBORO PHOTO VISUALIZATION: HOLLY STREET BIKE BOULEVARD



Holly Street is one of the recommended bike boulevards. Traffic calming treatments like street trees and speed humps will make this roadway safer for bicyclists and pedestrians.

\*BB = Bike Boulevard, BL = Bike Lane, PS = Paved Shoulders, SLM = Shared Lane Markings, WOL = Wide Outside Lanes



## GOLDSBORO PHOTO VISUALIZATION: ASH COMPLETE STREET RETROFIT



Ash Street (Business 70) near Leslie Street. The recommendation to complete a "road diet" or "Complete Street retrofit" is a visionary one. To accomplish this would require further study. Ash Street is an important gateway into Goldsboro with tremendous potential for economic development. A transformation of this road would make it more attractive and safe for motorists, pedestrians, and bicyclists traveling along and across Ash Street. Improvements would include a median island, street trees, consolidation of driveway entrances (reduction of conflict points), a sidewalk buffer, and bicycle lanes.



# Chapter 5: Pedestrian Network

## *Chapter Contents:*

*Types of Pedestrians*

*Methodology for  
Pedestrian Network Design*

*Pedestrian Facility Types*

*Pedestrian Network Maps*

*Sidewalk Network Tables*

*Intersection Improvement  
Tables*

*Photo Visualizations*

## OVERVIEW

For the purposes of this Plan, the pedestrian network refers to improvements within the roadway right-of-way. The pedestrian network includes a series of recommended changes that will create a more safe, accessible, and connected walkway system. The pedestrian network types include sidewalks and roadway crossing improvements such as marked crosswalks, countdown signals, curb ramps, and curb extensions. It is important to remember that the greenway network (Chapter 3) is an essential part of a comprehensive pedestrian system as well. This chapter describes pedestrian types, methodology, and facility types and includes pedestrian network maps, and features project cutsheets with maps, photo renderings, and cost estimates.

## TYPES OF PEDESTRIANS

Everyone is a pedestrian at some stage in their daily travel. This means pedestrians are a highly diverse road user group which includes children, adults, senior citizens, teenagers, joggers, the disabled and mobility impaired, and transit riders.

Pedestrians have a variety of characteristics so 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 walk. 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.

Taken from the WalkBikeNC Plan, the table on the following page summarizes common pedestrian characteristics for various age groups and anticipated portions of the state's population by 2030. According to the *Envision 35: Goldsboro Comprehensive Plan*, the median age of Goldsboro's population increased by 37.3% from 1980 to 2010, while North Carolina's median age increased 24.5%, suggesting a more rapidly aging community in Goldsboro than the state as a whole.



Pedestrians Characteristics by Age and NC Population	% Goldsboro Urbanized Area Population, 2000	% NC Population, 2000	% NC Population, 2030
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<b>Ages 1-4</b>			
<ul style="list-style-type: none"> <li>Learning to walk</li> <li>Requires constant adult supervision</li> <li>Developing peripheral vision and depth perception</li> </ul>	26.1% (under 18)	24% (under 18)	25.2% (under 18)
<b>Ages 5-8</b>			
<ul style="list-style-type: none"> <li>Increasing independence, but still requires supervision</li> <li>Poor depth perception</li> </ul>	26.1% (under 18)	24% (under 18)	25.2% (under 18)
<b>Ages 9-13</b>			
<ul style="list-style-type: none"> <li>Susceptible to “dart out” intersection dash</li> <li>Poor judgment</li> <li>Sense of invulnerability</li> <li>Improved awareness of traffic environment</li> </ul>	26.1% (under 18)	24% (under 18)	25.2% (under 18)
<b>Ages 14-18</b>			
<ul style="list-style-type: none"> <li>Poor judgment</li> </ul>	26.1% (under 18)	24% (under 18)	25.2% (under 18)
<b>Ages 19-40</b>			
<ul style="list-style-type: none"> <li>Active, fully aware of traffic environment</li> </ul>	40.5% (18-44)	41% (18-44)	34.6% (18-44)
<b>Ages 41-65</b>			
<ul style="list-style-type: none"> <li>Slowing of reflexes</li> </ul>	21.2% (45-64)	22.5% (45-64)	22.4% (45-64)
<b>Ages 65+</b>			
<ul style="list-style-type: none"> <li>Difficulty crossing street</li> <li>Vision loss</li> <li>Difficulty hearing vehicles approaching from behind</li> </ul>	12.2% (65+)	12% (65+)	17.8% (65+)

Sources: AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities (July 2004), Exhibit 2-1, and the US Census Bureau, Interim State Population Projections, 2005.



## METHODOLOGY FOR PEDESTRIAN NETWORK DESIGN

The recommended pedestrian network was designed in mind for all types of pedestrians with a special focus of providing a connected network that safely creates separation from the roadway via sidewalk and highly-visible and appropriate intersection and crossing improvements. The network was developed based on Steering Committee input, public input, NCDOT Division input, existing conditions analysis, recommendations from previous studies, noted destinations, presence of existing local and regional greenway projects, and field analyses (including the mapping of informal footpaths as noted in Chapter 2). The network identifies important projects, but, in the long term, sidewalks and appropriate crossing facilities should be implemented on all streets (see Chapter 6).



### The Hub + Spokes Model

The image at left shows some of the key components for the overall bicycle, pedestrian and trail network based on a model of hubs (destinations) and spokes (walking and bicycling corridors).

The image below *conceptually* shows how this model of hubs and spokes could be applied in Goldsboro, NC, with a network of complete streets (in grey) and greenways (in green) connecting key destinations throughout the city. **Keep in mind the map below only conceptually shows these linkages. See maps on the following pages for actual pedestrian network recommendations.**



## PEDESTRIAN FACILITY TYPES

### Sidewalks

Sidewalks are the primary mode of pedestrian travel in most areas and are a crucial element in any pedestrian network. Typically, a sidewalk is at least five-feet wide and ideally features a buffer between it and the roadway.

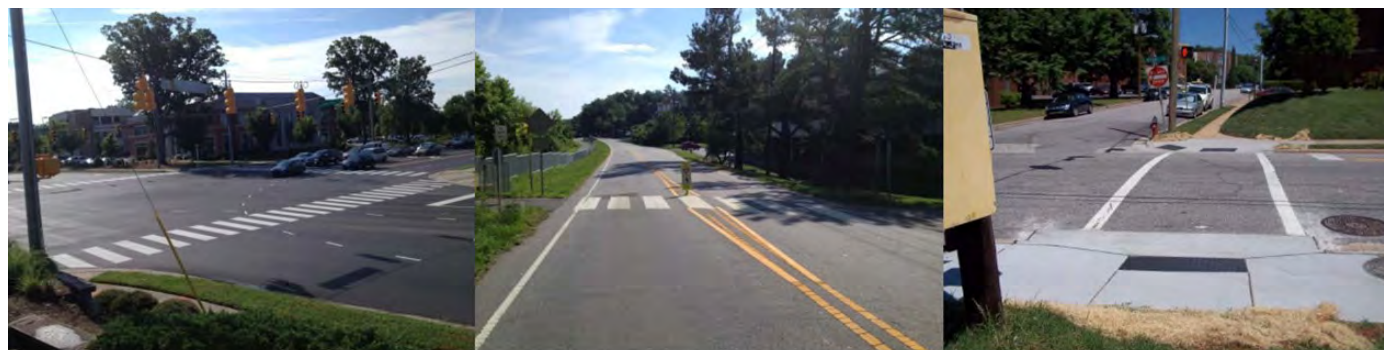


Sidewalk in Burgaw, NC

### Marked Crosswalks

Crosswalks are used to alert motorists to locations where they should expect pedestrians and to identify a designed crossing location for pedestrians. A crosswalk may be marked or unmarked since, legally, crosswalks exist at all intersections, unless specifically prohibited. Marked crosswalks reduce pedestrian crashes by 25% according to the 2008 FHWA Desktop Reference for Crash Reduction Factors. **In October 2013, Raleigh adopted a new crosswalk marking standard (high visibility markings at signalized intersections; high visibility markings at midblock locations; parallel bar markings at stop controlled locations). This is also recommended for Goldsboro (see Chapter 6).**

*Marked crosswalks may reduce pedestrian crashes by 25% (2008 FHWA Crash Reduction Factors).*



Marked crosswalks in Raleigh, NC

## Countdown Signals

Pedestrian signal heads indicate to pedestrians when they should cross a street. Countdown signals that indicate the amount of time pedestrians have remaining to cross the street should be installed with all new or replacement signals. Pedestrian signal indications should be used at traffic signals wherever warranted, according to the MUTCD.

Countdown signals  
(and marked  
crosswalk) in  
Greenville, NC

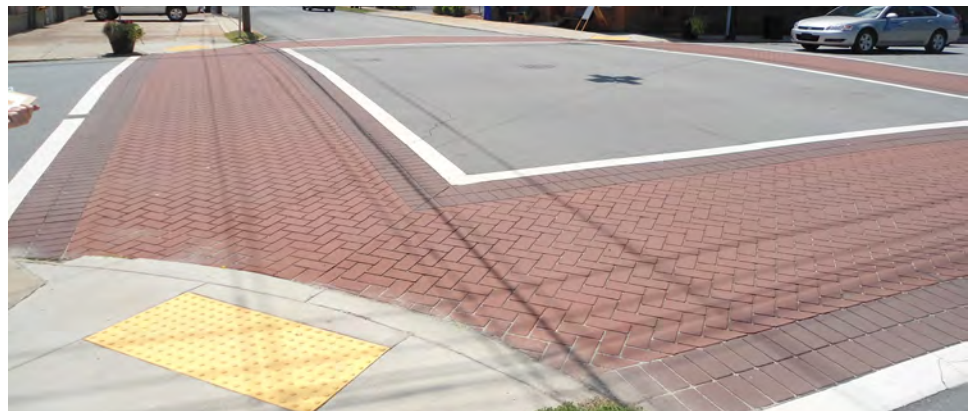


*Adding pedestrian signalization may reduce crashes by upwards of 55%. Replacing WALK/ DON'T WALK signals with countdown signals may reduce pedestrian crashes by 25% (2008 FHWA Crash Reduction Factors).*

## Curb Ramps

Curb ramps provide access between the sidewalk and roadway for people using wheelchairs, strollers, walkers, crutches, handcarts, bicycles, and also for pedestrians with mobility impairments who have trouble stepping up and down high curbs. Curb ramps must be installed at all intersections and midblock locations where pedestrian crossings exist, as mandated by federal legislation (1973 Rehabilitation Act and 1990 Americans with Disabilities Act). In most cases, separate curb ramps for each crosswalk at an intersection should be provided rather than having a single ramp at a corner for both crosswalks.

Curb ramp  
(with truncated  
dome) in  
Mebane, NC.



## Pedestrian Hybrid Beacon

A hybrid beacon, also known as a High-Intensity Activated Crosswalk (HAWK), consists of a signal-head with two red lenses over a single yellow lens on the major street and pedestrian and/or bicycle signal heads for the minor street. There are no signal indications for motor vehicles on the minor street approaches. Hybrid beacons were developed specifically to enhance pedestrian crossings of major streets. However, several cities have installed modified hybrid beacons that explicitly incorporate bicycle movements.(NACTO).



HAWK signal in Boone, NC

## Median Islands

Median islands—also known as center islands, refuge islands, pedestrian islands, or median slow points—are raised islands placed in the center of the street at intersections or midblock to help protect crossing pedestrians from motor vehicles. Center crossing islands allow pedestrians to deal with only one direction of traffic at a time, and they enable them to stop partway across the street and wait for an adequate gap in traffic before crossing the second half of the street. They are a proven crash reduction device for pedestrians.



*Refuge islands may reduce pedestrian crashes by 56% (2008 FHWA Crash Reduction Factors).*

Median islands in Charlotte, NC (photo courtesy of City of Charlotte).



## Curb Extensions

Curb extensions (also called bulb-outs or bump-outs) are extensions of sidewalks that narrow the street, increase pedestrian visibility, and decrease pedestrian crossing distance. They are an element of traffic calming that prioritizes pedestrian safety, reduces vehicle speeds, and serves to protect on-street parking. Curb extensions should however not intrude into a bicycle lane.

Curb extensions in Rocky Mount, NC (Note curb extension associated with crosswalk at stoplight).



## Pedestrian Signage

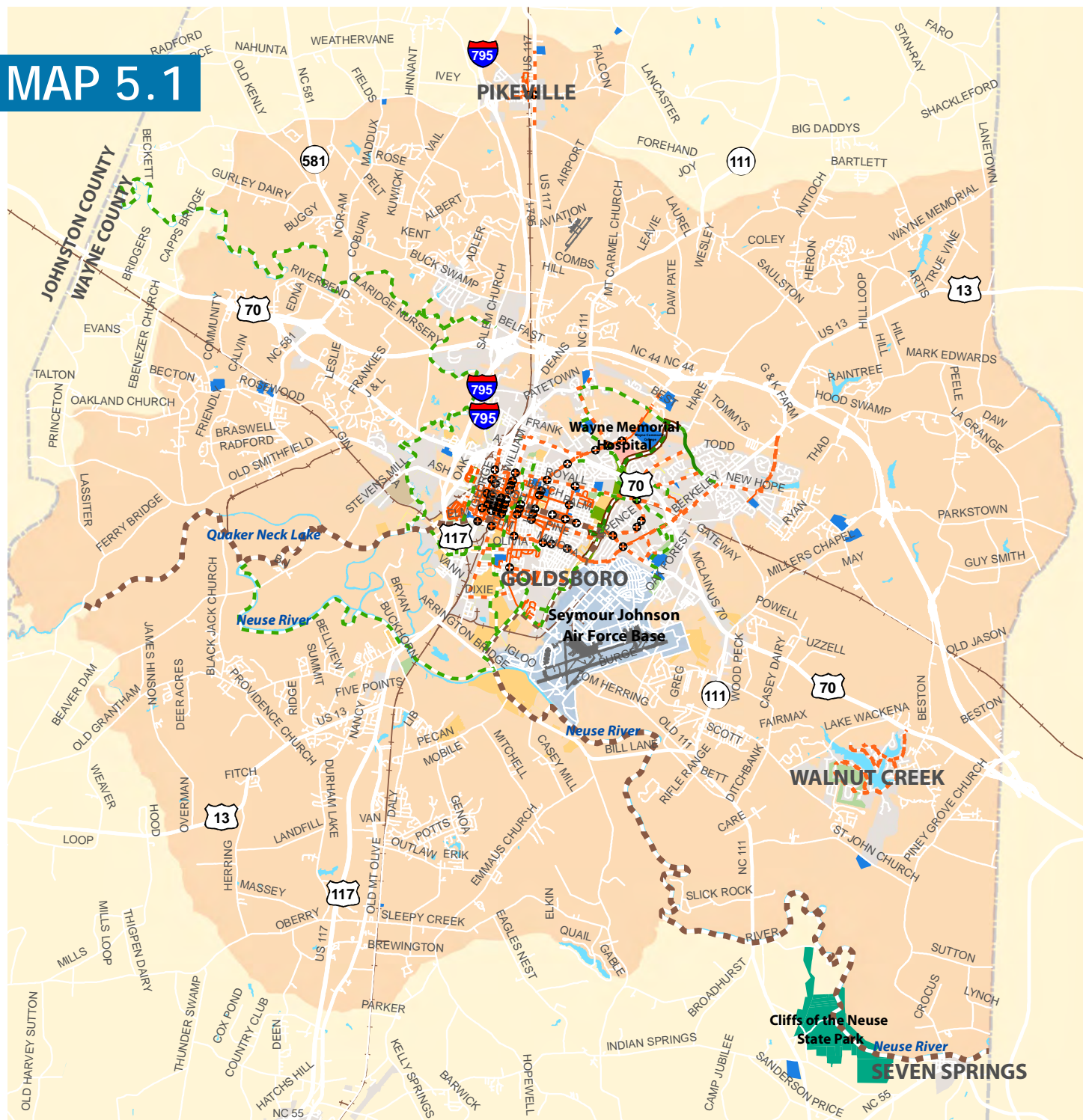
In-street pedestrian crossing signs reinforce the presence of crosswalks and remind motorists of their legal obligation to yield for pedestrians in marked or unmarked crosswalks. This signage is often placed at high-volume pedestrian crossings that are not signalized. Regular pedestrian warning signage is another type of common signage used to warn motorists of pedestrian crossings.

Pedestrian in-roadway signage at school in Conover, NC.





# MAP 5.1



## Recommended Pedestrian Facilities - MPO



### Legend

#### Recommended Ped. Facilities

- ◆ Crossing Improvement
- Sidewalk
- Shared-Use Path

#### Existing Infrastructure

- Existing Sidewalk
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- Railroad

#### Lands of Interest

- City Greenway Lands
- Park
- State Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

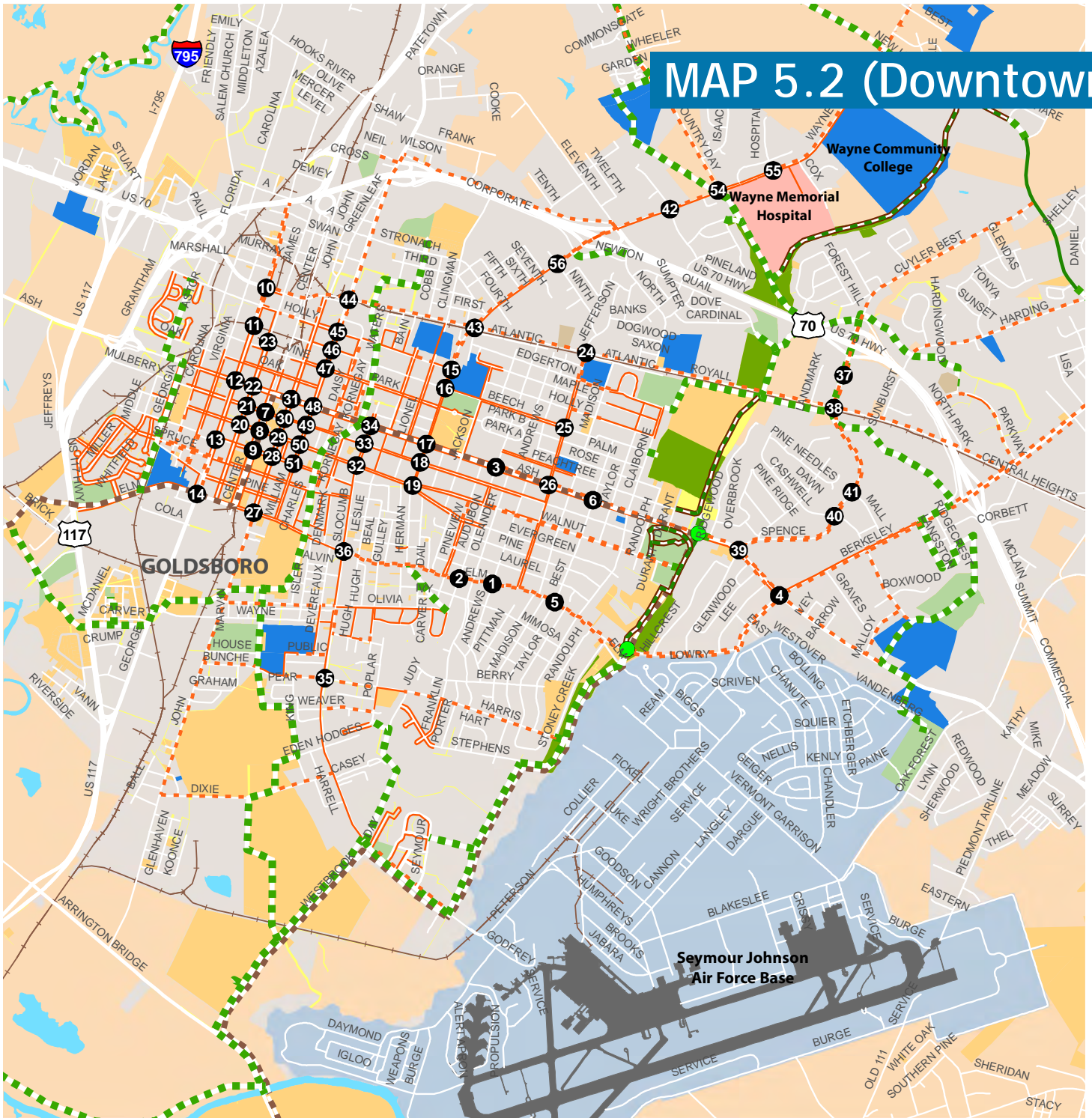
#### Additional Context

- Proposed Mountains-to-Sea Trail Alignment
- Water Bodies
- Seymour Johnson Air Force Base
- City Limits
- MPO Limits
- Wayne County Border

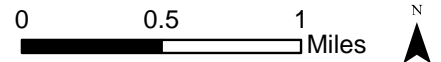




# MAP 5.2 (Downtown)



## Recommended Pedestrian Facilities - Downtown



### Legend

#### Recommended Ped. Facilities

- HAWK Signal
- Crossing Improvement\*
- - - Sidewalk
- - - Shared-Use Path

#### Existing Infrastructure

- Existing Sidewalk
- Existing Shared-Use Path
- Funded Shared-Use Path
- Roadway
- + Railroad

#### Lands of Interest

- City Greenway Lands
- Park
- Schools
- Hospital
- Other Destinations
- City Easements
- Other City/County Property

#### Additional Context

- - - Proposed Mountains-to-Sea Trail Alignment
- Water Features
- Seymour Johnson Air Force Base
- City Limits
- MPO Limits



\*Crossing Improvements correspond to table starting on page 5-12.



## SIDEWALK NETWORK BY SEGMENT

Roadway	From	To	Side	Foot-path	Length (Feet)
Royall Avenue	William Street	Spence Street	North	Y	12,532
Harris Street	Ben Brewington Court	Stoney Creek Parkway	South	N	3,995
Berkeley Boulevard	Elm Street	Ash Street	Both	Y	3,393
Spence Avenue	Ash Street	US 70	Both	Y	14,357
Central Heights Road	New Hope Road	US 13	Both	N	12,519
Royall Avenue	Spence Street	Berkeley Boulevard	North	Y	4,577
John Street	Dixie Trail	Elm Street	East	N	7,485
Elm Street	Slocumb Street	Berkeley Boulevard	Both	Y	21,140
Herman Street	Beech Street	Royall Avenue	West	Y	1,679
Herman Street	Holly Street	Royall Avenue	East	Y	1,228
Cashwell Drive	Berkeley Boulevard	Malloy Street	South	Y	2,184
Ash Street	Spence Avenue	Berkeley Boulevard	Both	Y	2,926
Walnut Street	Audubon Avenue	Stoney Creek Park	Both	Y	8,578
Jefferson Avenue	Edgerton Street	Royall Avenue	Both	N	1,540
Edgerton Street	Jefferson Avenue	Madison Avenue	Both	N	1,635
Holly Street	Leslie Street	Lionel Street	North	N	443
Bunche Drive	Stadium Road	Slocumb Street	North	N	986
Bunche Drive	John Street	Sycamore Street	North	N	1,316
Olivia Lane	Deveraux Street	Slocumb Street	South	N	318
Public Drive	Existing Sidewalk	Slocumb Street	North	N	791
Spruce Street	Railroad	James Street	Both	N	3,045
Virginia Avenue	Pine Street	Chestnut	Both	N	1,485
George Street	Elm Street	Chestnut	Both	Y	1,189
Carolina Avenue	Pine Street	Walnut Street	East	N	1,022
George Street	Railroad	US 70	Both	Y	5,266
US 70 Bypass Side Rd	William Street	Eleventh Street	North	N	5,575
Holly Street	James Street	Center Street	South	N	411
Daisy Street	Mulberry Street	Holly Street	Both	N	2,297
Kornegay Street	Ash Street	Park Avenue	Both	N	1,045
Main Street	Russell Drive	Mill Street	Both	N	3,338
Main Street	Railroad Street	Goldsboro Street	North	N	403
US 117	Mt Carmel Church Rd	Big Daddys Road	East	N	3,371
Walnut Creek Drive	Breezewood Drive	US 70	Both	N	9,797
Pinehurst Lane	Doral Drive	End of Road	Both	N	2,579
Doral Drive	Pinehurst Lane	Walnut Creek Drive	Both	N	2,185
Walnut Creek Drive	Doral Drive	End of Road	Both	N	10,726
Mill Road	Lakeshore Drive	Walnut Creek Drive	Both	N	21,982
Lakeshore Drive	Lakeshore Drive	Mill Road	Both	N	10,792



Roadway	From	To	Side	Foot-path	Length (Feet)
Olivia Lane	John Street	Deveraux Street	South	N	2,426
Pineview Avenue	Evergreen Avenue	Walnut Street	Both	N	982
Holly Street	Jefferson Avenue	Existing Sidewalk	North	N	794
Wayne Memorial Drive	New Hope Road	Tommy's Road	East	N	2,487
Country Day Road	Patetown Road	Wayne Memorial Drive	West	N	6,535
Patetown Road	Country Day Road	Kearney Lane	West	N	2,804
Newsome Street	Slocumb Street	Slaughter Street	North	N	498
Slaughter Street	Newsome Street	Existing Sidewalk	West	N	212
Poplar Street	Weaver Place	Existing Sidewalk	East	N	80
Harris Street	Slocumb Street	Poplar Street	South	N	1,289
Weaver Drive	Slocumb Street	Poplar Street	North	N	1,294
Malloy Street	Ash Street	Cashwell Drive	East	N	1,461
Berkeley Boulevard	Mall Access	New Hope Road	West	Y	6,850
Berkeley Boulevard	Ash Street	Fallin Boulevard	Both	Y	9,899
Ash Street	Berkeley Boulevard	Greenwood Middle School	North	N	3,056
Wayne Memorial Drive	Hospital Road	New Hope Road	West	N	4,283
Wayne Memorial Drive	Royall Avenue	Country Day Road	Both	Y	8,505
Herman Street	Royall Avenue	Railroad	East	N	68
Ash Street	Audubon Avenue	Spence Street	North	Y	5,579
Cuyler Best Road	US 70	New Hope Road	West	N	6,475
William Street	McIntire Street	US 70	East	Y	4,306
John Street	Holly Street	Atlantic Avenue	West	N	312
Slocumb Street	Newsome Street	Olivia Lane	East	Y	650
US 117	Big Daddy's Road	High School	East	N	4,404
Slocumb Street	Day Circle	Proposed Shared-Use Path	North	Y	2,102
Neil Street	William Street	Tuskegee Street	South	N	645
Mill Street	Main Street	School Street	West	N	1,220
Eleventh Street	Lincoln Mercury Drive	Wayne Memorial Drive	West	N	163
Grantham Street	George Street	William Street	North	N	2,062
Harding Drive	Proposed Shared-Use Path	New Hope Road	North	N	4,699
Parkway Drive	North Park Drive	Berkeley Boulevard	South	N	2,297
New Hope Road	Berkeley Boulevard	Central Heights Drive	South	N	3,761
Central Heights Road	New Hope Road	Existing Sidewalk	East	N	270
New Hope Road	Central Heights Road	Food Lion	North	N	862
Dixie Trail	John Street	Slocumb Street	North	N	3,692



## SIGNALIZED INTERSECTION RECOMMENDATIONS

The following table provides recommendations for pedestrian improvements at more than 50 signalized intersections and rail road crossings in Goldsboro. Table contents are based on a field inventory by project consultants in early 2014. The circled number in each row correspond to Map 5.2 Recommended Pedestrian Facilities on page 5-9.

<i>Road 1</i>	<i>Road 2</i>	<i>Nearby Destinations</i>	<i>Speed Limit</i>	<i>Marked Crosswalk Present? Condition?</i>	<i>Ped Signal Present? (Y/N)</i>	<i>Intersection Field Notes</i>	<i>Recommendations</i>
Andrews Ave <b>1</b>	Elm St	Residential	35/25	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor.	Provide at least one high-visibility crosswalk across Elm and two standard crosswalks along Elm. Provide pedestrian countdown signals and curb ramps with truncated domes.
Audubon St <b>2</b>	Elm St	Residential	25	No	N	Part of an MPO/TIP Pedestrian Corridor.	Provide two high-visibility crosswalk across Elm and two standard crosswalks along Elm. Provide pedestrian countdown signals and curb ramps with truncated domes.
Audubon St <b>3</b>	Ash St	Residential, small business	25	No; but stop lines present	N		Provide two high-visibility crosswalk across Ash and two standard crosswalks along Ash. Provide pedestrian countdown signals. Complete curb ramps with truncated domes.
Berkeley Blvd <b>4</b>	Ash St	Pharmacies, shopping centers, small businesses, and nearby residential and school	35	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor. Concrete medians on each street, ranging from 2-5 feet wide. Opportunity for pedestrian refuge islands. One bike and one pedestrian accident nearby.	Provide at least one high-visibility crosswalk across Ash and one standard crosswalks along Ash. Provide pedestrian countdown signals. Complete curb ramps with truncated domes. Consider opportunity for a pedestrian refuge islands.
Best St <b>5</b>	Elm St	Residential	35/25	No	N	Part of an MPO/TIP Pedestrian Corridor.	Provide at least one high-visibility crosswalk across Elm and one standard crosswalks along Elm. Provide pedestrian countdown signals and curb ramps with truncated domes.
Best St <b>6</b>	Ash St	Food Lion and small businesses	35/25	No; but stop lines present	N	Sidewalk on Best near this intersection is not in the original GIS data set. One bus stop nearby on Best.	Provide at least one high-visibility crosswalk across Ash and one standard crosswalks along Ash. Provide pedestrian countdown signals. Complete curb ramps with truncated domes.



<b>Road 1</b>	<b>Road 2</b>	<b>Nearby Destinations</b>	<b>Speed Limit</b>	<b>Marked Crosswalk Present? Condition?</b>	<b>Ped Signal Present? (Y/N)</b>	<b>Intersection Field Notes</b>	<b>Recommendations</b>
Center St <b>7</b>	Mulberry St	Downtown destinations, small businesses, Town Hall, gov't services	20	Yes; Not highly visible, but in good condition with stop lines	Y	Large landscaped median with street furniture and bicycle racks. Sidewalk features brick pavers. Pedestrian friendly streetscape elements such as benches, wide sidewalk, trash cans, landscaping, hanging planters, street trees. Mid-block pedestrian crossing signage just north of this intersection.	Provide two high-visibility crosswalk along Center, one along the south side of Mulberry. Add truncated domes to curb ramps on south side.
Center St <b>8</b>	Walnut St	Downtown destinations, small businesses	20	Yes; Not highly visible; in fair condition with stop lines.	Y	Large landscaped median with street furniture. Sidewalk features brick pavers. Pedestrian friendly streetscape elements such as benches, wide sidewalk, trash cans, landscaping, hanging planters, pedestrian scale lighting, street trees.	Provide two high-visibility crosswalk along Center, one along the south side of Walnut. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Center St <b>9</b>	Chestnut St	Downtown destinations, small businesses, Cornerstone Commons	20	Yes; Not highly visible, in poor condition with stop lines	Y	This is a two-stage east-west intersection. Concrete median with street trees. Some sidewalk features brick pavers. Pedestrian friendly streetscape elements such as wide sidewalk, trash cans, landscaping, hanging planters, pedestrian scale lighting, street trees.	Provide two high-visibility crosswalk along Center, one along the south side of Chestnut. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
George St <b>10</b>	Grantham St/US 70 Business	Express Mart, gas station auto services, small businesses	35	N	N	Sidewalk near this intersection is not in the original GIS data set. One pedestrian accident and one bus stop nearby.	Provide at least one high-visibility crosswalk across Grantham/US 70 Business and standard crosswalks along Grantham/US 70 Business. Provide pedestrian countdown signals. Complete curb ramps with truncated domes.
George St <b>11</b>	Railroad (just south of Grantham St)	Small businesses along George St	35	N/A	N/A	Railroad crossing. Existing east side sidewalks do not connect over the RR tracks (no pedestrian accommodation)	Initiate discussions with RR owners & operators. Provide safe, complete, and accessible crossings over RR tracks for pedestrians, bicyclists, wheeled-devices and people with disabilities.



<b>Road 1</b>	<b>Road 2</b>	<b>Nearby Destinations</b>	<b>Speed Limit</b>	<b>Marked Crosswalk Present? Condition?</b>	<b>Ped Signal Present? (Y/N)</b>	<b>Intersection Field Notes</b>	<b>Recommendations</b>
George St <b>12</b>	Ash St	Restaurant, Dollar General, small businesses	35/20	Yes; Not highly visible, but in good condition with stop lines	Y	High pedestrian activity observed (3 pedestrians in 5 minutes w/ cold weather). Pedestrian crash.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps with truncated domes.
George St <b>13</b>	Chestnut St	Residential, NC Wesleyan College	35	N	N	Chestnut St is off-set at George St. Fair sight distance.	Provide high visibility crosswalks and pedestrian countdown signals along both sides of George, and at least one across George. Complete curb ramps with truncated domes.
George St <b>14</b>	Elm St	D & H Mart, Family Dollar, small businesses, restaurant, School Street Elem.	35	N	N	Worn footpaths near intersection. High pedestrian activity observed. Bus Stop. Fair sight distance.	Provide high visibility crosswalks and pedestrian countdown signals along both sides of George, and at least one across George. Complete curb ramps with truncated domes.
Herman St <b>15</b>	Holly St	Wayne School of Engineering, Goldsboro High School, residential, and nearby elementary school	35	Yes; Not highly visible, in fair to poor condition with stop lines	Y	Part of an MPO/TIP Pedestrian Corridor. Sidewalk recommended by MPO in State TIP along Herman; footpath noted on Herman. Pedestrian school crossing signs.	Provide high visibility crosswalks in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Herman St <b>16</b>	Beech St	Residential, Herman Park, Wayne School of Engineering/Goldsboro High School	25	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor. Major crossing for park, school and neighborhood. Sight distance: (tree on NW corner blocks some view).	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Herman St <b>17</b>	Ash St	Herman Park, Wayne County Office Building (DSS/DPH), Rite Aid, Goldsboro Recreation and Parks Department, small businesses	35	Yes; Highly visible, in good condition with stop lines	Y	Pedestrian crash and nearby bus stops. Crosswalk currently in one place only. Historic marker signage.	Provide high visibility crosswalks in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Herman St <b>18</b>	Mulberry St	Residential and church	25	No	N	Pedestrian crash	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Herman St <b>19</b>	Evergreen and Walnut	Residential, including public housing nearby	25	No; but stop lines present	N	This is a five-points intersection with roundabout/traffic circle potential with reconstruction.	Consider redesigning this intersection with a roundabout/traffic circle. If not feasible, provide high visibility crosswalks and pedestrian countdown signals. Complete curb ramps with truncated domes.





Road 1	Road 2	Nearby Destinations	Speed Limit	Marked Crosswalk Present? Condition?	Ped Signal Present? (Y/N)	Intersection Field Notes	Recommendations
James St <b>20</b>	Walnut St	Downtown destinations, small businesses	25	N	N	Some street furniture (trash cans). Bus Stop.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps with truncated domes.
James St <b>21</b>	Mulberry St	Downtown destinations, small businesses, church	25	N	Y	Existing parking is close to intersection.	Provide high visibility crosswalks in all directions. Complete curb ramps with truncated domes.
James St <b>22</b>	Ash St	Comco Fuel Mart, small businesses, church	35/25	N	N	Historic signage on the NW corner.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps with truncated domes.
James St <b>23</b>	RR (just north of Vine)	Small industrial businesses along George St	35	N/A	N/A	Railroad crossing. Existing east side sidewalks do not connect over the RR tracks (no pedestrian accommodation)	Initiate discussions with RR owners & operators. Provide safe, complete, and accessible crossings over RR tracks for pedestrians, bicyclists, wheeled-devices and people with disabilities.
Jefferson Ave <b>24</b>	Royall Ave	Boys and Girls Club, small businesses, nearby residential	35	Yes; Not highly visible, in fair to poor condition with stop lines	Y	Part of an MPO/TIP Pedestrian Corridor. RR tracks and small roadway located directly south of intersection. Footpaths nearby (no pedestrian accommodations at RR tracks). Mid-block pedestrian crossing and "Do Not Pass" signage just west of this intersection (at boys and Girls Club)	Provide high visibility crosswalks, pedestrian countdown signals, and curb ramps with truncated domes on at least one side both across and along Royall. Also, initiate discussions with RR owners & operators for tracks directly south of this intersection. Provide safe, complete, and accessible crossings over RR tracks for pedestrians, bicyclists, wheeled-devices and people with disabilities.
Jefferson Ave <b>25</b>	Beech St	Residential, Goldsboro Housing Authority Service Center	25	No; but stop lines present	N	Sight distance: landscaping on NW corner blocks some view.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Jefferson Ave <b>26</b>	Ash St	Residential, small businesses, Express Mart, Edge-wood Community Development School	35/25	No; but stop lines present	N	Ash is off-set at Jefferson. Two bus stops.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
John St <b>27</b>	Elm St	Restaurant (Sof-T-Serve), residential, small business	20	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor. Bike crash; two bus stops. Landscaping is overgrown on nearby sidewalk (covering entire width)	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.



<b>Road 1</b>	<b>Road 2</b>	<b>Nearby Destinations</b>	<b>Speed Limit</b>	<b>Marked Crosswalk Present? Condition?</b>	<b>Ped Signal Present? (Y/N)</b>	<b>Intersection Field Notes</b>	<b>Recommendations</b>
John St <b>28</b>	Chestnut St	Downtown destinations, small businesses, church, residential	20	No; but stop lines present	N	Pedestrian crash, bus stop; truncated domes on ramps.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions).
John St <b>29</b>	Walnut St	Downtown destinations, small businesses, Arts Council of Wayne County	20	Yes; Not highly visible, in poor condition with stop lines	N	Some sidewalk features brick pavers. Pedestrian friendly streetscape elements such as wide sidewalk, trash cans, landscaping. Parking very close to intersection.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
John St <b>30</b>	Mulberry St	Downtown destinations, small businesses, Jefferys Building, block from Town Hall	20	No; but stop lines present	N	Limited streetscape elements (trash cans only); nearby bus stop.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
John St <b>31</b>	Ash St	Small businesses, banks, restaurants, near downtown destinations,	20	No; but stop lines present	N	Speed limit is 20, but observed speeds are much higher.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Slocumb St <b>32</b>	Walnut St	Residential, including Walnut St School Apartments	25	No; but stop lines present	N	Pedestrian crash and two bus stops. Sight distance: tree on SE corner blocks some view.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps with truncated domes.
Slocumb St <b>33</b>	Mulberry St	Residential	25	No; but stop lines present	N	Pedestrian crash and bike crash	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Provide curb ramps with truncated domes.
Slocumb St <b>34</b>	Ash St	Small businesses, church, barber shop, auto services, nearby residential	35	No; but stop lines present	N		Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Slocumb St <b>35</b>	Harris St	Residential	35/25	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor. Also need sidewalk from Schools to Slocumb St on Harris	Provide at least one high visibility crosswalk and pedestrian countdown signal across Slocumb, and at least one along Slocumb. Provide curb ramps with truncated domes.



<b>Road 1</b>	<b>Road 2</b>	<b>Nearby Destinations</b>	<b>Speed Limit</b>	<b>Marked Crosswalk Present? Condition?</b>	<b>Ped Signal Present? (Y/N)</b>	<b>Intersection Field Notes</b>	<b>Recommendations</b>
Slocumb St <b>36</b>	Elm St	Express Mart, nearby residential	25	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor. Nearby footpaths, pedestrian crash, bike crash, and multiple bus stops	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Spence Ave <b>37</b>	at Walmart	Pinewood Square shopping center, Walmart, North Plaza Shopping Center, hotels and restaurants	35	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor. Concrete landscaped median on west side. Pedestrian activity could include service industry employees in addition to customers. Multiple pedestrian accidents nearby.	Provide at least one high visibility crosswalk and pedestrian countdown signal across Spence, and at least one along Spence. Complete curb ramps with truncated domes.
Spence Ave <b>38</b>	Royall Ave	Pinewood Square shopping center, Walmart, North Plaza Shopping Center, hotels and restaurants	35	No	N	Part of an MPO/TIP Pedestrian Corridor. RR tracks located directly south of intersection (no pedestrian accommodations at RR tracks). Sight distance note: elevation and curve blocks some view.	Provide high visibility crosswalks, pedestrian countdown signals, and curb ramps with truncated domes on at least one side both across and along Royall. Provide pedestrian countdown signals. Provide curb ramps with truncated domes. Also, initiate discussions with RR owners & operators for tracks directly south of this intersection. Provide safe, complete, and accessible crossings over RR tracks for pedestrians, bicyclists, wheeled-devices and people with disabilities.
Spence Ave <b>39</b>	Ash St	Small businesses and nearby residential	35	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor. Pedestrian sign at the east Ash approach.	Provide at least one high visibility crosswalk and pedestrian countdown signal across Ash, and at least one along Ash. Provide curb ramps with truncated domes.
Spence Ave <b>40</b>	Cashwell	Small businesses, Crossroads Plaza, and nearby residential	35	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Spence Ave <b>41</b>	Mall Rd	Small businesses, Express Mart	35	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor.	Provide at least one high visibility crosswalk and pedestrian countdown signal across Spence, and at least one along Spence. Provide curb ramps with truncated domes.



<b>Road 1</b>	<b>Road 2</b>	<b>Nearby Destinations</b>	<b>Speed Limit</b>	<b>Marked Crosswalk Present? Condition?</b>	<b>Ped Signal Present? (Y/N)</b>	<b>Intersection Field Notes</b>	<b>Recommendations</b>
Wayne Memorial Drive <b>42</b>	Lockhaven Dr	Pharmacies, small businesses, and nearby residential	35	No; but stop lines present	N	Three pedestrian crashes nearby. Two bus stops.	Provide at least one high visibility crosswalk and pedestrian countdown signal across Wayne Memorial, and two along Wayne Memorial. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Wayne Memorial Drive/Herman St <b>43</b>	Royall Ave	Pharmacy, food mart, residential, small businesses, Goldsboro High School and Middle School	35	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor. RR tracks located directly south of intersection (no pedestrian accommodations at RR tracks). Footpaths observed near intersection. One pedestrian accident and two bus stops nearby.	Provide high visibility crosswalks, pedestrian countdown signals, and curb ramps with truncated domes on at least one side, both across and along Royall. Provide pedestrian countdown signals. Also, initiate discussions with RR owners & operators for tracks directly south of this intersection. Provide safe, complete, and accessible crossings over RR tracks for pedestrians, bicyclists, wheeled-devices and people with disabilities.
William St <b>44</b>	Royall Ave	Industrial and auto services	35	No; but stop lines present	N	Part of an MPO/TIP Pedestrian Corridor. Two pedestrian crashes and a nearby bus stop. RR tracks and small roadway located directly south of intersection. Footpaths nearby (no pedestrian accommodations at RR tracks).	Provide high visibility crosswalks, pedestrian countdown signals, and curb ramps with truncated domes on at least one side, both across and along Royall. Also, initiate discussions with RR owners & operators for tracks directly south of this intersection. Provide safe, complete, and accessible crossings over RR tracks for pedestrians, bicyclists, wheeled-devices and people with disabilities.
William St <b>45</b>	Holly St	Small industrial businesses, Salvation Army	25	No; but stop lines present	N	Pedestrian crash and nearby bus stop	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
William St <b>46</b>	Beech St	Auto services, Fast Strip Mart, residential	25	No; but stop lines present	N	Nearby existing sidewalk is poorly maintained on NW side.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps with truncated domes.
William St <b>47</b>	Park Ave	Auto services, House of Fordham (social/religious service), residential	25	No; but stop lines present	N	Nearby bike crash.	Provide high visibility crosswalks and pedestrian countdown signals in all directions. Complete curb ramps with truncated domes.



Road 1	Road 2	Nearby Destinations	Speed Limit	Marked Crosswalk Present? Condition?	Ped Signal Present? (Y/N)	Intersection Field Notes	Recommendations
William St <b>48</b>	Ash St	Banks, restaurants, AT&T, Chamber of Commerce, Visitors Center, and Post Office	20	Yes; Not highly visible, but in good condition with stop lines	Y	Bicycle crash. Two historic signage markers.	Provide high visibility crosswalks in all directions.
William St <b>49</b>	Mulberry St	Wayne County Museum, post office church, small businesses, nearby residential	20	Yes; Not highly visible, but in good condition with stop lines	Y	Mulberry St is offset at William St.; two pedestrian crashes. Civil War Trail signage. Off-set intersection may impact sight distance.	Replace current crosswalks with high visibility crosswalks. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
William St <b>50</b>	Walnut St	Wayne Co Veterans Memorial, small businesses, county courthouse, nearby residential	20	Yes; Not highly visible, in poor condition with stop lines	Y	Veterans Memorial serves as a park. Historic marker signage.	Provide high visibility crosswalks in all directions. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
William St <b>51</b>	Chestnut St	Wayne Co courthouse, small businesses, Co Administrative Building, nearby residential	20	Yes; Not highly visible, in poor condition with stop lines	Y	Crosswalk lines nearly invisible. Mid-block pedestrian crossing signage just north of this intersection.	Replace current crosswalks with high visibility crosswalks. Complete curb ramps (currently single ramps serving crossings in both directions); add truncated domes.
Main St <b>52</b>	RR	Downtown Pikeville	25	No; Pedestrians forced in road at RR xing	N	Existing sidewalk on Main Street in Downtown; no ped crossing of RR	Continue sidewalk/ADA-compliant crossing of RR tracks that gets pedestrians out of road; Add marked crosswalks across Railroad Street
Main St <b>53</b>	US 117	Downtown Pikeville; convenient stores	25/35	No; but stop lines present	N	Existing sidewalk on only one leg but recommended sidewalk along two more legs. Some curb ramps missing.	Add marked crosswalks; complete ADA compliant curb ramps; add countdown signals.
Wayne Memorial Dr <b>54</b>	Country Day Rd	Wayne Memorial Hospital, Wayne Community College, Wayne Country Day School, residential	35	No; but stop lines present	Y	Existing sidewalk on hospital side. Two curb ramps are present but are overgrown and need to be upgraded.	Add high visibility crosswalks, pedestrian countdown signals, and curb ramps with truncated domes on all sides to accommodate the recommended sidewalk on the north side and the recommended trail crossing at this intersection.
Wayne Memorial Dr <b>55</b>	Hospital Rd	Wayne Memorial Hospital, medical offices, Wayne Community College	35	No; but stop lines present	Y	Existing sidewalk on south side and northwest side. Median on hospital side forces pedestrians into road. Curb ramps present.	Add high visibility crosswalks, pedestrian countdown signals, and curb ramps with truncated domes on all sides. Redesign the hospital-side median to accommodate pedestrians.
Wayne Memorial Drive <b>56</b>	Ninth Street	Carly C's grocery, shopping, residential	35	No; but stop lines present	Y	No curb ramps, no sidewalk or crosswalks to connect to shopping.	Add high visibility crosswalks, ADA-compliant curb ramps with truncated domes, and pedestrian countdown signals in all directions.

## GOLDSBORO PHOTO VISUALIZATION: ASH AND BERKELEY INTERSECTION



With no pedestrian crossing amenities, this intersection is not hospitable for pedestrians. The addition of countdown signals, marked crosswalks, and curb ramps are essential.

## GOLDSBORO PHOTO VISUALIZATION: ROYALL AND SPENCE INTERSECTION



Royall and Spence were noted often by the public as needing pedestrian improvements. The addition of sidewalk, crosswalk, and curb ramps are needed at this intersection. In addition, the railroad crossing should be pedestrian-friendly as well.

## GOLDSBORO PHOTO VISUALIZATION: HERMAN/WAYNE MEMORIAL AND ROYALL INTERSECTION



One of the many footpaths in Goldsboro is found here along Herman Street. Sidewalk should be provided along this roadway.



## GOLDSBORO PHOTO VISUALIZATION: JOHN AND WALNUT INTERSECTION



Downtown Goldsboro features sidewalks making walking an enjoyable experience. Small intersection improvements like curbbulbouts, marked crosswalks, and curbramps will make for shorter crossing distances and better visibility.

## PIKEVILLE PEDESTRIAN RECOMMENDATIONS

As a small town, Pikeville is walkable but would be improved with key sidewalk and crossing improvements discussed below.



Main Street at  
Railroad crossing  
Downtown.

### ***Key Recommended Sidewalks***

- » Main Street (from Russell Drive to Mill Street) - Both sides
- » Main Street (from Railroad Street to Goldsboro Street) - North side
- » US 117 (from Mt Carmel Church Road to Big Daddys Road - East side
- » US 117 (from Big Daddy's Road to High School) - East side
- » Mill Street (filling gaps from Main Street to Park) - West side

### ***Key Crossing Improvements***

- » Main Street at US 117 - Despite not having sidewalk on all legs at the time of this study, high visibility marked crosswalks, curb ramps, and countdown signals should be added.
- » Main Street at RR crossing - Additional space or sidewalk crossing of RR tracks would prevent pedestrians from having to walk in the road. In addition, marked crosswalks should be provided along Main Street crossing SE Railroad Street.

### ***Other Notes***

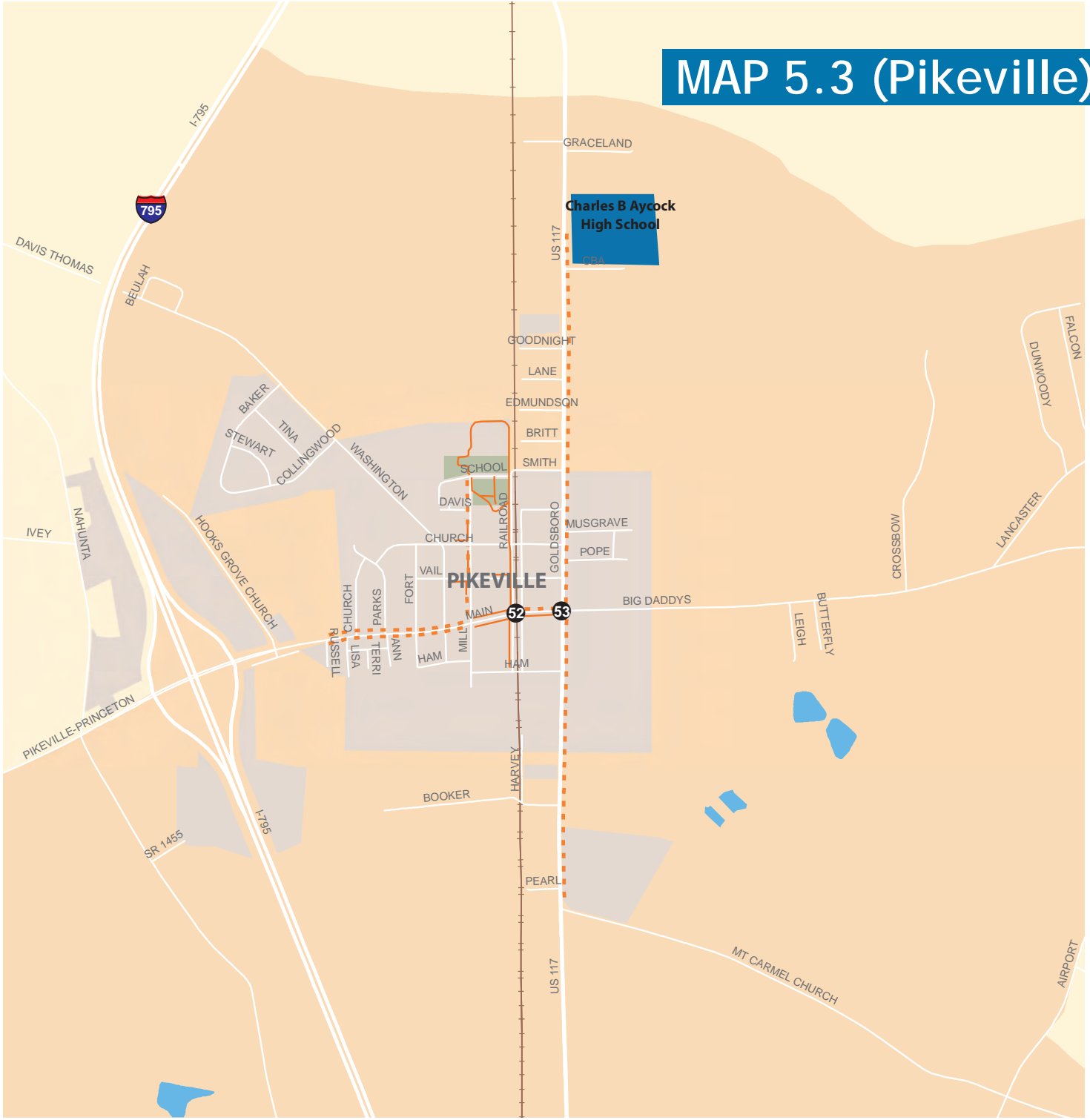
- » While other parts of Pikeville would benefit from sidewalk, the above projects are most important for overall connectivity and safety along major roads and connecting important destinations. Residential roads would benefit from sidewalk and traffic calming as well and should be explored over time.

### ***Pedestrian safety benefits***

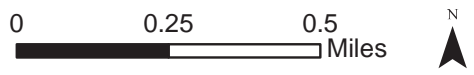
- » 88% crash reduction factor when adding sidewalk along a roadway; 25% crash reduction factor when replacing WALK/DON'T WALK signals with countdown signals (FHWA).



# MAP 5.3 (Pikeville)



**Recommended Pedestrian Facilities - Pikeville**



Legend

- Recommended Ped. Facilities**
- Sidewalk
  - Crossing Improvement

- Existing Infrastructure**
- Existing Sidewalk
  - Roadway
  - Railroad

- Lands of Interest**
- Park
  - Schools

- Additional Context**
- Water Features
  - City Limits
  - MPO Limits





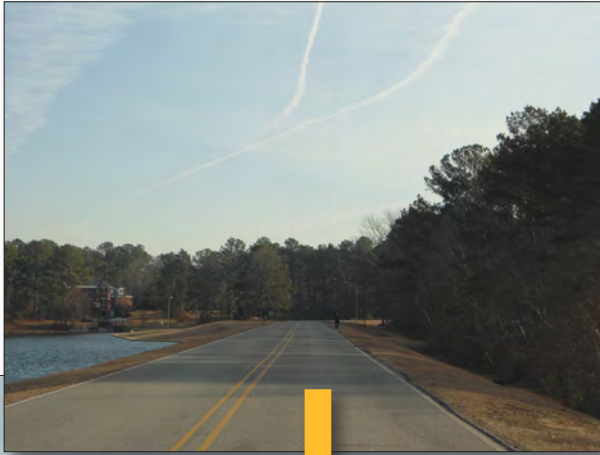
## PIKEVILLE PHOTO VISUALIZATION: MAIN STREET/RAILROAD CROSSING IN DOWNTOWN PIKEVILLE



The Main Street crossing of the Railroad is an important crossing to improve for pedestrians. The addition of separated sidewalk with ADA-compliant crossing of railroad tracks, and marked crosswalks across Railroad Street would be a significant improvement.



## WALNUT CREEK PHOTO VISUALIZATION: MILL ROAD SIDEWALKS



Mill Road in Walnut Creek is a scenic roadway. The addition of sidewalks would create a separated space for pedestrians.



## WALNUT CREEK PEDESTRIAN RECOMMENDATIONS

As a residential community, Walnut Creek is a very beautiful place to walk for recreation. Sidewalks are recommended along the main community roads. A lower-cost alternative would be traffic calming elements like speed humps, mini-circles, or chicanes.



Walnut Creek Road

### ***Recommended Sidewalks***

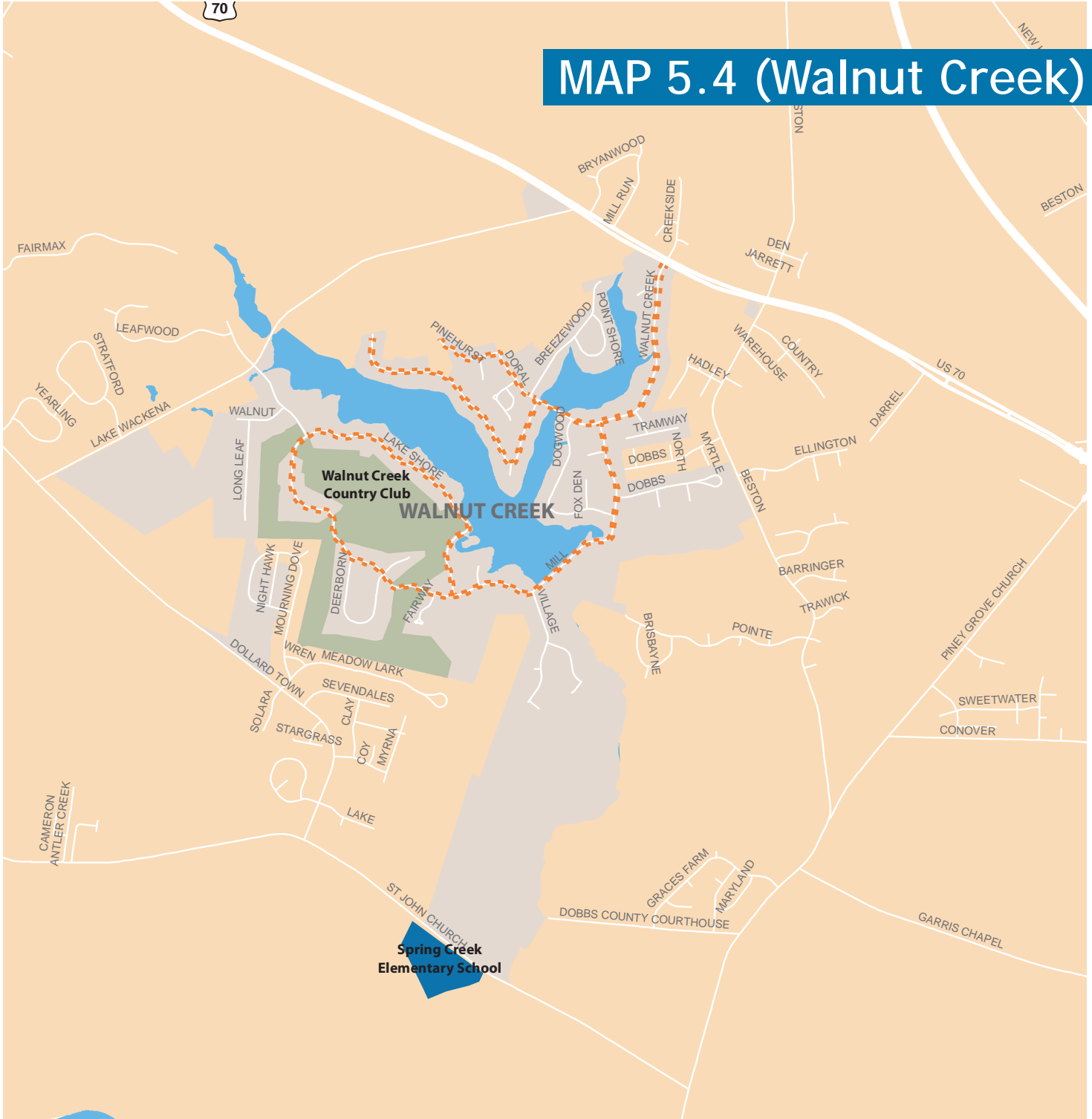
- » Walnut Creek Drive (from Breezewood Drive to US 70) - both sides
- » Pinehurst Lane (from Doral Drive to End of Road) - both sides
- » Doral Drive (from Pinehurst Lane to Walnut Creek Drive) - both sides
- » Walnut Creek Drive (from Doral Drive to End of Road) - both sides
- » Mill Road (from Lakeshore Drive to Walnut Creek Drive) - both sides
- » Lakeshore Drive (from Lakeshore Drive to Mill Road) both sides

### ***Aging Population in Walnut Creek***

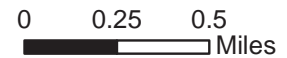
The median age in Walnut Creek is 53.5; this compares to 45 for North Carolina and 36 for Goldsboro. Sidewalk and traffic calming additions will be useful to address pedestrian age issues described on page 5-2.



# MAP 5.4 (Walnut Creek)



## Recommended Pedestrian Facilities - Walnut Creek



### Legend

#### Recommended Ped. Facilities

- Sidewalk

#### Existing Infrastructure

- Roadway
- Railroad

#### Lands of Interest

- Park
- Schools

#### Additional Context

- Water Features
- City Limits
- MPO Limits









# 6: Policies

## *Appendix Contents:*

### *Bicycle and Pedestrian Policy and Regulatory Review*

## BICYCLE AND PEDESTRIAN POLICY AND REGULATORY REVIEW

**One of the most cost effective implementation strategies for Wayne County, Goldsboro, and other regional communities is to establish land development regulations and street design policies that promote walkable and bikeable new development and capital projects.** As part of a comprehensive approach to developing recommendations for a more walkable and bikeable Goldsboro area, the City of Goldsboro, Wayne County and Town of Walnut Creek ordinances, development standards and policies were reviewed to identify general issues and opportunities impacting the bicycle and pedestrian environments across jurisdictions. The recommendations in this section generally fall under the 6 E's category of "Evaluation and Planning." Regulatory standards and policies were analyzed through the lens of the project visions and goals, specifically, the vision of making the Goldsboro area "an attractive regional destination where a convenient network of sidewalks, bikeways, and greenways brings people of all ages and abilities together; safely connects them to where they want to go."

Model regulatory and policy language from around North Carolina and the U.S. was identified for elements including land use/transportation integration, connectivity, Complete Streets, and bicycle parking, enabling the City and County jurisdictions to maximize bicycle/pedestrian and greenway improvements in conjunction with new development, redevelopment, and corridor improvement projects. In addition, recommended policy language additions to enhance greenway development are included.

The recommendations below are organized into three major categories of "Complete Streets and Greenways", "Pedestrian and Bicycle-oriented Urban Design Elements", and "Connectivity." In each category, we have aligned our recommended changes with strategic policies recommended by the Envision 35 Comprehensive Plan process. All of the major categories are interrelated, but based on the goals of Envision 35, the existing conditions analysis, and the goals of this plan, the following key recommendations from the table below should be implemented first.



## ***PRIORITY POLICY AND REGULATORY RECOMMENDATIONS:***

1. Develop and adopt a Complete Streets Policy and Design Guidelines (Strategies 1.1 and 1.2)
2. Revise and expand sidewalk requirements and sidewalk infill policy (Strategies 1.3, 1.4, and 1.11)
3. Develop or revise other Complete Street element requirements (Strategies 1.5 through 1.10)
4. Require dedication or reservation of greenway corridors (Strategy 1.6.)
5. Revise and update Connectivity requirements (Strategies 3.1 through 3.3)
6. Revise and update Land use and Urban Design Requirements to be more pedestrian and bicycle-oriented (Strategies 2.1 and 2.6)

These approaches will complement other specific capital projects, and education, enforcement, and evaluation recommendations provided elsewhere in this planning document.



Topics/Strategies	Comments/Recommendations			
	Wayne County	City of Goldsboro	Walnut Creek	General Recommendations
<b>Complete Streets and Greenways</b>				
<p><b>1. Adopt Complete Streets Policy</b></p> <p>A complete streets policy allows cities and towns to work towards creating a street network that encourages pedestrian and bicycle travel and provides safe and comfortable roadways for all users.</p>	<p>No specific policy</p> <p><b>Inadequate</b></p>	<p>No specific policy</p> <p><b>Inadequate</b></p> <p>Envision 35, Strategy 1.64: <i><b>"The City may consider the development and adoption of a complete streets policy. This policy should focus on providing a wide range of transportation options including: access to transit, bicycling lanes and sharrows, and pedestrian access facilities. Increased attention should be given to streets programmed for resurfacing and/or expansion"</b></i></p>	<p>No specific policy</p> <p><b>Inadequate</b></p>	<p>The National Complete Streets Coalition provides great guidelines for designing streets that cater to all users: (<a href="http://www.completestreets.org/resources/complete-streets-best-practices/">http://www.completestreets.org/resources/complete-streets-best-practices/</a>).</p>
<p><b>2. Develop Complete Street Design Guidelines for a variety of contexts and all street/roadway user groups</b></p> <p>The subsections below include recommendations for basic elements of Complete Streets. These elements include sidewalks, bikeways, pedestrian-scaled lighting and street trees as some of the most fundamental elements for pedestrian and bicycle users. Access management, multi-modal level of service assessments, and traffic calming are also critical for developing complete street networks for all users through the development review and capital project implementation process. The NCDOT <i>Complete Street Guidelines</i> and the design guidelines that accompany this plan also include detailed recommendations on complete street design elements.</p>	<p>Uses NCDOT <i>Subdivision Roads Minimum Construction Standards</i>, which are not currently complete street-oriented.</p> <p><b>Needs Improvement</b></p>	<p>UDO Section 7.2 Minimum Requirements For Subdivision Road Construction includes various requirements for major and local streets, however, the requirements are not context-based and do not include bikeway requirements. The minimum widths for local streets are too wide to promote low speed motor vehicle traffic movements. In general, the menu of street alternatives needs to be more refined to provide better complete street options that meet local goals for connectivity, safety, and comfort.</p> <p><b>Inadequate</b></p>	<p>93.46 STREETS. Provides a number of minimum widths for streets and street ROWs. The minimum widths for thoroughfares may not be sufficient for bike lanes. The minimum widths for local streets are too wide to promote low speed motor vehicle traffic movements. In general, the menu of street alternatives needs to be more refined to provide better complete street options that meet local goals for connectivity, safety, and comfort.</p> <p><b>Inadequate</b></p>	<p>In addition to the very thorough NCDOT <i>Complete Streets Guidelines</i>, The National Complete Streets Coalition provides great guidelines for designing streets that cater to all users: (<a href="http://www.completestreets.org/resources/complete-streets-best-practices/">http://www.completestreets.org/resources/complete-streets-best-practices/</a>).</p> <p>Wayne County and/or its municipalities could adopt and endorse the NCDOT guidelines and other national guidelines, including the NACTO <i>Urban Bikeway Design Guide</i>: (<a href="http://nacto.org/cities-for-cycling/design-guide/">http://nacto.org/cities-for-cycling/design-guide/</a>)</p> <p>The design guidelines would then need to be integrated into development standards for new development, as was done with the <i>Raleigh Street Design Manual</i> (<a href="http://www.raleighnc.gov/content/extra/Books/PlanDev/StreetDesignManual/#1">http://www.raleighnc.gov/content/extra/Books/PlanDev/StreetDesignManual/#1</a>) and the <i>Charlotte Urban Street Design Guidelines</i>: (<a href="http://charmeck.org/city/charlotte/transportation/plansprojects/pages/urban%20street%20design%20guidelines.aspx">http://charmeck.org/city/charlotte/transportation/plansprojects/pages/urban%20street%20design%20guidelines.aspx</a>)</p>



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<p><b>3. Require Pedestrian accommodations (sidewalks, crosswalks, etc) during new or redevelopment</b></p> <p><i>Sidewalks are the primary mode of pedestrian travel and are a crucial element in any pedestrian network. Sidewalks should be part of a continuous network, connected with crosswalks and separated from traffic with a buffer. To maintain a high quality of service, sidewalks should be kept level, smooth, and free of debris, and they should be kept continuous across driveways and other entrances. They should also be kept free of conflicts, such as utility poles or fire hydrants, with sidewalk dimensions that allow for appropriate unobstructed walking space. (NCDOT Complete Streets Planning and Design Guidelines, p. 42)</i></p> <p><b>Envision 35: Goldsboro Urbanized Area Comp Plan recommends the following changes the Wayne County and City of Goldsboro development standards</b> to promote transit, bike and pedestrian connectivity (Implementing Strategy 1.21): Cul-de-sac and block-length maximums; Internal connectivity standards; <b>sidewalk requirements</b></p>	<p><b>Sidewalks not required</b>, but may be provided as a form of "Open Space" Sec. 70-103 (h) Open Space (1)a.: "Sidewalks built to state department of transportation standards <b>may be provided</b> by the developer, if approved by the planning board or the board of commissioners as leading to a pedestrian designation point such as school, park, etc. <b>Sidewalks may constitute all or part of the open space requirements.</b> The amount of sidewalk shall be calculated at a cost equal to the amount of reduction from the maximum open space requirement, based on current valuation for property tax purposes."</p> <p><b>Needs Improvement</b></p> <p>The 2008 Comprehensive Plan for Wayne County encourages multimodal, walkable communities and includes policies to support the construction of sidewalks. Relevant pedestrian network actions and policies in the plan include:</p> <p>Action 1.4: <b>Reexamine the County's development standards to evaluate the need for improved pedestrian systems (sidewalks, greenways, streetlights etc.)</b> in new residential developments.</p>	<p><b>Sidewalks required</b> on interior and exterior roadways for multi-family and commercial development. (UDO Chapter 5)</p> <p><b>Good.</b> Should apply to all new development, including single family residential development of a certain size threshold (e.g., number of housing units, density).</p> <p><i>Sidewalks required by street type are as follows:</i> 1. Sidewalks shall be provided along <b>both sides of all major thoroughfares</b> as shown on the official Thoroughfare or Transportation Plan. 2. Sidewalks shall be provided along <b>one side of all minor streets, including cul-de-sacs.</b> (UDO 7.16)</p> <p><b>Good.</b></p>	<p><b>Sidewalks not required.</b> Optional in PUDs.</p> <p><i>(§ 94.69 PLANNED UNIT DEVELOPMENT: (5) Sidewalks. Sidewalks shall be provided as deemed necessary by the Village Council, after receiving the recommendation of the Planning Board who will also determine design and construction characteristics.)</i></p> <p><b>Inadequate</b></p>	<p>For good model language, see City of Wilson, NC UDO, Section 6.3: Required Improvements for All Development (and related sections that follow) <a href="http://www.wilsonnc.org/attachments/pages/545/CH%206-Infrastructure%20Standards.pdf">http://www.wilsonnc.org/attachments/pages/545/CH%206-Infrastructure%20Standards.pdf</a></p> <p><i>"The minimum unobstructed walking space for a sidewalk on a street is five feet, with six feet or wider applications for higher-volume, higher-speed streets, and/or more intensive land uses."</i></p> <p>NCDOT Complete Streets Planning and Design Guidelines (p 42)</p>



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<p><b>4. Require sidewalks or bike accommodations by roadway type</b></p>	<p><b>No.</b> The County uses the NCDOT <i>Subdivision Roads Minimum Construction Standards</i>. Neither the County Code of Ordinances nor the NCDOT standards require sidewalks.</p> <p><b>Needs Improvement</b></p>	<p><i>Sidewalks required by street type are as follows:</i></p> <ol style="list-style-type: none"> <li><i>Sidewalks shall be provided along <b>both sides of all major thoroughfares</b> as shown on the official Thoroughfare or Transportation Plan.</i></li> <li><i>Sidewalks shall be provided along <b>one side of all minor streets, including cul-de-sacs.</b></i></li> </ol> <p><i>When sidewalk construction is required by the Unified Development Ordinance, the City Council for site plans requiring City Council approval or the Planning Director for plans requiring staff approval, may allow the developer the option of paying a fee in lieu for sidewalk construction. The fees acquired from this ordinance shall be used for sidewalk projects within the city of Goldsboro and its extra-territorial jurisdiction (UDO Sec. 7.1.6)</i></p> <p><b>Good</b>, however could be improved to require sidewalks on both sides based on density of development or land uses. Also, the fee-in-lieu requirement removes predictability from the development of the sidewalk network since there are no criteria for providing an exception.</p>	<p>No.</p> <p><b>Inadequate</b></p>	<p>Better standards would require or provides sidewalks on both sides of all collector and arterial streets and on <i>at least one side of local streets</i> where warranted by density and/or system connectivity.</p> <p>Five foot wide sidewalks along local streets and six foot wide sidewalks along collectors and arterials are preferred minimum widths. Five feet is the minimum width required for two adults to walk side-by-side. In areas of higher density and mixed-use development, the minimum required width for sidewalks should be six feet or more. The land use context and density of development necessitates a greater level of requirement for sidewalk specifications. In areas such as downtown with buildings at the back of the sidewalk and ground level retail, sidewalks should be as wide as 10-18 feet wide.</p> <p>See NCDOT <i>Complete Streets Planning and Design Guidelines</i> for context-based pedestrian zone recommendations.</p> <p>See Chapter 4 of the NCDOT <i>Complete Streets Planning and Design Guidelines</i> for recommendations of sidewalk and bikeway type by roadway type.</p> <p>Also: NCDOT <i>Traditional Neighborhood Development (TND) Guidelines</i>: <a href="http://ntl.bts.gov/lib/22000/22600/22616/tnd.pdf">http://ntl.bts.gov/lib/22000/22600/22616/tnd.pdf</a></p>
<p><b>5. Require pedestrian-scaled lighting (&lt; 18' tall) required along streets and pathways</b></p>	<p><b>Not required.</b> Street lights required, but no requirements for pedestrian-scaled lights for walkways and pathways</p> <p>Sec. 70-105 (d): <i>Streetlights. All subdivisions that involve additional public street improvements shall have streetlights installed throughout the subdivision in accordance with the standards of National Electrical Safety Code.</i></p> <p><b>Needs Improvement</b></p>	<p><b>Not required.</b> Street lights required, but no requirements for pedestrian-scaled lights for walkways and pathways. (UDO Sec. 7.1.5)</p> <p><i>The City should <b>consider factoring issues relating to the promotion of public safety into the normal review process</b> for development proposals. Themes associated with Crime Prevention through Environmental Design (CPTED) should be utilized to improve upon overall community safety and appearance. This effort should address a range of issues <b>including lighting</b>, building deterioration, increasing "eyes on the street", and open space design. (Envision 35 Implementation Strategy 1.72)</i></p> <p><b>Needs Improvement</b></p>	<p><b>Not required.</b></p> <p><b>Inadequate</b></p>	<p>Pedestrian-scale lighting should not exceed eighteen (18) feet in height over the sidewalk and should be located at key intersections or crossings and along preferred pedestrian routes. Pedestrian-scale lighting also enhances the illumination of bicycle facilities since the lighting is located closer to the sidewalk and roadway.</p> <p>See Town of Wendell UDO, Sections 11.10 and 11.11 for pedestrian-scaled lighting requirements by zoning district and for lighting requirements for greenways and walkways: <a href="http://files.wendell.ghifi.com/departments/planning/zoning/udo-unified-development-ordinance/Chapter_11_-_amended_071410.pdf">http://files.wendell.ghifi.com/departments/planning/zoning/udo-unified-development-ordinance/Chapter_11_-_amended_071410.pdf</a></p>



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<p><b>6. Require street trees between sidewalk and curb</b></p> <p>In addition to their value for improving the air quality, water quality, and beauty of a community, street trees can help slow traffic and improve comfort for pedestrians. Trees add visual interest to streets and narrow the street’s visual corridor, which may cause drivers to slow down. When planted in a planting strip between the sidewalk and the curb, street trees also provide a buffer between the pedestrian zone and the street.</p>	<p>None required.</p> <p><b>Inadequate</b></p>	<p>UDO 6.3.10 STREET YARD DESIGN STANDARDS requires street trees be planted in “street yards” along property frontages.</p> <p>Unfortunately, “street yards” are not in the public right of way and, therefore, trees are not required between the sidewalk and the street curb where they can provide separation between pedestrians and roadway travel lanes.</p> <p><b>Good</b>, but could use improvement.</p>	<p>§ 93.68 REQUIRED IMPROVEMENTS AND CONTRIBUTION TO CAPITAL IMPROVEMENT FUND (F) Street trees. It is <b>recommended</b> that street trees be planted in all subdivisions. The planting of street trees is considered a duty of the subdivider as well as good business practice. Street trees are a protection against excessive heat and glare and enhance the attractiveness and value of the property. Trees, where planted, <b>shall be planted inside the property lines</b> where they are less subject to injury, decrease the chance of motor accidents, and enjoy more favorable conditions for growth.</p> <p><b>Needs Improvement</b></p>	<p>See NCDOT <i>Complete Streets Planning and Design Guidelines</i> for context-based pedestrian and “green” zone recommendations.</p> <p>See also, Town of Wendell UDO Chapter 8, especially section 8.8, Street Trees:  <a href="http://files.wendell.ghifi.com/departments/planning/zoning/udo-unified-development-ordinance/Chapter_8_-_amended_092611.pdf">http://files.wendell.ghifi.com/departments/planning/zoning/udo-unified-development-ordinance/Chapter_8_-_amended_092611.pdf</a></p>
<p><b>7. Require designated bikeways (bike lanes, shoulders, greenways, etc) during new development or redevelopment</b></p>	<p>Not required.</p> <p><b>Inadequate</b></p>	<p>Not required. Street design guidelines do not address bicycle facilities and do not require that they be included with new roadway construction, even on collector and thoroughfare streets.</p> <p><b>Inadequate</b></p>	<p>Not required.</p> <p><b>Inadequate</b></p>	<p>Generally, as traffic volumes exceed 3,000 vehicles per day and traffic speeds exceed 25mph, facilities to separate bicycle and motor vehicle traffic are recommended. Multi-lane roads are typically more dangerous for all users because of the increased traffic volume, the potential for higher speeds, and the additional number of conflict locations due to turning vehicles.</p> <p>See Chapter 4 of the NCDOT <i>Complete Streets Planning and Design Guidelines</i></p> <p>Also, see:            Chapters 6 of Wake Forest, NC UDO for recommendations for bikeways and greenways, esp. sections 6.8.2, 6.9, 6.10.  <a href="http://www.wakeforestnc.gov/udo.aspx">http://www.wakeforestnc.gov/udo.aspx</a>            Chapter 7 of the Wilson, NC UDO regarding greenways.  <a href="http://www.wilsonnc.org/attachments/pages/545/CH%207-Parks%20&amp;%20Open%20Space.pdf">http://www.wilsonnc.org/attachments/pages/545/CH%207-Parks%20&amp;%20Open%20Space.pdf</a></p>
<p><b>8. Require dedication, reservation or development of greenways</b></p>	<p>Dedication or reservation of “Open Space” is required in new subdivisions, however, the <b>types or amounts of dedication is not specified</b>, but various types of trail-related facilities are <u>allowed</u>:  <i>“Provision of active and/or passive recreation opportunities (e.g., ball fields, playgrounds, tennis courts, swimming pools, basketball courts, golf courses, <b>bikeways, walking trails, nature trails, and picnic areas</b>), either for the general public or for the subdivision’s residents or employees and their guests.” (Sec. 103-70 (h)(2)a.4)</i></p> <p><b>Needs Improvement</b></p>	<p>Not required</p> <p><b>Inadequate</b></p> <p><b>Envision 35 Implementation Strategies 1.96 and 1.102:</b> <i>The City will discourage improvements of any kind in undisturbed conservation areas (as shown on Map 39) within the 100-year floodplain; designate these areas for open space corridors, greenways, and other low-intensity uses.</i></p>	<p>Not required</p> <p><b>Inadequate</b></p>	<p>Consider adding requirements for greenway reservation, dedication, or provision in new developments where a greenway or trail is shown on an adopted plan or where a property connects to an existing or proposed greenway.</p> <p>See requirements in Wake Forest, NC UDO, Section 6..8.2 Greenways: <i>“When required by <u>Wake Forest Open Space &amp; Greenways Plan</u> or the <u>Wake Forest Transportation Plan</u>, greenways and multi-use paths shall be provided according to the provisions [that follow in the section cited above].”</i>  <a href="http://www.wakeforestnc.gov/udo.aspx">http://www.wakeforestnc.gov/udo.aspx</a></p>



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<p><b>9. Require new sidewalks, bike lanes, greenways, etc., to connect to existing facilities</b></p>	<p>Not required. <b>Inadequate</b></p>	<p>Not required. <b>Inadequate</b></p>	<p>Not required. <b>Inadequate</b></p>	<p>Connectivity of facilities is critical for walking and biking conditions. New development should be required to connect to or extend existing facilities bicycle and pedestrian facilities.</p> <p>See: Chapters 6 of Wake Forest, NC UDO for recommendations for bikeways and greenways, esp. sections 6.5.3, 6.8.2, 6.9, 6.10. <a href="http://www.wakeforestnc.gov/udo.aspx">http://www.wakeforestnc.gov/udo.aspx</a> Chapter 7 of the Wilson, NC UDO regarding greenways. <a href="http://www.wilsonnc.org/attachments/pages/545/CH%207-Parks%20&amp;%20Open%20Space.pdf">http://www.wilsonnc.org/attachments/pages/545/CH%207-Parks%20&amp;%20Open%20Space.pdf</a></p>
<p><b>10. Consider pedestrian and bicycle concerns and Level of Service (LOS) in Traffic Impact Analyses and other engineering studies</b></p> <p>See <i>Envision 35</i> Section 8. Transportation, page 8-5 for a multi-modal level of service framework from Florida DOT.</p>	<p>No specific guidelines <b>Inadequate</b></p>	<p>No specific guidelines <b>Inadequate</b></p>	<p>No specific guidelines <b>Inadequate</b></p>	<p>Wayne County and its municipalities should consider adopting multi-modal of service standards where active transportation and transit use are expected to be high. Consideration of bicycle and pedestrian levels of service assure adequate facilities for bicyclists and pedestrians. This also helps promote walking and bicycling as a legitimate means of transportation.</p> <p>The NCDOT <i>Complete Streets Planning and Design Guidelines</i> provides factors of "Quality of Service " and LOS for bicycle, pedestrian, and transit modes (See Chapter 3, page 39 and Chapter 5): <a href="http://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf">http://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf</a></p> <p>The City of Raleigh uses multimodal level of service approach in determining road improvements and traffic mitigation: <a href="http://www.raleighnc.gov/content/extra/Books/PlanDev/StreetDesignManual/#71">http://www.raleighnc.gov/content/extra/Books/PlanDev/StreetDesignManual/#71</a></p> <p>Charlotte, NC uses Pedestrian LOS and Bicycle LOS Methodologies for intersection improvements in their <i>Urban Street Design Guidelines</i>: <a href="http://charmeck.org/city/charlotte/transportation/plansprojects/pages/urban%20street%20design%20guidelines.aspx">http://charmeck.org/city/charlotte/transportation/plansprojects/pages/urban%20street%20design%20guidelines.aspx</a></p>
<p><b>11. Adopt traffic calming programs, policies, and standards</b></p>	<p>None cited <b>Inadequate</b></p>	<p>None cited <b>Inadequate</b></p>	<p>None cited <b>Inadequate</b></p>	<p>The National Complete Streets Coalition provides good guidelines for traffic calming through their best practices manual: (<a href="http://www.completestreets.org/resources/complete-streets-best-practices/">http://www.completestreets.org/resources/complete-streets-best-practices/</a>).</p>



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<p><b>2. Develop an access management program or policy</b></p> <p>Access management should be considered in all land use/zoning decisions. (<i>Envision 35</i> Guiding Land Use/Planning Principles, p. 9-31)</p>	<p>See NCDOT <i>Subdivision Roads Minimum Construction Standards</i> and NCDOT <i>Complete Streets Planning and Design Guidelines</i>.</p> <p><b>Inadequate</b></p>			<p>Requiring cross-access between adjacent parcels of land is a great tool for reducing the amount of traffic on major roads while increasing connectivity for pedestrians, bicycles, and cars.</p> <p>The NCDOT <i>Complete Streets Planning and Design Guidelines</i> provides recommended "Access Density" guidelines (See Chapter 4, page 61 and following). These guidelines could be the basis for regulatory updates to the municipal codes: <a href="http://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf">http://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf</a></p>
<p><b>3. Establish a sidewalk retrofit/infill program or policy</b></p> <p><i>Envision 35</i> Strategy I.66: <i>The City and County should consider street and sidewalk improvements adjacent to existing school sites. This effort shall involve the installation of raised crosswalks to help reduce vehicle speeds and improved pedestrian visibility. Curb extensions may also be considered to shorten pedestrian crossing distance, eliminate parking on or near the crosswalk, and improve sight distance for pedestrians.</i></p>	<p>None cited</p> <p><b>Inadequate</b></p>	<p>None cited</p> <p><b>Inadequate</b></p>	<p>None cited</p> <p><b>Inadequate</b></p>	<p>The communities should consider developing sidewalk infill and maintenance program where City staff periodically inventory the street network to identify sidewalk gaps, and develop strategies, project prioritization criteria and funding for completing these gaps. Potential project prioritization criteria include filling gaps along key pedestrian routes, near major pedestrian trip generators like schools, and along streets with high vehicle volumes.</p> <p>The City of Greenville, SC's NSTEP program provides a good example of a sidewalk infill policy and program: <a href="http://www.greenvillesc.gov/publicworks/CivilEngineering.aspx">http://www.greenvillesc.gov/publicworks/CivilEngineering.aspx</a></p>
<p><b>14. Establish a crosswalk and curb ramp retrofit/infill program or policy.</b></p>	<p>None cited</p> <p><b>Inadequate</b></p>	<p>None cited</p> <p><b>Inadequate</b></p>	<p>None cited</p> <p><b>Inadequate</b></p>	<p>The City of Goldsboro, Town of Pikeville, and Village of Walnut Creek should adopt a crosswalk policy based on the new Raleigh, NC policy that establishes appropriate crosswalk type for the specific roadway crossing type. High-visibility, ladder-style marked crosswalks should be installed at signalized intersections and midblock crossings; parallel bar markings should be installed at stop controlled locations. This is especially important where sidewalks are present. ADA-compliant curb ramps should also always be provided when they do not exist.</p>





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	Wayne County	City of Goldsboro	Walnut Creek	General Recommendations
<p><b>Pedestrian- and Bicycle-oriented Urban Design Elements</b></p>				
<p><b>1. Develop pedestrian-oriented form-based or design-based development standards</b></p> <p>Pedestrian and bicycle design requirements and land use policy are fundamental to creating a more walkable and bikeable community.</p> <p><i>The City and County may <b>amend their ordinances to include Active Health Design guidelines</b> that require buildings to have:</i></p> <ul style="list-style-type: none"> <li><i>an obvious pedestrian entrance,</i></li> <li><i>pedestrian level entrance,</i></li> <li><i>pedestrian level windows, and weather protection; are oriented to the street;</i></li> <li><i>have architectural details and pedestrian style signage on the street; and</i></li> <li><i>emphasize alternative means of transportation. (Envision 35 Implementation Strategy 1.63)</i></li> </ul>	<p>None.</p> <p><b>Inadequate</b></p>	<p>Generally no, with the exception of the development requirements in the CBD, which are very pedestrian-oriented. (UDO Section 5.3)</p> <p>The <i>Design Guidelines for Downtown Goldsboro</i> (<a href="http://www.ci.goldsboro.nc.us/documents/notices/DraftGuidelines.pdf">http://www.ci.goldsboro.nc.us/documents/notices/DraftGuidelines.pdf</a>) provide good pedestrian-oriented guidance for new development and redevelopment. These guidelines could be expanded to include other pedestrian-oriented and mixed use districts in the City.</p> <p><b>Good in CBD. Needs improvement in other districts.</b></p>	<p>No. In fact, the minimum lot size (greater than half acre) is not supportive of pedestrian-oriented neighborhoods:</p> <p>§ 93.47 LOTS. (B) Residential lots shall be at least 25,000 square feet in area of usable land, not less than 120 feet wide at the building line, nor less than 150 feet in depth.</p> <p><b>Inadequate</b></p>	<p><i>“Form-based codes foster predictable built results and a high-quality public realm by using physical form (rather than separation of uses) as the organizing principle. [Form-based codes are typically used to develop places that are pedestrian-friendly.]</i></p> <p><i>“Form-based codes address the relationship between building facades and the public realm [typically streets], the form and mass of buildings in relation to one another, and the scale and types of streets and blocks. The regulations and standards in form-based codes are presented in both words and clearly drawn diagrams and other visuals.”</i></p> <p><a href="http://www.formbasedcodes.org/what-are-form-based-codes">http://www.formbasedcodes.org/what-are-form-based-codes</a></p> <p>Some North Carolina communities that have form-based or design based elements in their ordinances include:</p> <ul style="list-style-type: none"> <li>Belmont</li> <li>Cornelius</li> <li>Davidson</li> <li>Huntersville</li> <li>Knightdale</li> <li>Salisbury</li> <li>Wake Forest</li> <li>Waynesville</li> <li>Wendell</li> <li>Wilson</li> </ul>
<p><b>2. Allow/Require Mixed use buildings and blocks</b></p> <p><b>Envision 35 Strategy 1.21:</b> <i>The City of Goldsboro UDO and Wayne County zoning and subdivision ordinances should be reviewed and revised to <b>accommodate/encourage Mixed Use I and II development.</b> The ordinance revisions should consider locating stores, offices, residences, schools, and recreation spaces within walking distance of each other in relatively compact areas which promote:</i></p> <ul style="list-style-type: none"> <li><i>• Independence of movement, especially for the young and the elderly who can conveniently walk, cycle, or ride transit.</i></li> <li><i>• Safety in commercial areas, through around-the-clock presence of people.</i></li> <li><i>• Reduction in auto use, especially for shorter trips.</i></li> </ul>	<p>Permitted, but not encouraged.</p> <p><b>Needs Improvement</b></p>	<p>Specifically allowed in the CBD. (UDO Section 5.3)</p> <p><b>Good in CBD. Needs improvement in other districts.</b></p>	<p>Not addressed, but potentially permitted in Planned Unit Developments</p>	<p>Mixed use should be encouraged in appropriate zoning districts, as recommended by Envision 35. This increases the number of destinations that can be reached by walking or biking and is fundamental to developing walkable places.</p>



Topics/Strategies	Comments/Recommendations			
	Wayne County	City of Goldsboro	Walnut Creek	General Recommendations
<p><b>3. Require off-street motor vehicle parking behind or to side of buildings in commercial districts</b></p> <p>Having buildings close to the street instead of parking lots creates a more pedestrian friendly environment by bringing building entrances closer to the sidewalk. It also creates a human-scaled street that's more pleasurable for walking— for example: consider the differences in the walking environment of downtown Goldsboro versus that of a strip shopping area.</p>	<p>Not required.</p> <p><b>Inadequate</b></p>	<p>In CBD only. (UDO Chapter 5)</p> <p><b>Needs Improvement</b> Consider requiring in neighborhood and other mixed use or pedestrian oriented business districts as well.</p>	<p>No.</p> <p><b>Inadequate</b></p>	<p>See City of Wilson UDO, Chapter 9: Parking &amp; Driveways, Section 9.3</p> <p><a href="http://www.wilsonnc.org/attachments/pages/545/CH%209-Parking%20%20Driveways.pdf">http://www.wilsonnc.org/attachments/pages/545/CH%209-Parking%20%20Driveways.pdf</a></p>
<p><b>4. Define maximum automobile parking requirements</b></p> <p>Requiring parking maximums and reducing the number of required off-street parking spaces for new development creates a more pedestrian friendly environment, prevents overbuilt and unsightly parking lots, and reduces parking construction costs.</p>	<p>Yes. (Appendix A, Sec. 71, Table 2)</p> <p><b>Needs Improvement</b></p>	<p>Yes. However, with the exception of the CBD district (where no parking is required), the minimums and maximums for residential and commercial development are not based on land use context and walkability and are generally too high for pedestrian-supportive development.</p> <p><b>Needs Improvement</b></p> <p><i>Envision 35: Goldsboro Comp Plan</i> recommends the following to promote infill development: "Consideration of reduced performance standards, such as parking for infill redevelopment." (Implementing Strategy 1.1(e))</p> <p>"Consideration of <b>reduced performance standards, such as parking for infill redevelopment.</b>" (Implementing Strategy 1.21)</p> <p>The City may <b>consider the adoption of maximum parking standards</b> that alleviate the need to provide large surface lots on valuable infill land. (Implementing Strategy 1.83)</p>	<p>No. Minimums only.</p> <p><b>Inadequate</b></p>	<p>Tie parking standards to land use context. For example, fewer spaces may be required in CBD (see Goldsboro ordinance) and other pedestrian-oriented areas. Parking maximums only should be considered in such districts. Also, on-street parking should be allowed to count towards parking requirements for greater sharing of public parking resources and to maximize development capacity.</p> <p>See Town of Davidson, NC Planning Ordinance, <a href="https://nc-davidson2.civicplus.com/DocumentCenter/View/4126">https://nc-davidson2.civicplus.com/DocumentCenter/View/4126</a></p>
<p><b>5. Adopt bicycle parking requirements</b></p> <p><i>The City and County should consider amending the zoning and subdivision regulations to require the establishment of bicycle parking for new and redeveloped commercial, industrial, and institutional uses.</i> (Envision 35, Implementation Strategy 1.67 and 1.87)</p>	<p>None.</p> <p><b>Inadequate</b></p>	<p>None.</p> <p><b>Inadequate</b></p>	<p>None.</p> <p><b>Inadequate</b></p>	<p>Bicycles should receive equal consideration when calculating parking needs with specific calculations provided for determining the amount of bicycle parking provided by district type. Design and location standards for bicycle parking should be clearly stated to provide for safe and convenient access to destinations. Different standards of bicycle parking are needed for short-term visitors and customers and for longer term users like employees, residents, and students.</p> <p>See City of Wilson UDO, Chapter 9: Parking &amp; Driveways, Section 9.4 and 9.6: <a href="http://www.wilsonnc.org/attachments/pages/545/CH%209-Parking%20%20Driveways.pdf">http://www.wilsonnc.org/attachments/pages/545/CH%209-Parking%20%20Driveways.pdf</a></p> <p>Good standards for bicycle parking design can be found through the Association of Pedestrian and Bicycle Professionals' <i>Bicycle Parking Guidelines</i>. (<a href="http://www.apbp.org">www.apbp.org</a>)</p>

Topics/Strategies	Comments/Recommendations			
	Wayne County	City of Goldsboro	Walnut Creek	General Recommendations
<p><b>6. Adopt Other place-supportive parking regulations</b> (On-street parking allowed to count towards minimums, shared parking, pricing, employer incentives/programs, etc.)</p>	<p><b>Interconnectivity [of Parking Lots] Required</b>—All parking lots shall dedicate access easements and provide interconnectivity to adjoining properties where such connections are practical. The Planning Board may waive this requirement when it is demonstrated that topographical, incompatibility of land uses or other factors make such connections impractical. (Appendix A, Zoning, Section 71. B. 15)</p> <p>Shared parking allowed between land uses. (Appendix A, Zoning, Section 71. C.)</p> <p><b>Good.</b></p>	<p><b>Parking lot interconnectivity required.</b> This allows for fewer trips on major roadways and potentially fewer turning movement conflicts at driveways.</p> <p><i>UDO Section 6.1.3.15. Interconnectivity Required – All parking lots shall dedicate access easements and provide interconnectivity to adjoining properties where such connections are practical.</i></p> <p>Shared Parking is allowed (UDO Section 6.1.6)</p> <p><b>Good.</b></p>	<p>No requirements for shared parking or allowances for on-street parking to count towards minimums.</p> <p><b>Inadequate</b></p>	<p>Shared parking is a good start. Other policies that reduce the need for parking, contribute to walkable and bikeable places and have economic benefits are: establishing parking maximums, parking pricing in downtown areas (such as parking meters), allowing on-street parking spaces to count towards parking requirements, and Transportation Demand Management programs such as promoting carpool programs for large employers.</p>
<b>Connectivity Requirements</b>				
<p><b>1. Revise block size requirements</b></p> <p><b>“[A] Good [street] network provides more direct (shorter) routes for bicyclists and pedestrians to gain access to the thoroughfares and to the land uses along them (or allows them to avoid the thoroughfare altogether). Likewise, good connections can also allow short-range, local vehicular traffic more direct routes and access, resulting in less traffic and congestion on the thoroughfares. This can, in turn, help make the thoroughfare itself function as a better, more complete street. For all of these reasons, a complete local street network should generally provide for multiple points of access, short block lengths, and as many connections as possible.”</b> (NCDOT Complete Streets Planning and Design Guidelines, p 59)</p> <p><i>Envision 35: Goldsboro Urbanized Area Comp Plan</i> recommends the following changes the Wayne County and City of Goldsboro development standards to promote transit, bike and pedestrian connectivity (Implementing Strategy 1.21): <b>Cul-de-sac and block-length maximums; Internal connectivity standards; sidewalk requirements</b></p>	<p>Code of Ordinances Sec. 70-103 (a) Blocks: (2) Blocks shall <b>not be less than 400 feet or more than 1,800 feet.</b></p> <p><b>Needs Improvement.</b> . .see Background &amp; Recommendations</p> <p>(4) <b>“Where deemed necessary by the planning board or the board of commissioners, a pedestrian crosswalk at least 15 feet in width may be required to provide convenient public access to a public area such as a park or school, to a water area, or to a areas such as shopping centers, religious, or transportation facilities.”</b></p> <p><b>Good, but needs improvement:</b> Include a better definition of “pedestrian crosswalk” (presumed here to be a pedestrian accessway based on context/intent) and a quantifiable standard for when standard is to be applied. A good rule of thumb is when a block is 800 feet or longer in width, a pedestrian accessway should be provided. See the notes in the “Recommendations” column.</p>	<p>UDO Sec. 7.1.8 Blocks: <i>In no case shall block lengths exceed fourteen hundred feet or be less than four hundred feet.</i></p> <p>UDO Sec. 7.2.c. Blocks: <b>Where deemed necessary by the Planning Commission, a pedestrian crosswalk at least five feet in width may be required.</b></p> <p><b>Needs Improvement.</b> . .see Background &amp; Recommendations. See also Wayne County Recommendations.</p>	<p>Code of Ordinances § 93.49 BLOCKS. <i>Block lengths shall not exceed 1200 feet or be less than 400 feet.</i></p> <p><b>Needs Improvement.</b> . .see Background &amp; Recommendations</p>	<p>Development density should determine the length of a block, with shorter blocks being more appropriate in areas of higher density. <b>Maximum block length in any situation should rarely exceed 800-1000 feet for good connectivity. In areas with highest development density (urbanized, mixed use centers and high density neighborhoods) block lengths can be as little as 200 feet.</b> In areas with blocks as long as 800 feet or greater, a pedestrian and/or bicycle path of 6-8 feet in width should be required, with an easement of 15-20 feet wide.</p> <p>See the example table on page 59 of the NCDOT <i>Complete Streets Planning and Design Guidelines</i> for a context-based approach to block size.</p>



Topics/Strategies	Comments/Recommendations			
	Wayne County	City of Goldsboro	Walnut Creek	General Recommendations
<p>The following documents were referenced for this policy and regulatory review.</p> <p>Other references for best practices are listed in the column on the far right.</p>	<p>GUIDELINES AND REGULATIONS Wayne County, NC Code of Ordinances 2008 Comprehensive Plan for Wayne County Envision 35: Goldsboro Urbanized Area Comprehensive Plan <a href="http://www.ci.goldsboro.nc.us/documents/planning/comprehensive_plan.pdf">http://www.ci.goldsboro.nc.us/documents/planning/comprehensive_plan.pdf</a> NCDOT Subdivision Roads Minimum Construction Standards</p>	<p>GUIDELINES AND REGULATIONS City of Goldsboro Unified Development Ordinance, Zoning Code: <a href="http://www.ci.goldsboro.nc.us/zoning_code.aspx">http://www.ci.goldsboro.nc.us/zoning_code.aspx</a> Envision 35: Goldsboro Urbanized Area Comprehensive Plan <a href="http://www.ci.goldsboro.nc.us/documents/planning/comprehensive_plan.pdf">http://www.ci.goldsboro.nc.us/documents/planning/comprehensive_plan.pdf</a> The Design Guidelines for Downtown Goldsboro (<a href="http://www.ci.goldsboro.nc.us/documents/notices/DraftGuidelines.pdf">http://www.ci.goldsboro.nc.us/documents/notices/DraftGuidelines.pdf</a>)</p>	<p>Walnut Creek Code of Ordinances, <a href="http://www.amlegal.com/nxt/gateway.dll/North%20Carolina/walnutcreek_nc/villageofwalnutcreeknorthcarolinacodeofordinances?templates\$fn=default.htm\$3.0&amp;vid=amlegal:walnutcreek_nc">http://www.amlegal.com/nxt/gateway.dll/North%20Carolina/walnutcreek_nc/villageofwalnutcreeknorthcarolinacodeofordinances?templates\$fn=default.htm\$3.0&amp;vid=amlegal:walnutcreek_nc</a></p>	<p>REFERENCED DOCUMENTS AND RESOURCES: NCDOT Complete Streets Planning and Design Guidelines (July 2012): <a href="http://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf">http://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf</a> NCDOT Traditional Neighborhood Development (TND) Guidelines: <a href="http://ntl.bts.gov/lib/22000/22600/22616/tnd.pdf">http://ntl.bts.gov/lib/22000/22600/22616/tnd.pdf</a> City of Wilson, NC UDO: <a href="http://www.wilsonnc.org/attachments/pages/545/CH%206-Infrastructure%20Standards.pdf">http://www.wilsonnc.org/attachments/pages/545/CH%206-Infrastructure%20Standards.pdf</a> Town of Wendell, NC UDO: <a href="http://www.townofwendell.com/departments/planning/development/zoning/udo-unified-development-ordinance">http://www.townofwendell.com/departments/planning/development/zoning/udo-unified-development-ordinance</a> City of Wake Forest, NC UDO: <a href="http://www.wakeforestnc.gov/udo.aspx">http://www.wakeforestnc.gov/udo.aspx</a> See Town of Davidson, NC Planning Ordinance, <a href="https://nc-davidson2.civicplus.com/DocumentCenter/View/4126">https://nc-davidson2.civicplus.com/DocumentCenter/View/4126</a> Association of Pedestrian and Bicycle Professionals' <i>Bicycle Parking Guidelines</i>. (<a href="http://www.apbp.org">www.apbp.org</a>)</p> <p>And other documents noted in this column in the rows above.</p>



# Chapter 7: Programs

## *Chapter Contents:*

### *Program Partners*

### *Existing Programs and Recommended Enhancements*

### *Program Recommendations*

## OVERVIEW

This chapter provides a review of existing programs in the Goldsboro MPO and a toolbox of program resources that can be used to improve upon and launch new bicycle and pedestrian programs. These initiatives complement the infrastructure recommendations that are presented in Chapters 3 through 5. While improving pedestrian and bicycle infrastructure is critical to increasing walking and bicycling rates and safety, program efforts play an equally important role in developing a more bike- and walk-friendly culture. Programs are generally categorized by the Five “E”s (Education, Encouragement, Enforcement, Evaluation, and Equity). The first four of these “E”s are discussed in detail with the fifth “E” Equity considered an essential element throughout. These programs can ensure that more residents learn bicycle and pedestrian safety, understand the benefits of walking and biking, and receive guidance on why and how to integrate walking and bicycling into their everyday lives. In essence, these efforts market active transportation to the general public and ensure the maximum “return on investment” in the form of more residents walking and bicycling and a higher degree of safety and awareness.

The following sections contain information on current and potential program partners, existing programs, and new program ideas to pursue, with a description of the basic approach and links to model programs and resources. Recommendations were informed by the public and stakeholders and are based on national best practices.





## PROGRAM PARTNERS

### City of Goldsboro, Town of Pikeville, and Village of Walnut Creek

Goldsboro's Bicycle and Pedestrian Advisory Committee, formed out of this planning process, will work with Public Works, Engineering, Planning, and other staff to assist in the coordination of projects and programs.

### North Carolina Department of Transportation (NCDOT)

NCDOT will necessarily be involved in any project on state-owned facilities, and can be a strong partner as well for trainings related to active transportation. See [www.ncdot.gov/bikeped/safetyeducation/](http://www.ncdot.gov/bikeped/safetyeducation/) for more information about safety and education program resources offered by NCDOT.

### Wayne County Health Department

One of the WCHD's priorities is to promote physical activity for all ages. They will be a natural partner on programs that aim to increase physical activity and promote active living.

### GoWayneGo

This group was created in 2013 to develop ideas about how to improve the health and wellness of Wayne County residents. Its mission is to "Make Wayne County a place where healthy living is the norm," a major goal of which is to increase physical activity among local residents. GoWayneGo is an ideal partner on any bicycle and pedestrian encouragement program and on education programs that address health and wellness issues.

### Health and Wellness Alliance of Wayne County

This grassroots group brings together community partners, businesses, and public agencies dedicated to fostering a culture of health and wellness through awareness, advocacy, and activities. They are an ideal partner on any bicycle and pedestrian encouragement program and on education programs that address health and wellness issues.

### Seyboro Cyclists

This local cycling club has been riding the roads of Wayne, Lenoir, and Greene Counties for over two decades. The club is open to cyclists of all ages, abilities, and styles of riding. Seyboro Cyclists may be interested in supporting bicycle education and encouragement programs and events. They may also be able to provide volunteer support for greenway trail initiatives.

### Friends of Wayne County Greenways

This volunteer group is a champion for the development of a local network of greenway trails that are accessible to residents and visitors throughout Wayne County. They are an ideal partner for all greenway trail initiatives and for education and encouragement programs that promote greenway use and physical activity.

### Wayne County Public Schools

Wayne County schools are natural partners for Safe Routes to School efforts as well as on enforcement actions related to student safety. Working with school



administration, faculty, and staff will be important in implementing valuable education and encouragement programs that teach children traffic safety and promote walking and bicycling.

### **Local Police Departments**

The Police Departments of Goldsboro, Pikeville, and Walnut Creek will continue to lead the investigation of traffic safety problems and execution of enforcement campaigns. The enforcement recommendations in this chapter will only be successful if implemented with the partnership and support of the local Police Departments.

### **Parks and Recreation Departments**

City of Goldsboro and Wayne County Parks and Recreation Departments are natural partners for public events and classes. Coordinating with Parks and Recreation staff will be especially important for any greenway trail initiatives and education and encouragement programs.

### **Wayne Community College**

Wayne Community College has the potential to contribute to the pedestrian and bicycle environment in Goldsboro. College representatives may be natural partners for certain pedestrian and bicycle safety campaigns that are aimed at students and at the walking and bicycling environment around the campus.

### **Parent Teacher Associations (PTAs)**

PTAs can be effective partners in implementing Safe Routes to School efforts and other school-oriented traffic safety initiatives.

### **Wayne County Chamber of Commerce**

The Chamber may be interested in supporting bicycle and pedestrian initiatives that draw residents and visitors to the county, such as Open Streets Events, rides and races, and themed walking and bicycling tours.

### **Goldsboro Travel and Tourism Division**

The Division may be interested in supporting bicycle and pedestrian initiatives that draw residents and visitors to the city, such as Open Streets Events, rides and races, and themed walking and bicycling tours.

### **Downtown Goldsboro Development Corporation**

The DGDC supports the economic development of Downtown Goldsboro through music events, the farmers market, and a self-guided walking tour. The group may be interested in supporting bicycle and pedestrian initiatives that draw residents and visitors to the downtown, such as Open Streets Events, rides and races, and themed walking and bicycling tours.

### **Boys and Girls Club**

The Boys and Girls Clubs of Wayne County offer after school and summer programs for children and conduct occasional youth bicycle education classes. This group will be a valuable contributor to youth education and encouragement programs.

## EXISTING PROGRAMS AND RECOMMENDED ENHANCEMENTS

### Youth Bicycle Education

The Boys & Girls Club of Wayne County offers youth bicycle safety education once per year to teach children traffic safety and how to safely ride a bike. In addition, Goldsboro Police Officers conduct a bicycle safety education program with local youth.

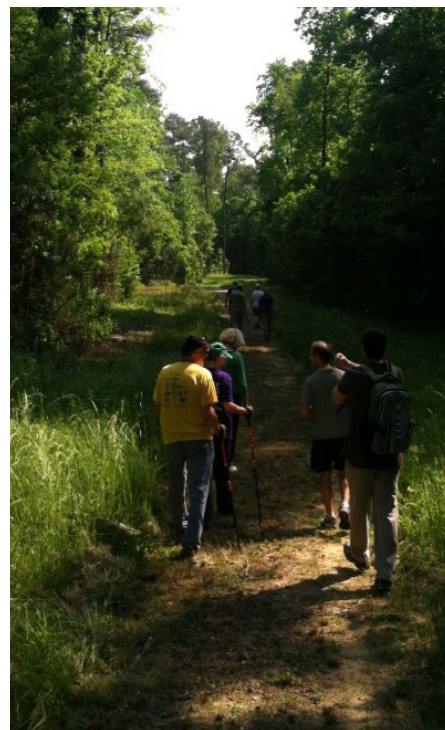
**Recommendation:** The Boys & Girls Club should consider expanding its education efforts and possibly partnering with the Goldsboro Police Department to offer an expanded program. A larger program could include a week-long walking and biking safety camp where children learn all aspects of traffic safety, such as how to safely cross a street, how to be visible at night, and where to safely ride. Goldsboro Police could also expand their efforts and offer interactive bicycle and pedestrian education at local community events. A bike rodeo, where police officers and volunteers teach children traffic safety and bicycle riding skills, is an ideal way to teach and encourage children to bike.

Wayne County Public Schools should offer similar youth bicycle education courses as part of Safe Routes to School programs at every elementary and middle school (see page 7-). Local police departments and Seyboro Cyclists would be ideal partners for these efforts.

### Friends of the Greenway Group

Friends of Wayne County Greenways conducts a variety of trail advocacy events to build support for local trails to connect to the statewide Mountains to Sea Trail. The group hosts regular Trail Cleanup Days and trail walks, hikes, and rides.

**Recommendation:** As greenway trails are developed in Wayne County, Friends of Wayne County Greenways should work with the City of Goldsboro and other partners to host trail celebration events. Events could include a themed fun run/walk, bike ride, or race, along with a ribbon cutting and festival as new portions of trail open. These events could be jointly sponsored by GoWayneGo, City of Goldsboro Parks and Recreation, Wayne County Parks and Recreation, and local businesses.





## GoWayneGo Commitment

Great Health for Wayne County

Health is important to me and my family!

### Our daily goals:

- 5 fruits & vegetables
- 3 balanced meals
- 2 hours of TV/electronics max
- 1 hour of physical activity
- 0 sugary drinks, except on occasion

## GoWayneGo Physical Activity and Health Programs

GoWayneGo offers several active programs and events to promote better health in Wayne County. Residents can make the GoWayneGo Commitment to Great Health, log weight loss progress, and attend a variety of fitness and sports programs listed on the GoWayneGo website, including the Summer Walk & Roll Series of walks, hikes, and bike rides.

**Recommendation:** Continue the great work already begun. Evaluate progress in the GoWayneGo Commitment and weight loss. Maintain involvement with this Plan's Committee going forward to assist with implementation.

## Outdoor Community Events

Several partners are already involved in developing and hosting a variety of outdoor community events within Goldsboro and Wayne County. The Goldsboro Farmers Market, Cornhole Charity Tournaments, Movies on the Lawn, Cruise the Neuse Paddle Trip, and Center Street Jam Series are some of the events offered.

**Recommendation:** Outdoor community events offer valuable partnership opportunities for bicycle and pedestrian programs. A bike rodeo, where police officers and volunteers teach children traffic safety and riding skills, could be included as part of outdoor events downtown. An Open Streets Event (see page 7-13) could be held in conjunction with, or spun off of, other outdoor events such as Center Street Jam. City staff and volunteer organizations could pass out bicycle and pedestrian event information and traffic safety materials.



## Organized Walks, Rides, and Races: Downtown Criterium Race

In May 2014, Goldsboro and the Seyboro Cyclists Club hosted the Downtown Goldsboro Criterium Race. The race included a closed course through the downtown, with race categories for men and women of all ages, including kids, juniors, and a 45+ group. The race advertised local restaurants, shopping, and bars and attracted hundreds of participants and spectators to downtown.

**Recommendation:** Expand upon the momentum and success of the Downtown Criterium Race to offer regular bicycle rides, walks, and races in Downtown Goldsboro. These events draw large crowds that patronize local businesses and help to build Goldsboro's reputation as a bike- and walk-friendly city. Similar events should be held throughout Goldsboro, particularly as part of a celebration when new trails, bike lanes, or other facilities are constructed. Having the Mayor or other elected officials participate helps to draw attention to these events and raises bicycle and pedestrian awareness among key decision-makers.





## PROGRAM RECOMMENDATIONS

### Education

#### *Media Campaign to Educate Motorists, Bicyclists, and Pedestrians*

**Purpose:** Educate all road users on traffic laws and safety tips to reduce crashes and make roadways more comfortable for all users

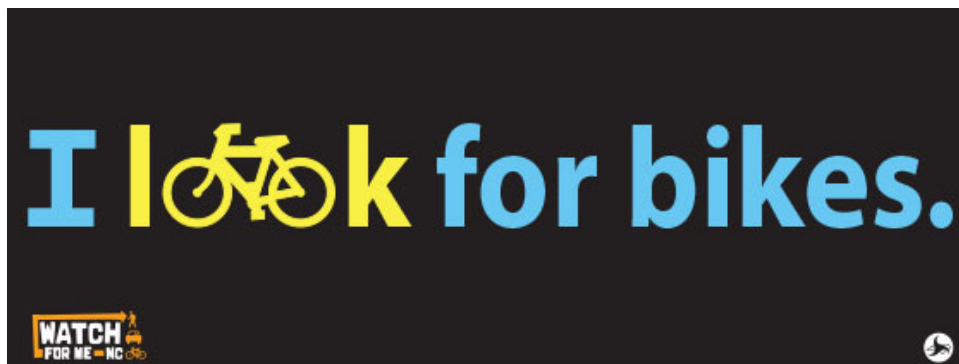
**Audience:** General public

**Partners:** Goldsboro MPO; Goldsboro, Pikeville, and Walnut Creek Police Departments; NCDOT; Seyboro Cyclists; Bicycle and Pedestrian Advisory Committee

Watch for Me NC is a comprehensive traffic safety campaign launched through NCDOT to reduce the number of pedestrian and bicyclists involved in crashes with motor vehicles. The campaign consists of educational messaging directed individually towards drivers, bicyclists, and pedestrians in order to teach people traffic laws and safety tips unique to each mode. Public outreach is conducted through bus advertisements and banners, brochures, bumper stickers, gas pump stickers, TV and radio advertisements, and a police enforcement effort.

The pilot program was launched in the Triangle communities of Raleigh, Durham, Chapel Hill, and Carrboro and will be expanding statewide. The Goldsboro MPO and local police departments should work with NCDOT to launch a local Watch for Me NC Campaign. Seyboro Cyclists and the Bicycle and Pedestrian Advisory Committee could help with outreach through local events, programs, and online.

Watch for Me NC website: <http://www.watchformenc.org/>





## Safe Routes to School (SRTS) Program

**Purpose:** Provide opportunities for children to safely walk and bike to school; improve traffic safety around schools through investments in bicycle and pedestrian infrastructure and programs

**Audience:** School-aged children and their parents; school administrators, faculty, and staff

**Partners:** Wayne County Public Schools; Parent-Teacher Associations (PTAs); Goldsboro, Pikeville, and Walnut Creek Police Departments; City of Goldsboro and Town of Pikeville Public Works staff; community volunteers



Safe Routes to School (SRTS) is a program that enables and encourages children to walk and bike to school. The program helps make walking and bicycling to school a safe and more appealing method of transportation for children. SRTS facilitates the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools. SRTS programs should be implemented in every elementary and middle school within Wayne County Public Schools.

An important first step for SRTS programs in Wayne County Public Schools would be to host a Safe Routes to School Community Workshop. Designed to help communities develop sound SRTS programs based on their unique local context, this is a one-day event that provides information on best practices, useful strategies, and available resources. NCDOT's Safe Routes to School Program offers a customized version of the "Safe Routes to School National Course," developed by the National Center for Safe Routes to School and the Pedestrian and Bicycle Information Center. Next steps would include developing leaders and key contacts at each school, developing SRTS action plans, and prioritizing projects around each school.

The North Carolina Safe Routes to School Program is supported by federal funds through SAFETEA-LU and MAP-21 legislation. Please note that all SRTS projects "shall be treated as projects on a Federal-aid system under chapter 1 of title 23, United States Code." Although no local match is required and all SRTS projects are 100% federally funded under the SAFETEA-LU, agencies are encouraged to leverage other funding sources that may be available to them, including grant awards, local, state, or other federal funding. SRTS funds can be used for proposed projects that are within 2 miles of a school public or private, K-8, in a municipality or in the county jurisdiction.

In response to the Strategic Transportation Investments law of June 2013, proposed SRTS projects will be considered as part of the Bicycle and Pedestrian project input with Strategic Prioritization Office for funding consideration. The most common types of eligible SRTS projects are sidewalks or a shared-use path. However, intersection improvements (e.g., marking/upgrading crosswalks), on-street bicycle facilities (e.g., bike lanes, wide paved shoulders), or off-street shared-use paths are also eligible for SRTS funds.

For more information and a comprehensive list of eligible projects, please visit the FHWA SRTS program: [http://www.fhwa.dot.gov/environment/safe\\_routes\\_to\\_school/overview/](http://www.fhwa.dot.gov/environment/safe_routes_to_school/overview/)

### SRTS RESOURCES AND SAMPLE PROGRAMS

#### NATIONAL CENTER FOR SAFE ROUTES TO SCHOOL:

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

#### MARIN COUNTY, CA:

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

#### GREENVILLE, NC:

<http://www.saferoutesinfo.org/data-central/success-stories/greenville-north-carolina-community-comes-together-pedestrian-safety>

#### OTHER NC SUCCESS STORIES:

<http://www.saferoutesinfo.org/data-central/success-stories/north-carolina>

### Professional Development Courses

**Purpose:** Educate and train planners, engineers, and other professional staff on best practices for bicycle and pedestrian facility planning, design, and implementation

**Audience:** Professional staff in Planning, Public Works, Parks and Recreation, Engineering, and related departments and fields

**Partners:** City of Goldsboro, Town of Pikeville, and Village of Walnut Creek Departments; GIS staff; County staff; MPO staff; NCDOT staff

Professional development courses provide training to transportation and other professionals who may not have received extensive experience or training in pedestrian and bicycle facilities. These courses are helpful for educating staff on bicycle and pedestrian design standards, complete streets concepts, how to coordinate with other departments on bicycle and pedestrian projects, funding opportunities, and other topics related to bicycle and pedestrian planning, design, and implementation. Courses are available through NCDOT, the Association of Bicycle and Pedestrian Professionals (APBP), the Pedestrian and Bicycle Information Center (PBIC), and others.

Educating professional staff in these issues helps to ensure that bicycle and pedestrian improvements are appropriately included in future projects and development. It also helps staff understand why it is important to include bicycle and pedestrian accommodations, and the benefits that such improvements provide to the community.

Sample programs:

- Institute for Bicycle and Pedestrian Innovation: <http://www.ibpi.usp.pdx.edu/>
- <http://www.pedbikeinfo.org/training/webinars.cfm>

### Traffic Ticket Diversion Class

**Purpose:** Educate first-time traffic offenders, including motorists, bicyclists, and pedestrians, on roadway safety and traffic laws

**Audience:** General public, usually first-time offenders of particular traffic violations

**Partners:** City of Goldsboro, Town of Pikeville, and Village of Walnut Creek Police Departments; Wayne County Court System

A diversion class is offered to first-time offenders of certain community-related traffic violations, such as motorists speeding, pedestrians jaywalking, or bicyclists running a stoplight. In lieu of receiving a citation and/or fine, individuals can take a one-time free or inexpensive class instead. In Marin County, interested citizens can take the class even if they did not receive a ticket. This program is a good way to educate all road users about their rights and responsibilities.

Sample program:

- Marin County, CA: <http://www.marinbike.org/Campaigns/ShareTheRoad/Index.shtml#StreetSkills>



### PBIC Webinar

**Statewide Complete Streets: How states are working with communities for friendlier roads**



Stefanie Seskin, National Complete Streets Coalition  
Lauren Blackburn, North Carolina DOT  
Paula Reeves, Washington State DOT  
Chris Berrens, Minnesota DOT

April 10, 2 pm



## SAMPLE BICYCLE AND PEDESTRIAN WEBSITES

**PORTLAND, OR:**  
<http://www.portlandoregon.gov/transportation/60164>

**AUSTIN, TX:**  
<http://austintexas.gov/bicycle>

**RALEIGH, NC:**  
<http://www.raleighnc.gov/government/content/PWksTranServices/Articles/BicycleProgram.html>

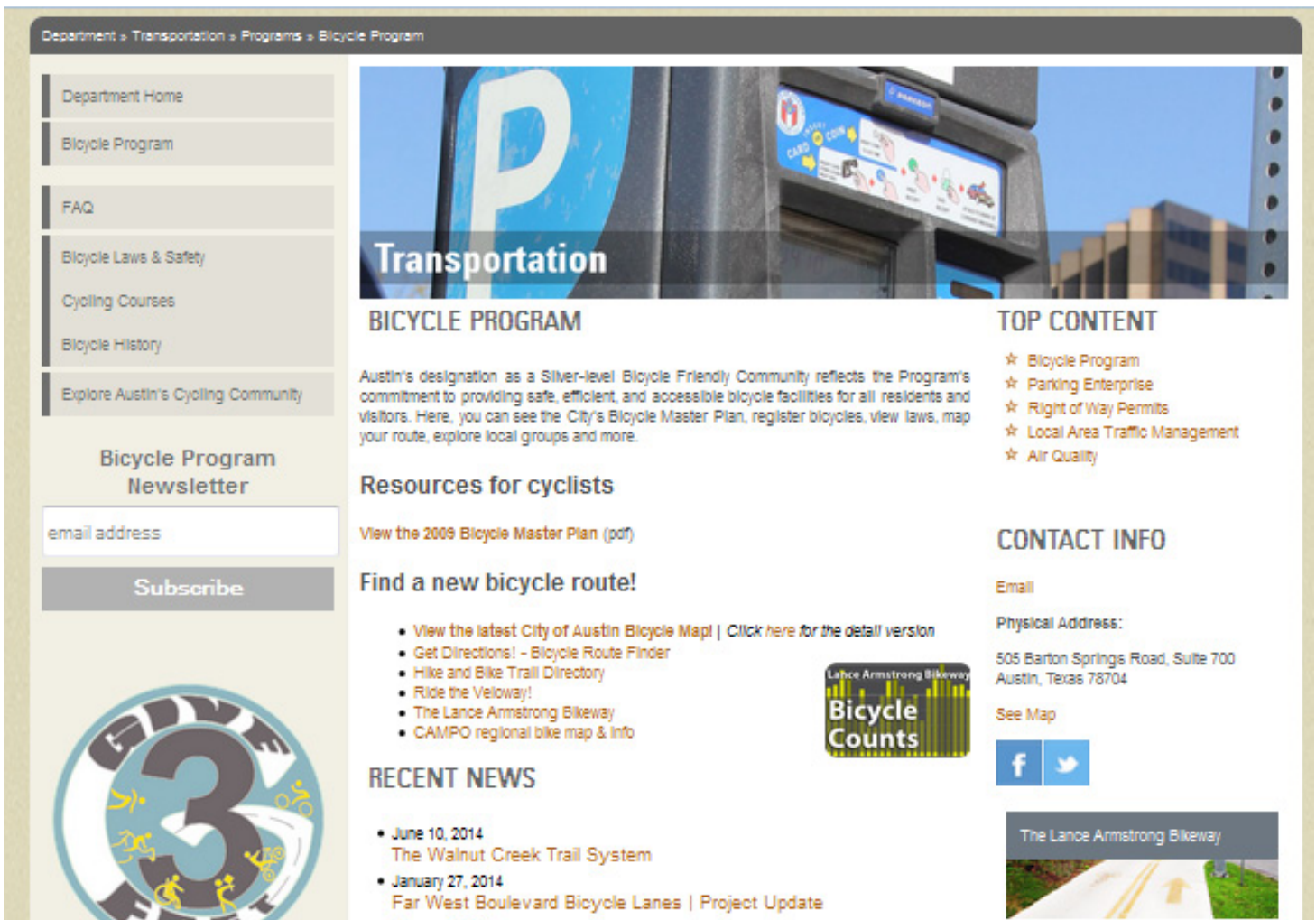
### One Stop Website

**Purpose:** Provide a comprehensive website of bicycle and pedestrian resources for residents, visitors, and businesses

**Audience:** General public

**Partners:** City of Goldsboro Planning Department; Bicycle and Pedestrian Advisory Committee; City of Goldsboro and Town of Pikeville Public Works Departments; IT staff; Village of Walnut Creek

Many current and potential pedestrians and bicyclists do not know where to turn to find out about walking and bicycling laws, events, maps, safety tips, and groups. Partners should work together to develop a “one-stop” website that offers a variety of walking and biking resources. A website is not usually difficult to set up, but it will only be successful if the site is both easy to use and updated frequently. All website content should be reviewed regularly for accuracy. The bicycling community can assist in keeping the site up to date. Other recommended programs in this appendix could be housed on the website, such as Walk Bike NC materials, Traffic Ticket Diversion Class information, event information, local business discounts for bicyclists, and walk and bike maps. This website could build upon the Weebly website used for this planning process.



## Encouragement

### *Local Business Discounts for Bicyclists*

**Purpose:** Encourage and reward residents and visitors for making trips by bike; promote a bicycle-friendly culture among businesses in Goldsboro

**Audience:** General public visiting restaurants, shops, and services by bike

**Partners:** Local restaurants, shops, bars, and other businesses; Bicycle and Pedestrian Advisory Committee; Downtown Goldsboro Development Corporation

The Bicycle and Pedestrian Advisory Committee should work with the Downtown Goldsboro Development Corporation and Wayne County Chamber of Commerce to encourage local businesses to offer discounts to patrons who bicycle to their business. The discount could be a daily or once-weekly promotion that encourages residents and visitors to visit local businesses by bike. One successful version of the program requires bicyclists to purchase a low-cost program sticker that they display on their helmets. This allows businesses to identify participating bicyclists and provide discounts to those customers. A business discount program could be especially popular with businesses in downtown that have limited motor vehicle parking. In return for businesses' participation, a "Bicycle-Friendly Local Businesses" feature, along with discount information, could be featured on the One-Stop Website (see page 7-11).

Sample programs:

- Salt Lake City, UT: <http://www.bikeslc.com/GetBiking/DiscountsforBicyclists.html>
- Long Beach, CA: <http://www.bikelongbeach.org/bike-friendly-businesses>

### *Walk and Bike to School Days*

**Purpose:** Encourage children to walk to school in order to provide opportunities for physical activity and safety education

**Audience:** Schoolchildren and their parents

**Partners:** Wayne County Public Schools; Police Departments

Local schools should offer regular Walk and Bike to School Days to encourage physical activity and transportation options to school. These events could be annual, such as International Walk to School Day in October, monthly, or even weekly (such as a "Walking Wednesdays" program). Students could either walk or bike individually with their parents or participate in a "Walking School Bus" in which volunteer parents and teachers lead children along a designated walking route to school, picking up children along the way. Schools should offer incentives to students who participate in Walk and Bike to School Day activities and events to promote the initiative and reward their participation.

For more information: <http://www.walkbiketoschool.org/>







### Open Streets Events

**Purpose:** Raise awareness of bicycling and walking opportunities in Goldsboro and Wayne County; Encourage people to participate in walking and biking activities in a fun, traffic-free environment

**Audience:** General public

**Partners:** Downtown Goldsboro Development Corporation, City of Goldsboro Parks and Recreation Department, GoWayneGo

Open Streets Events are periodic street festivals (typically held on the weekend) that create a temporary park that is open to the public for walking, bicycling, dancing, hula hooping, roller skating, and other forms of human-powered activity. These programs are known by many names: Open Streets, Ciclovias, Sunday Parkways, Summer Streets, and Sunday Streets. They have been very successful internationally and are rapidly becoming popular in the United States. They promote health by creating a safe and attractive space for physical activity and social interaction, and are cost-effective compared to the cost of building new parks for the same purpose. These events can be weekly events or one-time events, and are generally very popular and well-attended. Activities at an Open Streets Events can include bicycle obstacle courses, a BMX show, jump roping, Zumba, a Kids' Bike Rally, and prize drawings.

These events lend themselves to innovative partnerships and public/private funding. Health care providers whose mission includes facilitating physical activity are often major sponsors. Businesses may also help sponsor the event if it brings customers to their location.



- Portland Sunday Parkways Guide: <http://www.portlandonline.com/transportation/index.cfm?c=51522&a=274625>
- Sunday Parkways videos: <http://www.streetfilms.org/tag/ciclovias/>
- Bull City Play Streets (Durham): <https://www.facebook.com/BullCityOpenStreets>





### Walking & Bicycling Maps and Tours

**Purpose:** Encourage walking and biking by providing easy-to-read maps of on-road bicycle facilities, sidewalks, trails, and routes for reaching destinations by foot or by bike; Promote walking and biking tourism within the Goldsboro MPO

**Audience:** General public

**Partners:** Downtown Goldsboro Development Corporation, Wayne County Chamber of Commerce, City of Goldsboro Travel and Tourism Division, City of Goldsboro Planning Department

One of the most effective ways of encouraging people to walk and bike is through the use of maps and guides. The City of Goldsboro should develop a walk and bike map and distribute it to residents and visitors both in print and online; copies could be available for free or for a small charge at City Hall, local bike shops, gyms and recreation centers, and at other businesses. The map should show where existing bike lanes, sidewalks, trails, and other facilities are located and help to guide people to enjoyable routes and destinations.; safety tips and links to local resources are also valuable additions. The map should be updated on a regular basis to reflect the most current facilities in town.

The City and its partners should also collaborate on creating one or more guided walking and bicycling tour routes, such as tours of Civil War sites, breweries, wineries, local farms, and/or public art. Live tours should be hosted by knowledgeable tour guides (annually or more frequently as demand permits) and publicized widely. The tour routes should be preserved in a brochure and/or a self-guided (e.g., iPod-based) tour for those who cannot attend the live tour. The maps should be distributed widely, both in print and online, to maximize availability and use.

Goldsboro already has numerous partners who may be able to help develop guided and self-guided walks or rides and manage tour logistics. The Downtown Goldsboro Development Corporation, Wayne County Chamber of Commerce, and the City of Goldsboro Travel and Tourism Division may be willing to partner on walking and biking maps and tours to promote tourism and economic development.

### SAMPLE WALK/BIKE MAPS

**DURHAM, NC:**

<http://durhamnc.gov/ich/op/dot/Pages/Durham-Bike-Hike-Map.aspx>

**RALEIGH, NC:**

<http://www.raleighnc.gov/government/content/PWksTranServices/Articles/BicycleProgram.html>

**GREENVILLE, NC:**

[http://www.greenvillenc.gov/departments/public\\_works\\_dept/information/bike\\_maps/working12.html](http://www.greenvillenc.gov/departments/public_works_dept/information/bike_maps/working12.html)

### SAMPLE WALK/BIKE TOURS

**BEDFORD, PA:**

<http://www.visitbedfordcounty.com/walkingtours.html>

**AUSTIN, TX:**

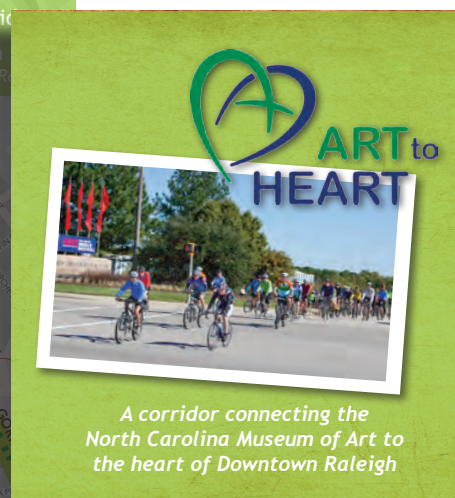
[http://www.austintexas.org/visitors/plan\\_your\\_trip/historic\\_walking\\_tours](http://www.austintexas.org/visitors/plan_your_trip/historic_walking_tours)

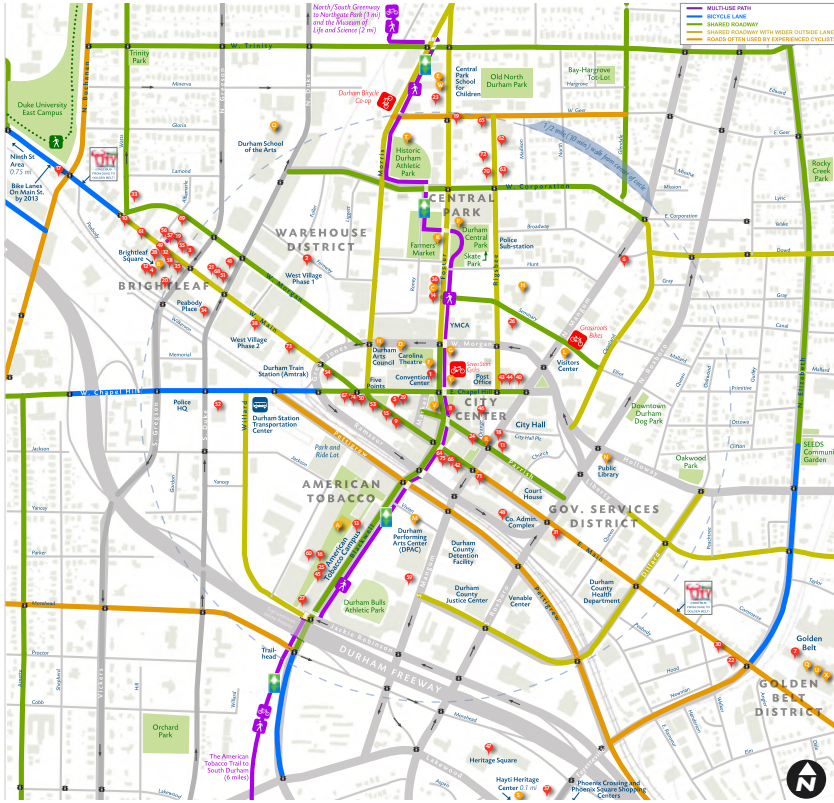
**LEXINGTON, KY:**

<http://www.visitlex.com/idea/bicycle-tour.php>

**PHILADELPHIA, PA:**

<http://museumwithoutwallsaudio.org/wp-content/uploads/2012/03/PHL-Outdoor-Public-Art-Bike-Map.pdf>





### Downtown Legend

- Bicycle Organization
- Parks & Plazas
- Downtown Restaurants
- Buildings
- East Coast Greenway
- Traffic Light
- Hiking/Walking Trail - This map refers to the wide network that links the North-South Greenway (top of the map) to the American Tobacco Trail (bottom of the map).
- SHARED ROADWAY with wider outside lane - Higher speeds and/or volumes, combined with narrow lanes can be problematic for cyclists.
- MULTIPLE PATH - (e.g., the American Tobacco Trail (North-South Greenway), etc.)
- SHARED ROADWAY with wider outside lane - Higher speeds and/or volumes, combined with narrow lanes can be problematic for cyclists.
- BICYCLE LANE or should shoulder - on higher traffic streets
- SHARED ROADWAY WITH WIDER OUTSIDE LANE - on moderate and higher traffic streets
- ROADS OFTEN USED BY EXPERIENCED CYCLISTS - (e.g., streets with wide shoulders, dedicated routes, or wide outside lanes but not road shoulders)

### Downtown Restaurants

1. Zeno's Restaurant/Bar	17. Mellow Mushroom	33. Mellow Mushroom
2. Alan's Durham Bistro	18. Mellow Mushroom	34. Mellow Mushroom
3. Alan's Durham Bistro	19. Mellow Mushroom	35. Mellow Mushroom
4. Alan's Durham Bistro	20. Mellow Mushroom	36. Mellow Mushroom
5. Alan's Durham Bistro	21. Mellow Mushroom	37. Mellow Mushroom
6. Alan's Durham Bistro	22. Mellow Mushroom	38. Mellow Mushroom
7. Alan's Durham Bistro	23. Mellow Mushroom	39. Mellow Mushroom
8. Alan's Durham Bistro	24. Mellow Mushroom	40. Mellow Mushroom
9. Alan's Durham Bistro	25. Mellow Mushroom	41. Mellow Mushroom
10. Alan's Durham Bistro	26. Mellow Mushroom	42. Mellow Mushroom
11. Alan's Durham Bistro	27. Mellow Mushroom	43. Mellow Mushroom
12. Alan's Durham Bistro	28. Mellow Mushroom	44. Mellow Mushroom
13. Alan's Durham Bistro	29. Mellow Mushroom	45. Mellow Mushroom
14. Alan's Durham Bistro	30. Mellow Mushroom	46. Mellow Mushroom
15. Alan's Durham Bistro	31. Mellow Mushroom	47. Mellow Mushroom
16. Alan's Durham Bistro	32. Mellow Mushroom	48. Mellow Mushroom

### Art & Culture

1. American Tobacco Campus  
2. Duke University  
3. Durham City Hall  
4. Durham Convention Center  
5. Durham Performing Arts Center  
6. Durham Public Library  
7. Durham Public Library  
8. Durham Public Library  
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100. Durham Public Library

### Transit Information

**Durham Station**  
Durham Station is the main transfer point for Durham Area Transit Authority (DATA) and Triangle Transit buses in Durham. Connections to bus service are also available at Durham Station.

**The Bull City Connector**  
This is a FREE route from Duke to Golden Belt, including North Street and Downtown Durham, operating every 15 minutes from 6:30am to 9pm, Mon-Fri, and every 20 minutes 6pm to midnight, Mon-Fri, and 6:27am to midnight, Sat. See [www.bullcityconnector.com](http://www.bullcityconnector.com)

**Plan your Bus Trip**  
You have many transit choices, not all of them fit on this map! Visit [GoTriangletrip.com](http://GoTriangletrip.com) to use the online Trip Planner. The trip planner will tell you which bus has the best route, when it comes on your stop, how long your trip will take, and how much it costs. You can also use [GoTriangletrip.com](http://GoTriangletrip.com) to plan your trip on DATA, Cary Transit, CAT, Chapel Hill Transit, the NCSU WolfLink and Triangle Transit.

**Share the Ride**  
A good rule of thumb for carpooling is to limit the number of passengers to 4. Just enter your home address, work address, schedule and carpool for more information, visit [www.GoTriangletrip.com](http://www.GoTriangletrip.com)

**Upgrade to a Vanpool**  
A vanpool is a group of 7-15 commuters who live and work in the same place and have similar schedules. Vanpools generally allow monthly fee based on mileage. For more information visit [www.GoTriangletrip.com](http://www.GoTriangletrip.com)

**Get an Emergency? Get an Emergency Ride Home**  
Triangle Transit will get you home if you are on a bus and you are unable to get home. You must have an emergency and need to get home fast. It's free! Visit [www.GoTriangletrip.com](http://www.GoTriangletrip.com)

**Ride-Share Information**  
Ride-Share information is available for DATA and Triangle Transit buses. Reduce your travel time by holding up your seat when you get on the bus. Visit [www.GoTriangletrip.com](http://www.GoTriangletrip.com) for more information.

## BICYCLING IN THE BULL CITY

In the State of North Carolina, bicyclists have the same rights and duties as motorists. For a complete list of NC laws, visit [www.ncleg.gov/ncleg/ncleg.aspx?gs=1](http://www.ncleg.gov/ncleg/ncleg.aspx?gs=1)

- Check Traffic Signs and Signals** - Also stop signs, yield signs, and other signs that may affect your route.
- Always Use Hand Signals** - New rule of 18 inches back in 2005. Signaling is required.
- Always Use Headlights** - New rule of 18 inches back in 2005. Signaling is required.
- Always Use Taillights** - New rule of 18 inches back in 2005. Signaling is required.
- Always Use Mirrors** - New rule of 18 inches back in 2005. Signaling is required.
- Always Use Horns** - New rule of 18 inches back in 2005. Signaling is required.
- Always Use Bells** - New rule of 18 inches back in 2005. Signaling is required.
- Always Use Whistles** - New rule of 18 inches back in 2005. Signaling is required.
- Always Use Gongs** - New rule of 18 inches back in 2005. Signaling is required.
- Always Use Bells** - New rule of 18 inches back in 2005. Signaling is required.
- Always Use Whistles** - New rule of 18 inches back in 2005. Signaling is required.
- Always Use Gongs** - New rule of 18 inches back in 2005. Signaling is required.

**Bicycles and Pedestrians Advisory Committee**  
Residents can help improve the safety of bicycling and pedestrian travel in Durham by joining the Bicycles and Pedestrians Advisory Committee (BPAC). The BPAC meets the 3rd Tuesday of each month, while Durham City Hall is open to the public. The public is invited to attend.

**Bikes on Buses**  
Bicycles are allowed on buses in Durham. Bicycles are not allowed on buses in other parts of Durham County.

**Accident Map Contact Information**  
For more information, visit [www.durham.gov](http://www.durham.gov)

## PARKS, TRAILS, AND OPEN SPACE

**Durham Parks and Recreation**  
Durham Parks and Recreation serves to help citizens discover, explore, and enjoy the natural resources of Durham. The park and recreation services are provided by Durham Parks and Recreation.

**American Tobacco Trail (ATT)**  
The 22-mile trail is a multi-use trail that runs from the American Tobacco Campus to the American Tobacco Trail. The trail is open to bicyclists, runners, and walkers.

**Durham Open Space and Trails Commission (DOTS)**  
DOTS fosters the wise use of Durham's natural resources and addresses the City Council and the County Board of Commissioners on matters relating to open space preservation and development. Their web site also has local maps available for download. [www.durhamopen.com](http://www.durhamopen.com)

**The NC Mountains-to-Sea Trail (MST)**  
The Mountains-to-Sea Trail stretches 1,000 miles from Chocoma, North Carolina to the Great Smoky Mountains in Tennessee. The trail is open to bicyclists, runners, and walkers.

**Mountain Bike Trails**  
There are three mountain bike trail locations in Durham: Little River Regional Park, Camp Hill Park, and Little Park. Mountain bike trail conditions vary depending on maintenance. See the Triangle Off-Road Cycling website for more info. [www.triangleor.com](http://www.triangleor.com)

**Duke Forest**  
Duke Forest is a private land owned and managed by Duke University as an outdoor laboratory. Limited public recreation is permitted in the forest as long as it does not conflict with teaching and research projects. Permitted activities include hiking, biking, and horseback riding on the established roads, as well as fishing and picnicking. Group activities must be approved in advance. More information can be found on the web: [www.dukeforest.edu](http://www.dukeforest.edu)

**Little River Regional Park and Natural Area**  
The Little River Regional Park and Natural Area features 7.4 miles of hiking trails and 4 miles of equestrian trails. There are also 2 picnic shelters with grills, picnic restrooms, and a group playground (see map below). For more information, visit [www.durham.gov](http://www.durham.gov)

## BICYCLING ON STREETS

**Use the through lane to go straight, not the turn lane.**

**Make eye contact with drivers and verbal contact coming towards you who may turn left.**

**Ride in a straight line.** Avoid weaving between parked cars. Ride in a straight line at least 4 feet away from parked cars to avoid the door zone (see below).

**Motorists Pass with Care.** Coming at least 2 feet of passing space is the law, but at least 3 feet is courteous. Also, please slow down to pass if you feel the need to pass quickly. It's not the right time to pass.

**Never ride against traffic.** Riding against traffic is dangerous and illegal. Motorists often pull out of streets and driveways without checking for sidewalk bicyclists.

**When necessary, use entire travel lane.** Move toward the center when the lane is too narrow for motorists to pass safely or when you're moving at the same speed as traffic.

**Look inside parked cars before you pass them.** If you're unable to see someone inside, move outside the door zone or slow down and carefully pass.

**Watch behind you.** Keep track of traffic behind you, so you'll know whether you have enough room if you must swerve suddenly out of the door zone. A mirror helps you see traffic behind you as you pedal forward.

**Other all traffic regulations.** Riding is probably following the rules of the road. Know and follow the rules. Keep all road signs properly anticipated and react to them.

**Keep an eye on the motorist coming up on you.** Let them know you're behind them. Let them know you're behind them. Let them know you're behind them.

**Motorists Pass with Care.** Coming at least 2 feet of passing space is the law, but at least 3 feet is courteous. Also, please slow down to pass if you feel the need to pass quickly. It's not the right time to pass.

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## DURHAM BIKE & HIKE MAP

2012

This map was developed using input from many sources, primarily those listed below. Thank you to the many individuals and organizations who contributed to this map.

Durham Bicycles and Pedestrians Advisory Committee (BPAC)  
Durham Parks and Recreation  
Durham Public Library  
Durham Transportation Department  
Durham County Open Space and Recreation Division  
Durham Convention and Visitors Bureau  
Duke University Parking and Transportation Services  
East Coast Greenway  
Hiking/Walking Trail  
North-South Greenway  
Triangle Off-Road Cycling  
Triangle Transit

**Important Note to Map Users**  
This map is intended to provide information and is not intended to be used as a substitute for professional advice. The map is not intended to be used as a substitute for professional advice. The map is not intended to be used as a substitute for professional advice.





## Wayfinding Signage Program

**Purpose:** Enhance resident and visitor orientation by directing pedestrians, bicyclists, and motorists to popular destinations around town

**Audience:** General public

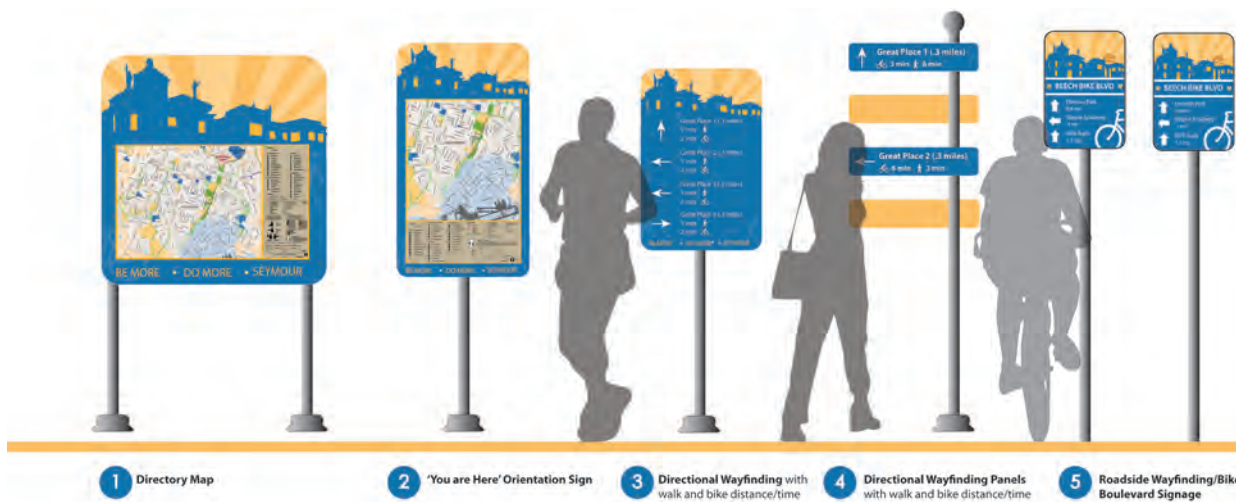
**Partners:** City of Goldsboro Public Works Department, Downtown Goldsboro Development Corporation, Wayne County Chamber of Commerce, City of Goldsboro Travel and Tourism Division, City of Goldsboro Planning Department

Wayfinding signage helps to orient residents and visitors to an area and makes a place more accessible and welcoming. A good wayfinding system can greatly contribute to tourism and economic development by creating an inviting environment for visitors and encouraging them to spend time at local destinations. While many wayfinding systems sufficiently address the needs of motorists, pedestrians and bicyclists have unique wayfinding needs and interests that should be addressed as part of any wayfinding system: they typically travel at slower speeds and shorter distances than motor vehicles, are better able to spontaneously stop and visit a place than motorists can, and require direction to convenient and secure bike parking.

Goldsboro should develop a quality wayfinding system for bicyclists and pedestrians that addresses these needs by providing clear direction to popular destinations and nearby bike parking. Signage should also include both an on-foot and on-bike travel time to each location (see photo on right). Such a system would be especially useful within downtown where there are many sights spread over several blocks. Materials for signage should reflect the character of Goldsboro and Wayne County and be selected for longevity and ease of maintenance. A wayfinding program can include directional signage, on-road markings, and kiosks with town maps. The Downtown Goldsboro Development Corporation, Wayne County Chamber of Commerce, and City of Goldsboro Travel and Tourism Division may be willing to partner on developing and maintaining a wayfinding program due to its focus on tourism and economic development.

Sample wayfinding signage programs:

- Oakland, CA: <http://www2.oaklandnet.com/oakca/groups/pwa/documents/report/oak025118.pdf>
- London, England: <http://www.tfl.gov.uk/microsites/legible-london/>





### *Bike to Work Day and Bike Month Activities*

**Purpose:** To showcase the benefits of bicycling and to encourage current and potential bicyclists to incorporate bicycling into their everyday lives

**Audience:** General public, commuters

**Partners:** Seyboro Cyclists, Bicycle and Pedestrian Advisory Committee, Police Departments, City of Goldsboro Parks and Recreation Department; Local bike shops; GoWayneGo; Seymour Johnson AFB

Cities and towns across the country participate in Bike to Work Day and National Bike Month annually during May. The League of American Bicyclists (LAB) hosts a website for event organizers. The website contains information on nationwide and local events, an organizing handbook, and promotional materials. Goldsboro should host National Bike Month events and activities annually, with the support of local bicycling groups and shops. Events and activities for Bike Month may change from year to year and should evolve and grow as the bicycling community in Goldsboro grows.

Bike to Work Day could include Bike to Work Day Breakfast Stations with free coffee and breakfast for bicyclists, free bicycle tune-ups, helmet or light giveaways, drawings for gift certificates to local bike shops, and other fun activities that reward and incentivize biking to work. Other Bike Month events could include an Open Streets Event, a Bike Rodeo for children where police and volunteers teach children safe riding skills, a police-escorted ride or race around the city, a month-long mileage challenge, and other activities that appeal to a variety of bicyclist ages and experience levels.

Sample programs:

- League of American Bicyclists Bike Month page: <http://www.bikeleague.org/content/national-bike-month>
- Sacramento, CA: <http://www.mayisbikemonth.com/>
- Seattle, WA: <http://www.cascade.org/bikemonth>
- San Francisco, CA: <https://www.sfbike.org/bike-month/>



## Enforcement

### *20's Plenty Campaign*

**Purpose:** Reduce crashes and crash severity by reducing vehicle speeds on neighborhood streets to 20 MPH

**Audience:** Motorists

**Partners:** City of Goldsboro and Town of Pikeville Public Works Departments; City of Goldsboro, Town of Pikeville, and Village of Walnut Creek Police Departments; Wayne County Court System

"20's Plenty" is a campaign that originated in the United Kingdom with the goal of minimizing pedestrian crash injuries and deaths. Lowering residential speeds to 20 MPH has enormous safety benefits for all users, especially pedestrians and cyclists, by reducing both the chance of a crash and its severity. This campaign could be implemented throughout the Goldsboro MPO in areas with high pedestrian and bicyclist traffic, such as in the downtown, on bicycle boulevards recommended in this plan and other neighborhood streets, and near schools, parks, and shopping centers.

A successful campaign will bring together several different strategies, including:

- Making residents aware of the benefits of 20 MPH roadways and engaging their partnership on raising awareness and buy-in from their neighbors.
- Identifying specific streets on which a 20 MPH speed limit is appropriate. Likely candidates include designated school walking or bicycling routes, roads identified in pedestrian or bicycle plans as important corridors, and residential streets whose residents request a 20 MPH program.
- Traffic engineering to ensure that the design speed of the street matches the new posted speed.
- Partnership with law enforcement to issue warnings and moving violations on designated 20 MPH streets.
- Evaluation of vehicle speeds and reported crashes (number and severity) before and after the integrated campaign is implemented to the effort to measure results and correct course.
- Changing the legal guidelines around minimum speed and/or authority to set speed limits. For example, the State Legislature may consider passing a law that would permit towns and cities to set speed limits on certain types of roadways, based on classification or designation in an adopted plan.

More about UK "Twenty's Plenty" campaign:

- <http://www.20splentyforus.org.uk/>
- <http://www.streetfilms.org/no-need-for-speed-20s-plenty-for-us/>





## The effect of speed

	Average for all ages	Over 60 year olds
At <b>40</b> mph	• 31% are killed	• 98% are killed
At <b>30</b> mph	• 7% are killed	• 50% are killed
At <b>20</b> mph	• 1% are killed	• 5% are killed

Data from Road Safety Web Publication No. 16 *Relationship between Speed and Risk of Fatal Injury: Pedestrians and Car Occupants* - Department for Transport (September 2010)

### *Speeding Enforcement & Speed Feedback Signs*

**Purpose:** Reduce speeding throughout Goldsboro MPO to lower the risk and severity of bicycle and pedestrian crashes

**Audience:** Motorists

**Partners:** City of Goldsboro and Town of Pikeville Public Works Departments; City of Goldsboro, Town of Pikeville, and Village of Walnut Creek Police Departments; Wayne County Court System



Speeding vehicles endanger all road users, including pedestrians and bicyclists. High-speed driving results in more frequent crashes and crashes that are more likely to result in serious injury or death. Targeted speed enforcement activities are a proven way to improve road safety and make walking and bicycling more comfortable.

Law enforcement officials should enforce speed near schools and parks, in downtown, and at locations that are known to have speeding problems (as identified by police officers and resident complaints). These campaigns are ideal for a Safe Routes to School Program; many towns hold an annual "Back to School Blitz" to enforce speed limits in school zones.

As part of ongoing enforcement against speeding, the City of Goldsboro should also consider creating a speed feedback sign request program to deploy speed feedback signs at the request of neighborhood associations and schools. The signs serve as a traffic calming device when used temporarily at strategic roadway locations. The town should also use speed feedback signs on streets with new pedestrian and bicycle facilities. The signs should be mounted temporarily (e.g., for two weeks) and then be moved to another location to keep motorists from becoming inured to the speed feedback sign effect.

Example speed feedback sign request program:

- Toronto, Canada: <http://www.toronto.ca/transportation/walking/wysp/>



## Crosswalk Enforcement Action Program

**Purpose:** Increase driver awareness of and yielding to pedestrian right-of-way in crosswalks; increase pedestrian safety at crosswalks

**Audience:** Motorists

**Partners:** City of Goldsboro and Town of Pikeville Public Works Departments; City of Goldsboro, Town of Pikeville, and Village of Walnut Creek Police Departments; Watauga County Court System

Crosswalk enforcement actions (sometimes known as “crosswalk stings”) raise public awareness about the legal obligation of motorists to stop for pedestrians at crosswalks. While crosswalk enforcement actions do result in tickets being distributed, the greater impact comes through media publicity of the event to reinforce the importance of obeying pedestrian crossing laws.

Most crosswalk enforcement sites are selected because they have been identified as locations where pedestrians have trouble crossing, and/or where a large volume of pedestrians (especially vulnerable pedestrians such as children and seniors) is expected. High-crash locations may also be candidates for enforcement actions. If locations near schools are selected, the best timing for an enforcement action is the back-to-school window just after school has begun for the year. Locations should be selected by local police departments in consultation with city engineers and planners. If any complaints from the public have been received about problem crossing locations, they should be considered. School officials will also have valuable input about school crossing locations that would benefit from targeted enforcement.

Once locations have been determined, police departments prepare by marking the safe crosswalk stopping distance with cones. Plainclothes police officers or trained volunteer decoys then attempt to cross at corners and marked mid-block crossings just before a vehicle passes the cone. (Decoys may also be notable community members, such as the mayor or a well-known business leader, to increase media interest in the event.) If motorists fail to yield to the pedestrian in a crosswalk, a second police officer issues a warning or a ticket at the officer’s discretion. It is recommended that the enforcement action be recorded on video to support issued violations should a motorist challenge the ticket.

The City of Goldsboro should conduct periodic crosswalk stings at key locations around the city, including downtown and near schools, parks, shopping centers. Problem locations or corridors reported by the public should also be included in crosswalk enforcement actions. First-time offenders receiving a ticket should also receive educational materials through the Watch for Me NC Campaign (see page 7-6) and/or the option of taking a Traffic Ticket Diversion Class (see page 7-9) for a waived or reduced fine.

Example crosswalk sting program:

- Chicago, IL: [http://www.cityofchicago.org/city/en/depts/cdot/provdrs/ped/svcs/crosswalk\\_enforcementinitiatives.html](http://www.cityofchicago.org/city/en/depts/cdot/provdrs/ped/svcs/crosswalk_enforcementinitiatives.html)
- New Jersey: <http://www.pedbikeinfo.org/data/library/details.cfm?id=4649>







## Evaluation

### *Bicycle and Pedestrian Advisory Committee*

**Purpose:** Represent bicycle and pedestrian interests in Goldsboro and Wayne County; Assist with the promotion and operation of bicycle and pedestrian projects and programs

**Audience:** City staff; City Council; General public

**Partners:** City of Goldsboro Planning Department; City of Goldsboro Police Department; Friends of Wayne County Greenways; GoWayneGo

Goldsboro should create a Bicycle and Pedestrian Advisory Committee to represent the community's interests regarding bicycle and pedestrian issues in Goldsboro and Wayne County. The committee's duties should include reviewing development and improvement considerations that affect walking and bicycling conditions, making recommendations for street and sidewalk improvements, pursuing bicycle and pedestrian improvements recommended in this plan, helping to track plan progress through benchmarking and an annual report, and assisting with the development and implementation of programs. The Steering Committee for this plan could serve as the starting group for a standing Bicycle and Pedestrian Advisory Committee.

Sample committees:

- Columbia, SC: <http://www.columbiasc.net/planning-preservation/bpac>
- Raleigh, NC: <http://www.raleighnc.gov/government/content/BoardsCommissions/Articles/BicyclePedestrianAdvisoryCommission.html>
- Durham, NC: <http://www.bikewalkdurham.org/>





### *Pedestrian and Bicycle Counts Program*

**Purpose:** Gather important benchmarking information about walking and bicycling rates throughout Goldsboro and Wayne County

**Audience:** City staff, City Council

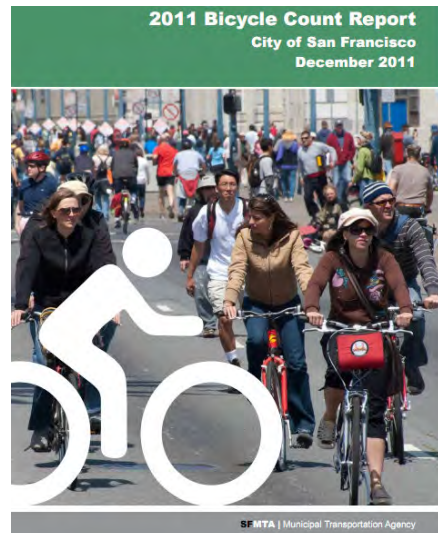
**Partners:** City of Goldsboro and Town of Pikeville Public Works Departments; City of Goldsboro Engineering and Planning Departments; Bicycle and Pedestrian Advisory Committee

In order to determine this plan’s success at helping Goldsboro and Wayne County residents walk and bike more, it is necessary to establish an annual data collection program. At a minimum, this program should tally the number of pedestrians and bicyclists at key locations around the community (particularly at pinch points, in downtown, near schools, and on greenway trails); the same locations should be counted in the same manner annually. If major pedestrian, bicycle, or greenway infrastructure projects are planned, baseline and post-construction user counts can be performed through this coordinated annual count process for maximum efficiency. This will provide the town with information about increases in walking and bicycling rates. Baseline user counts are also useful data for making the case for needed improvements; many people in Goldsboro already walk and bike for transportation and recreation, and counts can help to quantify the existing need for a new facility or intersection improvement.

It is recommended that the data collection program use methodology developed by the national National Bicycle and Pedestrian Documentation Project (NBPDP). Counts should be performed in the second week in September; one weekday count (from 5-7 PM on a Tuesday, Wednesday, or Thursday) and one Saturday count (12 noon – 2 pm) should be completed. Counters can be city staff or volunteers, as long as proper training is provided. If desired, the data collection effort can also include surveys to learn more about walking and bicycling demographics, where people are traveling to and from, and what their needs are.

The NBPDP website includes count and survey instructions, forms, and participant training materials:

- <http://bikepeddocumentation.org>





## Walking, Bicycling, and Greenways Report Card

**Purpose:** Share information about key walking and bicycling metrics

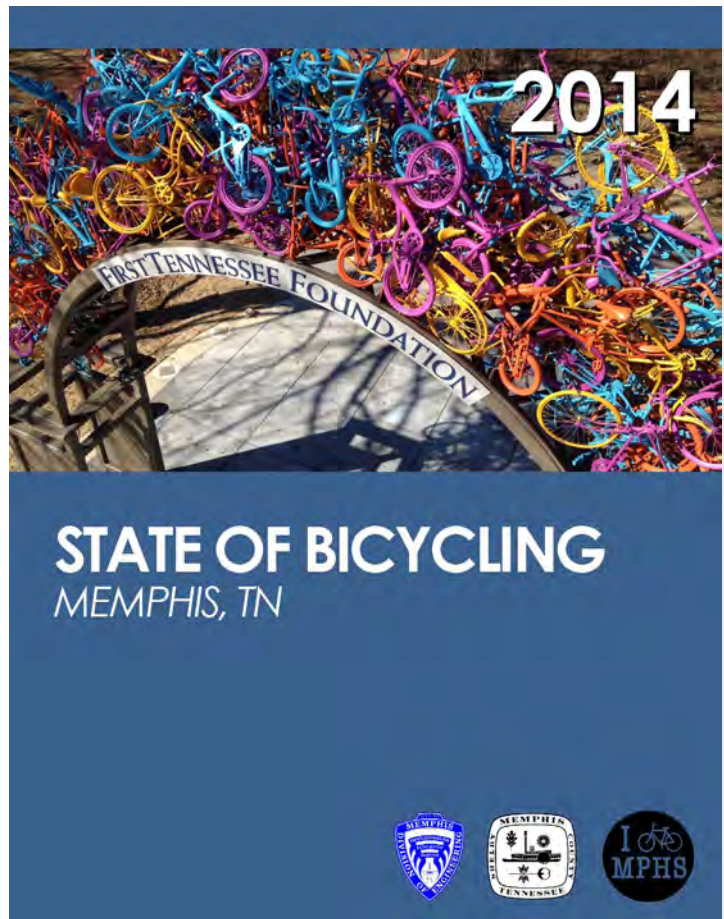
**Audience:** General public; Elected officials and decision makers; City staff

**Partners:** City of Goldsboro Planning and Engineering Departments; City of Goldsboro and Town of Pikeville Public Works Departments; Goldsboro Parks and Recreation Department, Bicycle and Pedestrian Advisory Committee

As the implementation of this plan progresses, a useful strategy is to use performance benchmarks to measure implementation accomplishments. A comprehensive review of the plan's progress should be published in an annual report that includes relevant performance metrics (walking and bicycling count results, new bicycle and pedestrian facility miles, completed projects, new and ongoing programs, pedestrian- and bicyclist-involved crashes). The report may also include information on user satisfaction, public perception of safety, or other qualitative data that has been collected related to walking and bicycling. Tracking successes over time helps to build momentum and justify continued or increased funding for bicycle and pedestrian projects and programs.

Sample program:

- City of San Francisco - San Francisco, CA: [http://www.sfbike.org/download/reportcard\\_2006/SF\\_bike\\_report\\_card\\_2006.pdf](http://www.sfbike.org/download/reportcard_2006/SF_bike_report_card_2006.pdf)





## Maintenance Hotlines

**Purpose:** Allow road users to report safety problems related to walking and bicycling facilities and request facilities

**Audience:** Goldsboro residents who walk and bicycle

**Partners:** City of Goldsboro Public Works Department; Bicycle and Pedestrian Advisory Committee

The City of Goldsboro can work together with residents to identify walking and bicycling safety issues by creating online forms and/or hotlines that residents can use to request maintenance or enhancements. The online form could be housed on the city's One-Stop Bicycle and Pedestrian Website (see page 7-11). A maintenance hotline benefits the public by helping them route their concerns to the correct party. It also benefits the city by making sure they hear about potential safety and liability issues early so they can take action. Many jurisdictions also find that this approach is beneficial because their scheduled maintenance and complaint-based inspection approach cannot identify every legitimate issue, so hotlines and web forms can essentially distribute the job of inspecting facilities to all residents.

The highest priority should be creating a mechanism for residents to report bicycling and walking safety issues such as cracked pavement, blocked drains, malfunctioning crossing signals, encroaching vegetation, and debris in bike lanes or along sidewalks or trails. Residents may also file complaints about property owners who repeatedly fail to clear vegetation or other debris from sidewalks. If desired, additional input may be invited such as allowing residents to request bicycling and walking maps by mail, allowing residents to request parking enforcement that impacts walking and bicycling (e.g., parked cars blocking ADA ramps or bike lanes), and/or allowing residents to request traffic safety enforcement.

Sample program:

- Durham "Report a Problem" web page: [http://www.bikewalkdurham.org/BPAC\\_report.html](http://www.bikewalkdurham.org/BPAC_report.html)


**Durham Bicycle and Pedestrian Advisory Commission (BPAC)**  
BPAC meets at 7:00pm, the third Tuesday of each month, in the Durham City Hall committee room. The public is always invited.

**bike walk durham.org**

**Report a Problem**  
In Durham, to report a problem with a sidewalk, bike path or other facility:

1. For emergencies – call 911
2. Non-emergency police issues (e.g., vehicles parked in bike lane or on sidewalk), call 560-4600
3. For most issues (potholes, sidewalk repairs, signal problems, street sweeping, etc.): Call [Durham One Call](#) (560-1200)
4. [Street Light Problems](#)
5. [Comments on Durham Bike Map](#)
6. [Request a Bike Rack on Public Property](#)
7. [Zoning Complaint Form](#) (to report a blocked / inaccessible bike rack or sidewalk on private property, etc.)

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# Chapter 8: Implementation

## Chapter Contents:

*Overview*

*Action Steps for  
Implementation*

*Organizational Framework*

*Infrastructure Action Steps*

*Evaluation*

*Maintenance*

## OVERVIEW

This chapter defines a structure for managing the implementation of the Goldsboro Bicycle, Pedestrian, and Greenway Plan. Implementing the recommendations of this plan will require leadership and dedication to bikeway, walkway, and trail development on the part of a variety of agencies. 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 partners who have led this planning effort, City of Goldsboro and Goldsboro MPO, need not accomplish the recommendations of this Plan by acting alone; success will be realized through collaboration with state and federal agencies, the private sector, and other non-profit organizations.

Given the present day economic challenges faced by local governments (as well as their state, federal, and private sector partners), it is difficult to know what financial resources will be available to implement this plan. However, there are still important actions to take in advance of major investments, including key organizational steps and the development of strategic lower-cost bikeway and walkway projects. Following through on the action steps described in this chapter will allow the key stakeholders to be prepared for community-wide network development over time while taking advantage of strategic opportunities, both now and as new, unexpected opportunities arise.

## ACTION STEPS FOR IMPLEMENTATION

The following is a recommended organizational framework for managing implementation of the bicycle, pedestrian, and greenway plan. The structure is based on input from the project Steering Committee, the public, targeted stakeholder interviews, and evidence of successful implementation strategies from around the southeast and the country. Suggested roles for the core types of stakeholders involved in implementation are described below. Actual roles may vary depending on how this Plan is implemented over time and the ongoing level of interest and involvement by specific stakeholders.

### **Form a Bicycle, Pedestrian, and Greenways Advisory Committee**

Leadership from individuals representing key stakeholders is essential to move this Plan from concept to reality. These individuals will help advocate for the Plan, and in their professional and personal capacity, they will seek out opportunities to utilize synergies with other projects, individuals, and organizations to keep this plan a priority in the ever-present competition for resources.



Bicycle, Pedestrian, & Greenways Advisory Committee (BPGAC) members should be chosen based on representation of key partner groups and community leaders who value biking, walking, and greenway facilities. Members should expect to contribute time, expertise, and resources towards accomplishing the tasks that lie ahead. Board members or key staff of partner non-profits, members of this project's Steering Committee, and representatives of large landowners may be likely candidates to serve on the BPGAC. The BPGAC should be a forum for leaders to convene periodically to discuss progress, share resources and tools, and otherwise coordinate planning and development activities for the recommended network.

### **Advance Programmatic and Communication Efforts**

A subgroup of the BPGAC should focus on the programmatic and communications elements of this Plan's implementation. This involves celebrating successes in new construction and otherwise raising awareness of the bicycle, pedestrian, and greenway network and its benefits. A key first task of this group is to work with local partners to implement the recommendations found in Chapter 7. These recommendations focus on educational, encouragement, and enforcement strategies for increasing awareness of the network and its benefits, and increasing overall usage.

Within the first 2-3 years of implementation, the City of Goldsboro should apply for Bike and/or Walk-Friendly Community designation. This program element are award programs that recognize municipalities that actively support bicycling and walking activities and safety. Becoming designated as a Bicycle- and Walk-Friendly Community signals to current residents, potential residents, and visitors that the town is a safe and welcoming place for individuals and families to live and recreate. The development and implementation of this plan is an essential first step toward becoming a Walk- and Bicycle Friendly Community.

### **Build Bicycle, Pedestrian, and Greenway Projects**

The City of Goldsboro, the MPO, and its partners should move forward with the design and construction of priority projects. This will require identifying funding, designing, constructing, and maintaining bicycle and pedestrian facilities. The "Infrastructure Action Steps" section later in this chapter provides detailed steps to address this important piece.

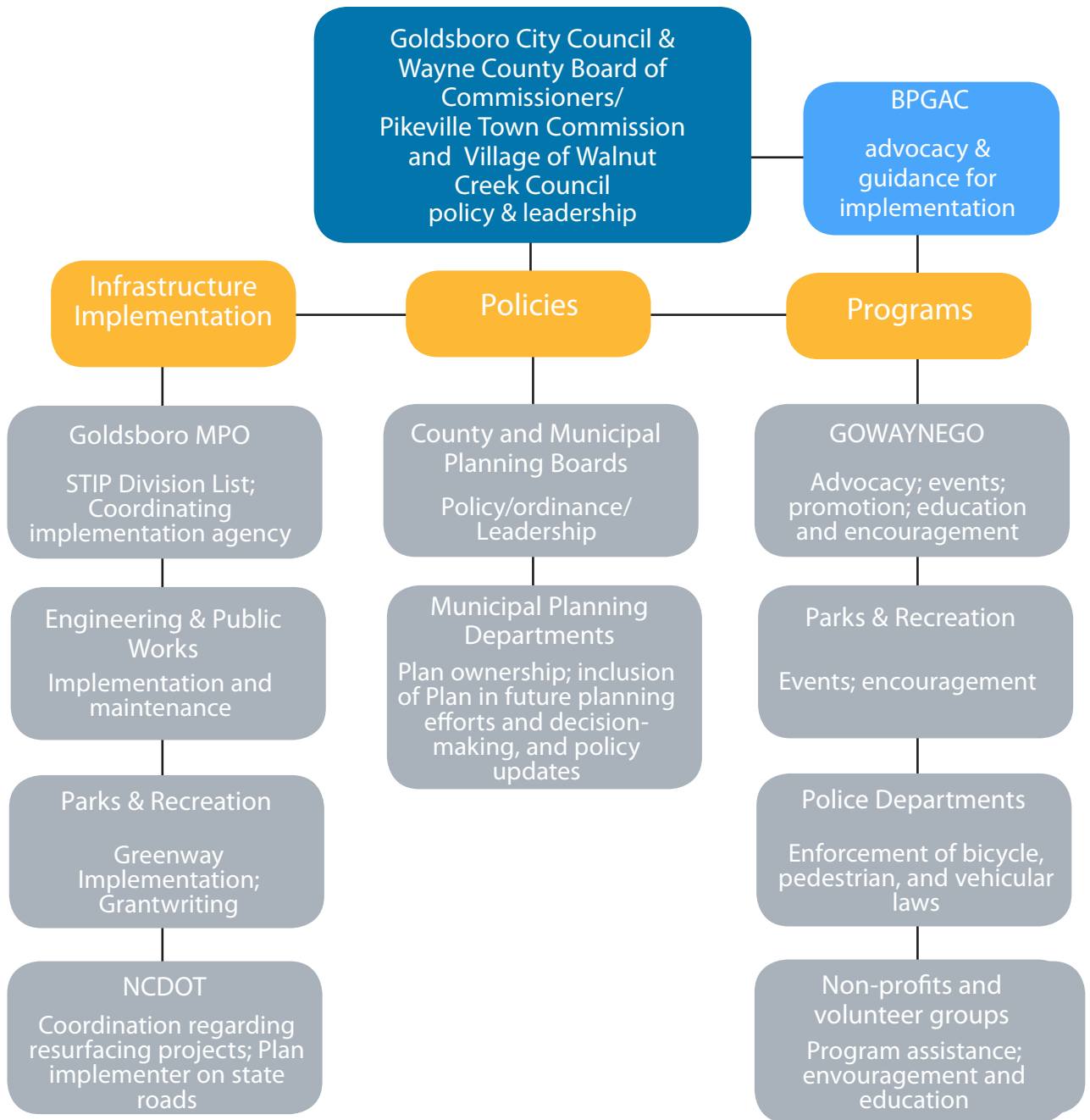
### **Consider Bicycle/Pedestrian/Trails Coordinator Position**

Given staff capacity issues at the City of Goldsboro and Goldsboro MPO, it is recommended that a bicycle/pedestrian/trails coordinator position be created. This position would support both the Goldsboro MPO and the City of Goldsboro Parks and Recreation Department in order to adequately address both transportation and recreation topics. This Coordinator position would be responsible for implementing this Plan and playing a leadership role with the BPGAC. The City of Durham/Durham MPO, City of Raleigh, City of Charlotte, City of Greensboro/Greensboro MPO, City of Winston-Salem/Winston-Salem MPO, and City of Greenville/Greenville MPO all have designated positions to focus on multi-modal transportation issues.



### Establish Stakeholder Roles

The organizational framework described in this section is presented visually below. The BPGAC, already discussed in this chapter, plays a leading role in this process with the City of Goldsboro and Goldsboro MPO, serving the function of staff support. Other stakeholders, such as Wayne County, Town of Pikeville, Village of Walnut Creek, GOWAYNEGO, and nonprofit organizations, are identified as partners.





## ORGANIZATIONAL FRAMEWORK

### Goldsboro MPO

One of 18 North Carolina MPOs, the Goldsboro MPO is responsible for leading regional transportation initiatives, bringing together representatives from Wayne County, City of Goldsboro, Town of Pikeville, and Village of Walnut Creek.

Role related to this Plan include:

- Serve as lead agency for implementation of on-road bicycle and pedestrian projects, working closely with NCDOT and its municipalities.
- Co-manage the Bicycle, Pedestrian, and Greenways Coordinator Position. The Coordinator would report to the City and the TCC/TAC boards of the MPO. The Coordinator would also manage and facilitate meetings for the BPGAC and play lead role in MPO roles described herein.
- Remain up-to-date on opportunities for facility development that coincide with other capital or maintenance projects, such as road resurfacing, new commercial or residential developments, new road construction, etc.
- Manage contracts for facility development on an as needed basis.
- Work with BPGAC to manage public relations for bicycling and walking.
- Work with network development partners to ensure a coordinated approach to operations and maintenance. Operations and maintenance tasks need to be supported by adequate funding and staff levels.
- Work actively to ensure bicycle and pedestrian projects are funded through the State prioritization process (STIP).

### City of Goldsboro Parks and Recreation

The mission of the Goldsboro Parks and Recreation Department is to provide a variety of recreation and leisure activities for a diverse population. The Department maintains a system of parks, indoor facilities and open spaces for the enjoyment, safety and well being of all citizens.

Roles related to this Plan include:

- Serve as lead agency for implementation of off-road greenway projects, working closely with NCDOT and its municipalities.
- Co-manage the Bicycle, Pedestrian, and Greenways Coordinator Position. The Coordinator would assist with grant applications and work with other City departments to ensure successful construction and maintenance of greenways.
- Coordinate among county and municipal planners to ensure greenway network connectivity between jurisdiction borders.
- Ensure that the greenway trail design guidelines of this plan are used in the design of greenway facilities and aim for uniform standards in greenway





facilities, such as with signage and wayfinding.

- Lead greenway programmatic activities to encourage use.
- Conduct evaluation activities along greenways such as recording trail user counts.

### **City of Goldsboro and City Departments**

The City of Goldsboro refers to leadership and other departments within the City.

Roles related to this Plan include:

- Adopt a set-aside budget for expenditures of funding that supports the bicycle, pedestrian, and greenways program. Local City staff should be prepared to provide supporting materials for the budget process, including any bicycling, walking, and trail-related reports, user estimates, and benchmarking statistics.
- Consider a bond referendum to fund projects from this Plan.
- Engineering Department – Work with the Goldsboro MPO and NCDOT to implement the infrastructure recommendations of this Plan, especially as they occur with new construction and roadway reconstruction/resurfacing efforts.
- Public Works Department – Work with the Goldsboro MPO and NCDOT to implement the infrastructure recommendations of this Plan using the Design Guidelines from this Plan. Ensure sidewalks are maintained.
- Planning Department – Work with the Goldsboro MPO and Parks and Recreation Department to implement the policy recommendations of this Plan.
- Police Department – Work with the Goldsboro MPO and Parks and Recreation Department to lead in programmatic implementation (especially enforcement). Participate actively in educating the community about lawful and appropriate bicycle, pedestrian, and motorist behavior.

### **Bicycle, Pedestrian, and Greenway Advisory Committee (BPGAC)**

As mentioned previously, this committee will play a major role in championing the implementation of this Plan.

Roles related to this Plan include:

- Advocate for implementing the bicycle, pedestrian, and greenways program.
- Facilitate cooperation among government agencies and nonprofit partners for network development.
- Define and recommend sources of funding for network development.



- Meet quarterly with an agenda that includes: A) Implementation progress updates from each of the member organizations, B) Confirmation of specific tasks to be completed by specific members before the next meeting, and C) Discussion of new opportunities and constraints and identification of ways to address them.
- Pursue funding including the solicitation of major donors and corporate sponsors.
- Build partnerships with land owners for greenway trail development, with special attention given to owners of large or contiguous tracts of land.
- Keep local leaders informed about bicycle, pedestrian, and greenway-related issues and developments through direct dialogue and personal e-mail; promote facility development among local leaders through creative approaches, such as organized tours of existing trails or proposed trail corridors.
- Rally public support for key public hearings and coordinate mass e-mail campaigns for special votes.
- Continue communication and build positive relationships with organizations such as utility companies, public and private schools, and others that can assist with issues related to potential bicycle and pedestrian facility right of way and trail development.

### **Non-Profits**

Non-profit organizations, such as GOWAYNEGO and the Downtown Goldsboro Development Corporation (DGDC), can serve a variety of purposes and are already leading many programmatic-related activities across the Goldsboro community.

Roles related to this Plan include:

- Lead education, encouragement, and enforcement programmatic efforts.
- Participate in the activities of the BPGAC and, as needed, provide representation on the committee.
- Maintain open dialogue with the BPGAC and the City of Goldsboro to promote resource- and information-sharing and reduce duplications of effort.
- Advocate, promote, and encourage the development of the bicycle, pedestrian, and greenway network throughout the community.
- Educate citizens as to the benefits of biking and walking and trails and greenways.
- Play an active role in raising funds for network development in concert with the BPGAC.



- When possible, fund programs or bicycling/walking amenities such as bicycle racks.
- Help to organize volunteers to assist with implementation and management.
- Sponsor or co-sponsor biking and walking and greenway events.

### **Wayne County, Village of Walnut Creek, and Town of Pikeville**

Wayne County and local municipality governments play key roles in facilitating implementation of this Plan.

Roles related to this Plan include:

- Participate in the activities of the BPGAC and, as needed, provide representation on the committee.
- Maintain open dialogue with the BPGAC and the City of Goldsboro to promote resource- and information-sharing and reduce duplications of effort.
- Contribute staff time and expertise to the network development process.
- Work with Goldsboro MPO to push forward bicycle and pedestrian projects for state-level funding (through STIP process).
- Whenever possible, accept ownership of greenway trails developed by other partners and, at minimum, accept responsibility for facility maintenance and operations.
- Where appropriate, assist in securing right of way for implementation.
- Manage on-street bikeway and walkway construction projects and, whenever possible, manage off-street greenway construction.
- Coordinate among county and municipal planners to ensure network connectivity between jurisdiction borders.
- Ensure that the design guidelines of this plan are used in the design of network facilities and aim for uniform standards in greenway trail facilities, such as with signage and wayfinding.
- Update and enforce bicycle and pedestrian-friendly ordinances and regulations and ensure that transportation-land use integration and the health of its citizens are considered with development decisions.
- Adopt a budget for expenditures of funding that supports the bicycle, pedestrian, and greenways program.



## NCDOT

NCDOT's mission is to "connect people and places safely and efficiently, with accountability and environmental sensitivity to enhance the economy, health and well-being of North Carolina."

Roles related to this Plan include:

- NCDOT Division Four should be prepared to provide guidance and technical support for implementing on-street bikeway and walkway facilities, as well as related greenway trail facilities such as shared-use paths in roadway corridors, trail-roadway crossings, and improvements that increase safety for bicyclists and pedestrians crossing bridges on state roadways.
- Continue working with City of Goldsboro and Goldsboro MPO on coordination of upcoming and future roadway projects that involve bikeway and walkway recommendations. Communication with City of Goldsboro, Wayne County, Town of Pikeville, and Village of Walnut Creek, and BPGAC regarding scheduled road maintenance and road construction projects is crucial to network development (Example success during this planning effort was installation of buffered bike lanes on Elm Street during scheduled resurfacing).

## INFRASTRUCTURE ACTION STEPS

While establishing the administrative structure described, stakeholders should move forward with infrastructure development by proceeding with the design and construction of priority projects. They should also work to identify funding for longer-term, higher-cost projects.

### Estimate Costs

Cost estimates for the greenway priority projects of the Plan are provided in Chapter 3. Costs for higher priority on-road bicycle and pedestrian projects are provided in Appendix I. Costs for developing additional network segments can be estimated using unit-level cost estimates listed below. Table 8-1 offers a summary of the fully burdened costs of the facility types recommended in this Plan. The paved greenway estimates assume a 10 foot wide asphalt path. All costs are total installed costs that include: planning and engineering, environmental, and contingency. Land acquisition costs are not included.

### Identify Funding

Achieving the vision that is defined within this Plan requires, among other things, a stable and recurring source of funding. Communities across the country that have successfully engaged in bicycle, pedestrian, and trail development programs have relied on multiple funding sources to achieve their goals. No single source of funding will meet the recommendations identified in this plan. Instead, stakeholders will need to work cooperatively a wide range of private sector, municipality, state, and federal partners to generate funds sufficient to implement the program.

**Table 8.1 Cost Estimates (Per Unit)**

Facility Type	Per Unit Cost
Paved Greenway	\$600,000-\$1,000,000
Paved Shoulder	\$400,000-\$600,000
Natural Greenway	\$100,000-\$275,000
Bicycle Route/ Bicycle Boulevard	\$10,000-\$114,000
Bicycle Lane	\$16,000-\$60,000
Shared-Lane Marking	\$8,000-\$14,000
Sidewalk with curb and gutter (one-side)	\$844,800 (\$160/LF)

A stable and recurring source of revenue is needed to generate funding that can then be used to leverage grant dollars from state, federal, and private sources. The ability of the local agencies to generate a source of funding for trails depends on a variety of factors, such as taxing capacity, budgetary resources, voter preferences, and political will. It is very important that these local agencies explore the ability to establish a stable and recurring source of revenue for trails.

Donations from individuals or companies are another potential source of local funding. Recommended funding sources are included in Appendix D: Funding Sources.

### Leverage Opportunities

In the course of seeking funding opportunities, consider partnerships with developers and non-traditional trail development partners. Implementing a community-wide bicycle, pedestrian, and trails system is an iterative process often well served by opportunistic chances. By involving the landowner or developer early in the trail development process, they have the opportunity to share in the discussions of the specific trail alignment and trail features, ultimately creating a transportation and recreation corridor that directly contributes to the economic potential of the developed property.

Proposed trail segments that connect to other regional trails also present opportunities to leverage investments. As the Mountains-to-Sea Trail moves forward with trail development, there is an opportunity to connect into this statewide trail system -- leveraging funding investments and generating awareness for a potential regional trail network that links each of these corridors to one another.

### Complete Priority Bicycle, Pedestrian, and Greenway Projects

By moving forward quickly on priority projects, the City and its stakeholders will demonstrate their commitment to carrying out the Plan and will better sustain enthusiasm generated during the outreach stages of the planning process. Chapter 3 and Appendix I identify priority bicycle, pedestrian, and trail projects.



## Design, Construct, and Maintain Network Facilities

Once a network segment is selected and, if necessary, land or easements are acquired, facility design typically follows. For this Plan, some facilities, such as bicycle routes or shared-lane markings, will require signage and limited construction activities. Other segments will require varying degrees of clearing and natural surface grading, but still may be able to be implemented without design or construction documents. Preliminary design plans should be reviewed by multiple stakeholders, including emergency service personnel and the local police department, so they can offer suggestions and have their voices heard from the very beginning. There is sometimes a disconnect between the designer and operating staff. Designs that are pleasing to the eye are not always conducive to good and inexpensive maintenance. Therefore, it is imperative that cost saving should be a part of any design, with a thorough review of the plans while they are in a preliminary stage.

Annual operations and maintenance costs vary, depending upon the facility to be maintained, level of use, location, and standard of maintenance. Operations and maintenance budgets should take into account routine and remedial maintenance over the life cycle of the improvements and on-going administrative costs for the operations and maintenance program. A full description of maintenance activities can be found on page 8-14.

On-road bicycle facilities can be implemented in a variety of ways. These are described briefly below:

**Striping** - Some roadways can be simply striped with bicycle lanes because of adequate, wide widths of the roadway's outside lanes. This is an inexpensive implementation method.

**Pavement Marking** - Sharrows, as described in Chapter 4, are simple pavement markings added to the roadway. In these cases, additional pavement width is not needed. Therefore, this is an inexpensive implementation method.

**Roadway Retrofit (Lane Narrowing)** - In some cases, existing roadway travel lanes can be narrowed to allow for a roadway restriped with bicycle lanes. The typical minimum travel lane is 10'. This is still inexpensive but requires removal of old striping. It is ideal to restripe during a scheduled resurfacing.

**Roadway Retrofit (Road Diet)** - In some cases, a reduction in travel lanes can be implemented to include bicycle lanes or cycle tracks. A full traffic analysis is required before implementing a road diet. A typical road diet occurs when converting a four-lane road to a three-lane with bicycle lanes.

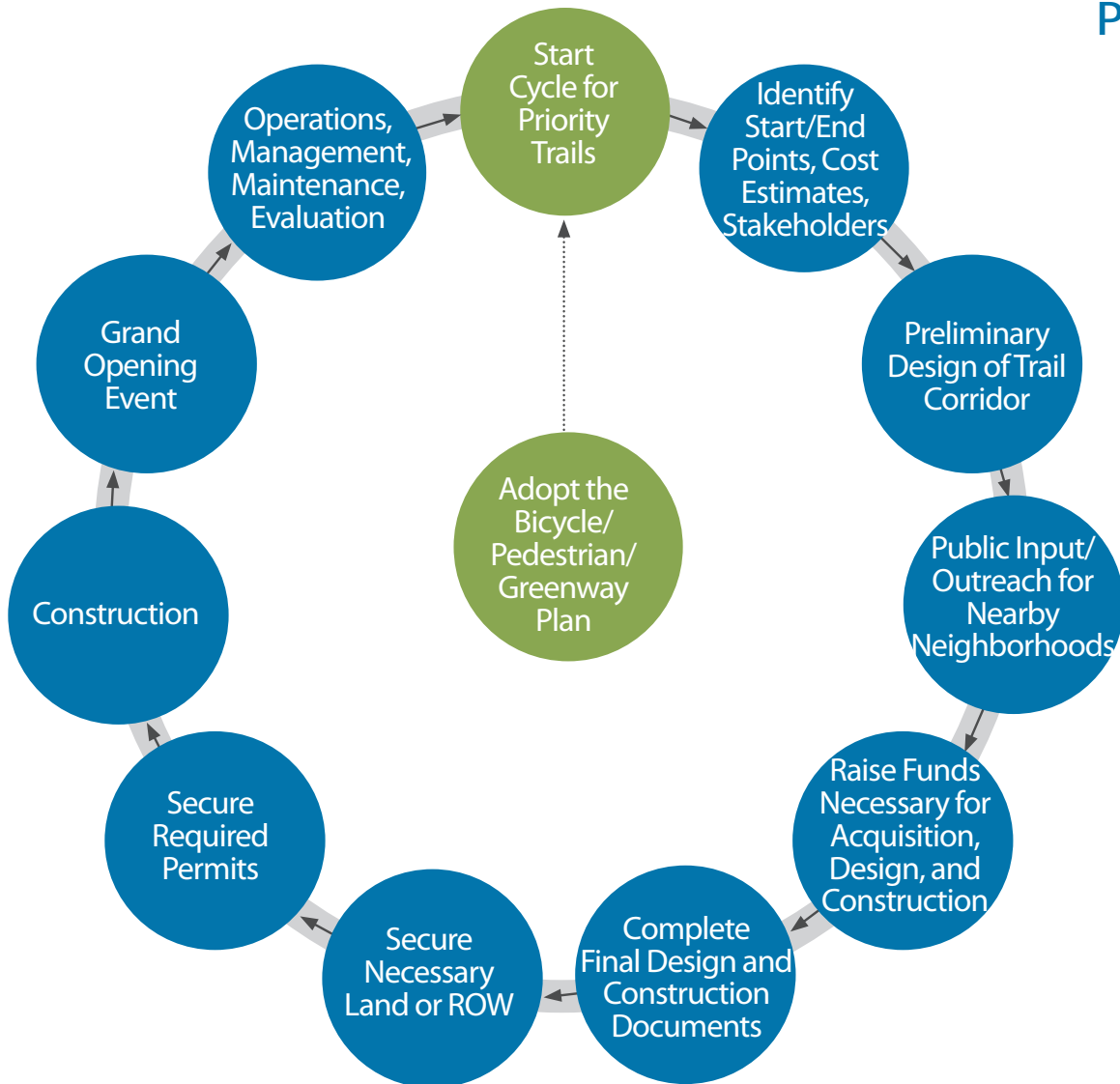
**Roadway Retrofit (Bicycle Boulevard)** - The addition of pavement markings, signage, and traffic calming measures can be added at varying costs on an existing residential roadway.

**New Construction** - When a new roadway is constructed or existing roadway reconstructed, the addition of bicycle lanes, paved shoulders, cycle tracks, or sidepaths may occur.

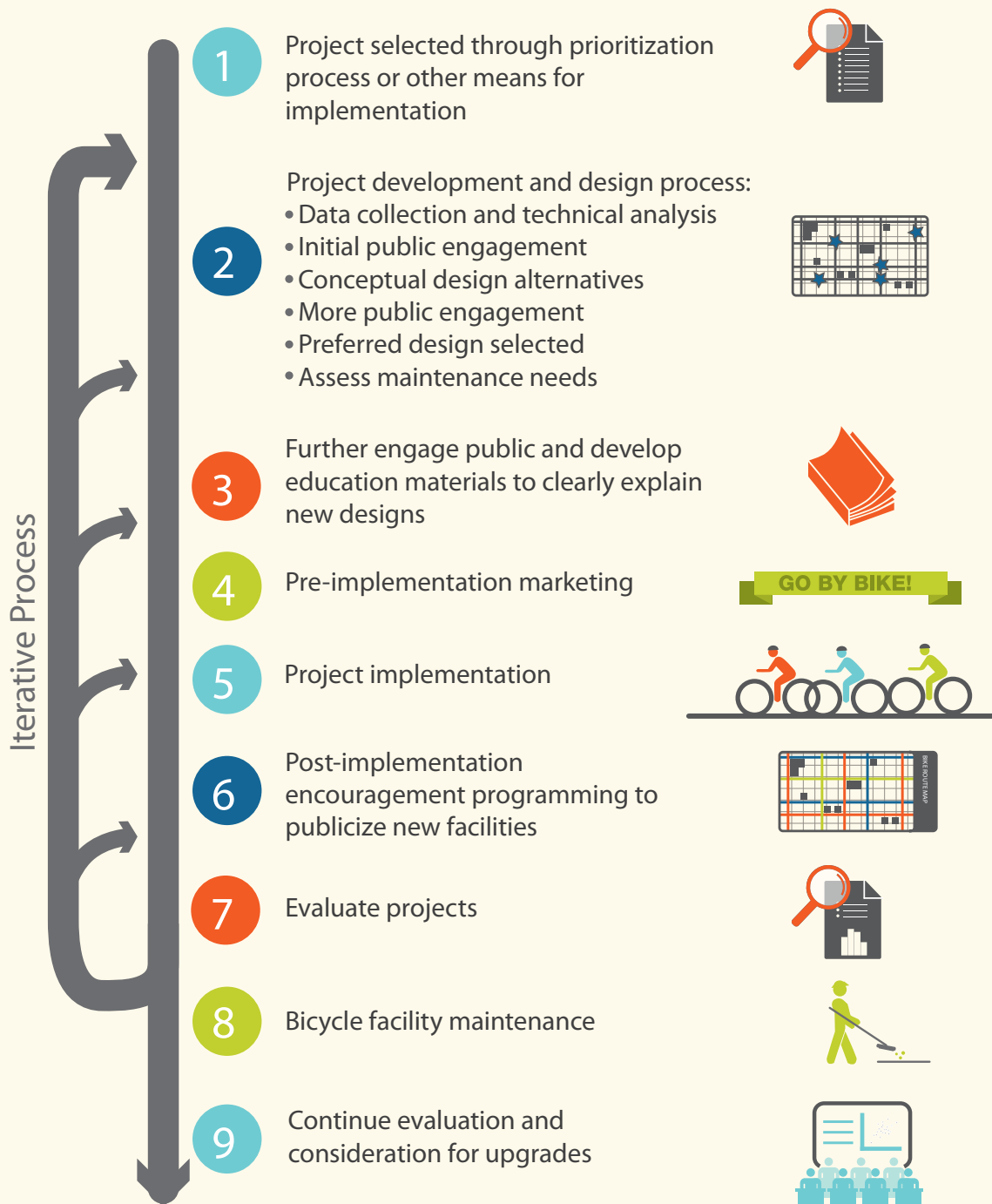
The typical greenway development process is portrayed in a chart on the following page. A suggested on-road bicycle project delivery process is shown on page 8-12.



## TYPICAL GREENWAY DEVELOPMENT PROCESS



# BICYCLE PROJECT DELIVERY PROCESS



The above graphic includes all possible steps in the on-road bicycle facility development process. The process is flexible based upon facility type, implementation method, and desired public involvement.





## EVALUATION (PERFORMANCE MEASURES)

The performance measures in the plan are important for assessing whether the plan is meeting its goals over time. While they are focused on assessing progress over the long-term, data on these measures should be collected on a regular basis to help track interim progress being made. This information will allow for course adjustments to be made to help ensure achievement of plan goals.

The plan performance measures are generated from the goals of the Plan (see Chapter 1). The performance measures for the Plan were selected in part based on the City's and State's ability to collect relevant data, both now and in the future. This data can help inform project selection and design, the development and success of education and encouragement programs, measures to improve safety, and other issues. Data and performance measures outlined in the following table represent the way the City and MPO will track achievement of the Plan's goals over time.

From the beginning, and continuously through the life of the BPGAC, it should brainstorm additional specific benchmarks to track through a monitoring program and honor their completion with public events and media coverage. Monitoring should be supported by programmatic efforts, where possible, such as conducting annual or bi-annual bicyclist, pedestrian, and greenway trail counts or creating an annual Bicycle, Pedestrian, & Greenways Report Card. Benchmarks should be revisited and revised periodically as network development efforts evolve.

**Table 8.2 Performance Measures**

Goal Categories	Performance Measure	Baseline Measurement	Performance Target/ Desired Trend
Safety, Economy, Health, Mobility, Environment	Number of bicycle and pedestrian programs	2014 Number	Increase
Mobility & Safety	Percentage of bicycle and pedestrian network completed	2014 Percentage	Increase
Safety	Bicycle/Pedestrian Collision Rates; Number of serious injuries and fatalities	NCDOT Dept. of Public Safety (2007-2012); City of Goldsboro Police Dept.	Reduce collision rates; Zero fatalities
Economy	Funding set aside for bike/ped improvements	2014 Number	Increase
Health, Economy, Mobility, Safety	Areas lacking bicycle and pedestrian facilities	2014 Number	Zero areas lacking bicycle and pedestrian facilities
Mobility	Commute mode share	2012 Census Data	Increase



## MAINTENANCE

The Goldsboro bicycle and pedestrian network should be viewed and maintained as a public resource. This network will become infrastructure similar to street systems or utility networks, serving the community for generations. The following guiding principles will help ensure the preservation of a first class system:

- Good maintenance begins with sound planning and design.
- Foremost, protect life, property, and the environment.
- Promote and maintain a quality outdoor recreation and transportation experience.
- Maintain quality control and conduct regular inspections.
- Include field crews, police and fire/rescue personnel in both the design review and ongoing management process.
- Maintain an effective, responsive public feedback system, and promote public participation.
- Be a good neighbor to adjacent properties.
- Operate a cost-effective program with sustainable funding sources.

Maintenance schedules and standards help keep trail systems attractive and as safe recreational destinations and transportation facilities, and are critical to the safety and enjoyment of trail users. Managing risk, safety, and security are important components woven into the management and maintenance scheme. Creating an effective administrative structure will foster the successful development and implementation of an efficient system with stable support, leading to a highly connected network of trails and pathways that will become part of everyday life and utility in Goldsboro. The following sections provide detail on how this will be achieved.

### Maintenance Activities

The following are typical duties and activities often performed by management and maintenance staff.

- Vegetation Management: mowing, litter clean-up, manure removal, pruning, trimming, weeding, invasive species management, tree removal, planting
- Drainage Cleaning and Maintenance: flushing, raking, slough and berm removal, cleaning drain dips
- Trailhead, Amenity, and Signage Maintenance: parking, toilet facilities, informational kiosks, picnic tables, benches, maps, trail rules and regulations, traffic control for trail users, mile markers, directional signs, fencing
- Trail Inspection/Patrolling: greet users, encourage proper etiquette, make minor repairs, report vandalism



General annual management and maintenance costs vary depending on the facility to be maintained, level of use, location, and standard of maintenance. Budgets should take into account routine and remedial maintenance over the life cycle of the improvements and on-going administrative costs for the program. The section below provides an overview of approximate costs for basic greenway, bicycle, pedestrian, and equestrian trail management and maintenance services. The estimates include field labor, materials, equipment, and administrative costs.

### **Routine Management and Maintenance Costs**

Routine management and maintenance refers to the day-to-day regimen of litter pick-up, trash and debris removal, weed and dust control, trail sweeping, sign replacement, tree and shrub trimming, and other regularly scheduled activities. It also includes minor repairs and replacements, such as fixing cracks and potholes or repairing a broken hand railing. The following are typical annual costs for different trail types.

#### **Greenway Trails**

Many factors influence greenway trail costs, such as amount of use, maintenance crew-size needed, proximity to urban centers, and number of interfaces with geographical and man-made features. Annual routine maintenance costs range from nominal to as high as \$7,000 per mile. Research conducted by the Rails-to-Trails Conservancy (RTC) indicates costs are often on the lower end for managing and maintaining rail trails at approximately \$1,500.

#### **On-Road Bicycle Facilities**

Maintenance of the on-roadway bicycle facility system is handled by the local Public Works Department and NCDOT. Some provision should be made however for up to fifteen regular inspections per year, to include minor repair or replacement of signs, vegetation grooming and other items that an inspector could remedy in the field. Additional attention should be paid to any potholes or other pavement damage. Additional sweeping may be required where bicycle lanes and wider shoulders are provided along roads. Staff costs can be reduced by training local volunteers or bicycle advocates to conduct inspections and providing a means for citizens to report bicycle facilities needing repairs.

#### **Pedestrian Facilities (On Road Sidewalk/Sidepath)**

Maintaining pedestrian facilities is an important part of maintaining the complete right-of-way for all users. When cracks, surface defects, tree root damage, and other problems are identified, they should be repaired to ensure sidewalks remain accessible to all pedestrians. Repairs are generally completed on an as-needed basis rather than through regularly scheduled evaluation of the sidewalk condition.

### **Remedial Management and Maintenance Costs**

Remedial Management and Maintenance refers to correcting significant defects in the network, as well as repairing, replacing, or restoring major components



that have been destroyed, damaged, or significantly deteriorated from normal usage and old age. Some items (“minor repairs”) may occur on a five- to ten-year cycle, such as repainting, seal coating asphalt pavement, or replacing signage. Major reconstruction items will occur over a longer period or after an event such as a flood. Examples of major reconstruction include stabilization of a severely eroded hillside, repaving a trail surface or a roadway that is part of the bicycle network, or replacing a footbridge. Remedial maintenance should be part of a long-term capital improvement plan.

The following estimates provide a general idea of potential remedial management and maintenance obligations:

#### Greenway Trails

A 7- to 15-year life is assumed for asphalt and crushed fine trails after which an overlay may be required. A complete resurfacing after 20 to 25 years is anticipated. Concrete is assumed to last twice as long. Bridges, tunnels, retaining walls and other heavy infrastructure are assumed to have a 100-year life or longer.

#### On-road Bicycle Facilities

Remedial work for on-road bicycle facilities includes asphalt repaving (five feet on either side of the street), curb and gutter, sewer-grate, and manhole repair. Pothole and crack repair are considered routine. Pavement markings, such as bicycle lane lines, bicycle stencil markings, and fog lines should be re-installed when other roadway pavement markings are improved. Since this work is done as part of the current street maintenance regime, the cost is assumed to be covered.

#### Pedestrian Facilities

Sidewalks should be constructed with concrete, which requires replacement in 50 to 75 years. A rough cost estimate for on-linear-mile of concrete sidewalk could be provided by NCDOT.

#### Setting Trail Priorities

A detailed and systematic management and maintenance system will help set priorities. Sound overall advice on setting trail maintenance priorities is provided in the U.S. Forest Service, Trail Construction and Maintenance Notebook, 2004 Edition (this edition is more specific on this topic than the updated 2007 edition. Though directed at backcountry trails, it is valid for all trail settings):

“High-quality and timely maintenance will greatly extend the useful life of a trail. The trail crew’s task is to direct water and debris off the tread, and keep the users on it. The best trail maintainers are those with “trail eye,” the ability to anticipate physical and social threats to trail integrity and to head off problems. Even though you know the proper maintenance specifications, sometimes there is too much work for the time you have to spend. How do you decide what to



do? Since it is a given that there will always be more work to do than people to do it, it's important to:

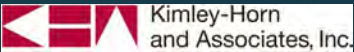
- Monitor your trail conditions closely.
- Decide what can be accomplished as basic maintenance.
- Determine what can be deferred.
- Identify what area will need major work.
- The first priority for trail work is to correct truly unsafe situations. This could mean repairing impassable washouts along a cliff, or removing blow down from a steep section of a pack stock trail.
- The second priority is to correct things causing significant trail damage--erosion, sedimentation, and off-site trampling, for instance.
- The third priority is to restore the trail to the planned design standard. This means that the ease of finding and traveling the trail matches the design specifications for the recreational setting and target user. Actions range from simply adding "reassurance markers" to full-blown reconstruction of eroded tread or failed structures.

Whatever the priority, doing maintenance when the need is first noticed will help prevent more severe and costly damage later."



GOLDSBORO MPO  
BICYCLE, PEDESTRIAN and GREENWAY PLAN

*Prepared for the Goldsboro MPO  
Prepared by Alta/Greenways, with assistance from Sage Design and Kimley Horn & Associates*





# Appendix A: Design Guidelines

## Appendix Contents:

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## OVERVIEW

The sections that follow serve as an inventory of pedestrian and bicycle design treatments and provide guidelines for their development. These treatments and design guidelines are important because they represent the tools for creating a walk- and bicycle-friendly, 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) is the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings.
- » American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities*, updated in June 2012 provides guidance on dimensions, use, and layout of specific bicycle facilities.
- » The National Association of City Transportation Officials' (NACTO) 2012 *Urban Bikeway Design Guide* is the newest publication of nationally recognized bikeway design standards, and offers guidance on the current state of the practice designs. All of the NACTO Urban Bikeway Design Guide treatments are in use internationally and in many cities around the US. The FHWA endorsed the NACTO Guide in 2013.
- » Meeting the requirements of the Americans with Disabilities Act (ADA) is an important part of any bicycle 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 *Complete Streets Planning and Design Guidelines*, released in 2012, provide NCDOT and municipality staff with a guide to planning and designing streets that meet the needs of all users, including pedestrians, bicyclists, and motor vehicles. The guidelines include detailed information on the processes, street types, and recommendations for creating complete streets in North Carolina.

Should these standards be revised in the future and result in discrepancies with this appendix, the 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.



## DESIGN NEEDS OF PEDESTRIANS

### Types of Pedestrians

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

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

**Table A-1: Pedestrian Characteristics by Age**

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

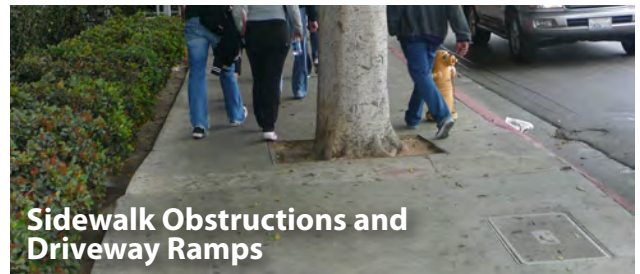
**Continuity:** Walking routes should be obvious and should not require pedestrians to travel out of their way unnecessarily.

**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.



## 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/ Enhancement 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

↑  
Areas that have significant accumulations of snow during the winter may prefer a wider furnishing zone for snow storage.

↑  
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.

#### Additional References and Guidelines

USDOJ. (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.

#### 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.

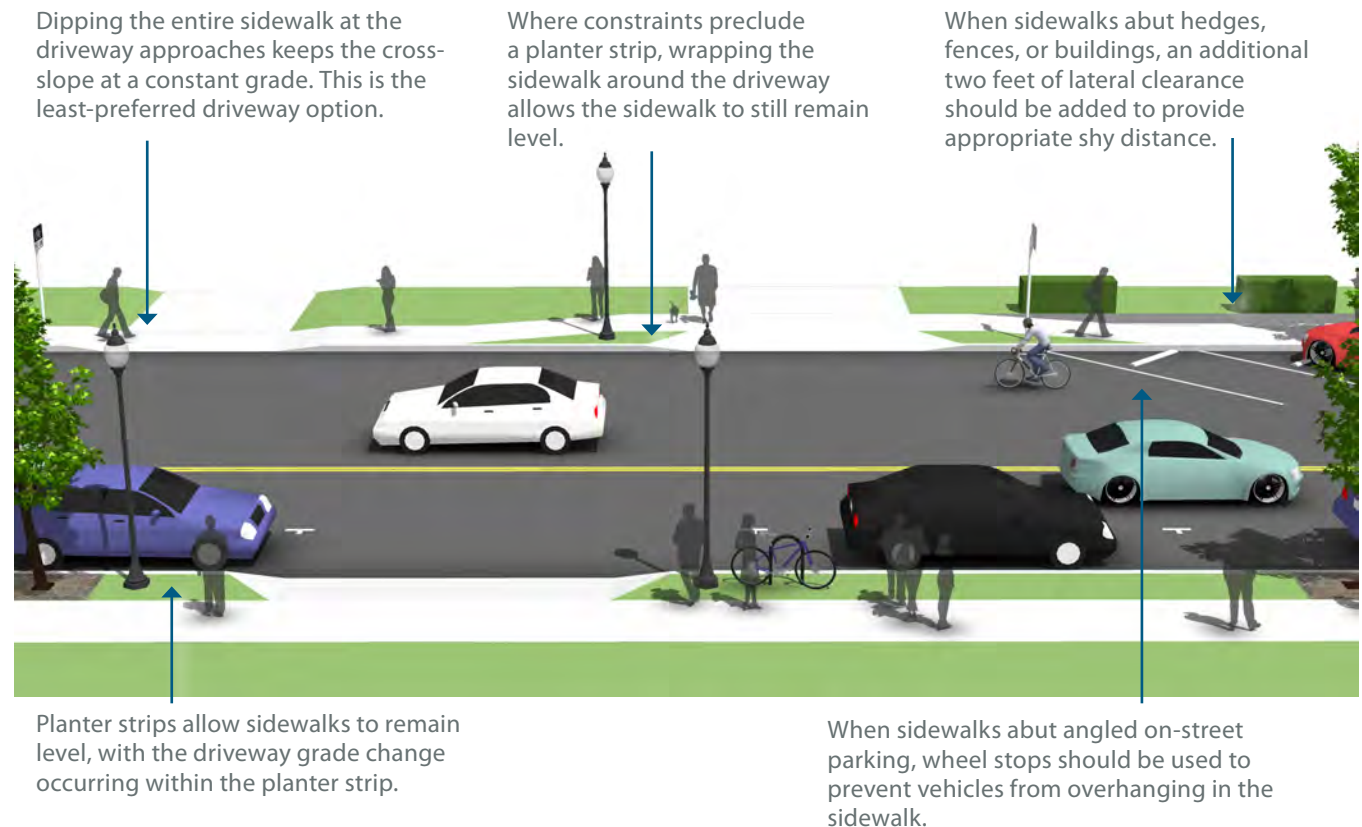
## Sidewalk Obstructions and Driveway Ramps

### 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.

#### Additional References and Guidelines

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

#### Materials and Maintenance

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

## Pedestrian Amenities

### Description

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

### Street Trees

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

### Street Furniture

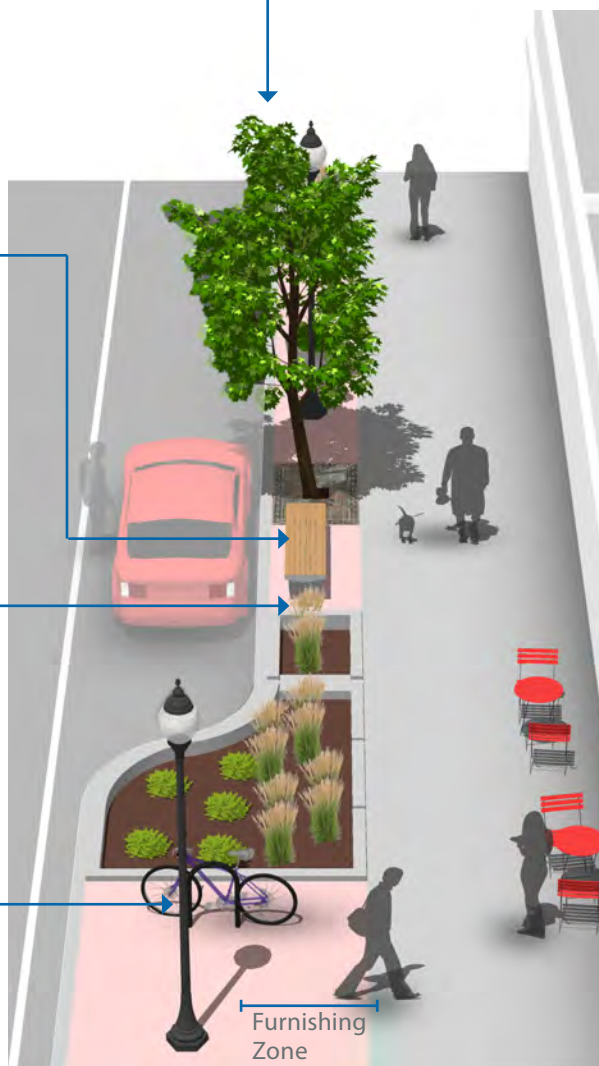
Providing benches at key rest areas and viewpoints encourages people of all ages to use the walkways by ensuring that they have a place to rest along the way. Benches should be 20" tall to accommodate elderly pedestrians comfortably. Benches can be simple (e.g., wood slats) or more ornate (e.g., stone,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

### Green Features

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

### Lighting

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



### Additional References and Guidelines

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

### Materials and Maintenance

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

## PEDESTRIANS AT INTERSECTIONS

Attributes of pedestrian-friendly intersection design include:

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

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

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

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

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

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

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



## Marked Crosswalks

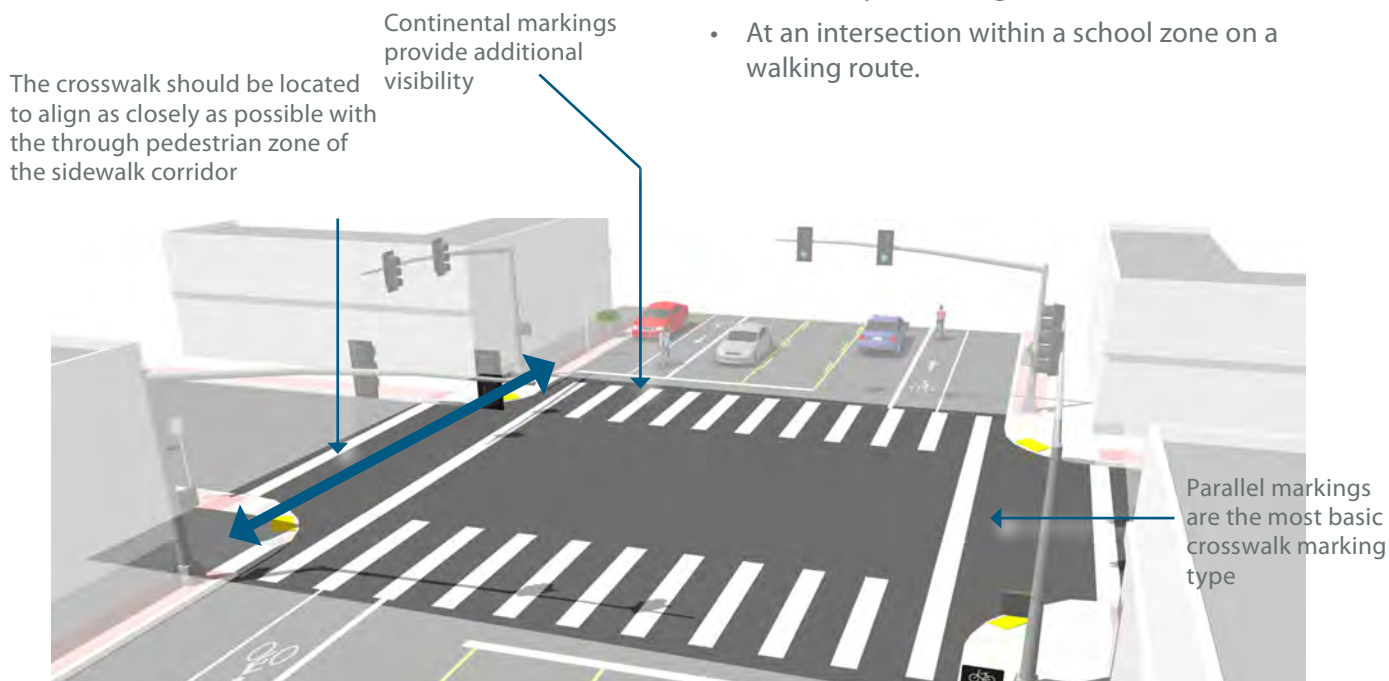
### Description

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

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

### Guidance

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



### Discussion

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

#### Additional References and Guidelines

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

#### Materials and Maintenance

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



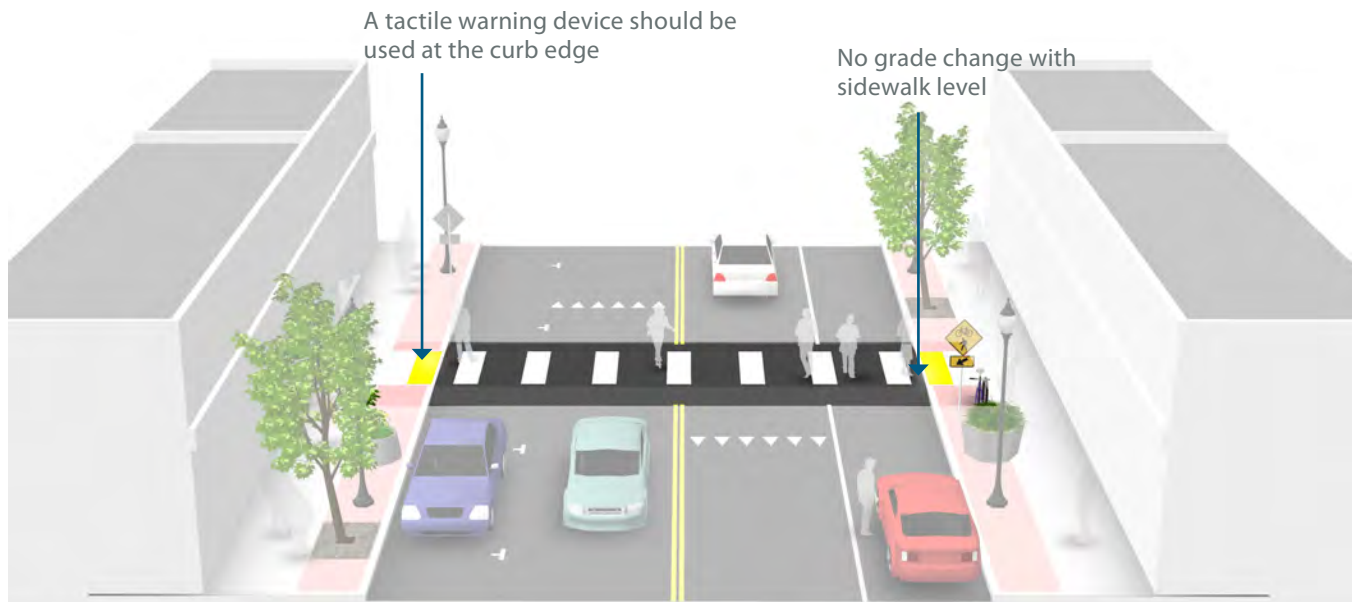
## Raised Crosswalks

### Description

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

### Guidance

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



### Discussion

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

#### Additional References and Guidelines

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

#### Materials and Maintenance

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

## Median Refuge Islands

### Description

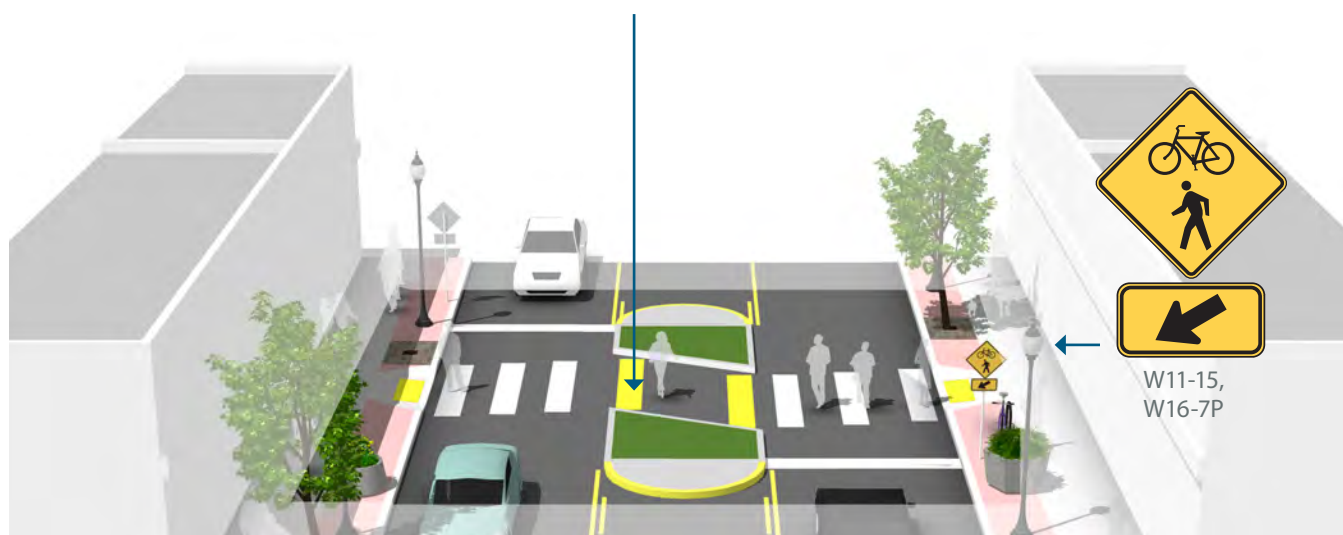
Median refuge islands are located at the mid-point of a marked crossing and help improve pedestrian safety by allowing pedestrians to cross one direction of traffic at a time. Refuge islands minimize pedestrian exposure by shortening crossing distance and increasing the number of available gaps for crossing.

### Guidance

- Can be applied on any roadway with a left turn center lane or median that is at least 6' wide.
- Appropriate at signalized or unsignalized crosswalks

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

- The refuge island must be accessible, preferably with an at-grade passage through the island rather than ramps and landings.
- The island should be at least 6' wide between travel lanes (to accommodate bikes with trailers and wheelchair users) and at least 20' long.
- On streets with speeds higher than 25 mph there should also be double centerline marking, reflectors, and "KEEP RIGHT" signage.



### Discussion

If a refuge island is landscaped, the landscaping should not compromise the visibility of pedestrians crossing in the crosswalk. Shrubs and ground plantings should be no higher than 1 ft 6 in. On multi-lane roadways, consider configuration with **active warning beacons** for improved yielding compliance.

#### Additional References and Guidelines

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

#### Materials and Maintenance

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



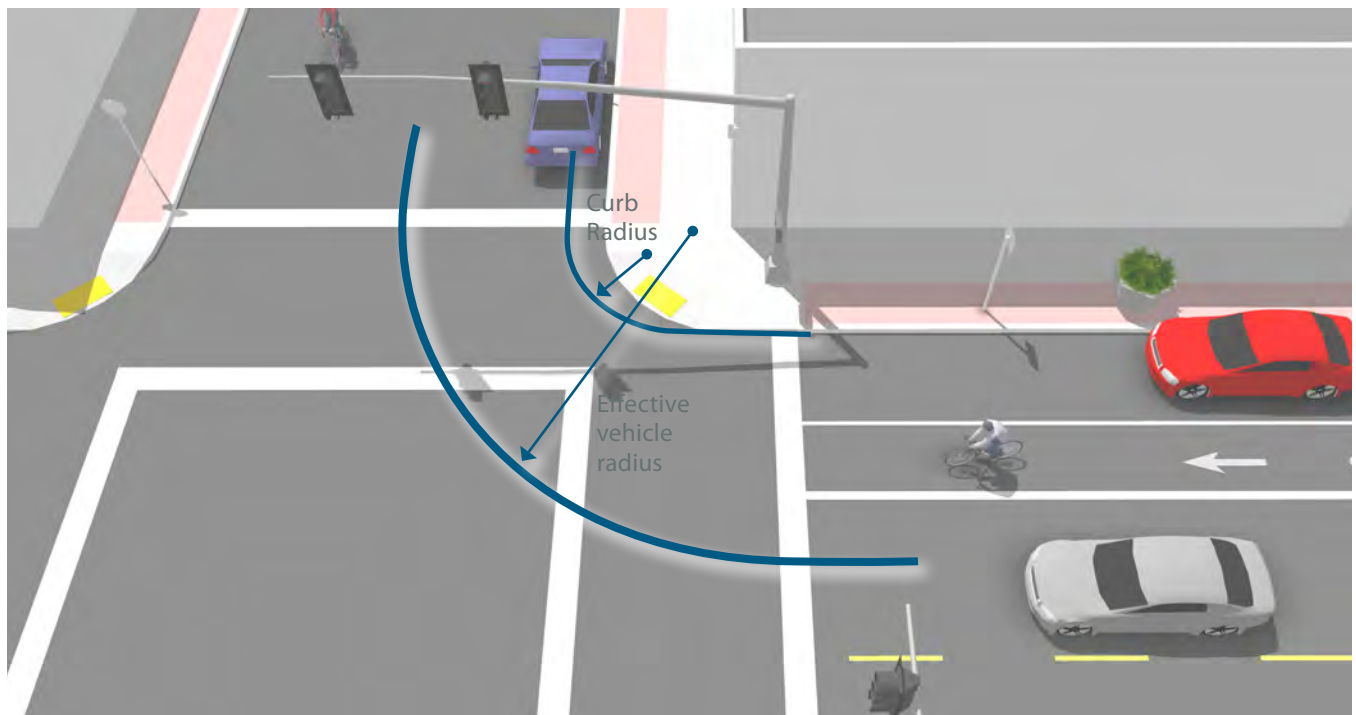
## Minimizing Curb Radii

### Description

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

### Guidance

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



### Discussion

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

#### Additional References and Guidelines

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

#### Materials and Maintenance

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

## Curb Extensions

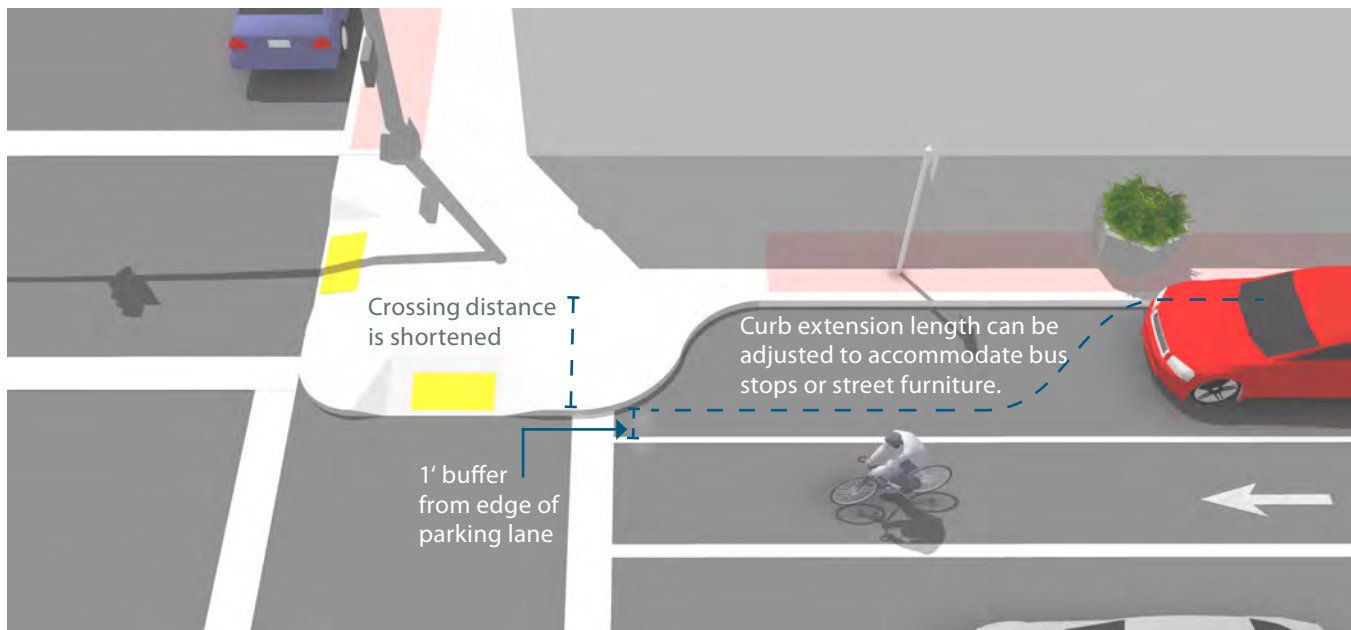
### Description

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

### Guidance

- In most cases, the curb extensions should be designed to transition between the extended curb and the running curb in the shortest practicable distance.

- For purposes of efficient street sweeping, the minimum radius for the reverse curves of the transition is 10 ft and the two radii should be balanced to be nearly equal.
- Curb extensions should terminate one foot short of the parking lane to maximize bicyclist safety.



### Discussion

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

#### Additional References and Guidelines

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

#### Materials and Maintenance

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



## ADA Compliant Curb Ramps

### Description

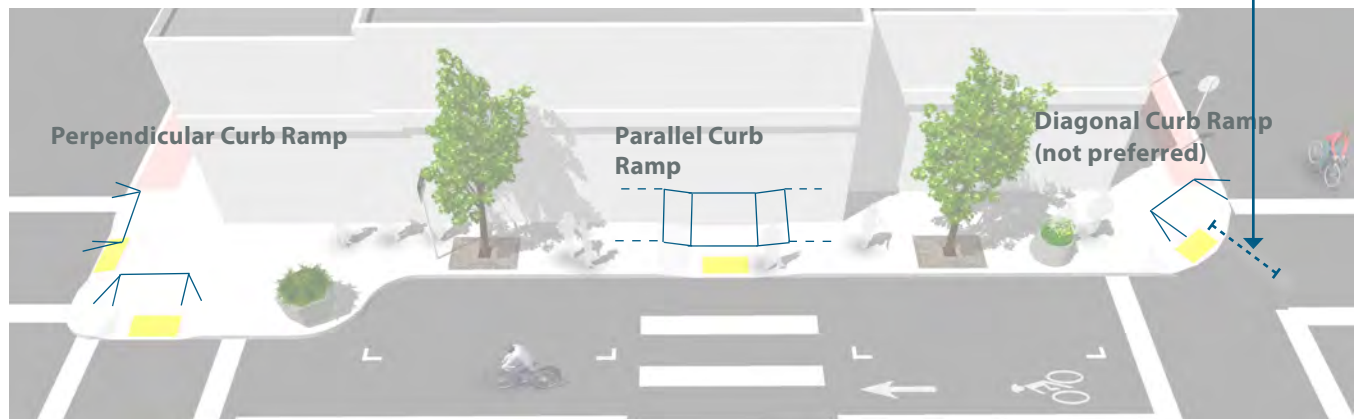
Curb ramps are the design elements that allow all users to make the transition from the street to the sidewalk. There are a number of factors to be considered in the design and placement of curb ramps at corners. Properly designed curb ramps ensure that the sidewalk is accessible from the roadway. A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

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

### Guidance

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

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



Crosswalk spacing not to scale. For illustration purposes only.

### Discussion

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

#### Additional References and Guidelines

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

#### Materials and Maintenance

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

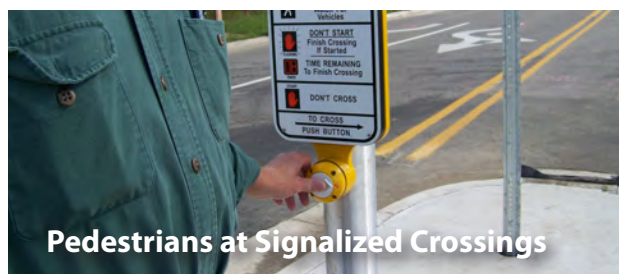
## Signalization

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

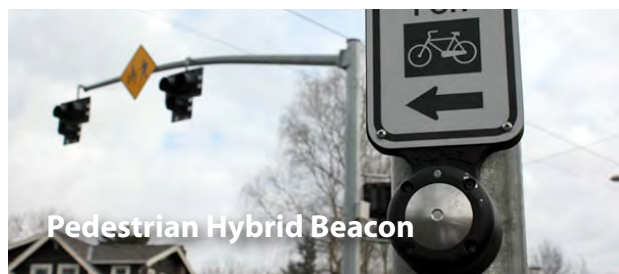
Flashing amber warning beacons can be utilized at unsignalized intersection crossings. Push buttons, signage, and pavement markings may be used to highlight these facilities for pedestrians, bicyclists and motorists.

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

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



**Pedestrians at Signalized Crossings**



**Pedestrian Hybrid Beacon**

### Additional References and Guidelines

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

### Materials and Maintenance

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

## Pedestrians at Signalized Crossings

### Description

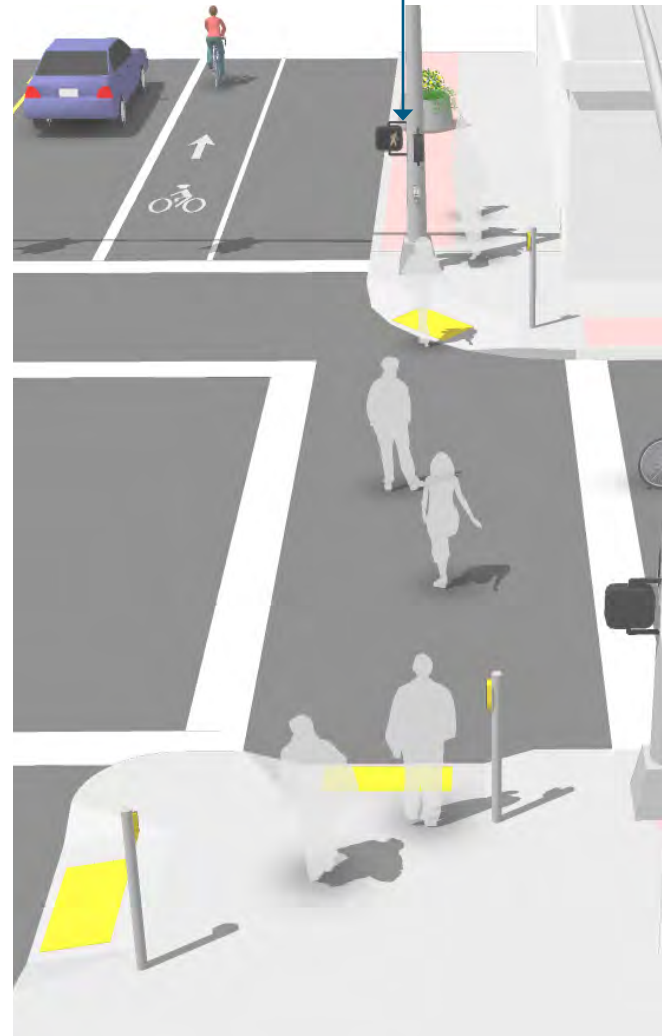
#### Pedestrian Signal Head

- 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.

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



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.

## Pedestrian Hybrid Beacon

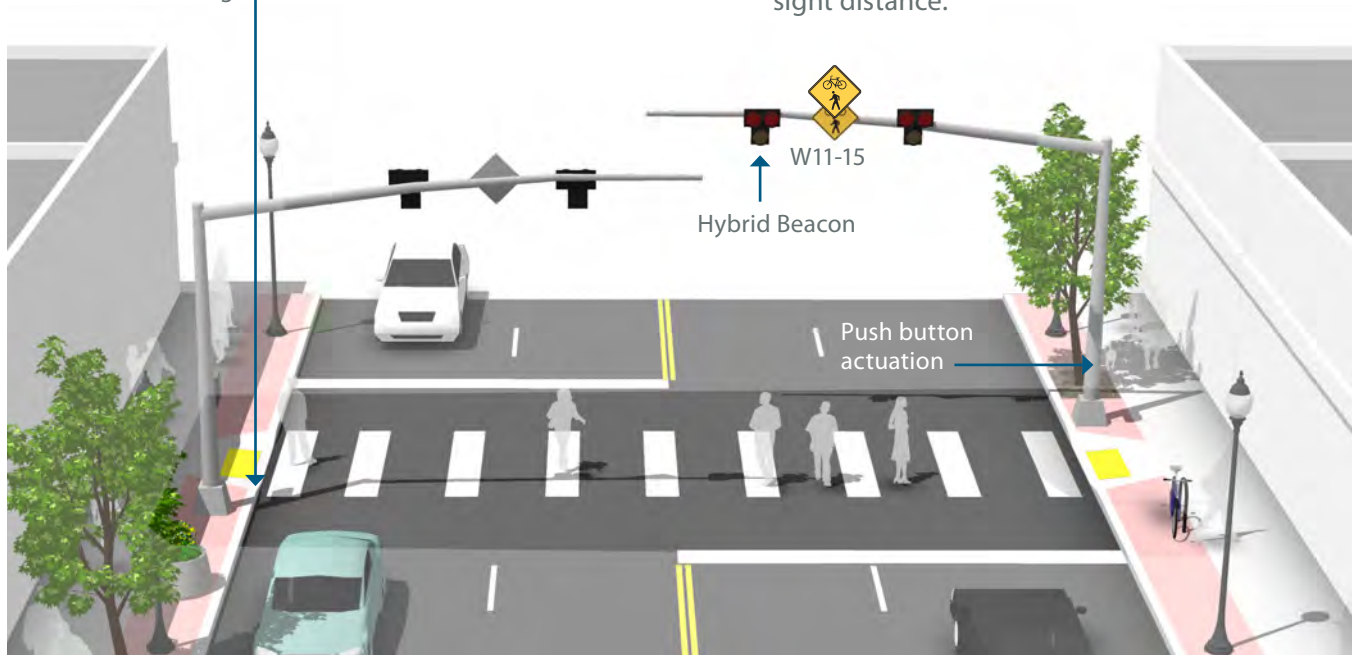
### Description

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.

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



### Discussion

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

#### Additional References and Guidelines

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

#### Materials and Maintenance

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



## Active Warning Beacons

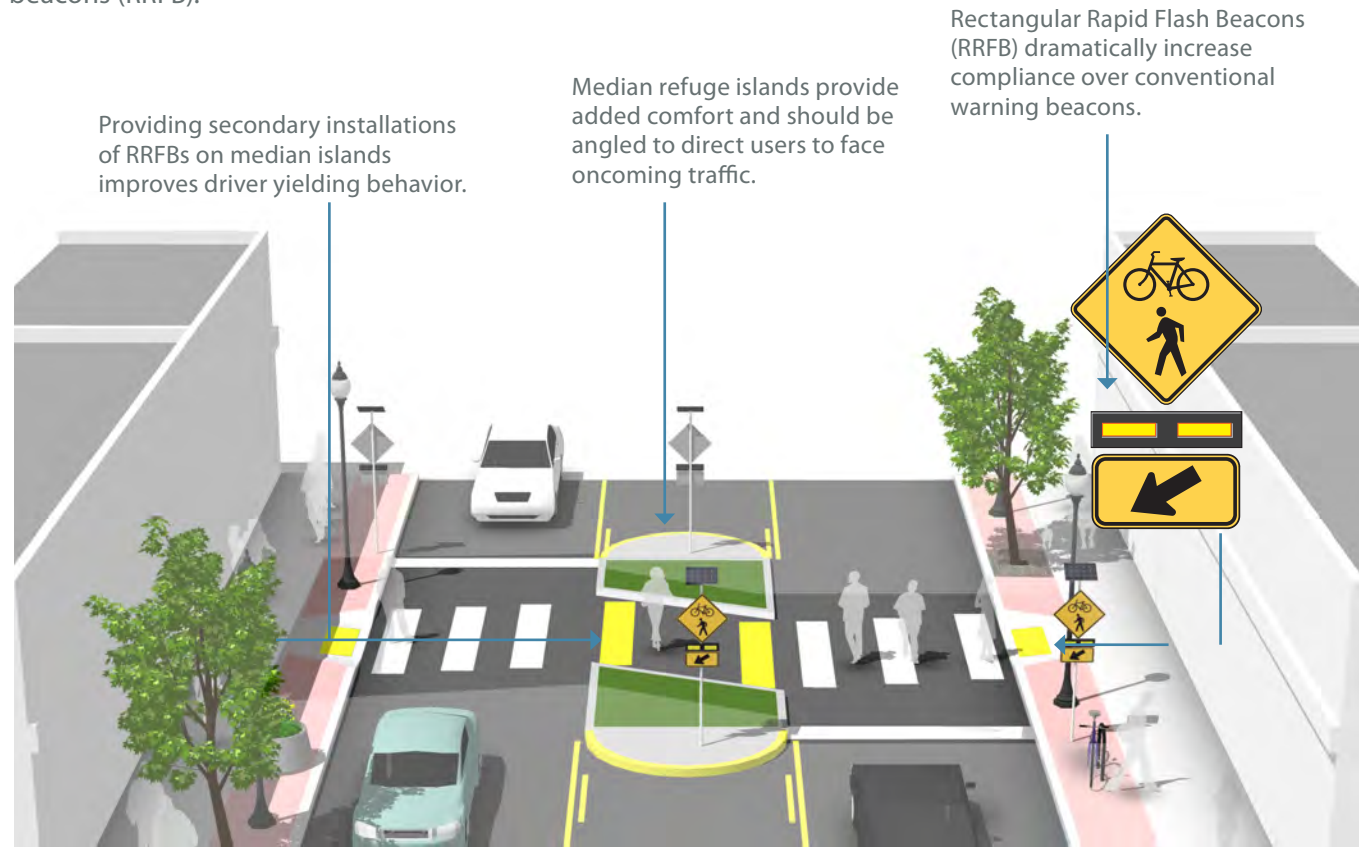
### Description

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 no decrease in yielding behavior over time.

#### Additional References and Guidelines

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)

#### Materials and Maintenance

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

## DESIGN NEEDS OF BICYCLISTS

The purpose of this section is to provide the facility designer with an understanding of how bicyclists operate and how their bicycle influences that operation. Bicyclists, by nature, are much more affected by poor facility design, construction, and maintenance practices than motor vehicle drivers. Bicyclists lack the protection from the elements and roadway hazards provided by an automobile’s structure and safety features. By understanding the unique characteristics and needs of bicyclists, a facility designer can provide quality facilities and minimize user risk.

### Bicycle as a Design Vehicle

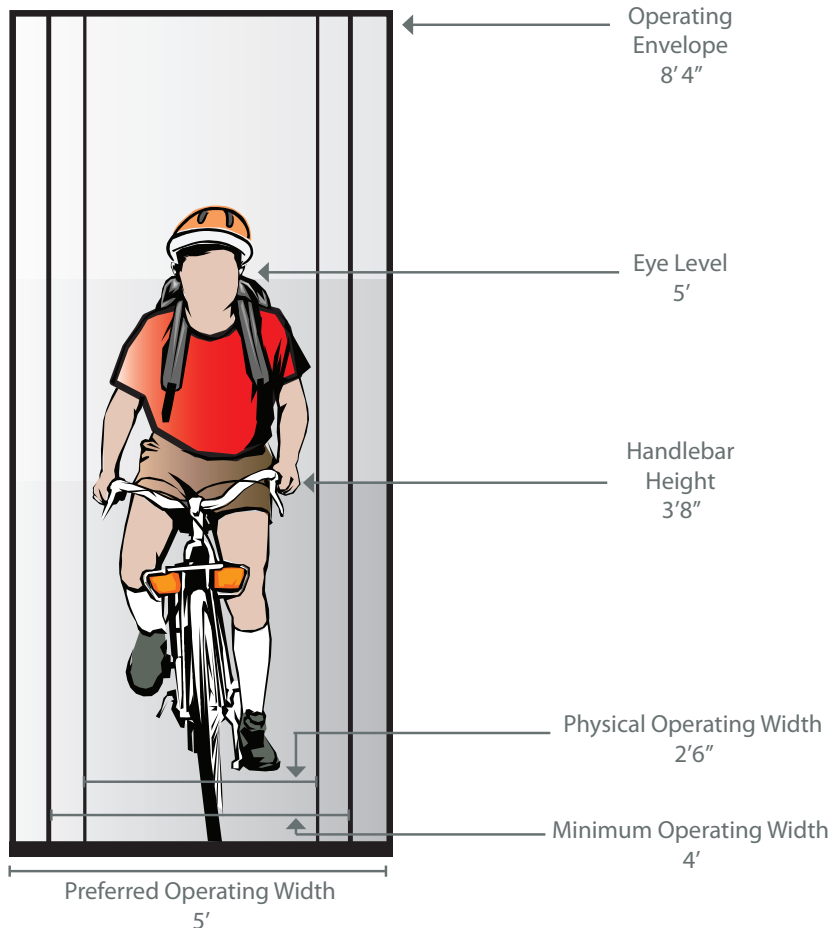
Similar to motor vehicles, bicyclists and their bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The design of a bikeway should consider reasonably expected bicycle types on the facility and utilize the appropriate dimensions.

The figure below illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility. This is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable.

In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories. The figure and table below summarize the typical dimensions for bicycle types.

#### Standard Bicycle Rider Dimensions

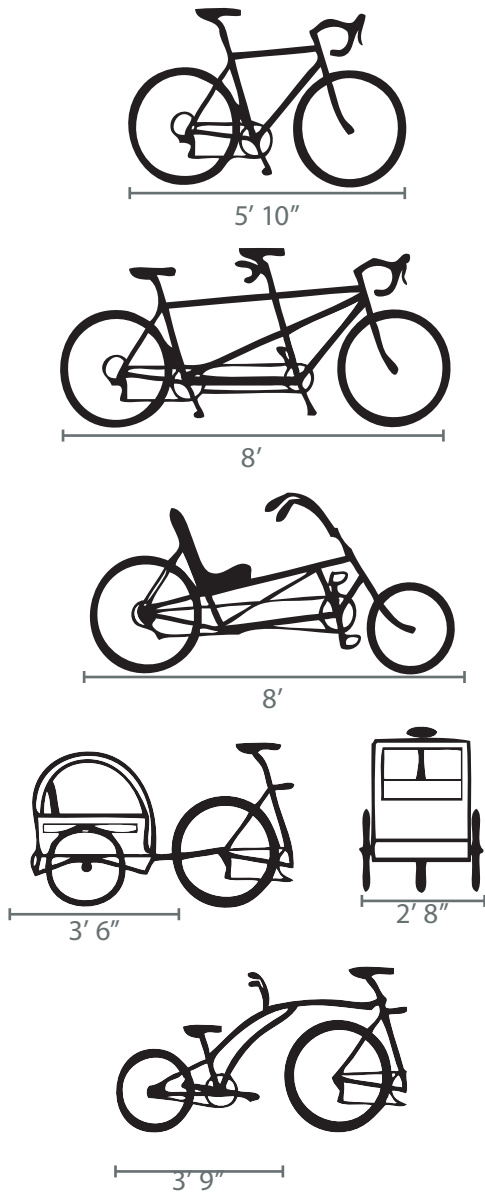
Source: AASHTO Guide for the Development of Bicycle Facilities, 3rd Edition







### Bicycle as Design Vehicle - Typical Dimensions



#### Bicycle as Design Vehicle - Typical Dimensions

Source: AASHTO Guide for the Development of Bicycle Facilities, 3rd Edition \*AASHTO does not provide typical dimensions for tricycles.

#### Design Speed Expectations

The expected speed that different types of bicyclists can maintain under various conditions also influences the design of facilities such as multi-use paths. The table to the right provides typical bicyclist speeds for a variety of conditions.

Bicycle Type	Feature	Typical Dimensions
Upright Adult Bicyclist	Physical width	2 ft 6 in
	Operating width (Minimum)	4 ft
	Operating width (Preferred)	5 ft
	Physical length	5 ft 10 in
	Physical height of handlebars	3 ft 8 in
	Operating height	8 ft 4 in
	Eye height	5 ft
Recumbent Bicyclist	Physical length	8 ft
	Eye height	3 ft 10 in
Tandem Bicyclist	Physical length	8 ft
	Physical width	2 ft 8 in
Bicyclist with child trailer	Physical length	10 ft
	Physical width	2 ft 8 in

### Bicycle as Design Vehicle - Design Speed Expectations

Bicycle Type	Feature	Typical Speed
Upright Adult Bicyclist	Paved level surfacing	15 mph
	Crossing Intersections	10 mph
	Downhill	30 mph
	Uphill	5 -12 mph
Recumbent Bicyclist	Paved level surfacing	18 mph

\*Tandem bicycles and bicyclists with trailers have typical speeds equal to or less than upright adult bicyclists.



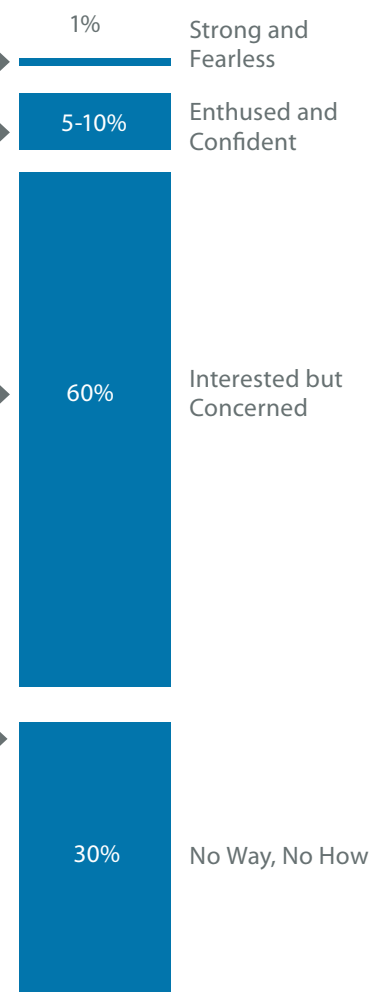
## TYPES OF BICYCLISTS

It is important to consider bicyclists of all skill levels when creating a non-motorized plan or project. Bicyclist skill level greatly influences expected speeds and behavior, both in separated bikeways and on shared roadways. Bicycle infrastructure should accommodate as many user types as possible, with decisions for separate or parallel facilities based on providing a comfortable experience for the greatest number of people.

The bicycle planning and engineering professions currently use several systems to classify the population, which can assist in understanding the characteristics and infrastructure preferences of different bicyclists. The most conventional framework classifies the “design cyclist” as Advanced, Basic, or Child<sup>1</sup>. A more detailed understanding of the US population as a whole is illustrated in the figure below. Developed by planners in Portland, OR<sup>2</sup> and supported by data collected nationally since 2005, this classification provides the following alternative categories to address varying attitudes towards bicycling in the US:

- **Strong and Fearless** (approximately 1% of population) – Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections -- even if shared with vehicles -- over separate bicycle facilities such as multi-use paths.
- **Enthusied and Confident** (5-10% of population) - This user group encompasses bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or multi-use paths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreationalists, racers and utilitarian bicyclists.
- **Interested but Concerned** (approximately 60% of population) – This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or multi-use trails under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These people may become “Enthusied & Confident” with encouragement, education and experience.
- **No Way, No How** (approximately 30% of population) – Persons in this category are not bicyclists, and perceive severe safety issues with riding in traffic. Some people in this group may eventually become more regular cyclists with time and education. A significant portion of these people will never ride a bicycle other than on rare occasions or under special circumstances (e.g., in a park, with a child).

*Typical Distribution of Bicyclist Types*



1 Selecting Roadway Design Treatments to Accommodate Bicycles. (1994). Publication No. FHWA-RD-92-073

2 Four Types of Cyclists. (2009). Roger Geller, City of Portland Bureau of Transportation.

<http://www.portlandonline.com/transportation/index.cfm?&a=237507>

## BICYCLE FACILITY SELECTION GUIDELINES

This section summarizes the bicycle facility selection typology developed for the City of Goldsboro. The specific facility type that should be provided depends on the surrounding environment (e.g. auto speed and volume, topography, and adjacent land use) and expected bicyclist needs (e.g. bicyclists commuting on a highway versus students riding to school on residential streets).

### Facility Selection Guidelines

There are no 'hard and fast' rules for determining the most appropriate type of bicycle facility for a particular location – roadway speeds, volumes, right-of-way width, presence of parking, adjacent land uses, and expected bicycle user types are all critical elements of this decision. Studies find that the most significant factors influencing bicycle use are motor vehicle traffic volumes and speeds. Additionally, most bicyclists prefer facilities separated from motor vehicle traffic or located on local roads with low motor vehicle traffic speeds and volumes. Because off-street pathways are physically separated from the roadway, they are perceived as safe and attractive routes for bicyclists who prefer to avoid motor vehicle traffic. Consistent use of treatments and application of bikeway facilities allow users to anticipate whether they would feel comfortable riding on a particular facility, and plan their trips accordingly. This section provides guidance on various factors that affect the type of facilities that should be provided.

#### *This section includes:*

- Facility Classification
- Facility Continua



## FACILITY CLASSIFICATION

### Description

Consistent with bicycle facility classifications throughout the nation, these Bicycle Facility Design Guidelines identify the following classes of facilities by degree of separation from motor vehicle traffic.

*Shared Roadways* are bikeways where bicyclists and cars operate within the same travel lane, either side by side or in single file depending on roadway configuration. The most basic type of bikeway is a signed shared roadway. This facility provides continuity with other bicycle facilities (usually bike lanes), or designates preferred routes through high-demand corridors.

*Shared Roadways* may also be designated by pavement markings, signage and other treatments including directional signage, traffic diverters, chicanes, chokers and /or other traffic calming devices to reduce vehicle speeds or volumes. Shared-lane markings are included in this class of treatments.

*Separated Bikeways*, such as bike lanes, use signage and striping to delineate the right-of-way assigned to bicyclists and motorists. Bike lanes encourage predictable movements by both bicyclists and motorists. Paved Shoulders are also included in this classification.

*Cycle Tracks* are exclusive bike facilities that combine the user experience of a separated path with the on-street infrastructure of conventional bike lanes.

*Multi-use Paths* are facilities separated from roadways for use by bicyclists and pedestrians. Greenways and side paths are included in this classification.



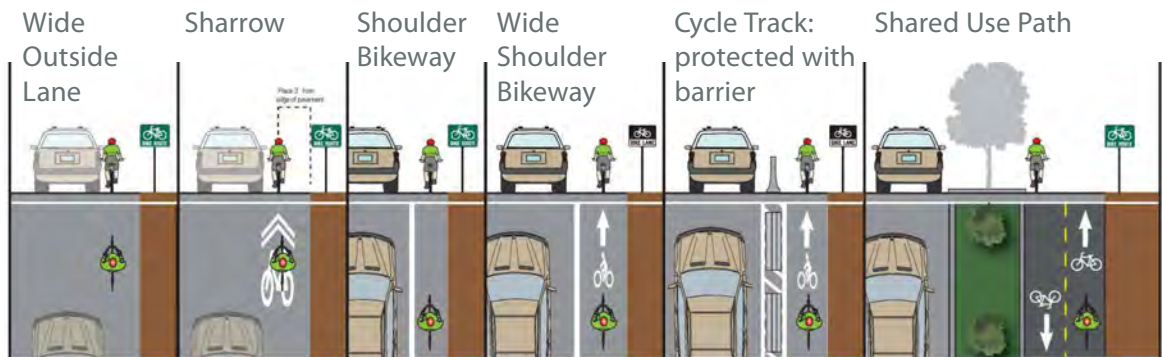


## FACILITY CONTINUA

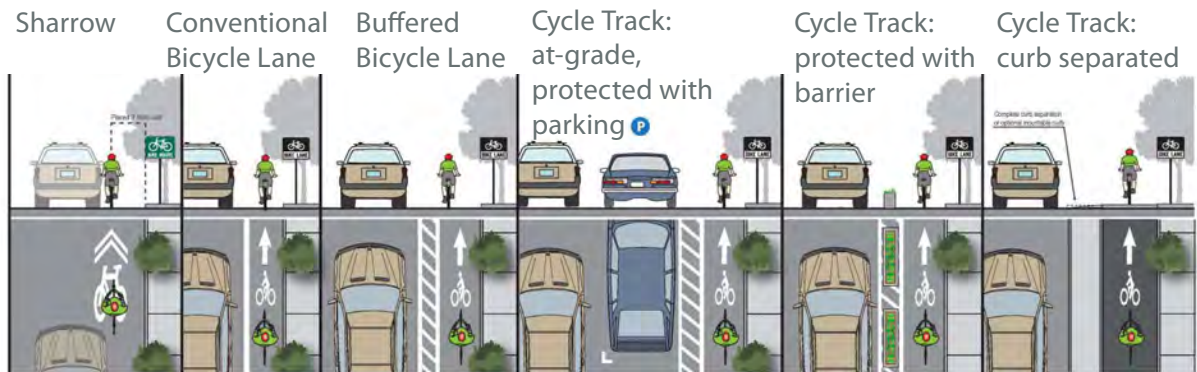
The following continua illustrate the range of bicycle facilities applicable to various roadway environments, based on the roadway type and desired degree of separation. Engineering judgment, traffic studies, previous municipal planning efforts, community input, and local context should be used to refine criteria when developing bicycle facility recommendations for a particular street. In some corridors, it may be desirable to construct facilities to a higher level of treatment than those recommended in relevant planning documents in order to enhance user safety and comfort. In other cases, existing and/or future motor vehicle speeds and volumes may not justify the recommended level of separation, and a less intensive treatment may be acceptable.



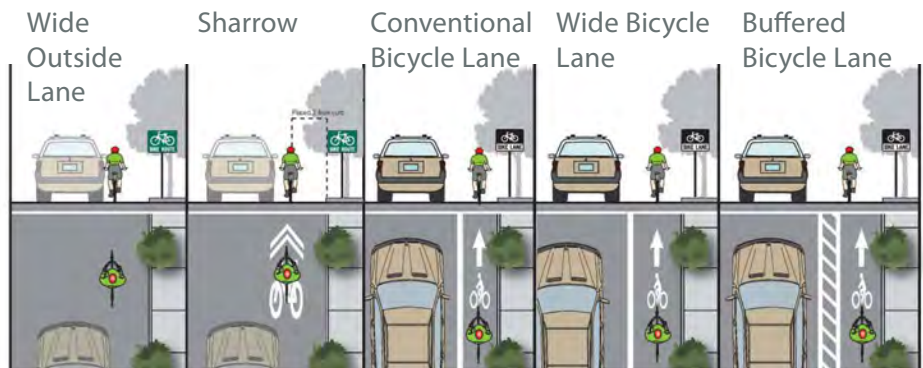
### Arterial/Highway Bikeway Continuum (without curb and gutter)



### Arterial/Highway Bikeway Continuum (with curb and gutter)



### Collector Bikeway Continuum



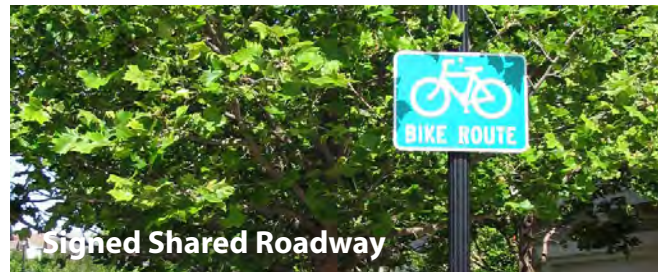
## Shared Roadways

On shared roadways, bicyclists and motor vehicles use the same roadway space. These facilities are typically used on roads with low speeds and traffic volumes, however they can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.

Shared roadways employ a large variety of treatments from simple signage and shared lane markings to more complex treatments including directional signage, traffic diverters, chicanes, chokers, and/or other traffic calming devices to reduce vehicle speeds or volumes.

### *This section includes:*

- Signed Shared Roadway
- Marked Shared Roadway
- Bicycle Boulevard



**Signed Shared Roadway**



**Marked Shared Roadway**



**Bicycle Boulevard**

## Signed Shared Roadways

### Description

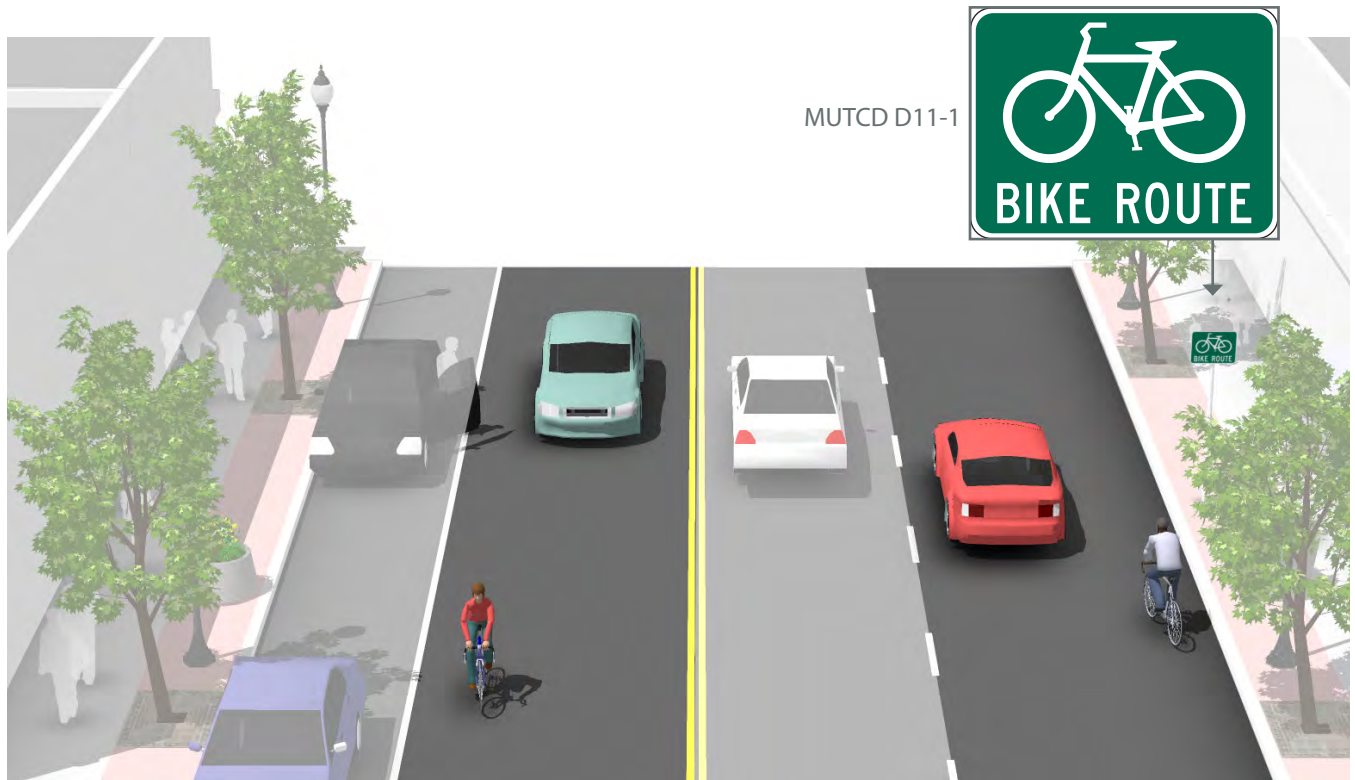
Signed Shared Roadways are facilities shared with motor vehicles. They are typically used on roads with low speeds and traffic volumes, however can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.

### Guidance

Lane width varies depending on roadway configuration.

Bicycle Route signage (D11-1) should be applied at intervals frequent enough to keep bicyclists informed of changes in route direction and to remind motorists of the presence of bicyclists. Commonly, this includes placement at:

- Beginning or end of Bicycle Route.
- At major changes in direction or at intersections with other bicycle routes.
- At intervals along bicycle routes not to exceed ½ mile.



MUTCD D11-1



### Discussion

Signed Shared Roadways serve either to provide continuity with other bicycle facilities (usually bike lanes) or to designate preferred routes through high-demand corridors.

This configuration differs from a **Bicycle Boulevard** due to a lack of traffic calming, wayfinding, pavement markings and other enhancements designed to provide a higher level of comfort for a broad spectrum of users.

### Additional References and Guidelines

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

### Materials and Maintenance

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

## Marked Shared Roadway

### Description

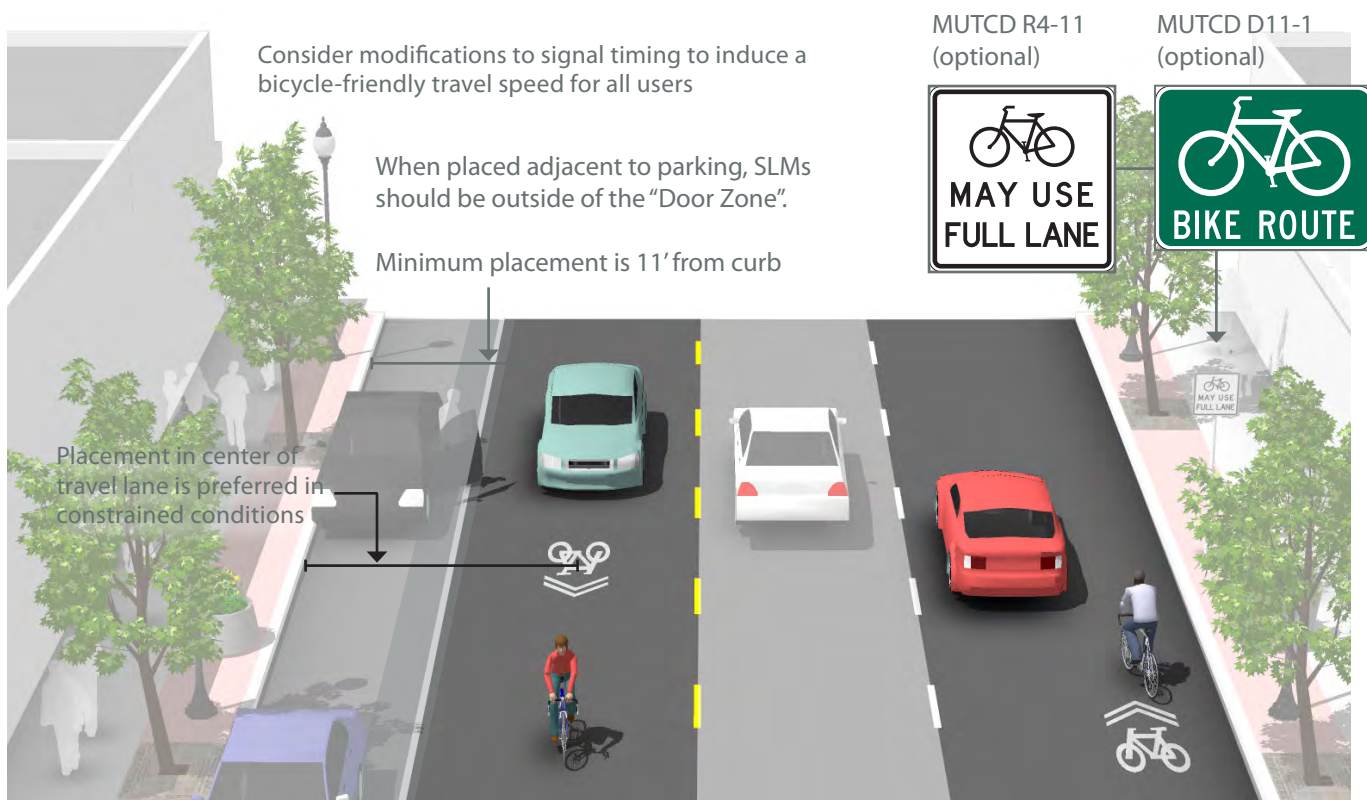
A marked shared roadway is a general purpose travel lane marked with shared lane markings (SLM) used to encourage bicycle travel and proper positioning within the lane.

In constrained conditions, the SLMs are placed in the middle of the lane to discourage unsafe passing by motor vehicles. On a wide outside lane, the SLMs can be used to promote bicycle travel to the right of motor vehicles.

In all conditions, SLMs should be placed outside of the door zone of parked cars.

### Guidance

- In constrained conditions, preferred placement is in the center of the travel lane to minimize wear and promote single file travel.
- Minimum placement of SLM marking centerline is 11 feet from edge of curb where on-street parking is present, 4 feet from edge of curb with no parking. If parking lane is wider than 7.5 feet, the SLM should be moved further out accordingly.



### Discussion

Bike Lanes should be considered on roadways with outside travel lanes wider than 15 feet, or where other lane narrowing or removal strategies may provide adequate road space. SLMs shall not be used on shoulders, in designated Bike Lanes, or to designate Bicycle Detection at signalized intersections. (MUTCD 9C.07)

This configuration differs from a Bicycle Boulevard due to a lack of traffic calming, wayfinding, and other enhancements designed to provide a higher level of comfort for a broad spectrum of users.

### Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities.  
 FHWA. (2009). Manual on Uniform Traffic Control Devices.  
 NACTO. (2012). Urban Bikeway Design Guide. NCDOT. (2000).  
 Traditional Neighborhood Development (TND) Guidelines.

### Materials and Maintenance

Placing SLMs between vehicle tire tracks will increase the life of the markings and minimize the long-term cost of the treatment.





## Bicycle Boulevard

### Description

Bicycle boulevards are a special class of shared roadways designed for a broad spectrum of bicyclists. They are low-volume, low-speed local streets modified to enhance bicyclist comfort by using treatments such as signage, pavement markings, traffic calming and/or traffic reduction, and intersection modifications. These treatments allow through movements of bicyclists while discouraging similar through-trips by non-local motorized traffic.

### Guidance

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



### Pavement Markings

identify the street as a bicycle priority route.

### Enhanced Crossings

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

### Partial Closures

and other volume management tools limit the number of cars traveling on the bicycle boulevard.

### Speed Humps

manage driver speed.

**Curb Extensions** shorten pedestrian crossing distance.

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



### Discussion

Bicycle boulevard retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments for bicyclists, these intersections can become major barriers along the bicycle boulevard and compromise safety.

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

### Additional References and Guidelines

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

### Materials and Maintenance

Vegetation should be regularly trimmed to maintain visibility and attractiveness.

## SEPARATED BIKEWAYS

Designated exclusively for bicycle travel, separated bikeways are segregated from vehicle travel lanes by striping, and can include pavement stencils and other treatments. Separated bikeways are most appropriate on arterial and collector streets where higher traffic volumes and speeds warrant greater separation.

Separated bikeways can increase safety and promote proper riding by:

- Defining road space for bicyclists and motorists, reducing the possibility that motorists will stray into the bicyclists' path.
- Discouraging bicyclists from riding on the sidewalk.
- Reducing the incidence of wrong way riding.
- Reminding motorists that bicyclists have a right to the road.

### *This section includes:*

- Shoulder Bikeways
- Bicycle Lanes
- Buffered Bike Lanes
- Uphill Bicycle Climbing Lane
- Cycle Tracks



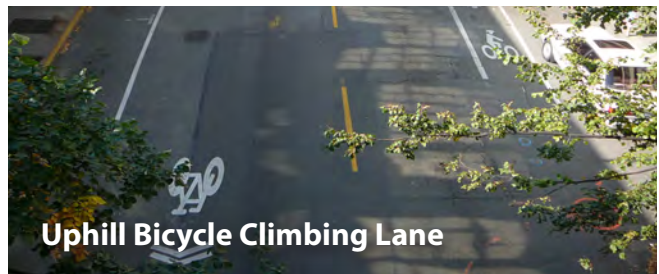
Shoulder Bikeways



Bicycle Lanes



Buffered Bike Lanes



Uphill Bicycle Climbing Lane



Cycle Tracks



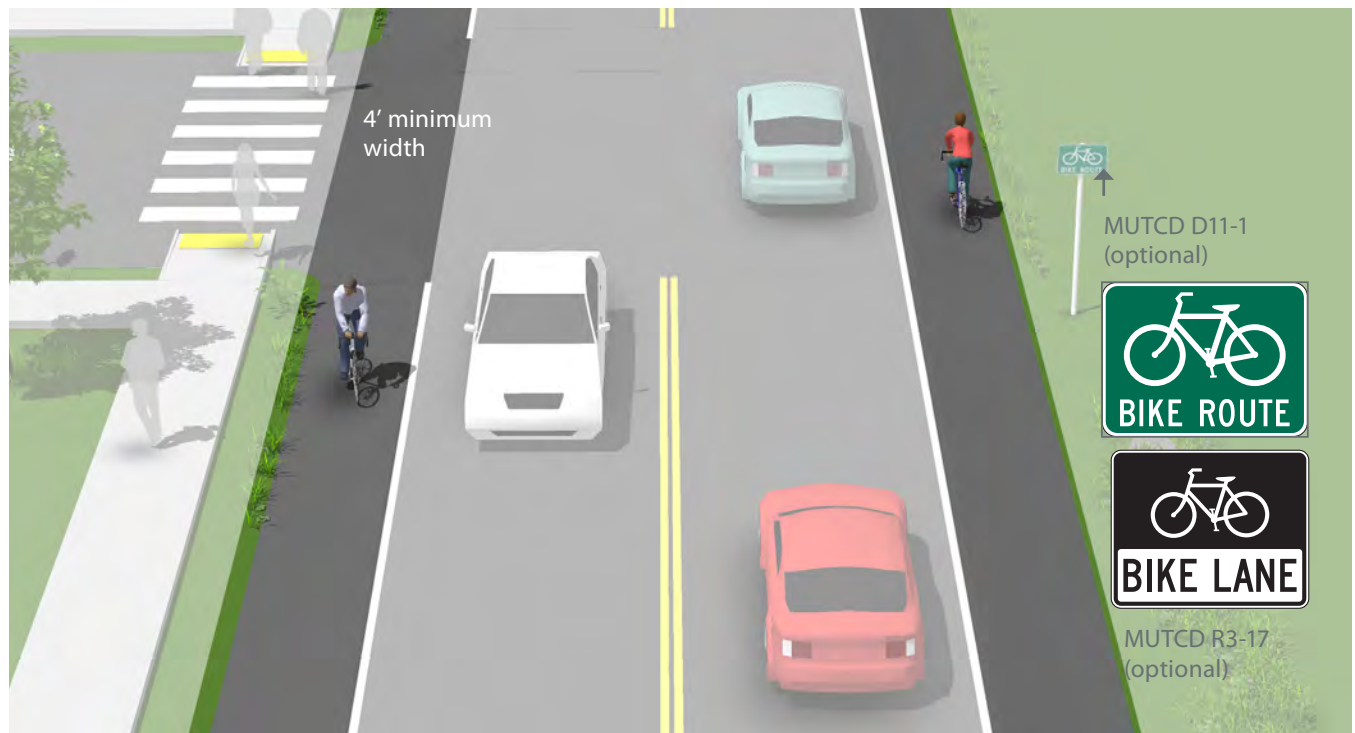
## Shoulder Bikeways

### Description

Typically found in less-dense areas, shoulder bikeways are paved roadways with striped shoulders (4'+) wide enough for bicycle travel. Shoulder bikeways often, but not always, include signage alerting motorists to expect bicycle travel along the roadway. Shoulder bikeways should be considered a temporary treatment, with full bike lanes planned for construction when the roadway is widened or completed with curb and gutter. This type of treatment is not typical in urban areas and should only be used where constraints exist.

### Guidance

- 4 foot minimum width. Greater widths preferred.
- If it is not possible to meet minimum bicycle lane dimensions, a reduced width paved shoulder can still improve conditions for bicyclists on constrained roadways. In these situations, a minimum of 3 feet of operating space should be provided.



### Discussion

A wide outside lane may be sufficient accommodation for bicyclists on streets with insufficient width for bike lanes but which do have space available to provide a wider (14'-16') outside travel lane. Consider configuring as a marked shared roadway in these locations.

Where feasible, roadway widening should be performed with pavement resurfacing jobs.

### Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. NCDOT. (1994). Bicycle Facilities Planning and Design Guidelines.

### Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Shoulder bikeways should be cleared of snow through routine snow removal operations.

## Bicycle Lanes

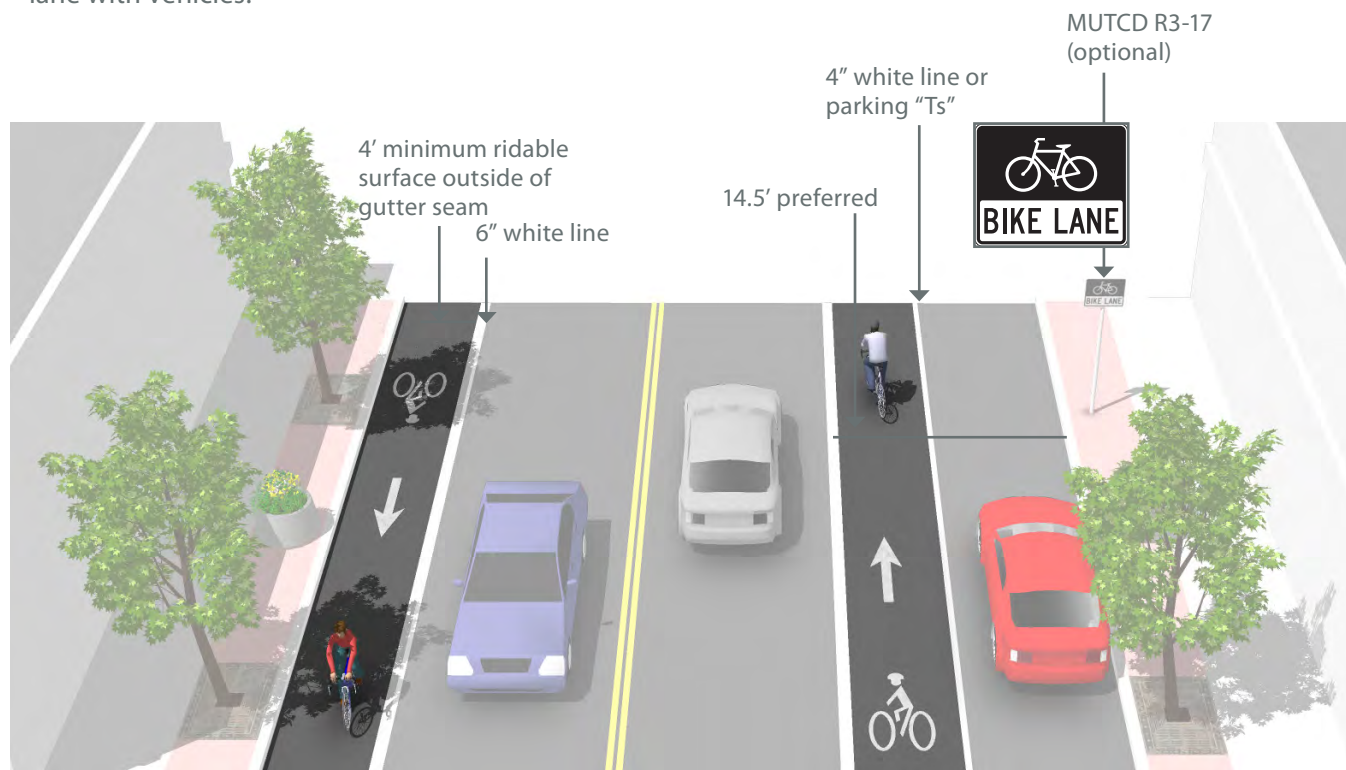
### Description

Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane.

Many bicyclists, particularly less experienced riders, are more comfortable riding on a busy street if it has a striped and signed bikeway than if they are expected to share a lane with vehicles.

### Guidance

- 4 foot minimum when no curb and gutter is present.
- 5 foot minimum when adjacent to curb and gutter or 3 feet more than the gutter pan width if the gutter pan is wider than 2 feet.
- 14.5 foot preferred from curb face to edge of bike lane. (12 foot minimum).
- 7 foot maximum width for use adjacent to arterials with high travel speeds. Greater widths may encourage motor vehicle use of bike lane.



### Discussion

Wider bicycle lanes are desirable in certain situations such as on higher speed arterials (45 mph+) where use of a wider bicycle lane would increase separation between passing vehicles and bicyclists. Appropriate signing and stenciling is important with wide bicycle lanes to ensure motorists do not mistake the lane for a vehicle lane or parking lane. Consider Buffered Bicycle Lanes when further separation is desired.

#### Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. NACTO. (2012). Urban Bikeway Design Guide. NCDOT. (2000). Traditional Neighborhood Development (TND) Guidelines. NCDOT. (1994). Bicycle Facilities Planning and Design Guidelines.

#### Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.



## Buffered Bike Lanes

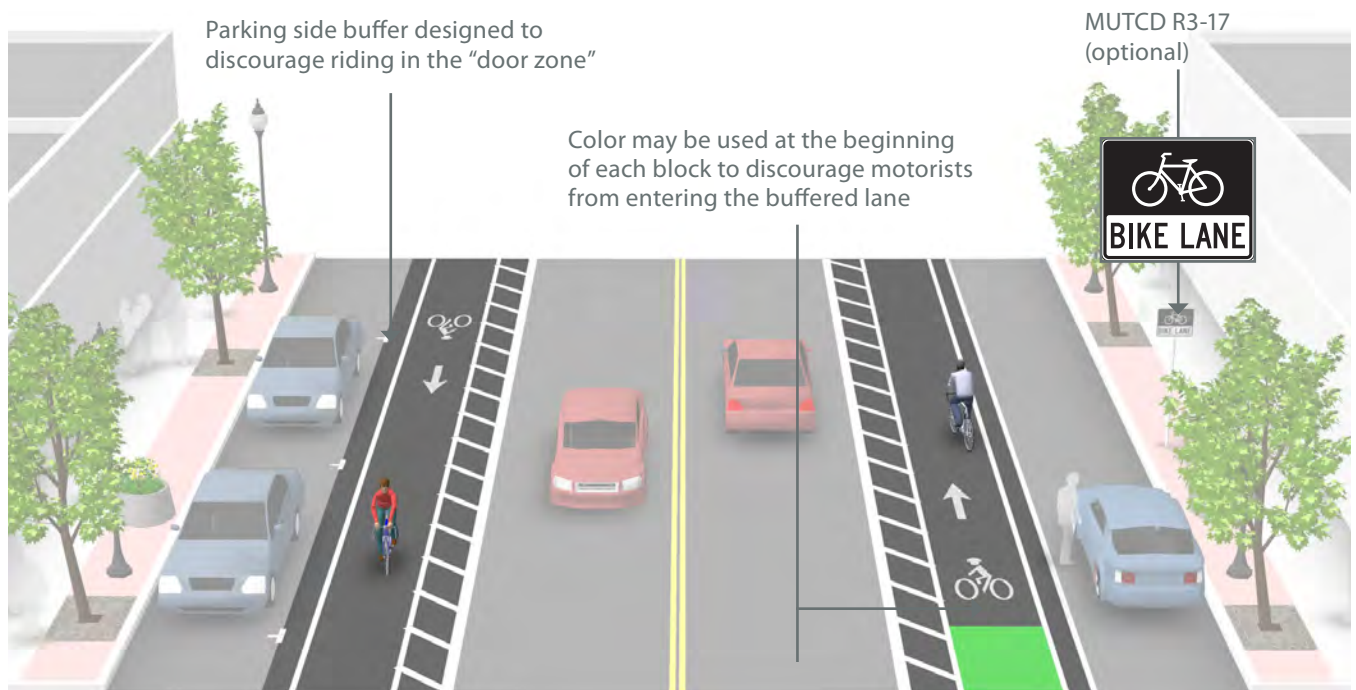
### Description

Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space, separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. Buffered bike lanes are allowed as per MUTCD guidelines for buffered preferential lanes (section 3D-01).

Buffered bike lanes are designed to increase the space between the bike lane and the travel lane or parked cars. This treatment is appropriate for bike lanes on roadways with high motor vehicle traffic volumes and speed, adjacent to parking lanes, or a high volume of truck or oversized vehicle traffic.

### Guidance

- Where bicyclist volumes are high or where bicyclist speed differentials are significant, the desired bicycle travel area width is 7 feet.
- Buffers should be at least 2 feet wide. If 3 feet or wider, mark with diagonal or chevron hatching. For clarity at driveways or minor street crossings, consider a dotted line or colored pavement for the inside buffer boundary where cars are expected to cross.



### Discussion

Frequency of right turns by motor vehicles at major intersections should determine whether continuous or truncated buffer striping should be used approaching the intersection. Commonly configured as a buffer between the bicycle lane and motor vehicle travel lane, a parking side buffer may also be provided to help bicyclists avoid the 'door zone' of parked cars.

### Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. (3D-01) NACTO. (2012). Urban Bikeway Design Guide.

### Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

## Uphill Bicycle Climbing Lane

### Description

Uphill bike lanes (also known as “climbing lanes”) enable motorists to safely pass slower-speed bicyclists, thereby improving conditions for both travel modes.

### Guidance

- Uphill bike lanes should be 6-7 feet wide (wider lanes are preferred because extra maneuvering room on steep grades can benefit bicyclists).
- Can be combined with Shared Lane Markings for downhill bicyclists who can more closely match prevailing traffic speeds.



### Discussion

This treatment is typically found on retrofit projects as newly constructed roads should provide adequate space for bicycle lanes in both directions of travel. Accommodating an uphill bicycle lane often includes delineating on-street parking (if provided), narrowing travel lanes and/or shifting the centerline if necessary.

### Additional References and Guidelines

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

### Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.



## Cycle Tracks

### Description

A cycle track is an exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. A cycle track is physically separated from motor traffic and distinct from the sidewalk. Cycle tracks have different forms but all share common elements—they provide space that is intended to be exclusively or primarily used by bicycles, and are separated from motor vehicle travel lanes, parking lanes, and sidewalks.

Raised cycle tracks may be at the level of the adjacent sidewalk or set at an intermediate level between the roadway and sidewalk to separate the cycle track from the pedestrian area.

### Guidance

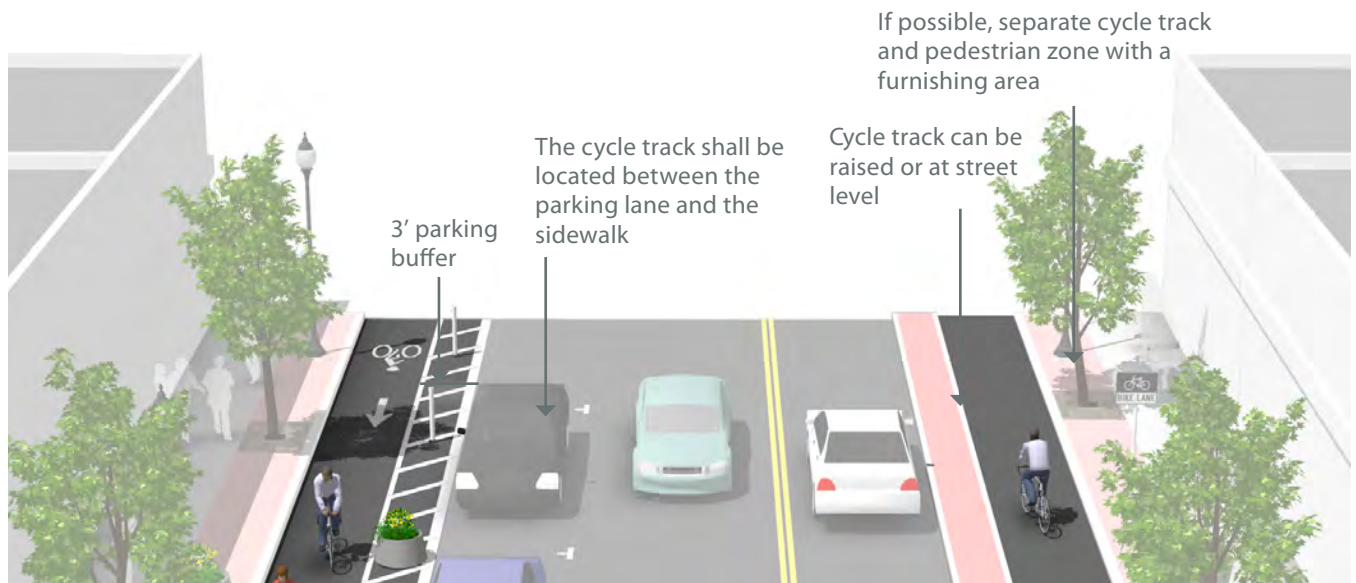
Cycle tracks should ideally be placed along streets with long blocks and few driveways or mid-block access points for motor vehicles.

#### One-Way Cycle Tracks

- 7 foot recommended minimum to allow passing. 5 foot minimum width in constrained locations.

#### Two-Way Cycle Tracks

- Cycle tracks located on one-way streets have fewer potential conflict areas than those on two-way streets.
- 12 foot recommended minimum for two-way facility. 8 foot minimum in constrained locations



### Discussion

Special consideration should be given at transit stops to manage bicycle and pedestrian interactions. Driveways and minor street crossings are unique challenges to cycle track design. Parking should be prohibited within 30 feet of the intersection to improve visibility. Color, yield markings and “Yield to Bikes” signage should be used to identify the conflict area and make it clear that the cycle track has priority over entering and exiting traffic. If configured as a raised cycle track, the crossing should be raised so that the sidewalk and cycle track maintain their elevation through the crossing.

### Additional References and Guidelines

NACTO. (2012). Urban Bikeway Design Guide.

### Materials and Maintenance

In cities with winter climates, barrier separated and raised cycle tracks may require special equipment for snow removal.

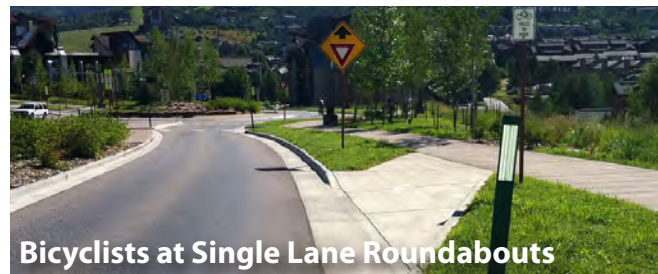
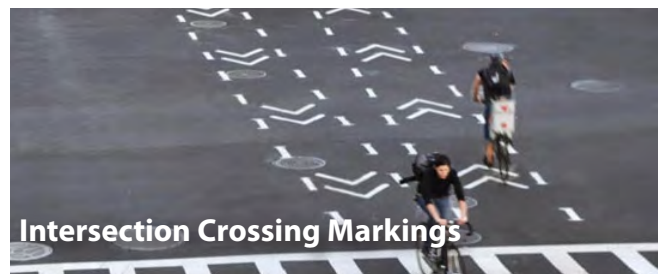
## SEPARATED BIKEWAYS AT INTERSECTIONS

Intersections are junctions at which different modes of transportation meet and facilities overlap. An intersection facilitates the interchange between bicyclists, motorists, pedestrians and other modes in order to advance traffic flow in a safe and efficient manner. Designs for intersections with bicycle facilities should reduce conflict between bicyclists (and other vulnerable road users) and vehicles by heightening the level of visibility, denoting clear right-of-way and facilitating eye contact and awareness with other modes. Intersection treatments can improve both queuing and merging maneuvers for bicyclists, and are often coordinated with timed or specialized signals.

The configuration of a safe intersection for bicyclists may include elements such as color, signage, medians, signal detection and pavement markings. Intersection design should take into consideration existing and anticipated bicyclist, pedestrian and motorist movements. In all cases, the degree of mixing or separation between bicyclists and other modes is intended to reduce the risk of crashes and increase bicyclist comfort. The level of treatment required for bicyclists at an intersection will depend on the bicycle facility type used, whether bicycle facilities are intersecting, and the adjacent street function and land use.

### *This section includes:*

- Bike Lanes at Right Turn Only Lanes
- Colored Bike Lanes in Conflict Areas
- Combined Bike Lane/Turn Lane
- Intersection Crossing Markings
- Bicyclists at Single Lane Roundabouts







## Bike Lanes at Right Turn Only Lanes

### Description

The appropriate treatment at right-turn lanes is to place the bike lane between the right-turn lane and the right-most through lane or, where right-of-way is insufficient, to use a shared bike lane/turn lane.

The design (right) illustrates a bike lane pocket, with signage indicating that motorists should yield to bicyclists through the conflict area.

### Guidance

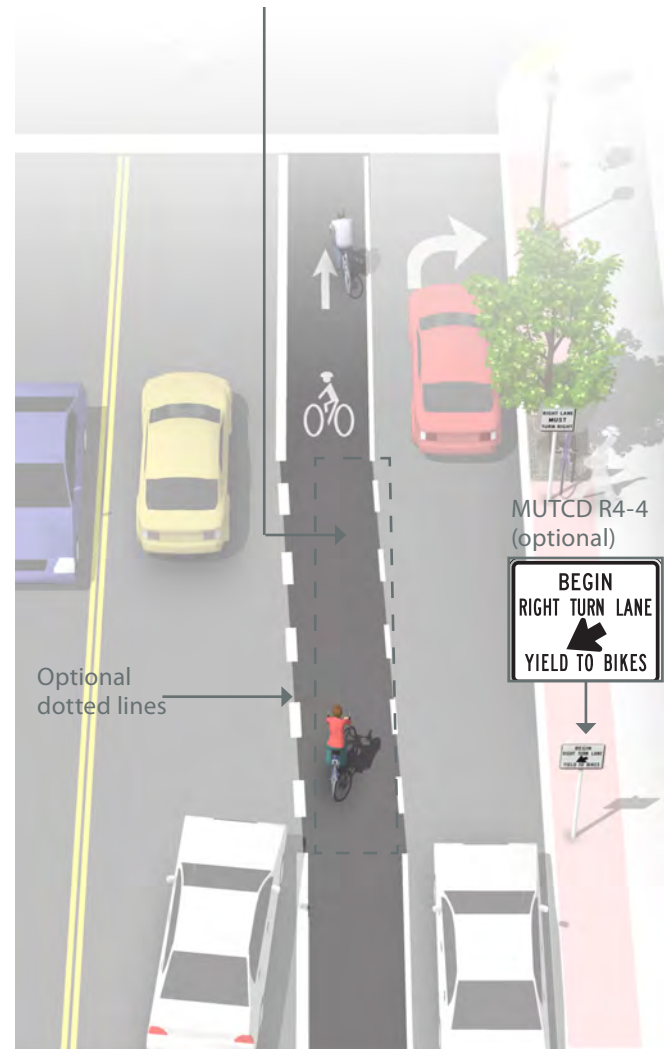
At auxiliary right turn only lanes (add lane):

- Continue existing bike lane width; standard width of 5 to 6 feet or 4 feet in constrained locations.
- Use signage to indicate that motorists should yield to bicyclists through the conflict area.
- Consider using colored conflict areas to promote visibility of the mixing zone.

Where a through lane becomes a right turn only lane:

- Do not define a dotted line merging path for bicyclists.
- Drop the bicycle lane in advance of the merge area.
- Use shared lane markings to indicate shared use of the lane in the merging zone.

Colored pavement may be used in the weaving area to increase visibility and awareness of potential conflict



### Discussion

For other potential approaches to providing accommodations for bicyclists at intersections with turn lanes, please see shared bike lane/turn lane, bicycle signals, and colored bike facilities.

#### Additional References and Guidelines

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

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

## Colored Bike Lanes in Conflict Areas

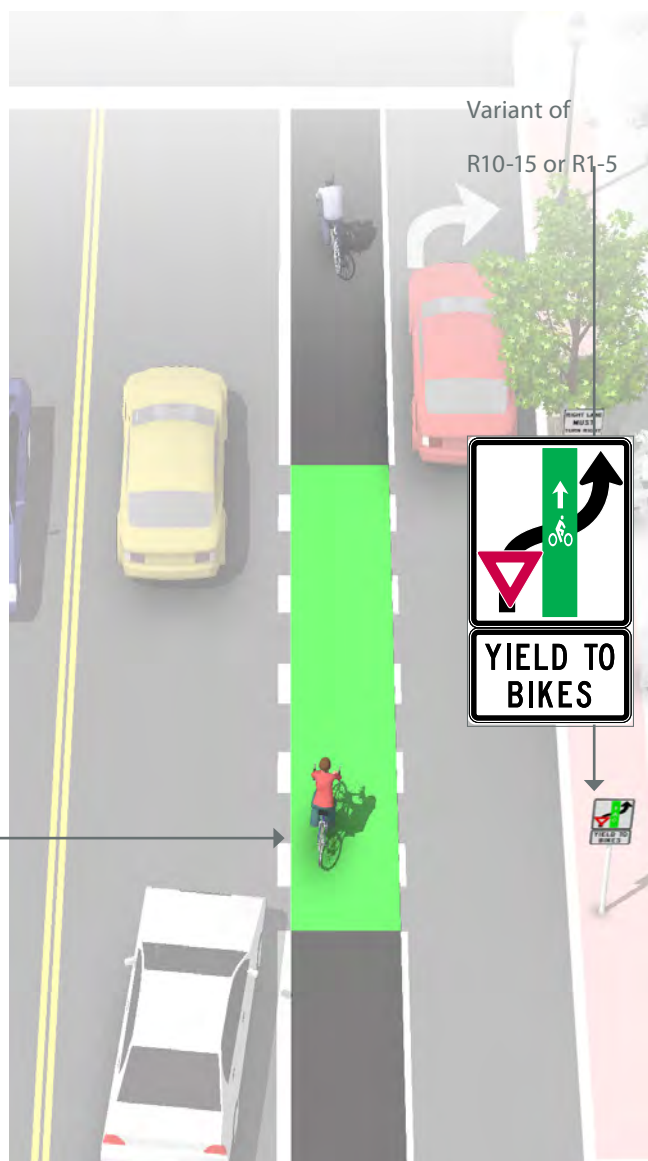
### Description

Colored pavement within a bicycle lane increases the visibility of the facility and reinforces priority of bicyclists in conflict areas.

### Guidance

- Green colored pavement was given interim approval by the Federal Highways Administration in March 2011. See interim approval for specific color standards.
- The colored surface should be skid resistant and retro-reflective.
- A “Yield to Bikes” sign should be used at intersections or driveway crossings to reinforce that bicyclists have the right-of-way in colored bike lane areas.

Normal white dotted edge lines should define colored space



### Discussion

Evaluations performed in Portland, OR, St. Petersburg, FL and Austin, TX found that significantly more motorists yielded to bicyclists and slowed or stopped before entering the conflict area after the application of the colored pavement when compared with an uncolored treatment.

#### Additional References and Guidelines

FHWA. (2011). Interim Approval (IA-14) has been granted. Requests to use green colored pavement need to comply with the provisions of Paragraphs 14 through 22 of Section 1A.10. NACTO. (2012). Urban Bikeway Design Guide.

#### Materials and Maintenance

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



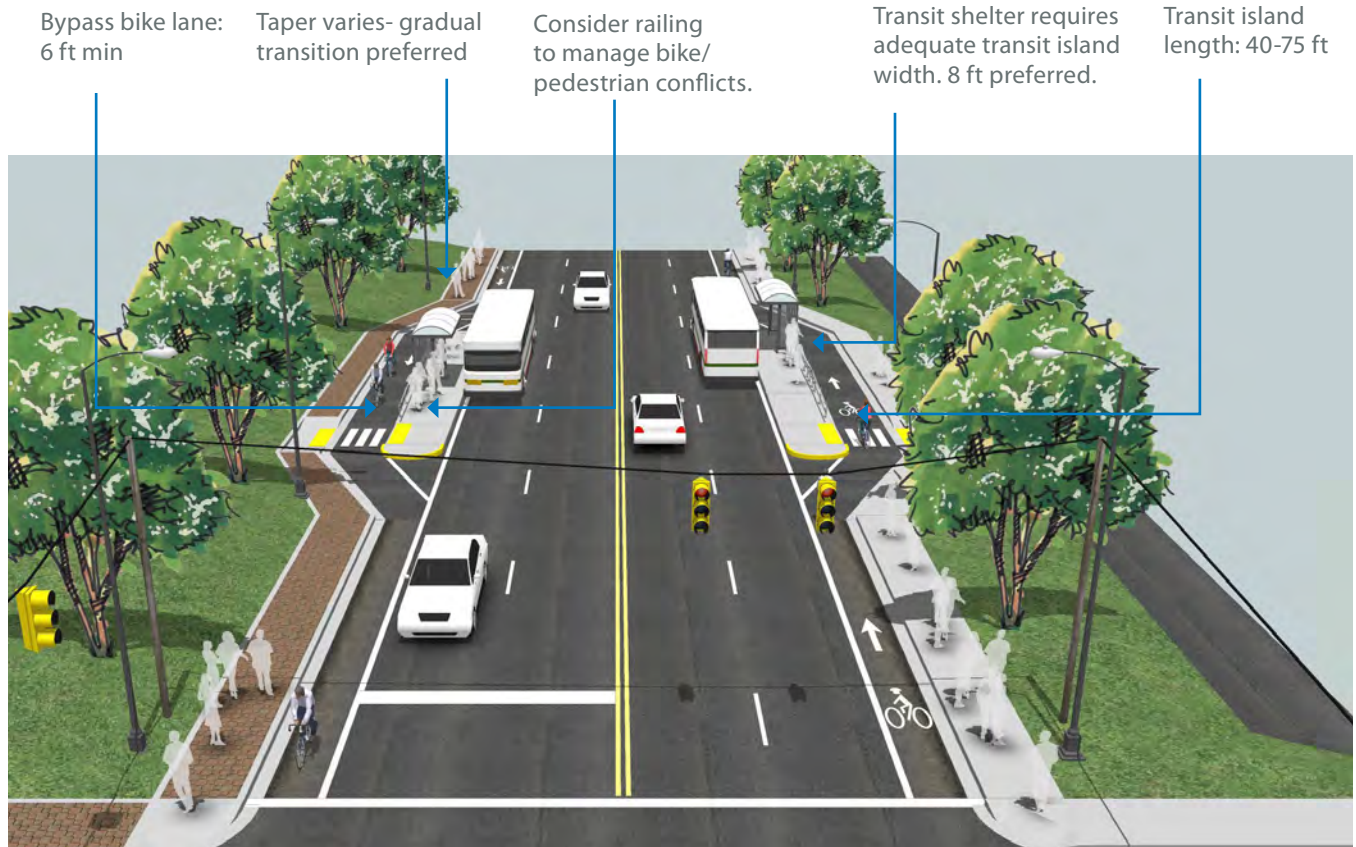
## Bicycle Lane Transit Bypass

### Description

Transit bypass bike lane is a channelized lane for bicycles designed to allow bicyclists to pass stopped busses, and prevent conflicts with busses pulling to the curb. This is particularly helpful on corridors with high volumes of transit vehicles and bicyclists, where “leapfrogging” may occur.

### Guidance

- Appropriate in areas with high volumes of busses and bicyclists.
- 6 foot minimum width bypass lane.
- Transit island should be wide enough to hold all waiting transit riders.



### Discussion

Ensure an adequate width bicycle lane where the bypass lane rejoins the roadway so that bicyclists do not encroach into adjacent lanes.

Conflicts with pedestrians may be increased over conventional bus stop designs. Consider railings to direct pedestrians to a single location where they may cross to the sidewalk.

### Additional References and Guidelines

NACTO. (2012). Urban Bikeway Design Guide.

### Materials and Maintenance

The channelized bicycle lane may require additional sweeping to maintain free of debris.

## Combined Bike Lane / Turn Lane

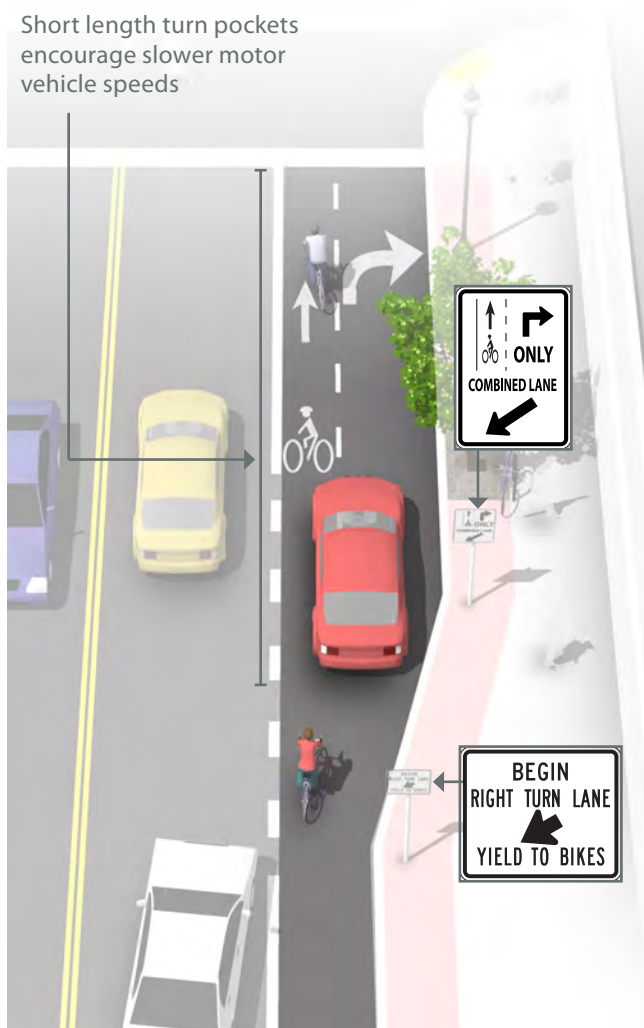
### Description

The combined bicycle/right turn lane places a standard-width bike lane on the left side of a dedicated right turn lane. A dotted line delineates the space for bicyclists and motorists within the shared lane. This treatment includes signage advising motorists and bicyclists of proper positioning within the lane.

This treatment is recommended at intersections lacking sufficient space to accommodate both a standard through bike lane and right turn lane.

### Guidance

- Maximum shared turn lane width is 13 feet; narrower is preferable.
- Bike Lane pocket should have a minimum width of 4 feet with 5 feet preferred.
- A dotted 4 inch line and bicycle lane marking should be used to clarify bicyclist positioning within the combined lane, without excluding cars from the suggested bicycle area.
- A “Right Turn Only” sign with an “Except Bicycles” plaque may be needed to make it legal for through bicyclists to use a right turn lane.



### Discussion

Case studies cited by the Pedestrian and Bicycle Information Center indicate that this treatment works best on streets with lower posted speeds (30 MPH or less) and with lower traffic volumes (10,000 ADT or less). May not be appropriate for high-speed arterials or intersections with long right turn lanes. May not be appropriate for intersections with large percentages of right-turning heavy vehicles.

### Additional References and Guidelines

NACTO. (2012). Urban Bikeway Design Guide. This treatment is currently slated for inclusion in the next edition of the AASHTO Guide for the Development of Bicycle Facilities

### Materials and Maintenance

Locate markings out of tire tread to minimize wear. Because the effectiveness of markings depends on their visibility, maintaining markings should be a high priority.



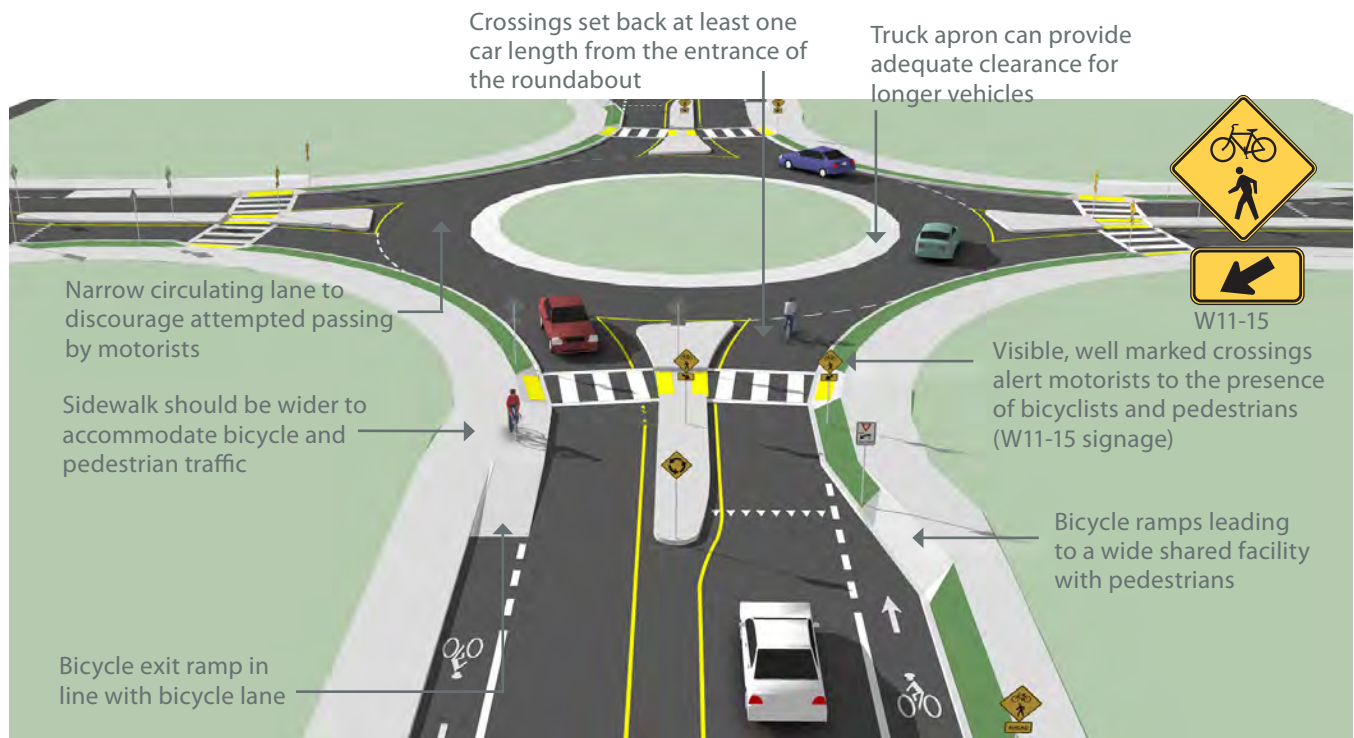
## Bicyclists at Single Lane Roundabouts

### Description

In single lane roundabouts it is important to indicate to motorists, bicyclists and pedestrians the right-of-way rules and correct way for them to circulate, using appropriately designed signage, pavement markings, and geometric design elements.

### Guidelines

- 25 mph maximum circulating design speed.
- Design approaches/exits to the lowest speeds possible.
- Encourage bicyclists navigating the roundabout like motor vehicles to “take the lane.”
- Maximize yielding rate of motorists to pedestrians and bicyclists at crosswalks.
- Provide separated facilities for bicyclists who prefer not to navigate the roundabout on the roadway.



### Discussion

Research indicates that while single-lane roundabouts may benefit bicyclists and pedestrians by slowing traffic, multi-lane roundabouts may present greater challenges and significantly increase safety problems for these users.

### Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2000). Roundabouts: An Informational Guide. FHWA. (2010). Roundabouts: An Informational Guide, Second Edition. NCHRP 672

### Materials and Maintenance

Signage and striping require routine maintenance.

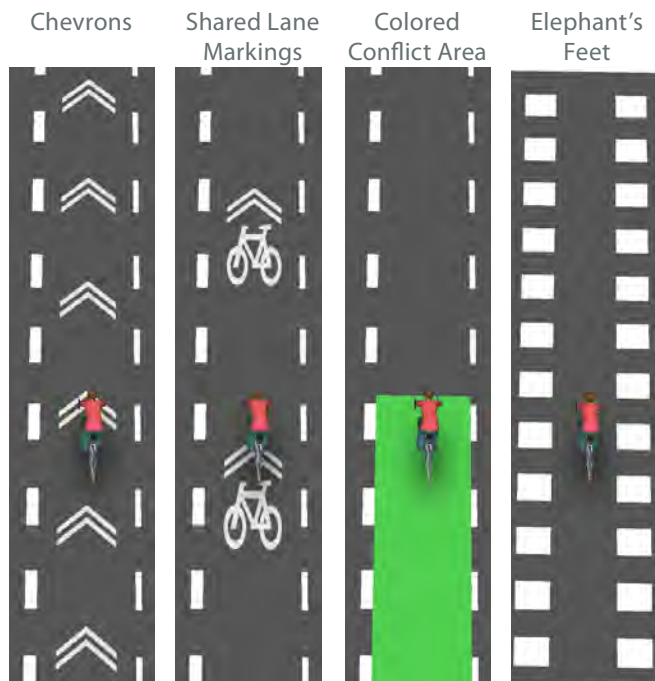
## Intersection Crossing Markings

### Description

Bicycle pavement markings through intersections indicate the intended path of bicyclists through an intersection or across a driveway or ramp. They guide bicyclists on a safe and direct path through the intersection and provide a clear boundary between the paths of through bicyclists and either through or crossing motor vehicles in the adjacent lane.

### Guidance

- See MUTCD Section 3B.08: “dotted line extensions”
- Crossing striping shall be at least six inches wide when adjacent to motor vehicle travel lanes. Dotted lines should be two-foot lines spaced two to six feet apart.
- Chevrons, shared lane markings, or colored bike lanes in conflict areas may be used to increase visibility within conflict areas or across entire intersections. Elephant’s Feet markings are common in Canada, and in use in Chicago, IL.



### Discussion

Additional markings such as chevrons, shared lane markings, or colored bike lanes in conflict areas are strategies currently in use in the United States and Canada. Cities considering the implementation of markings through intersections should standardize future designs to avoid confusion.

### Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. (3A.06). NACTO. (2012). Urban Bikeway Design Guide.

### Materials and Maintenance

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



## SIGNAGE PROGRAMS

A comprehensive system of signage ensures that information is provided regarding the safe and appropriate use of all facilities, both on-road and on multi-use paths. The bicycle network should be signed seamlessly with other alternative transportation routes, such as bicycle routes from neighboring jurisdictions, trails, historic and/or cultural walking tours, and wherever possible, local transit systems.

Signage includes post- or pole-mounted signs and pavement striping. Signage is further divided into information signs, directional/wayfinding signs, regulatory signs and warning signs. Trail signage should conform to the Manual on Uniform Traffic Control Devices and the American Association of State Highway Transportation Official Guide for the Development of Bicycle Facilities. Bicycle signage should also be coordinated with local colleges and universities.

Share the Road signs remind motorists that bicyclists have the right to ride on the roadway.



## Directional Signs

Implementing a well-planned and attractive system of signing can greatly enhance bikeway facilities by signaling their presence and location to both motorists and existing or potential bicycle users. Effective signage can encourage more bicycling by leading people to bikeways, and by creating a safe and efficient transportation option for local residents and visitors.

The signage examples to on page B-27 show a number of different signs and markings, both on poles and on the roadway. Wayfinding signs such as these improve the clarity of travel direction while illustrating that destinations are only a short ride away. The signs shown are provided only as a point of reference for the purposes of these guidelines and are not being adopted by Goldsboro.

## Regulatory/Warning Signs

Regulatory and warning bicycle signage like the examples shown on page B-25 should conform to the Manual on Uniform Traffic Control Devices (MUTCD). The signage on page B-25 are examples of regulatory signs for bicycle (their labels are sign reference numbers for the MUTCD).

## Special Purpose Signage

The “Share the Road” sign (to the left), is designed to advise motorists that bicyclists are allowed to share and have the right to cycle on narrow roadways with motor vehicles. For more on the “Share the Road Initiative” go to: [http://ncdot.org/transit/bicycle/safety/programs\\_initiatives/share.html](http://ncdot.org/transit/bicycle/safety/programs_initiatives/share.html)

Innovative signage is often developed to increase bicycle awareness and improve visibility (such as ‘Bikes Allowed Use of Full Lane’, bottom left). Special purpose signs to be installed on public roadways in North Carolina must be approved by NCDOT’s Traffic Control Devices Committee and/or the City of Goldsboro. New designs can be utilized on an experimental basis with NCDOT approval.



The “Bikes Allowed Use of Full Lane” sign is currently used on an experimental basis in several cities.



R1-1



R1-2



R3-17



R3-17a



R3-17b



R4-1



R4-2



R4-3



R4-4



R4-7



R5-1b



R5-3



R5-6



R7-9



R7-9a



R9-3c



R9-3a



R9-5



R9-6



R9-7



R10-3



R10-22



R15-1





## Bikeway Signing

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

- Direction of travel
- Location of destinations
- Travel time/distance to those destinations

These signs will increase users' comfort and accessibility to the bicycle systems.

Signage can serve both wayfinding and safety purposes including:

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

A community-wide bicycle wayfinding signage plan would identify:

- Sign locations
- Sign type – what information should be included and design features
- Destinations to be highlighted on each sign – key destinations for bicyclists
- Approximate distance and travel time to each destination

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



Sign Types



Sign Placement

### *This section includes:*

- Sign Types
- Sign Placement

## Sign Types

### Description

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

### Confirmation Signs

Indicate to bicyclists that they are on a designated bikeway. Make motorists aware of the bicycle route. This signage can include destinations and distance/time, but does not include arrows.

### Turn Signs

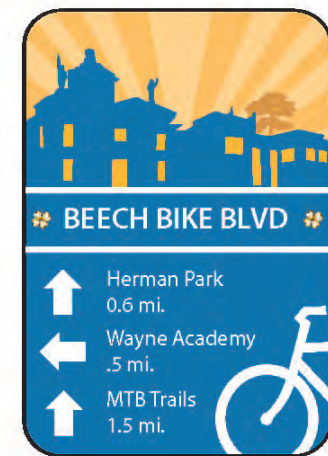
Indicate where a bikeway turns from one street onto another street. This signage can be used with pavement markings, and does include destinations and arrows.

### Decisions Signs

Mark the junction of two bikeways and informs bicyclists of the designated bike route to access key destinations. Destinations and arrows, distances and travel times are optional but recommended.

### Alternative Designs

A customized alternative design may be used to include pedestrian-oriented travel times, local town logos, and sponsorship branding.



### Discussion

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

Concept wayfinding signage package for Goldsboro, NC





## Sign Placement

### Guidance

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

### Decisions Signs

Near-side of intersections in advance of a junction with another bicycle route.

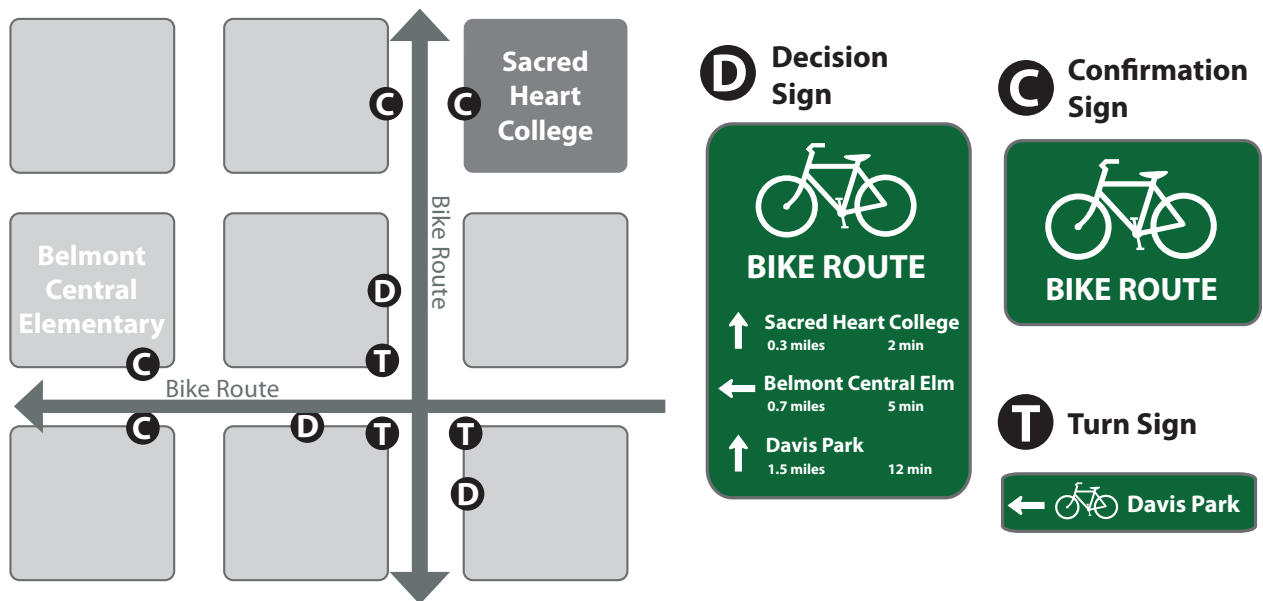
Along a route to indicate a nearby destination.

### Confirmation Signs

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

### Turn Signs

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



### Discussion

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

### Additional References and Guidelines

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

### Materials and Maintenance

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

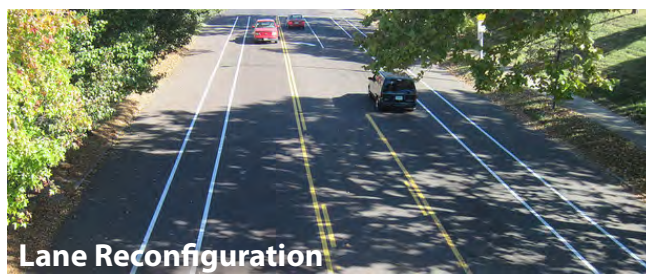
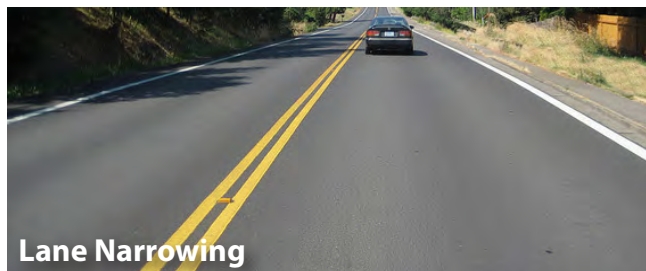
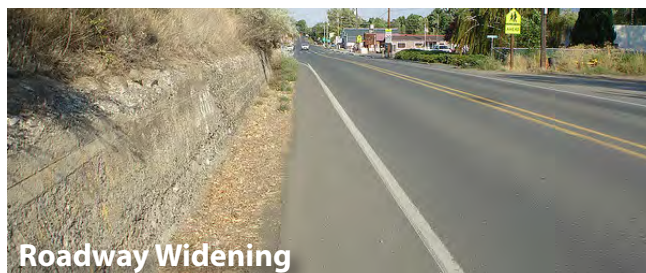
## RETROFITTING EXISTING STREETS TO ADD BIKEWAYS

Most major streets are characterized by conditions (e.g., high vehicle speeds and/or volumes) for which dedicated bike lanes are the most appropriate facility to accommodate safe and comfortable riding. Although opportunities to add bike lanes through roadway widening may exist in some locations, many major streets have physical and other constraints that would require street retrofit measures within existing curb-to-curb widths. As a result, much of the guidance provided in this section focuses on effectively reallocating existing street width through striping modifications to accommodate dedicated bike lanes.

Although largely intended for major streets, these measures may be appropriate for any roadway where bike lanes would be the best accommodation for bicyclists.

### *This section includes:*

- Roadway Widening
- Lane Narrowing
- Lane Reconfiguration
- Parking Reduction



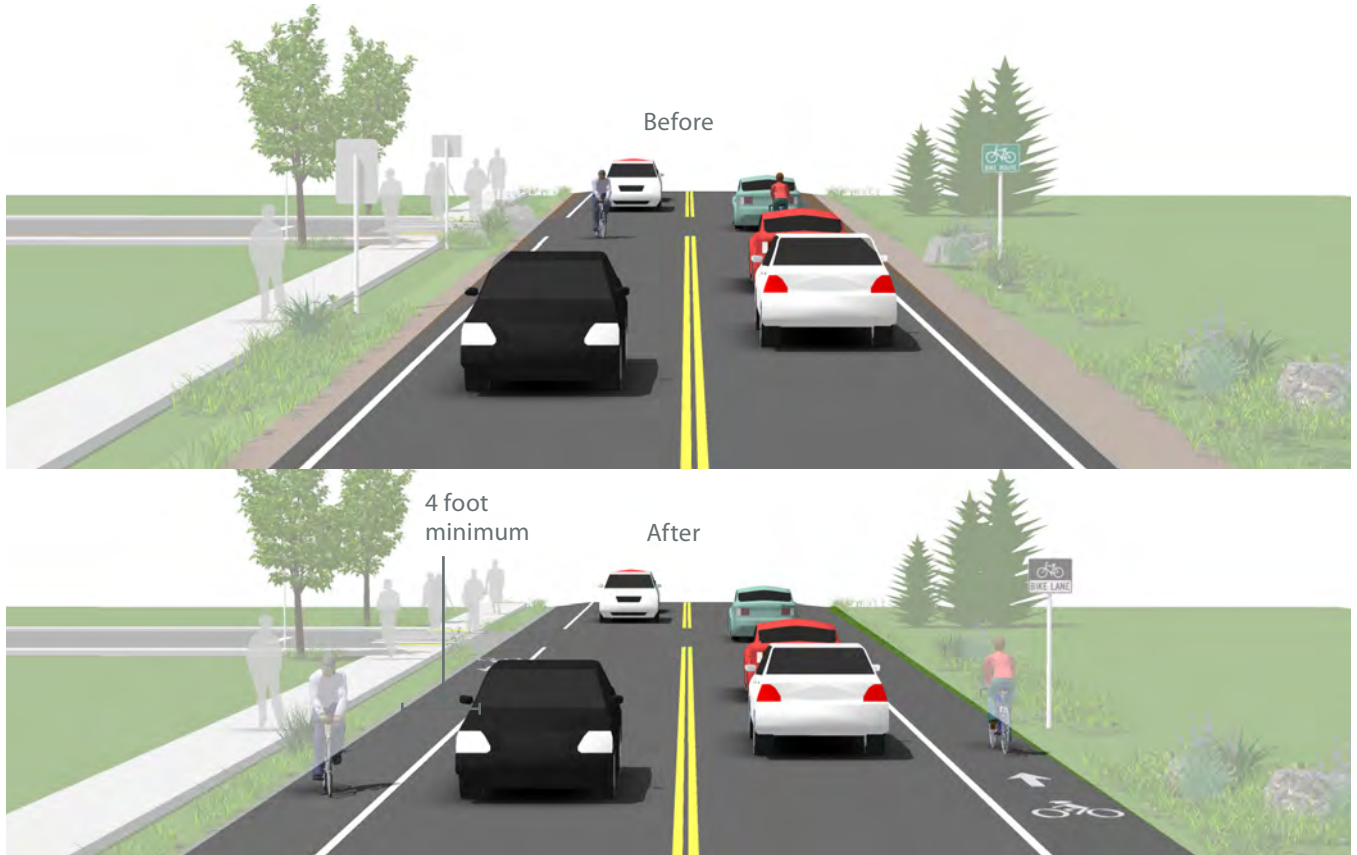
## Roadway Widening

### Description

Bike lanes can be accommodated on streets with excess right-of-way through shoulder widening. Although roadway widening incurs higher expenses compared with re-striping projects, bike lanes can be added to streets currently lacking curbs, gutters and sidewalks without the high costs of major infrastructure reconstruction.

### Guidance

- Guidance on bicycle lanes applies to this treatment.
- 4 foot minimum width when no curb and gutter is present.
- 6 foot width preferred.



### Discussion

Roadway widening is most appropriate on roads lacking curbs, gutters and sidewalks. If it is not possible to meet minimum bicycle lane dimensions, a reduced width paved shoulder can still improve conditions for bicyclists on constrained roadways. In these situations, a minimum of 3 feet of operating space should be provided.

### Additional References and Guidelines

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

### Materials and Maintenance

The extended bicycle area should not contain any rough joints where bicyclists ride. Saw or grind a clean cut at the edge of the travel lane, or feather with a fine mix in a non-ridable area of the roadway.

## Lane Narrowing

### Description

Lane narrowing utilizes roadway space that exceeds minimum standards to provide the needed space for bike lanes. Many roadways have existing travel lanes that are wider than those prescribed in local and national roadway design standards, or which are not marked. Most standards allow for the use of 11 foot and sometimes 10 foot wide travel lanes to create space for bike lanes.

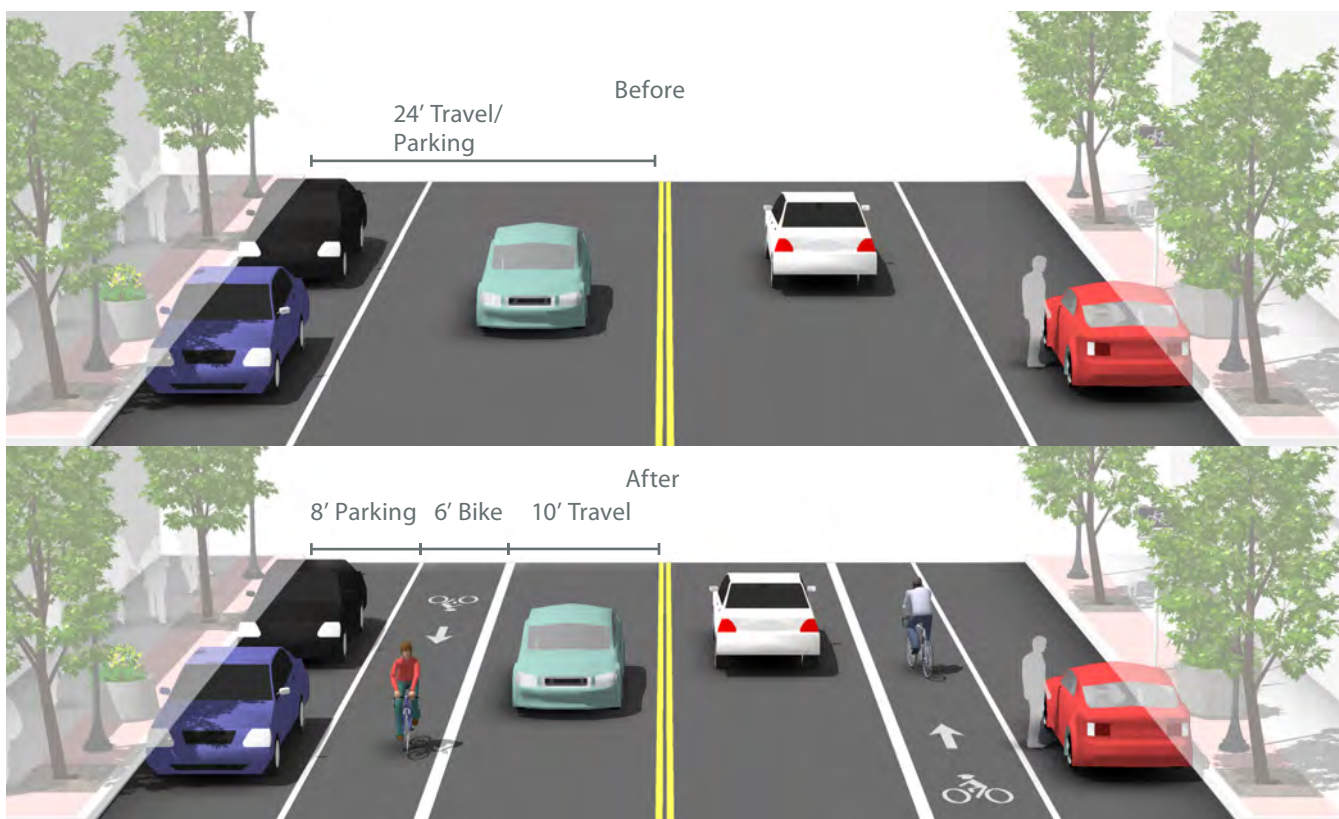
### Guidance

Vehicle lane width:

- Before: 10-15 feet
- After: 10-11 feet

Bicycle lane width:

- Guidance on Bicycle Lanes applies to this treatment.



### Discussion

Special consideration should be given to the amount of heavy vehicle traffic and horizontal curvature before the decision is made to narrow travel lanes. Center turn lanes can also be narrowed in some situations to free up pavement space for bike lanes.

AASHTO supports reduced width lanes in A Policy on Geometric Design of Highways and Streets: “On interrupted-flow operation conditions at low speeds (45 mph or less), narrow lane widths are normally adequate and have some advantages.”

### Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.

### Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement.



## Lane Reconfiguration

### Description

The removal of a single travel lane will generally provide sufficient space for bike lanes on both sides of a street. Streets with excess vehicle capacity provide opportunities for bike lane retrofit projects.

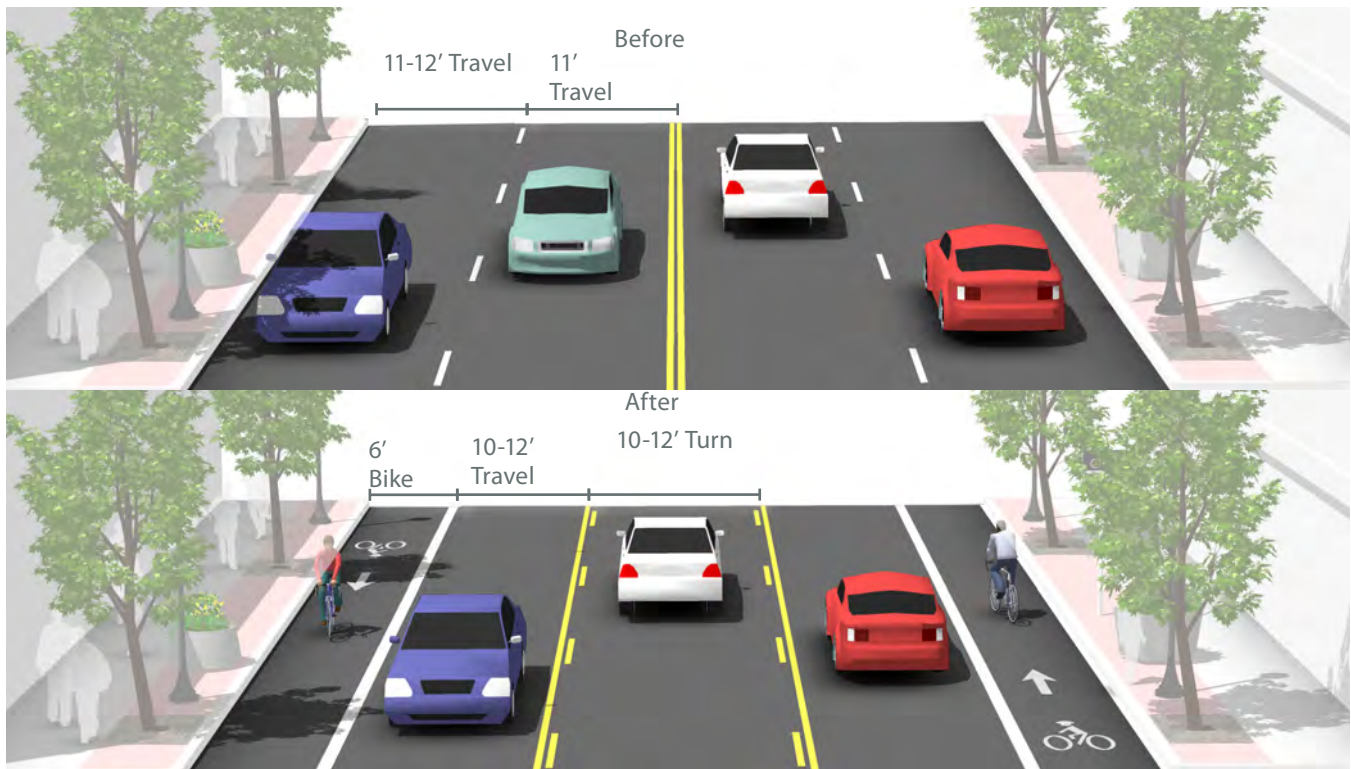
### Guidance

Vehicle lane width:

- Width depends on project. No narrowing may be needed if a lane is removed.

Bicycle lane width:

- Guidance on Bicycle Lanes applies to this treatment.



### Discussion

Depending on a street's existing configuration, traffic operations, user needs and safety concerns, various lane reduction configurations may apply. For instance, a four-lane street (with two travel lanes in each direction) could be modified to provide one travel lane in each direction, a center turn lane, and bike lanes. Prior to implementing this measure, a traffic analysis should identify potential impacts.

### Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2010). Evaluation of Lane Reduction "Road Diet" Measures on Crashes. Publication Number: FHWA-HRT-10-053

### Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement.

## Parking Reduction

### Description

Bike lanes can replace one or more on-street parking lanes on streets where excess parking exists and/or the importance of bike lanes outweighs parking needs. For example, parking may be needed on only one side of a street. Eliminating or reducing on-street parking also improves sight distance for bicyclists in bike lanes and for motorists on approaching side streets and driveways.

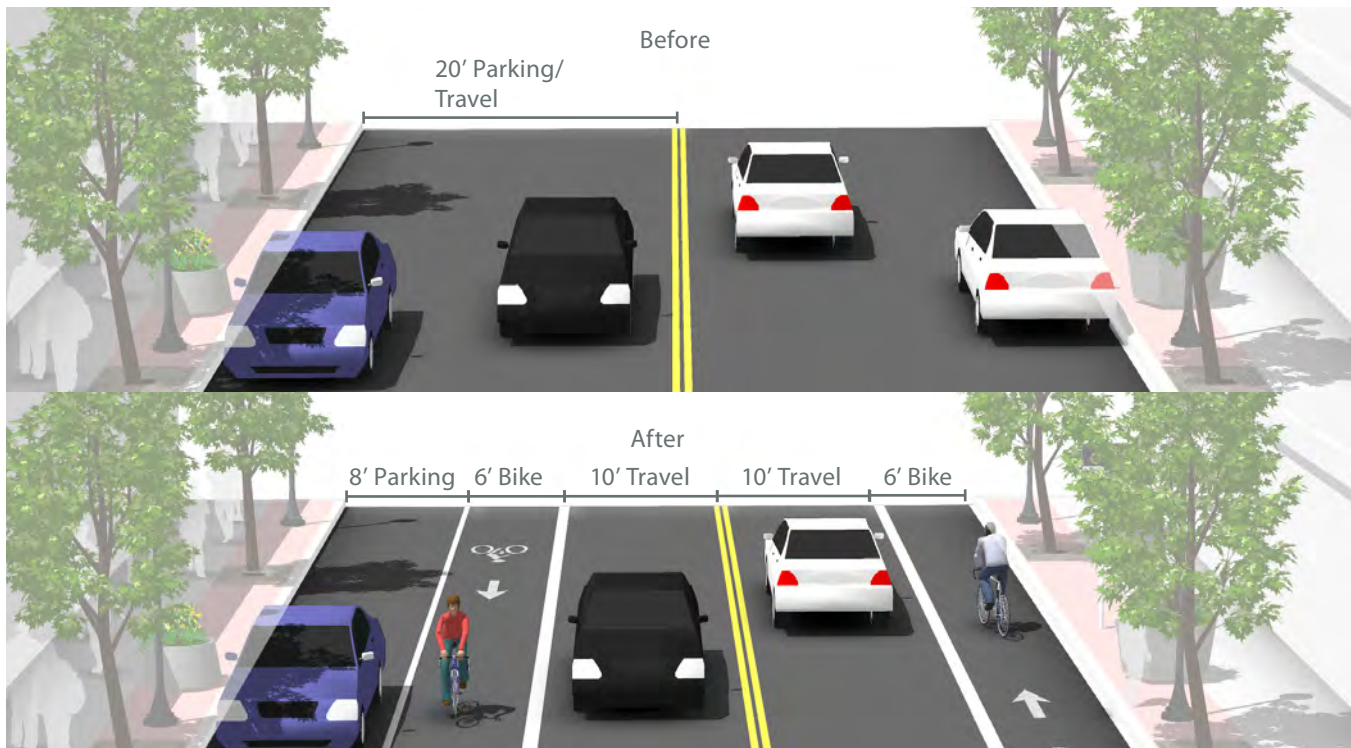
### Guidance

Vehicle lane width:

- Parking lane width depends on project. No travel lane narrowing may be required depending on the width of the parking lanes.

Bicycle lane width:

- Guidance on Bicycle Lanes applies to this treatment.



### Discussion

Removing or reducing on-street parking to install bike lanes requires comprehensive outreach to the affected businesses and residents. Prior to reallocating on-street parking for other uses, a parking study should be performed to gauge demand and to evaluate impacts to people with disabilities.

#### Additional References and Guidelines

- AASHTO. (2012). Guide for the Development of Bicycle Facilities.
- AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.

#### Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement.



## MULTI-USE PATHS AND OFF-STREET FACILITIES

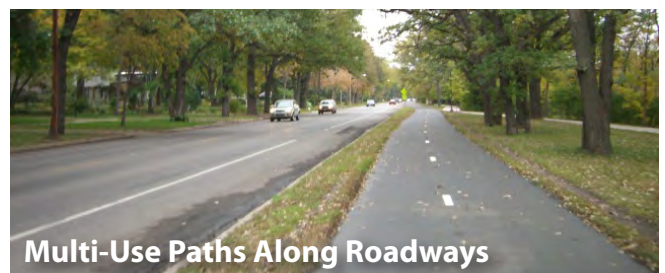
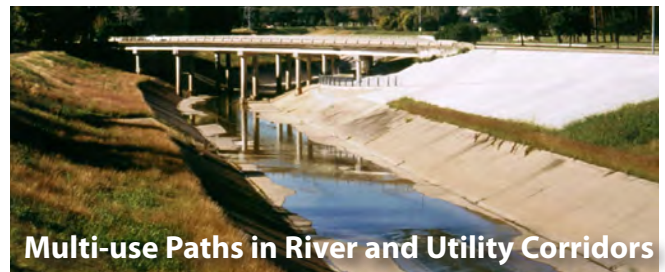
A multi-use path (also known as a greenway) allows for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where 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 paths 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
- Multi-use Paths in River and Utility Corridors
- Multi-Use Paths in Abandoned Rail Corridors
- Multi-use Paths in Active Rail Corridors
- Neighborhood Greenways
- Local Neighborhood Accessways
- Natural Surface Greenways
- Multi-Use Paths along Roadways



## General Design Practices

### Description

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.

#### Lateral Clearance

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

#### Overhead Clearance

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

#### Striping

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

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



### 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.

#### Additional References and Guidelines

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

#### 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.



## Multi-use Paths in River and Utility Corridors

### Description

Utility and waterway corridors often offer excellent greenway development and bikeway gap closure opportunities. Utility corridors typically include powerline and sewer corridors, while waterway corridors include canals, drainage ditches, rivers, and beaches. These corridors offer excellent transportation and recreation opportunities for bicyclists of all ages and skills.

### Guidance

Multi-use paths in utility corridors should meet or exceed general design practices. If additional width allows, wider paths, and landscaping are desirable.

### Access Points

Any access point to the path should be well-defined with appropriate signage designating the pathway as a bicycle facility and prohibiting motor vehicles.

### Path Closure

Public access to the path may be prohibited during the following events:

- Canal/flood control channel or other utility maintenance activities
- Inclement weather or the prediction of storm conditions



### Discussion

Similar to railroads, public access to flood control channels or canals is undesirable by all parties. Hazardous materials, deep water or swift current, steep, slippery slopes, and debris all constitute risks for public access. Appropriate fencing may be required to keep path users within the designated travel way. Creative design of fencing is encouraged to make the path facility feel welcoming to the user.

### Additional References and Guidelines

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

### 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.

## Multi-use Paths in Abandoned Rail Corridors

### Description

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

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

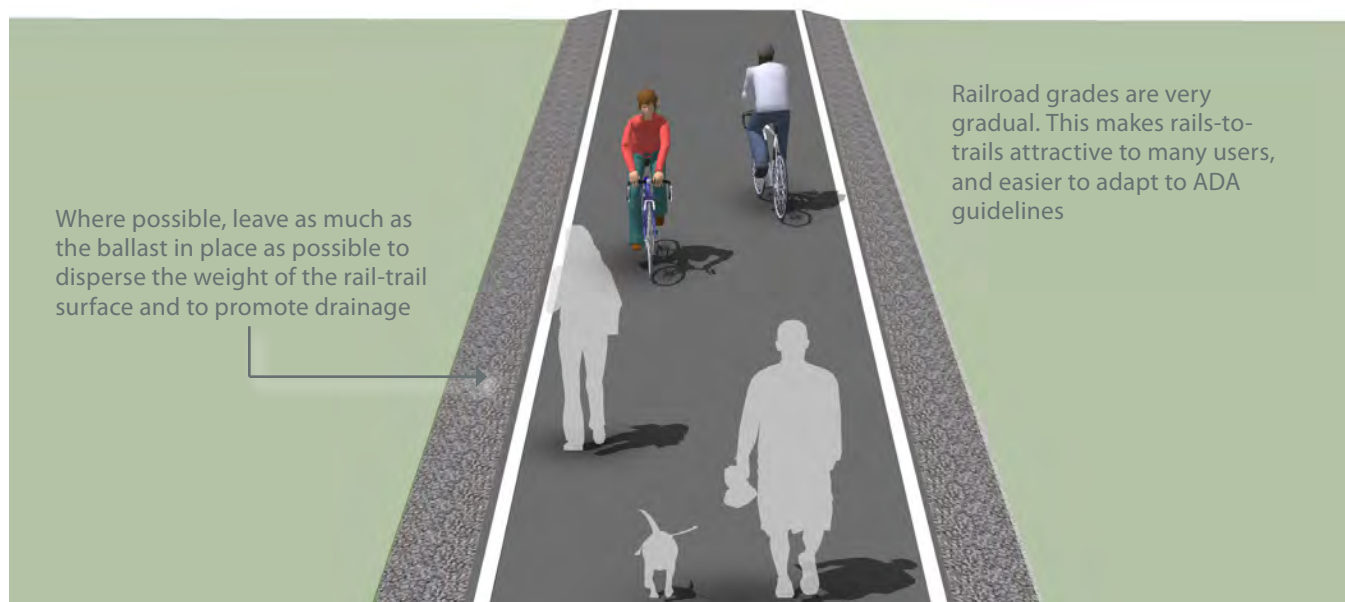
The railroad may form an agreement with any person, public or private, who would like to use the banked rail line as a trail or linear park until it is again needed for rail use. Municipalities should acquire abandoned rail rights-of-way whenever possible to preserve the opportunity for trail development.

### Guidance

Multi-use paths in abandoned rail corridors should meet or exceed general design practices. If additional width allows, wider paths, and landscaping are desirable.

In full conversions of abandoned rail corridors, the sub-base, superstructure, drainage, bridges, and crossings are already established. Design becomes a matter of working with the existing infrastructure to meet the needs of a rail-trail.

If converting a rail bed adjacent to an active rail line, see Multi-use Paths in Active Rail Corridors.



Where possible, leave as much as the ballast in place as possible to disperse the weight of the rail-trail surface and to promote drainage

Railroad grades are very gradual. This makes rails-to-trails attractive to many users, and easier to adapt to ADA guidelines

### Discussion

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

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

#### Additional References and Guidelines

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

#### 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.

## Local Neighborhood Accessways

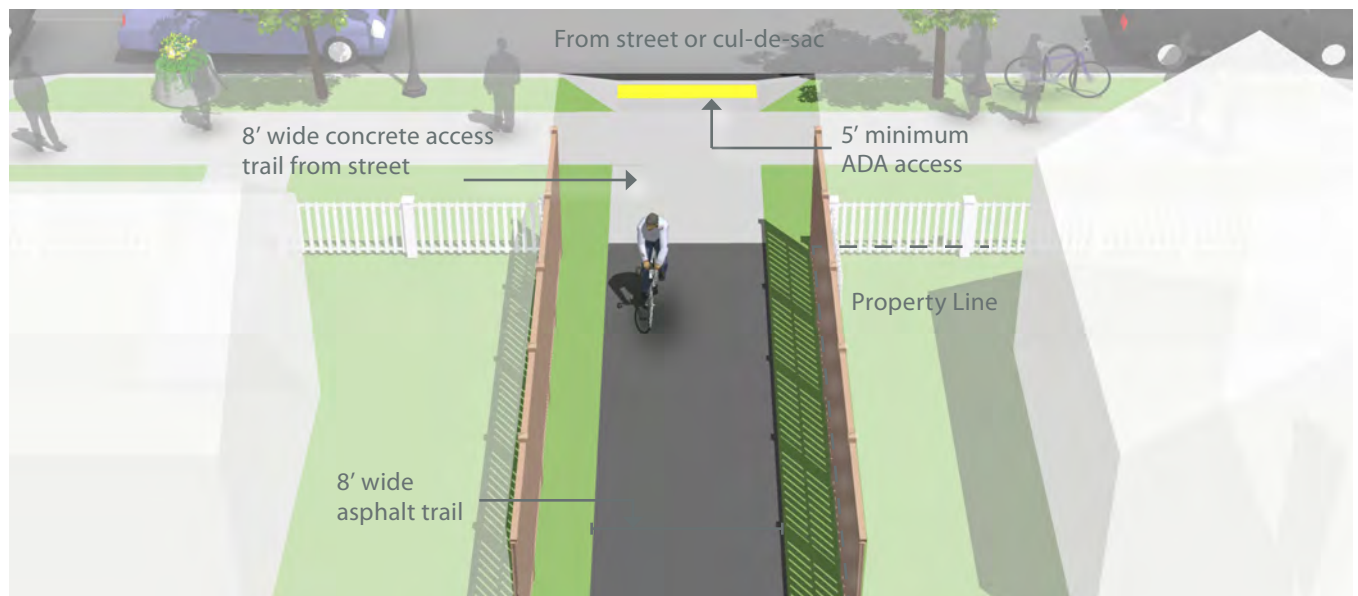
### Description

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

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

### Guidance

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



### Discussion

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

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

### Additional References and Guidelines

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

### Materials and Maintenance

Asphalt 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.

## Natural Surface Greenways

### Description

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

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

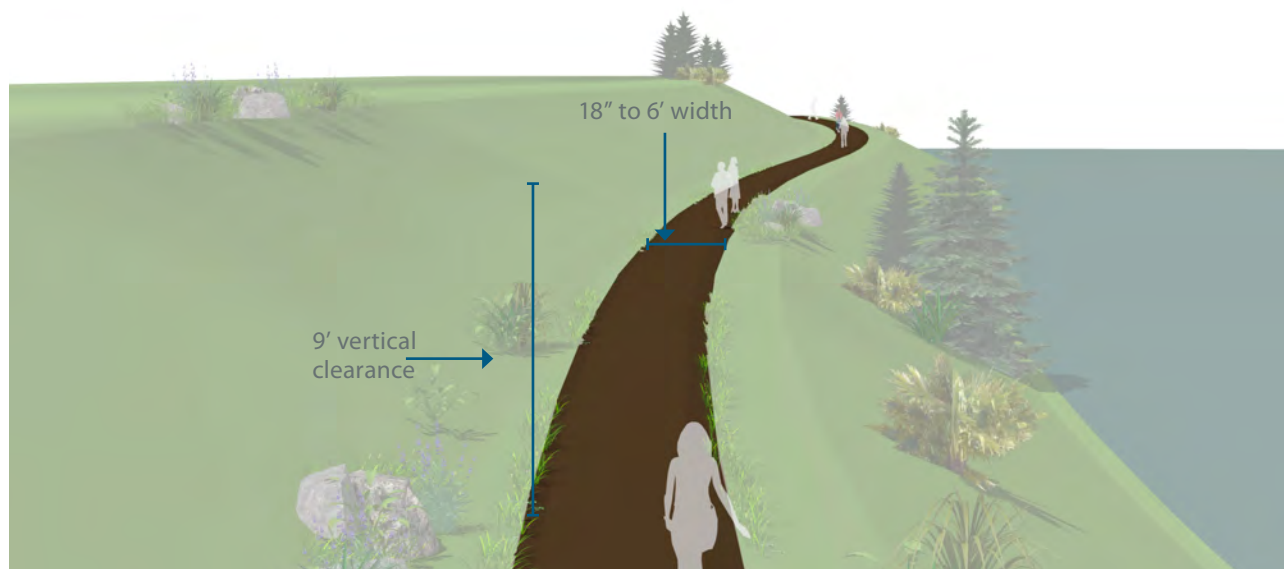
### Guidance

Trails can vary in width from 18 inches to 6 feet or greater; vertical clearance should be maintained at nine-feet above grade.

Base preparation varies from machine-worked surfaces to those worn only by usage.

Trail surface can be made of dirt, rock, soil, forest litter, or other native materials. Some trails use crushed stone (a.k.a. "crush and run") that contains about 4% fines by weight, and compacts with use.

Provide positive drainage for trail tread without extensive removal of existing vegetation; maximum slope is five percent (typical).



### Discussion

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

#### Additional References and Guidelines

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

#### Materials and Maintenance

Consider implications for accessibility when weighing options for surface treatments.



## Multi-Use Paths Along Roadways

### Description

A multi-use path 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.

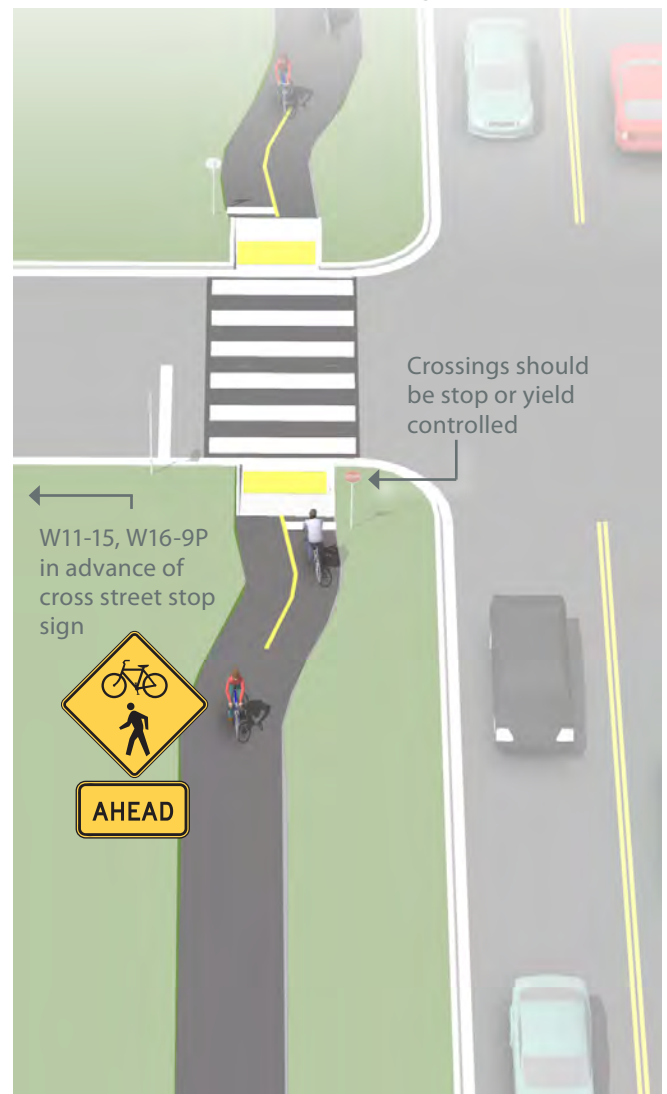
Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the path.

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of multi-use paths directly adjacent to roadways.

### Guidance

- 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 such as joggers, bicyclists, rollerbladers and pedestrians. A separate track (5' minimum) can be provided for pedestrian use.
- Bicycle lanes should be provided as an alternate (more transportation-oriented) facility whenever possible.

Pay special attention to the entrance/exit of the path as bicyclists may continue to travel on the wrong side of the street.



### 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.

#### Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. NACTO. (2012). Urban Bikeway Design Guide. See entry on Raised Cycle Tracks. NCDOT. (1994). Bicycle Facilities Planning and Design Guidelines.

#### 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.

## MULTI-USE PATH CROSSINGS

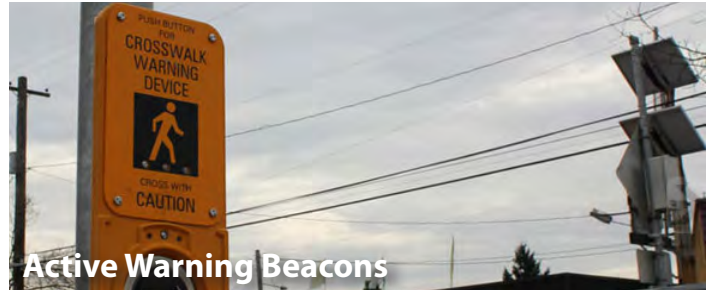
At-grade roadway crossings can create potential conflicts between path users and motorists, however, well-designed crossings can mitigate many operational issues and provide a higher degree of safety and comfort for path users. This is evidenced by the thousands of successful facilities around the United 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.



**Marked/Unsignalized Crossings**



**Active Warning Beacons**



**Route Users to Existing Signals**





## Unsignalized Marked Crossings

### Description

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

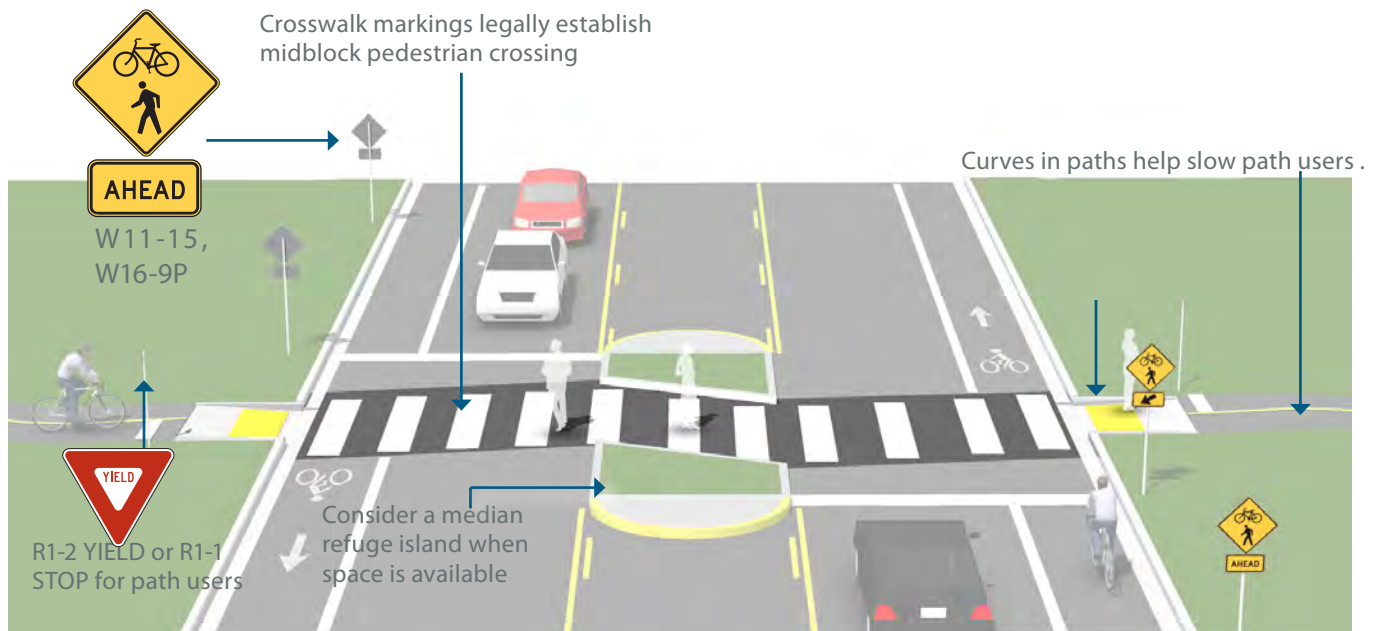
When space is available, using a median refuge island can improve user safety by providing pedestrians and bicyclists space to perform the safe crossing of one side of the street at a time.

### Guidance

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

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

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



### Discussion

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

### Additional References and Guidelines

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

### Materials and Maintenance

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

## Active Warning Beacons

### Description

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

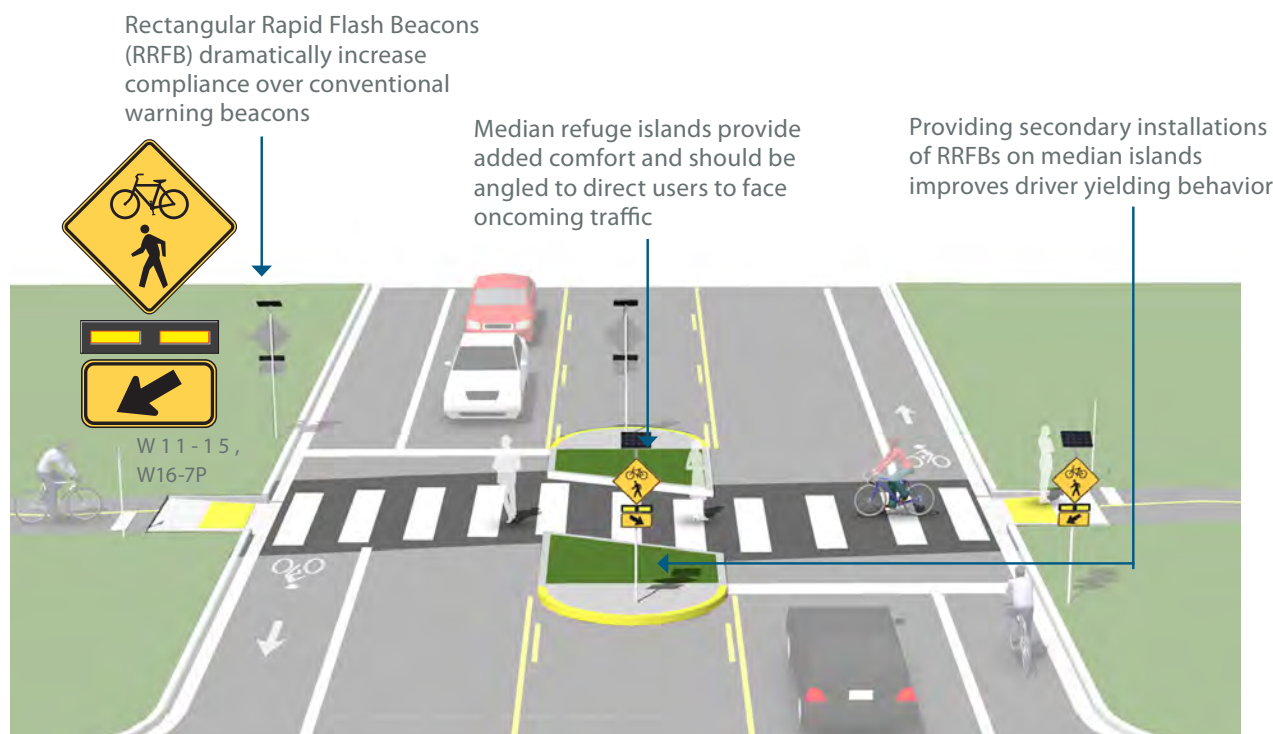
These enhancements include pathway user or sensor actuated warning beacons, Rectangular Rapid Flash Beacons (RRFB) shown below, or in-roadway warning lights.

### 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%. Additional studies of long term installations show little to no decrease in yielding behavior over time.

### Additional References and Guidelines

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.

### 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.



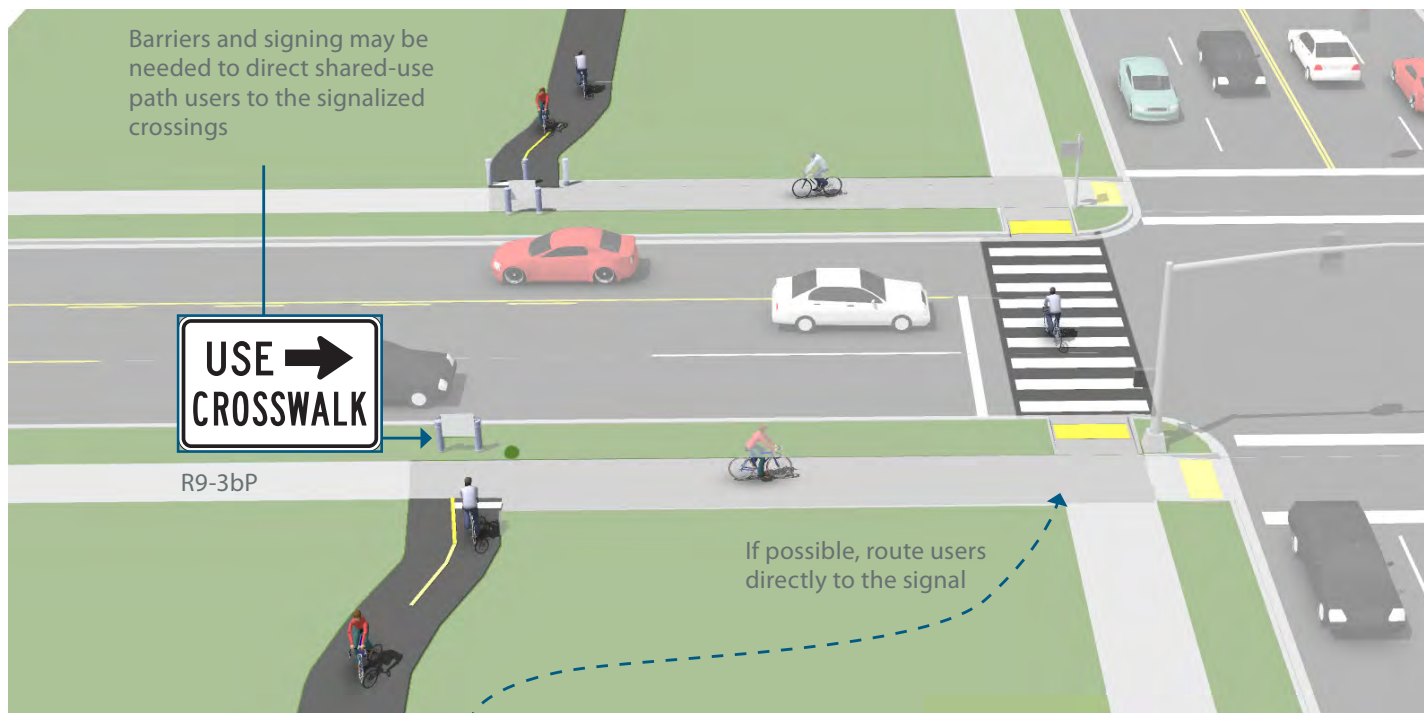
## Route Users to Signalized Crossings

### Description

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

### Guidance

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



### Discussion

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

#### Additional References and Guidelines

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

#### Materials and Maintenance

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

## BIKEWAY SUPPORT AND MAINTENANCE

### Bicycle Parking

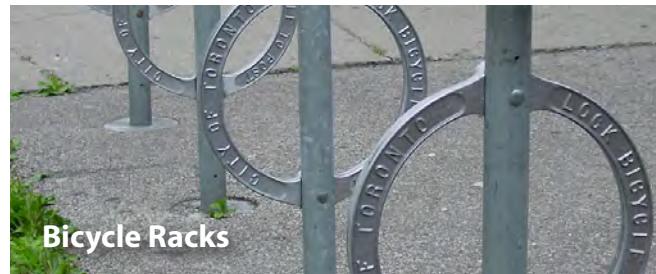
Bicyclists expect a safe, convenient place to secure their bicycle when they reach their destination. This may be short-term parking of 2 hours or less, or long-term parking for employees, students, residents, and commuters.

### Maintenance

Regular bicycle facility maintenance includes sweeping, maintaining a smooth roadway, ensuring that the gutter-to-pavement transition remains relatively flat, and installing bicycle-friendly drainage grates. Pavement overlays are a good opportunity to improve bicycle facilities.

### Recommended Bikeway Maintenance Activities

Maintenance Activity	Frequency
<b>Inspections</b>	Seasonal – at beginning and end of Summer
<b>Pavement sweeping/blowing</b>	As needed, with higher frequency in the early Spring and Fall
<b>Pavement sealing</b>	5 - 15 years
<b>Pothole repair</b>	1 week – 1 month after report
<b>Culvert and drainage grate inspection</b>	Before Winter and after major storms
<b>Pavement markings replacement</b>	As needed
<b>Signage replacement</b>	As needed
<b>Shoulder plant trimming (weeds, trees, brambles)</b>	Twice a year; middle of growing season and early Fall
<b>Tree and shrub plantings, trimming</b>	1 – 3 years
<b>Major damage response (washouts, fallen trees, flooding)</b>	As soon as possible



Bicycle Racks



Sweeping

### This Section Includes:

- Bicycle Racks
- Sweeping



## Bicycle Racks

### Description

Short-term bicycle parking is meant to accommodate visitors, customers, and others expected to depart within two hours. It should have an approved standard rack, appropriate location and placement, and weather protection. Racks should:

- Support the bicycle in at least two places, preventing it from falling over.
- Allow locking of the frame and one or both wheels with a U-lock.
- Is securely anchored to ground.
- Resists cutting, rusting and bending or deformation.

### Guidance

- 2' minimum from the curb face to avoid 'dooring.'
- Close to destinations; 50' maximum distance from main building entrance.
- Minimum clear distance of 6' should be provided between the bicycle rack and the property line.
- Locate racks in areas that cyclists are most likely to travel.



## Sweeping

### Description

Bicyclists often avoid shoulders and bike lanes filled with gravel, broken glass and other debris; they will ride in the roadway to avoid these hazards, potentially causing conflicts with motorists. Debris from the roadway should not be swept onto sidewalks (pedestrians need a clean walking surface), nor should debris be swept from the sidewalk onto the roadway. A regularly scheduled inspection and maintenance program helps ensure that roadway debris is regularly picked up or swept.



### Guidance

- Establish a seasonal sweeping schedule that prioritizes roadways with major bicycle routes.
- Sweep walkways and bikeways whenever there is an accumulation of debris on the facility.
- In curbed sections, sweepers should pick up debris; on open shoulders, debris can be swept onto gravel shoulders.
- Pave gravel driveway approaches to minimize loose gravel on paved roadway shoulders.
- Perform additional sweeping in the Spring to remove debris from the Winter.
- Perform additional sweeping in the Fall in areas where leaves accumulate.



## STANDARDS COMPLIANCE

Some of these treatments covered by these guidelines are not directly referenced in the current versions of the AASHTO Guide or the MUTCD, although many of the elements of these treatments are found within these documents. An "X" marking in the following table identifies the inclusion of a particular treatment within the national and state design guides. A "-" marking indicates a treatment may not be specifically mentioned, but is compliant assuming MUTCD compliant signs and markings are used.

In all cases, engineering judgment is recommended to ensure that the application makes sense for the context of each treatment, given the many complexities of urban streets.



	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
<b>Signed Shared Roadway</b>	X	X		X
<b>Marked Shared Roadway</b>	X	X	X	
<b>Bicycle Boulevard</b>		X	X	
<b>Shoulder Bikeway</b>	X	X		X
<b>Bicycle Lane</b>	X	X	X	X
<b>Buffered Bike Lane</b>	-	X	X	
<b>Uphill Bicycle Climbing Lane</b>	-	X	X	
<b>Cycle Tracks</b>	-	Called "one-way sidepath"	X	
<b>Bike Lanes at Right Turn Only Lanes</b>	X	X	X	X
<b>Colored Bike Lanes in Conflict Areas</b>	Interim Approval Granted	X	X	
<b>Combined Bike Lane/Turn Lane</b>	-		X	
<b>Intersection Crossing Markings</b>	X	X	X	
<b>Bicyclists at Single Lane Roundabouts</b>	-	X		
<b>Wayfinding Sign Types</b>	X	X	X	X
<b>Wayfinding Sign Placement</b>	X	X	X	X
<b>Multi-use Paths/Greenways</b>	X	X		X
<b>Shared Use Paths along Roadways</b>	X	Discouraged		Discouraged



# Appendix B: Public Involvement

## Appendix Contents:

*Overview*

*Steering Committee Meetings*

*Stakeholder Interviews/  
Community Meetings*

*Public Outreach Events*

*Project Resources*

*Public Comment Form Responses*

## OVERVIEW

Public engagement involved numerous components to spread awareness of the Goldsboro Bicycle, Pedestrian, and Greenway Plan and to ensure a variety of local perspectives containing essential insight were appropriately incorporated into the plan. Various mediums and resources were constructed so that all members of Goldsboro, Walnut Creek, Pikeville, Wayne County, and the surrounding areas had the opportunity to participate. Some people prefer or only have the resources to communicate in person, in writing, and/or electronically. Special effort was made to reach out to underserved populations. The public engagement component included the following:

1. Steering Committee Meetings (4)
2. Stakeholder Interviews/Community Meetings (16)
3. Public Input Events (7)
4. Project Information Resources (Website, Comment Forms, Etc.)

## STEERING COMMITTEE MEETINGS

The Project Steering Committee for the plan consisted of a mixture of representatives from state/local/county government, health/wellness groups, and also included representatives from Duke Energy, Wayne Memorial Hospital, and local businesses. The Project Steering Committee was involved throughout the process and met four times with project consultants from Alta/Greenways and Sage Design, focusing on project vision and goals (February 2014), existing conditions (May 2014), the draft plan (July 2014), and the final plan (September

*May 2014 Steering Committee Meeting*





2014). During the February 2014 meeting, the consultant gave a presentation on the planning process while the group established a mission statement and goals for the plan. In both February and May 2014 meetings, members of the Steering Committee worked with the consultant team to mark up local and regional maps to identify gaps in the current network and high priority areas. The final two meetings involved making revisions and addenda to the plan document. Input from the Steering Committee is reflected throughout the recommendations of this plan.

## STAKEHOLDER INTERVIEWS/COMMUNITY MEETINGS

The Project Consultant met with multiple stakeholders throughout the information-gathering portion of the planning process. Stakeholders provided valuable input towards the development of the Plan. Stakeholders included Wayne Community College, Goldsboro YMCA, City of Goldsboro Engineering, City of Goldsboro Parks & Recreation, City of Goldsboro Public Works, Chamber of Commerce, Duke Energy, Wayne County Schools, Downtown Goldsboro Development Corporation, business leaders, Town of Pikeville, Village of Walnut Creek, Goldsboro Housing Authority, and GOWAYNEGO. For meeting minutes, please see the end of this appendix.

## PUBLIC OUTREACH EVENTS

The Project Consultant attended multiple events in order to reach more Goldsboro area residents. These are described below.

### Pig in the Park Festival

Project consultants set up an informational booth at the Pig in the Park Festival on Saturday April 12, 2014. People were invited to learn about the plan and provide input via a public comment form about where they would like to see improvements for bicycling and walking. A public input map, information cards, and posters were provided for review and two project consultants answered questions and took comments. More than 50 people stopped by to learn about the plan and directly provide input. Nearly 60 comment forms were completed. The general feedback was highly positive, with many people interested in seeing Goldsboro become a more bike and pedestrian-friendly community.

*Pig in the Park Project Information Booth and Bicycle Photo Booth*





## Project Launch

The project team, alongside the Metropolitan Transportation Plan (MTP) Update Team, held a standalone workshop at the Boys & Girls Club on April 17, 2014. Project consultants had several stations for participants including project information boards, public input maps, and comment forms. A rolling video that described the planning process ran in the background as well. In addition, the team collected input from employees and visitors of the Boys & Girls Club. About a dozen citizens came to the event to provide input.



*Project Launch  
at the Boys &  
Girls Club*





*Goldsboro YMCA Project Information Booth*



*Center Street Jam Information Booth*

### **YMCA/Health Clinic**

Project consultants set up an informational booth at the YMCA entrance on June 12, 2014 from 1-4pm. Bicycle World, a local Goldsboro business, provided water bottles to hand out for those who completed comment forms. People stopped by to provide input on the regional map and completed over 50 comment forms. Generally, people were enthusiastic about providing more walking and bicycling options in the community.

### **Center Street Jam**

Project consultants set up an informational booth at the Center Street Jam on June 12, 2014 from 6-8pm. Bicycle World, a local Goldsboro business, provided water bottles to hand out for those who completed comment forms. Dozens of people stopped by to provide input on the regional map and completed over 40 comment forms. Many had walked or bicycled to the event and a common concern of citizens was having a safe place to walk and bicycle in Goldsboro.



### Summerfest (Fairview Park)

Project consultants set up an informational booth at the Summerfest event on June 21, 2014 during the afternoon. The Team chose this event located in the Fairview public housing area in an effort to reach more underserved populations. A public input map and hardcopy comment forms were provided. Dozens of people stopped by the booth to provide comments and ideas for making Goldsboro safer for walking and bicycling.

*Input at  
Summerfest*



### Cruise the Neuse

Project consultants joined the completion of the Cruise the Neuse event on June 21, 2014 during the morning. This was an opportunity to communicate our planning process and receive input. A couple dozen completed comment forms at this event.

### NCDOT Division 4 Meeting

In June 2014, City of Goldsboro staff and project consultants met with NCDOT Division 4 representatives to discuss project goals, planning process, and preliminary bicycle network recommendations. The primary goal was to determine opportunity for implementation of recommendations during scheduled roadway resurfacing projects. Each project located on NCDOT-owned roadways were reviewed and implementation strategies were discussed.

### Draft Plan Input Session

Upon completion of the Draft Plan, the project team held an event to present key recommendations. Participants were invited to respond to the network map recommendations.



## PROJECT RESOURCES

A number of resources were developed to enhance project awareness and participation. These tools also played a significant role in ensuring all members of the general public would have the opportunity to participate.

### Wayne Goldsboro Television

The project team was interviewed on a local government channel in April 2014. The team discussed the project and planning process and announced the importance of receiving public input. The Plan Launch event and Pig in the Park event were announced.

### Project Website

A project website was developed to provide further project information, maps, contact information, and additional resources. The website also featured a link to the online public comment form page, offering an additional medium for the Goldsboro community to become engaged and participate in the planning process. The website also featured an interactive map that allowed participants to place points at locations of bicycle and pedestrian need. A companion website in Spanish was provided as well.

Project Website:

[goldsborogreenway.weebly.com/](http://goldsborogreenway.weebly.com/)



**GOLDSBORO BICYCLE, PEDESTRIAN, AND GREENWAY PLAN COMMENT FORM**  
 Please take a few moments to fill out this short questionnaire. Your response will help build a better understanding of community needs and priorities. For more information go to: [www.goldsborogreenway.weebly.com/](http://www.goldsborogreenway.weebly.com/)

1. Where do you live?  
 City of Goldsboro | Town of Pikeville | Village of Walnut Creek | Wayne County

2. How do you rate present bicycling conditions in greater Goldsboro?  
 Excellent | Fair | Poor

3. How important to you is improving bicycling conditions in greater Goldsboro?  
 Very important | Somewhat important | Not important

4. When you ride your bicycle in greater Goldsboro, what is the primary purpose of your trip? (circle all that apply)  
 Transportation | Recreation | Exercise | To enjoy nature | Socialize | I do not bike  
 Other: \_\_\_\_\_

5. Where do you ride your bicycle?  
 Off-road (greenway path) | On-road | Both

6. How do you rate present walking conditions in greater Goldsboro?  
 Excellent | Fair | Poor

7. How important to you is improving walking conditions in greater Goldsboro?  
 Very Important | Somewhat Important | Not Important

8. When you walk in greater Goldsboro, what is the primary purpose of your trip? (circle all that apply)  
 Transportation | Recreation | Exercise | To enjoy nature | Walk the dog | Socialize | I do not walk  
 Other: \_\_\_\_\_

9. How often do you leave the Goldsboro area to use other trails (such as those in Clayton, Smithfield, and Raleigh)?  
 Never  
 Daily  
 Weekly  
 Monthly  
 Annually (once a year)

### Public Comment Form

A comment form was developed and was made available in both hard copy and online formats. The comment form was available online throughout the duration of the project. To maximize responses to the online form, the web address was distributed at public meetings, advertised in press releases, sent out to local interest groups, posted on Facebook pages, and included on project information cards that were distributed around town. 514 residents completed the comment form. In addition, a comment form was provided in Spanish with one resident completing it.

Combined results of the comment form (both English and Spanish versions) were collected and tabulated by the Consultant to provide insight into local residents' values and opinions about the project. The form can be seen later in this Appendix and the results are included in this Appendix as well.

### Facebook

Project information with a link to the project website and online comment form was posted on multiple area Facebook pages including the following:

- » City of Goldsboro
- » City of Goldsboro Parks and Recreation
- » Arts Council of Wayne County
- » Goldsboro News-Argus
- » Downtown Goldsboro
- » Goldsboro High School
- » Goldsboro Daily News
- » Goldsboro Disc Golf Club
- » United Way of Wayne County
- » Relay for Life of Wayne County
- » Wayne County Humane Society

**Goldsboro MPO - Plan de Bicicletas, Peatones y Caminos Verdes**

Gracias por su interés en el Plan de Bicicletas, Peatones y Caminos Verdes para el MPO de Goldsboro! A través de este plan, esperamos incrementar la seguridad de peatones y ciclistas, tener un mejor acceso a los destinos de la comunidad, y crear oportunidades para estilos de vida activos y saludables. Los temas de esta encuesta incluyen:

- El estado actual de su actividad como peatón o ciclista
- Barreras que le impiden al andar a pie o en bicicleta en su comunidad
- Puntos de oportunidad
- Prioridades para futuras mejoras
- Comentarios generales

Por favor tómese unos minutos para llenar este breve cuestionario. Su respuesta nos ayudará a comprender mejor las necesidades y prioridades de la comunidad. Incluye su edad, su nivel de bicicleta o caminar con regularidad, sus comentarios serán útiles. Todas las respuestas serán anónimas. Haga clic en "Siguiente" para comenzar. Gracias por su tiempo!

\*Nota: Para la mayoría de las preguntas, "Goldsboro" se utiliza para referirse a la subzona geográfica del MPO de Goldsboro, el cual incluye porciones del Condado de Wayne, la Ciudad de Pikeville, y pueblos del Walnut Creek.

1. ¿Dónde vives?  
 La ciudad de Goldsboro  
 El pueblo de Pikeville  
 El pueblo de Walnut Creek  
 El condado de Wayne

Project Comment Forms in English and Spanish

### Project Information Cards

The information card shown on the following page was designed to spread awareness of the project as well as to direct interested citizens to the website and to project contacts for further information. By providing the general public with access to different avenues of public input, these public engagement components provided a variety of opportunities for the voices of the Goldsboro community to be heard. A project information card was also distributed in Spanish.

Project Information Cards in English and Spanish

**GOLDSBORO BICYCLE PEDESTRIAN & GREENWAY PLAN**

How can Goldsboro and nearby communities become safer and more enjoyable for walking and bicycling? Please share your ideas at: [www.GoldsboroGreenway.weebly.com](http://www.GoldsboroGreenway.weebly.com)

**GOLDSBORO PLAN DE BICICLETAS, PEATONES Y CAMINOS VERDES**

¿Cómo cree usted que Goldsboro y las comunidades cercanas podrían ser más seguras y más agradables para caminar y andar en bicicleta? Por favor comparta sus ideas en: [www.GoldsboroGreenway.weebly.com/en-espanoldeol.html](http://www.GoldsboroGreenway.weebly.com/en-espanoldeol.html)



## Public Housing Authority Newsletter

Information about the project and how residents and provide their input was included in the Spring 2014 public housing newsletter. The newsletter was distributed to all residents of public housing areas in Goldsboro.

## Latino Community Leaders

Community leaders Gabriel and Alejandra Tinajero, owners of El Mercado on Parkway Drive, assisted in engaging the Spanish-speaking populations of the Goldsboro area. Comment forms and information cards in Spanish were delivered to El Mercado store in June 2014 with xx people in the Hispanic community contributing.

## Draft Plan Information Boards

A series of project information boards were created to showcase and invite feedback on the draft plan. These boards presented existing bicycle and pedestrian conditions in the Goldsboro region, visions/goals, types of bicycle and pedestrian facilities, benefits of greenways, and project recommendations. The boards were displayed at committee meetings and local events. Feedback received on the boards was incorporated into the final plan.

**PROJECT GOALS / BENEFITS of WALKABLE & BIKE-FRIENDLY COMMUNITIES**

**ENVIRONMENTAL BENEFITS**

- "Integrate land use and transportation policies to limit impacts to sensitive land, focus development in prime locations, encourage trips by modes other than personal automobiles, and enhance the region's quality of life." - Goldsboro Language Transportation Plan, p. 2-13
- Sidewalks, bike lanes, paths, and greenway trails help to reduce vehicle emissions, fuel consumption, and congestion.
- The natural buffer zones that occur along greenways protect streams, rivers, and lakes, preventing soil erosion and filtering pollution caused by agricultural and roadway runoff.
- Reduce 2 miles of driving with walking or biking a 365 days a year.
  - 730 lbs of carbon dioxide prevented from contributing to global warming.

**ECONOMIC BENEFITS**

- Increases residential property values by \$64 Million across the state.
- Property values are higher by \$4,000 to \$34,000 in walkable areas.
- An initial investment of \$6.7M in walking and bicycling facilities has generated \$60M in annual bicycle-related tourism revenue in the Outer Banks.
- Businesses, residents, and visitors consider quality of life factors like walkability and bikability when choosing locations to settle. Goldsboro needs to better position itself to take advantage of this economic opportunity.
- Increases water spending by \$68 Million annually.
- Reduces health care costs by \$76 Million annually.
- Generates \$174 Million for the state economy.
- 200 Miles of Greenway
- 100 Jobs
- 25,000 more people
- 80% Walk/Bike Tourism

**HEALTH BENEFITS**

- Walking and bicycling facilities promote an active, healthy lifestyle.
- Sixty-five percent of adults in North Carolina are either overweight or obese. The state is also ranked 5th worst in the nation for childhood obesity.
- Seventy percent of North Carolinians said they would walk or bike more if connected with a safe bicycle and pedestrian network.
- A Charlotte, NC, study found that residents who switched to walking to and using light rail for their commute weighed an average of 6.5 pounds less than those who continued to drive to work.

**SAFETY BENEFITS**

- Walking and bicycling infrastructure improvements and safety:

  - Install sidewalk along roadway: 85% pedestrian crash reduction
  - Install refuge islands: 56% pedestrian crash reduction
  - Convert unsignalized intersection to roundabout: 2.7% pedestrian crash reduction
  - Install countdown signals: 2.5% pedestrian crash reduction
  - Provide protected bicycle lanes: 36-40% bicyclist crash reduction

**MOBILITY BENEFITS**

- Walking and Bicycling facilities provide efficient commuting options.
- Seventeen percent of occupied households in Goldsboro do not have access to a vehicle.
- If bicycling and walking accommodations were improved, more than 70% of North Carolinians said they would walk and bike more for their daily needs.
- Walking and biking infrastructure is among the most cost-effective forms of transportation investment.

**SAFETY BY THE NUMBERS:**

**188** Number of known crashes involving a pedestrian or a bicyclist in Goldsboro between 2007-2011

**#1** The #1 goal of the Wayne County Health Department is to reduce the burden of chronic disease among County residents.

Project Information Board



## TYPES OF BICYCLISTS

It is important to consider bicyclists of all skill levels when creating a non-motorized plan or project. Bicyclist skill level greatly influences expected speeds and behavior, both in separated bikeways and on shared roadways. Bicycle infrastructure should accommodate as many user types as possible, with decisions for separate or parallel facilities based on providing a comfortable experience for the greatest number of people. A framework for understanding the characteristics, attitudes, and infrastructure preferences of different bicyclists in the US population as a whole is illustrated below.



**HIGHLY EXPERIENCED** (approximately 1% of population)  
 Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections – even if shared with vehicles – over separate bicycle facilities such as shared use paths.



**ENTHUSED AND CONFIDENT** (approximately 5-10% of population)  
 This user group encompasses bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or multi-use paths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreationalists, racers and utilitarian bicyclists.



**INTERESTED BUT CONCERNED** (approximately 60% of population)  
 This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or multi-use trails under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These people may become "Enthusied & Confident" with encouragement, education and experience.



**NO WAY, NO HOW** (approximately 30% of population)  
 Persons in this category are not bicyclists, and perceive severe safety issues with riding in traffic. Some people in this group may eventually become more regular cyclists with time and education. A significant portion of these people will not ride a bicycle under any circumstances.

Source: Four Types of Cyclists. (2009). Roger Geller, City of Portland Bureau of Transportation. Supported by data collected nationally since 2005.

**WHICH TYPE OF BICYCLIST ARE YOU?**

**WHICH TYPE SHOULD THE CITY AND MPO PLAN FOR?**

WHICH TYPE OF BICYCLIST ARE YOU?	WHICH TYPE SHOULD THE CITY AND MPO PLAN FOR?

Project Information Boards

## PROJECT OVERVIEW

### KEY INPUTS FOR PLAN DEVELOPMENT:



### PROJECT TIMELINE:

- Project Kick-Off  
February 2014
- Public Workshop #1  
April 2014
- Draft Plan  
Spring/Summer 2014
- Public Workshop #2  
Summer/Fall 2014
- Final Plan  
Winter 2014

### DRAFT VISION STATEMENT:

Goldsboro is an attractive regional destination where a convenient network of sidewalks, bikeways, and greenways:

- » Brings people of all ages and abilities together;
- » Safely connects them to where they want to go;
- » Promotes an active lifestyle and good health;
- » Highlights the local history, culture, and environment; and
- » Drives the local economy by drawing residents, visitors, and businesses to the area.

*What do you think? Changes? Additions?*

This Vision Statement combines input from the project Steering Committee and Stakeholders, outlining the overall vision for the outcomes of this plan:

## WALKING & BICYCLING TOOLBOX

### CYCLE TRACKS



### BICYCLE LANES/BUFFERED BICYCLE LANES



### SHARED LANE MARKINGS (SHARROWS)



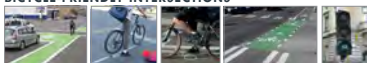
### PAVED SHOULDERS



### BICYCLE BOULEVARDS



### BICYCLE-FRIENDLY INTERSECTIONS



### MULTI-USE PATHS AND BOARDWALK



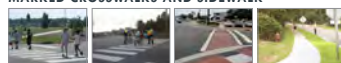
### MULTI-USE SIDE PATHS



### RAISED MEDIANS/CROSSING ISLANDS



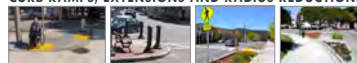
### MARKED CROSSWALKS AND SIDEWALK



### PEDESTRIAN-ACTIVATED SIGNALS AND CROSSINGS



### CURB RAMPS, EXTENSIONS AND RADIUS REDUCTIONS

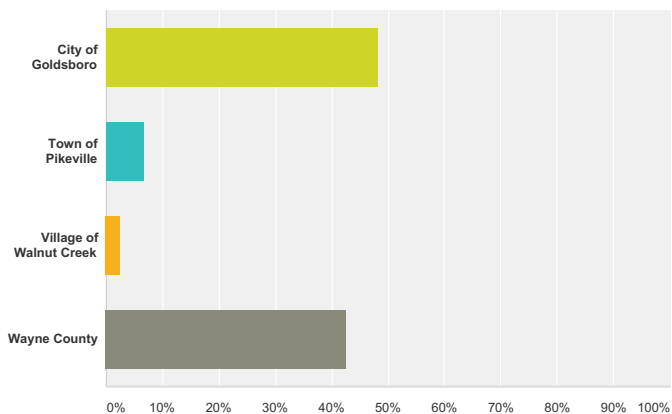




## PUBLIC COMMENT FORM RESPONSES

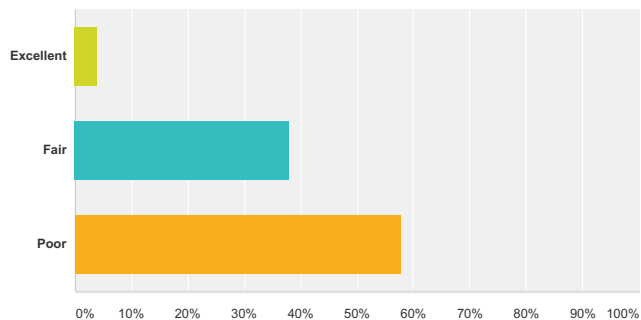
### Q1 Where do you live?

Answered: 475 Skipped: 39



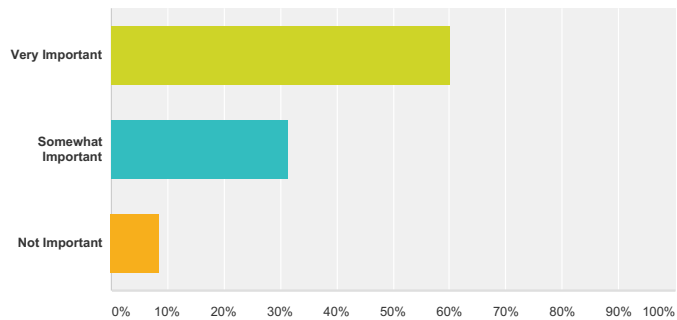
### Q2 How do you rate present bicycling conditions in greater Goldsboro?

Answered: 473 Skipped: 41



### Q3 How important to you is improving bicycling conditions in Greater Goldsboro?

Answered: 482 Skipped: 32

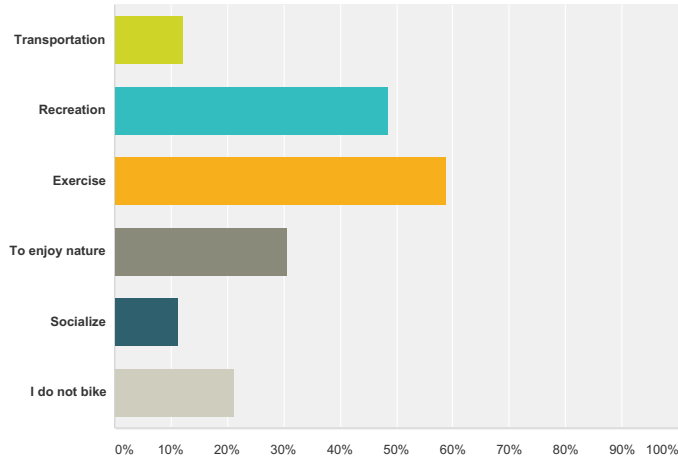






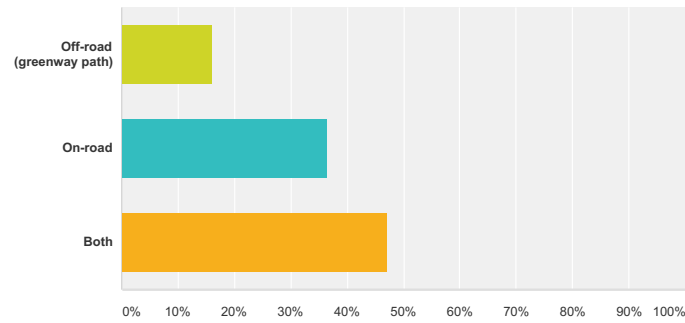
**Q4 When you ride your bicycle in greater Goldsboro, what is the primary purpose of your trip? (check all that apply)**

Answered: 476 Skipped: 38



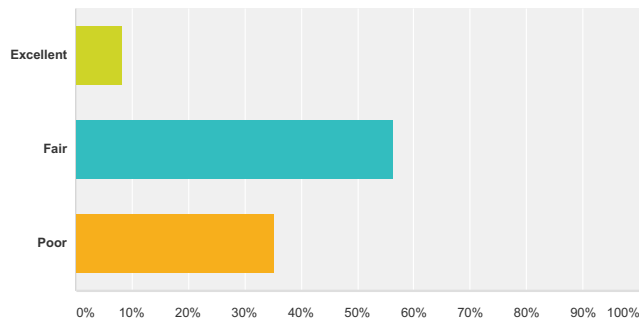
**Q5 Where do you ride your bicycle?**

Answered: 404 Skipped: 110



**Q6 How do you rate present walking conditions in greater Goldsboro?**

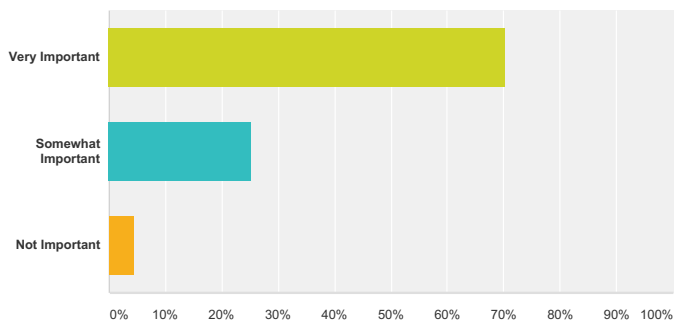
Answered: 479 Skipped: 35





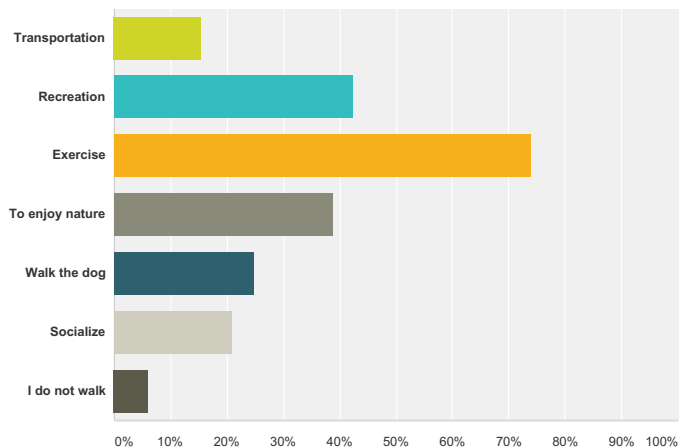
### Q7 How important is improving walking conditions in greater Goldsboro?

Answered: 479 Skipped: 35



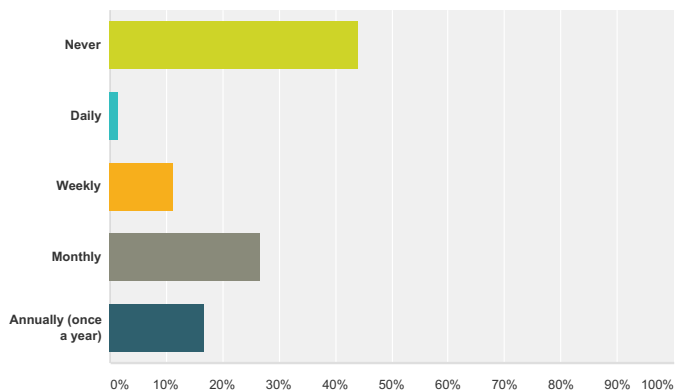
### Q8 When you walk in greater Goldsboro, what is the primary purpose of your trip? (check all that apply)

Answered: 477 Skipped: 37



### Q9 How often do you leave the Goldsboro area to use other trails (such as those in Clayton, Smithfield, and Raleigh)?

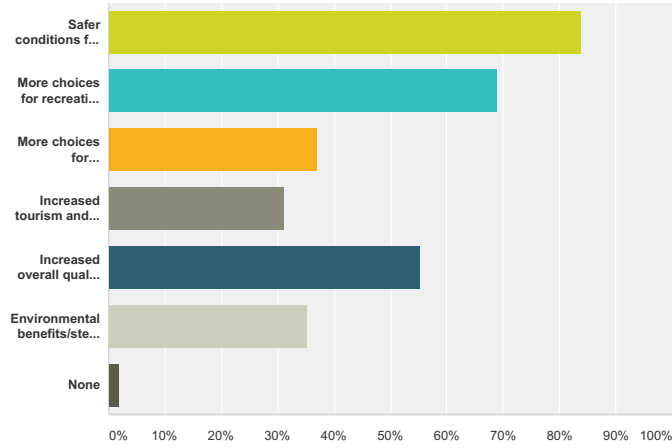
Answered: 480 Skipped: 34





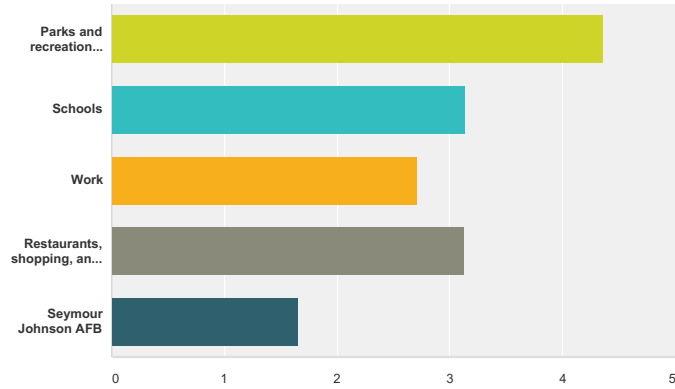
**Q10 What should be the most important goals and outcomes of this plan? (check all the apply)**

Answered: 468 Skipped: 46



**Q11 What destinations would you most like to be able to reach by bicycling or walking? Please rank (1 = most like to reach, 5 = least like to reach)**

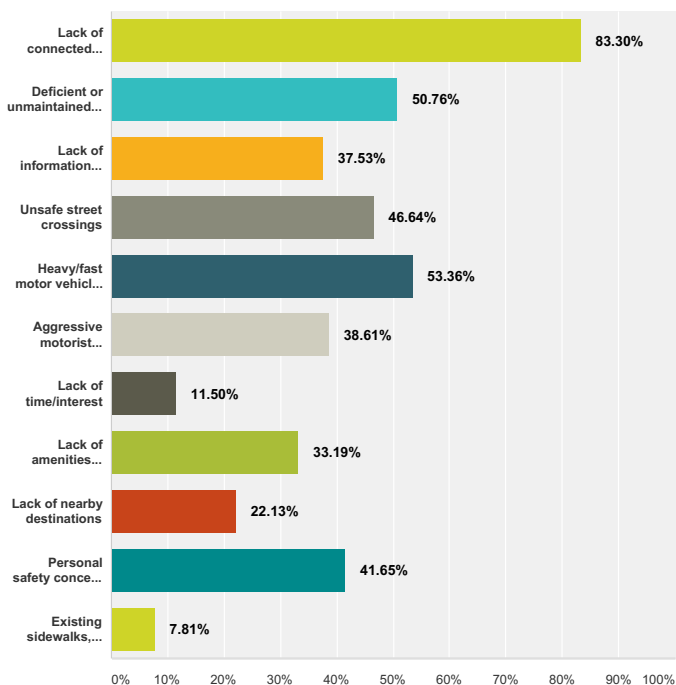
Answered: 443 Skipped: 71





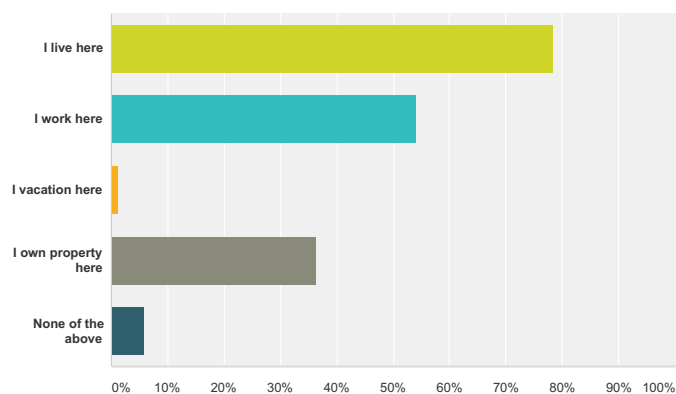
**Q12 What do you think are the factors that most DISCOURAGE bicycling or walking in greater Goldsboro? Please select up to five factors.**

Answered: 461 Skipped: 53



**Q14 What is your relationship to greater Goldsboro?**

Answered: 446 Skipped: 68





**QUESTION 13:** What are the top three locations for improving conditions for walking and bicycling in greater Goldsboro? Examples include locations where we need a new or improved sidewalk, trail, bicycle lane or intersection/street crossing.

Roadway/Location	Number of Votes	Most Requested from Public Input Events
Berkeley	79	#2
Ash	72	
Wayne Memorial	55	#3
Spence	46	#4
Downtown (generally)	41	
Herman Park	26	
New Hope	26	
Pikeville (generally)	18	
Royall	16	#1
Stoney Creek Park	16	
Hospital/Comm. College	15	
SJAFB	12	
Rosewood	9	
Elm	7	#5
William	7	
Center	5	
Slocumb	4	#6
Beech	4	





# Appendix C: Benefits of This Plan

Appendix Contents:

*Overview*

*Safety*

*Health*

*Economics*

*Mobility*

*Stewardship*

## OVERVIEW

When considering the amount of dedication, time, and valuable resources that it takes to create a walk- and bicycle-friendly community, it is also important to assess the immense value of active transportation. Better walking and bicycling facilities improve safety and encourage more people to walk and ride, which in turn improves health, provides a boost to the local economy, creates a cleaner environment, reduces congestion and fuel costs, and contributes to a better quality of life and sense of community.

Communities across the country have experienced and documented the benefits of providing a supportive environment for walking and bicycling. With a better active transportation network, Goldsboro can create a stronger, more vibrant community and take advantage of the many types of benefits described below.

The following sections discuss the many benefits of planning for and creating a walkable and bikeable community. Resources to more comprehensive research on each topic are provided at the end of each section.

### Key Benefits of this Plan





# Safety

## *Trends and Challenges*

According to a survey of 16,000 North Carolina residents for the 2011 North Carolina Bicycle and Pedestrian Safety Summit, the most commonly reported safety issue for walking and bicycling in North Carolina is **inadequate infrastructure** (75%). A lack of pedestrian and bicycle facilities, such as sidewalks, bike lanes, trails, and safe crossings, lead to unsafe walking and bicycling conditions:

- » Each year on average (2007-2011), 162 pedestrians and 19 bicyclists are killed in collisions with motor vehicles on North Carolina roads, with many more seriously injured.
- » North Carolina is ranked as one of the **least safe states** for walking (41st) and bicycling (44th).
- » **13% of all traffic fatalities** in North Carolina are bicyclists and pedestrians.
- » During the five-year period from 2007 to 2011, a total of 12,286 pedestrian-motor vehicle crashes and 4,700 bicycle-motor vehicle crashes were reported to North Carolina authorities.
- » In Goldsboro from 2007-2011, there were **188 known crashes** involving a bicyclist or pedestrian.



A cyclist attempts to cross Ash Street across from Stoney Creek Park.



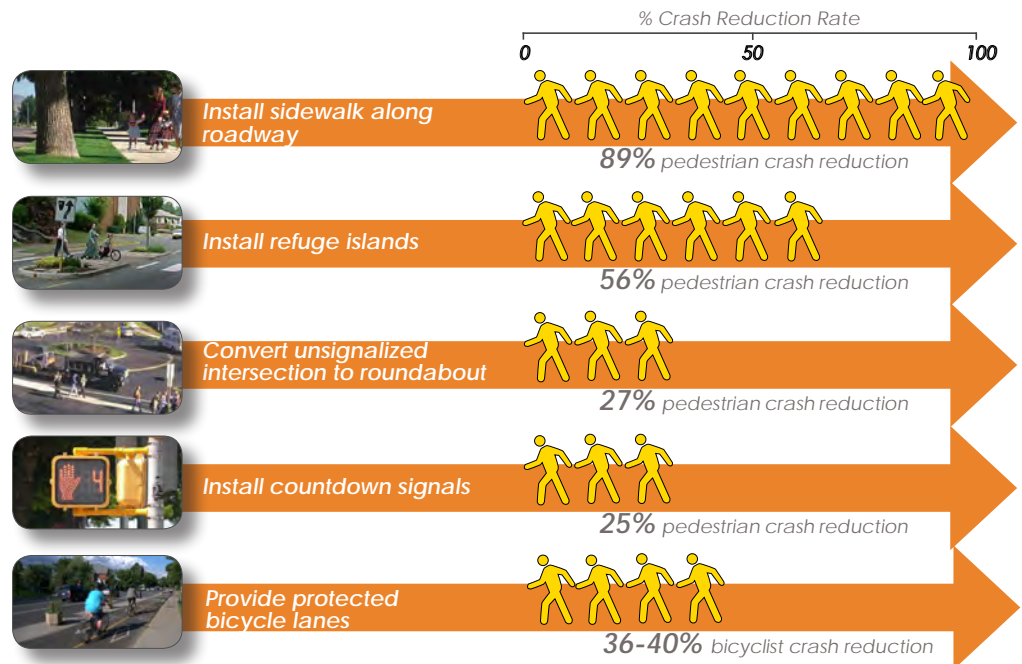


### Infrastructure Improvements and Safety

Separate studies conducted by the Federal Highway Administration and the University of North Carolina Highway Safety Research Center demonstrate that installing pedestrian and bicycle facilities directly improves safety by reducing the risk and severity of pedestrian-automobile and bicycle-automobile crashes. For example, installing a sidewalk along a roadway reduces the risk of a pedestrian “walking along roadway” crash by 89 percent. The graphic below shows how pedestrian and bicycle facility improvements have a direct, positive impact on safety.

The following web addresses link to more comprehensive research on active transportation and safety.

- » [www.ncdot.gov/bikeped/planning/walkbikenc/](http://www.ncdot.gov/bikeped/planning/walkbikenc/)
- » [www.pedbikeinfo.org/data/factsheet\\_crash.cfm](http://www.pedbikeinfo.org/data/factsheet_crash.cfm)



Federal Highway Administration. Desktop Reference for Crash Reduction Factors.  
<http://safety.fhwa.dot.gov/>

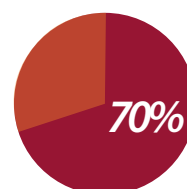
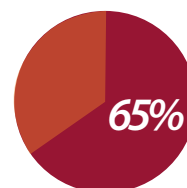


# Health

## Trends and Challenges

North Carolina's transportation system is one of the most important elements of our public environment, and it currently poses barriers to healthy living through active transportation. A growing number of studies show that the design of our communities—including neighborhoods, towns, transportation systems, parks, trails and other public recreational facilities—affects our level of physical activity. Regular physical activity is recognized as an important contributor to good health; the Centers for Disease Control and Prevention (CDC) recommend 30 minutes of moderate physical activity each day for adults and 60 minutes each day for children. Unfortunately, many people do not meet these recommendations because they lack environments where they can be physically active. Below are some key findings and challenges related to health, physical activity, and transportation in North Carolina.

- » **Sixty-five percent** of adults in North Carolina are either overweight or obese. The state is also ranked **5th worst** in the nation for childhood obesity.
- » Recent reports have estimated the annual direct medical cost of physical inactivity in North Carolina at \$3.67 billion, plus an additional \$4.71 billion in lost productivity. However, every dollar invested in pedestrian and bicycle trails can result in a savings of nearly \$3 in direct medical expenses.
- » **Seventy percent** of North Carolinians surveyed said they would walk or bike more if connected with a safe bicycle and pedestrian network.
- » A Charlotte study found that residents who stopped driving to work, and started walking to the light rail station and taking light rail to work, weighed an average of 6.5 pounds less than those who continued to drive to work.
- » Every **one dollar** invested in pedestrian and bicycle facilities saves as much as **three dollars** in direct medical expenses.





# #1

*The #1 goal of the Wayne County Health Department is to reduce the burden of chronic disease among County Residents*

Goldsboro Comprehensive Plan

## *Better Health Through Active Transportation*

In 2012, NCDOT’s Board of Transportation revised its mission statement to include “health and well-being” and passed a “Healthy Transportation Policy,” which declares the importance of a transportation system that supports positive health outcomes. Using active transportation to and from school, work, parks, restaurants, and other routine destinations is one of the best ways that children and adults can lead measurably healthier lives. Increasing one’s level of physical activity through walking and bicycling reduces the risk and impact of cardiovascular disease, diabetes, chronic disease, and some cancers. It also helps to control weight, improves mood, and reduces the risk of premature death.

The American Public Health Association also recognizes the health benefits of walk- and bike-friendly communities. According to its 2010 report, “Investments in transit, walking and bicycling facilities support transit use, walking and bicycling directly; they also support the formation of compact, walkable, transit-oriented neighborhoods that in turn support more walking, bicycling and transit and less driving. These built environments have repeatedly been associated with more walking, bicycling and transit use, more overall physical activity, and lower body weights; lower rates of traffic injuries and fatalities, particularly for pedestrians; lower rates of air pollution and greenhouse gas emissions; and better mobility for non-driving populations.”

The CDC determined that creating and improving places to be active could result in a **25 percent increase in the number of people who exercise** at least three times a week. This is significant considering that for people who are inactive, even small increases in physical activity can bring measurable health benefits. The establishment of a safe and reliable network of sidewalks, bikeways, and trails can have a positive impact on the health of nearby residents. The Rails-to-Trails Conservancy puts it simply: “Individuals must choose to exercise, but communities can make that choice easier.”

### Active Transportation: Pathway to Health

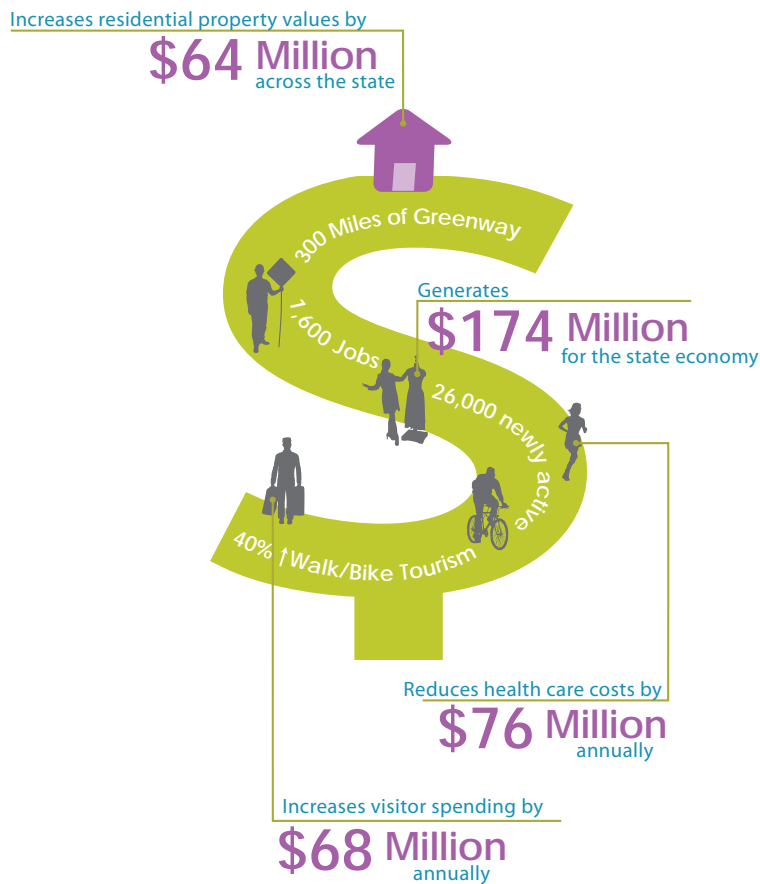
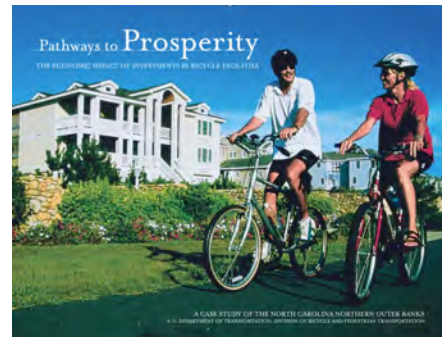


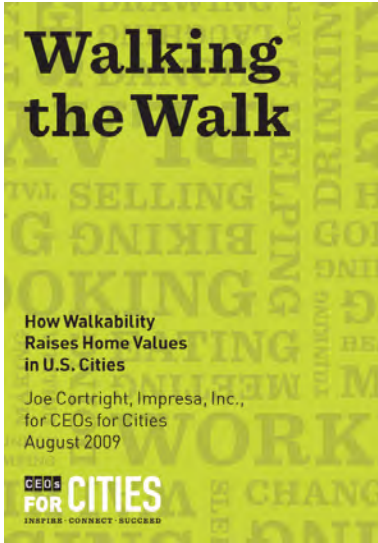
# Economics

Facilities for pedestrians and bicyclists generate economic returns for local businesses, raise property values, and reduce individual transportation costs. Making investments in walking and bicycling can help to attract residents, businesses, and visitors and will allow Goldsboro to better capitalize on the economic advantages of a walk- and bicycle-friendly community.

## *Benefits to Local Businesses*

Tourism is a major economic driver for North Carolina. The 6th most visited state in the United States, visitors spent as much as **\$18 billion a year**, many of whom partake in activities related to walking, hiking, or biking. Cities and towns receive an economic boost from visitors each year. In North Carolina's Outer Banks alone, the attraction of bicycling on vacation is estimated to have an **annual economic impact of \$60 million** and supports 1,407 jobs. The **annual return** to local businesses and state and local governments on bicycle facility development in the Outer Banks is approximately **nine times higher than the initial investment**.





### Increased Property Values

Pedestrian and bicycle facilities such as sidewalks, bike lanes, and greenway trails are popular community amenities that add value to properties nearby. According to a 2002 survey by the National Association of Realtors and the National Association of Homebuilders, homebuyers rank trails as the second-most important community amenity out of 18 choices, above golf courses, ball fields, parks, security, and others. This preference for trails is reflected in property values around the country:

The report, “Walking the Walk: How Walkability Raises Housing Values in U.S. Cities”, analyzed data from 94,000 real estate transactions in 15 major markets provided by ZipRealty and found that in **13 of the 15 markets**, higher levels of walkability, as measured by Walk Score, were directly linked to higher home values.

- » In the Shepard’s Vineyard residential development in Apex, North Carolina, homes along the regional greenway were priced \$5,000 higher than other residences in the development – and these homes were still the first to sell.
- » A study of home values along the Little Miami Scenic Trail in Ohio found that single-family home values increased by \$7.05 for every foot closer a home is to the trail.



These higher prices reflect how trails and greenways add to the desirability of a community, attracting homebuyers and visitors alike.

### Transportation Savings

When it comes to transportation costs, walking and bicycling are the most affordable forms of transportation available. According to the American Automobile Association, the cost of owning and operating a medium-sized sedan for one year, assuming one drives 10,000 miles per year, is approximately **\$7,804**. This includes the cost of the car itself, plus operating costs such as gas, maintenance, and tires, as well as operating costs such as depreciation, insurance, license and registration costs, taxes, and finance charges. Owning and operating a bicycle costs just **\$120 per year**, according to the League of American Bicyclists, for an average **annual savings of \$7,684 per vehicle**. The Pedestrian and Bicycle Information Center explains how these lower costs help individuals and communities as a whole: “When safe facilities are provided for pedestrians and bicyclists, more people are able to be productive, active members of society. Car ownership is expensive, and consumes a major portion of many Americans’ income.”

#### Annual Cost Per Mile

costs	yearly totals
<b>operating costs</b>	
gas per mile	_____
total miles driven	× _____
total gas	= _____
maintenance	+ _____
tires	+ _____
<b>total operating costs</b>	<b>+ =</b> _____
<b>ownership costs</b>	
depreciation	_____
insurance	+ _____
taxes	+ _____
license and registration	+ _____
finance charges	+ _____
<b>total ownership costs</b>	<b>+ =</b> _____
<b>other costs</b> (washing, accessories, etc.)	<b>+ =</b> _____
<b>total driving costs</b>	<b>=</b> _____
<b>total miles driven</b>	<b>÷</b> _____
<b>cost per mile</b>	<b>=</b> _____

Driving Costs Worksheet. American Automobile Association, Your Driving Costs Report: 2013 Edition.



# Mobility & Access

## Opportunity to Increase Walking and Bicycling Rates

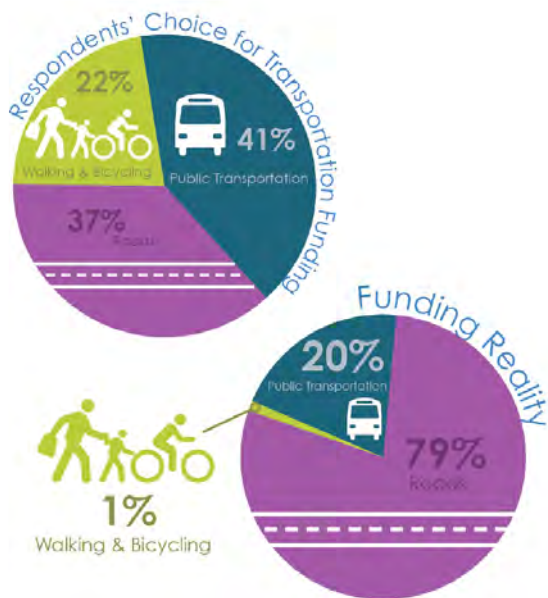
According to the 2011 Bicycle and Pedestrian Safety Survey, at least 70 percent of North Carolinians would walk or bike more for daily trips if walking and bicycling conditions were improved. Moreover, a national transportation poll found that Americans would like to see **22 percent** of transportation funding invested in walking and bicycling facilities, but current budget allocation sets aside only **one percent** of all transportation funding to walking and bicycling. With improved accommodations, walking and bicycling can provide alternatives to driving for commuting to work, running errands, or making other short trips.

More than one quarter of all trips (commute and non-commute) taken by Americans each and every day are **less than one mile**, equivalent to a walking trip of 15 minutes or a 6-minute bike ride; however, just 13 percent of all trips are made by walking or bicycling nationwide. To put these numbers into perspective, 34 percent of all trips are made by walking or bicycling in Denmark and Germany, and 51 percent of all trips in the Netherlands are by foot or by bike. Germany, Denmark, and the Netherlands are wealthy countries with high rates of automobile ownership, just like the United States. Yet an emphasis has been placed on providing quality walking and bicycling environments, which has alleviated the reliance on motor vehicles for short trips.

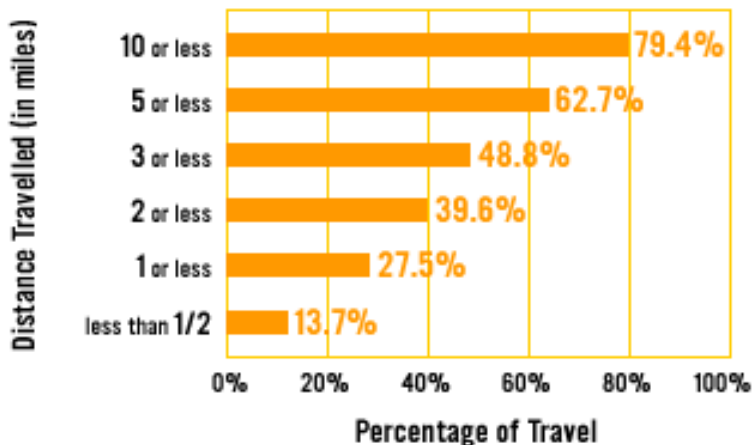
# 70%

*of North Carolinians said they would walk and bike more for their daily needs if walking and bicycling conditions were improved.*

NC Bicycle and Pedestrian Safety Summit 2011



## Daily Trip Distances



According to a national transportation poll, Americans think differently about transportation funding than the reality of current budget allocation. (Transportation for America, design by Collective Strength, and fielded by Harris Interactive, 2007)

Nearly 50 percent of all trips in the United States are 3 miles or less, or less than a 20 minute bike ride.. Chart from the Bicycle and Pedestrian Information Center website, [www.pedbikeinfo.org](http://www.pedbikeinfo.org)



# 17%

*of occupied households  
in Goldsboro do not have  
access to a vehicle.*

US Census Bureau, American Community  
Survey 5-Year Data 2008-2012

### *Improved Access to Destinations*

Many North Carolinians do not have access to a vehicle or are unable to drive. According to the 2009 National Household Travel Survey, 13 percent of persons age 15 or older do not drive, and 8.7 percent of U.S. households do not have access to an automobile. In Goldsboro, this number is much higher; 17 percent of all households in Goldsboro do not have access to an automobile. A well-connected pedestrian and bicycle network provides safe, convenient transportation options for those who are unable or unwilling to drive and helps to minimize the disadvantage of not having access to a motor vehicle. These improvements can increase access to important destinations for the young, the elderly, low-income families, and others who would otherwise have limited and less convenient travel options.

### *Reduced Vehicle Miles Traveled (VMT) & Congestion*

Taking short trips by foot or by bike can help to greatly reduce motor vehicle miles driven and traffic congestion. Under the Nonmotorized Transportation Pilot Program, walking and bicycling investments **averted an estimated 32 million driving miles** in four pilot communities between 2007 and 2010. These individual changes in travel behavior can add up to produce significant societal benefits. Traffic on arterials and other streets can be mitigated as people use sidewalks, trails, and other alternatives to get around. Parking lots can also be made less congested by reducing crowding, circling, and waiting for open spots.

The following web addresses link to more comprehensive research on transportation efficiency.

- » [www.ncdot.gov/bikeped/planning/walkbikenc/](http://www.ncdot.gov/bikeped/planning/walkbikenc/)
- » [www.pedbikeinfo.org/data/factsheet\\_general.cfm](http://www.pedbikeinfo.org/data/factsheet_general.cfm)



## Stewardship

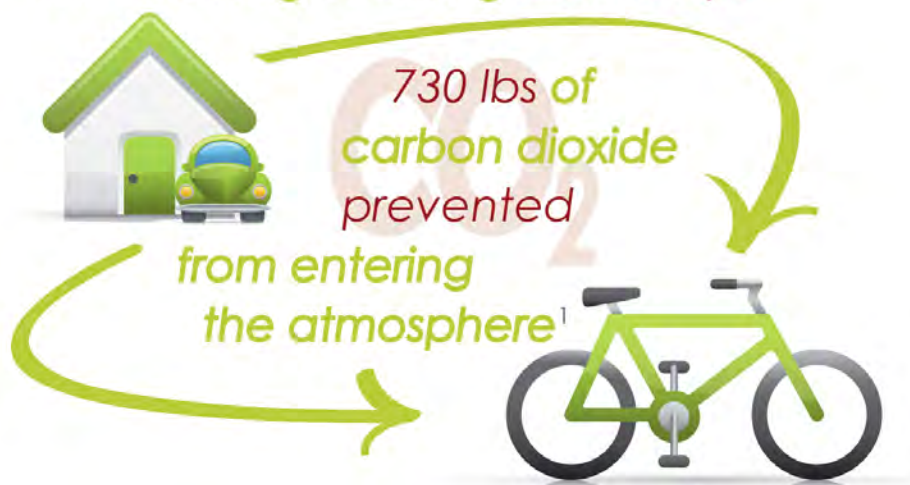
Stewardship addresses the impact that transportation decisions (both at the government/policy level and individual level) can have on the land, water and air that Goldsboro residents and visitors enjoy.

Providing safe accommodations for walking and bicycling can help to reduce automobile dependency, which in turn leads to a reduction in vehicle emissions – a benefit for residents and visitors and the surrounding environment. As of 2003, **27 percent** of U.S. greenhouse gas emissions are attributed to the transportation sector, and **personal vehicles account for almost two-thirds** (62 percent) of all transportation emissions. Primary emissions that pose potential health and environmental risks are carbon dioxide, carbon monoxide, volatile organic compounds, (VOCs), nitrous oxides (NOx), and benzene.

Children and senior citizens are particularly sensitive to the harmful affects of air pollution, as are individuals with heart or other respiratory illnesses. Increased health risks such as asthma and heart problems are associated with vehicle emissions. Even a modest increase in walking and bicycling trips (in place of motor vehicle trips) can have significant positive impacts. For example, replacing two miles of driving each day with walking or bicycling will, in one year, prevent 730 pounds of carbon dioxide from entering the atmosphere.

*Sidewalks, bike lanes, paths, and greenway trails help to reduce vehicle emissions, fuel consumption, and congestion.*

**Replace 2 miles of driving  
with walking or biking x 365 days =**







*The natural buffer zones that occur along greenways protect streams, rivers, and lakes, preventing soil erosion and filtering pollution caused by agricultural and roadway runoff.*

*“Integrate land use and transportation policies to limit impacts to sensitive land, focus development in prime locations, encourage trips by modes other than personal automobiles, and enhance the region’s quality of life.”*

GoldsboroLong-RangeTransportationPlan,  
p. 2-15

Below are some key findings related to stewardship and transportation in North Carolina:

- » Better pedestrian and bicycle facilities allow people to replace short driving trips with walking and bicycling, thus reducing fuel consumption. According to the National Association of Realtors and Transportation for America, **89 percent of Americans** believe that transportation investments should support the goal of reducing energy use.
- » North Carolina’s 2009-2013 Statewide Comprehensive Outdoor Recreation Plan (SCORP) found **“walking for pleasure” to be the most common outdoor recreational activity**, enjoyed by 82 percent of respondents, and bicycling by 31 percent of respondents.
- » The natural buffer zones that occur along greenways protect streams, rivers, and lakes, preventing soil erosion and filtering pollution caused by agricultural and roadway runoff.

The following web addresses link to more comprehensive research on active transportation and stewardship.

- » [www.ncdot.gov/bikeped/planning/walkbikenc/](http://www.ncdot.gov/bikeped/planning/walkbikenc/)
- » [www.pedbikeinfo.org/data/factsheet\\_environmental.cfm](http://www.pedbikeinfo.org/data/factsheet_environmental.cfm)



Before and after diagrams of a transformed suburban community from the Sprawl Repair Manual.





# Appendix D: Funding Resources

## Appendix Contents:

*Overview*

*Federal  
Funding Sources*

*State  
Funding Sources*

*Local Government  
Funding Sources*

*Private and Non-Profit  
Funding Sources*

## OVERVIEW

When considering possible funding sources for bicycle, pedestrian, and trail projects in the Goldsboro region, it is important to remember that not all construction activities or programs will be accomplished with a single funding source. It will be necessary to consider several sources of funding, that when combined, will support full project completion. Funding sources can be used for a variety of activities, including: programs, planning, design, implementation, and maintenance. This appendix outlines the most likely sources of funding from the federal, state, and local government levels as well as from the private and non-profit sectors. A summary table of funding sources is included at the end of this appendix. It should be noted that this section reflects the funding available at the time of writing. Funding amounts, fund cycles, and even the programs themselves may change over time.

## FEDERAL FUNDING SOURCES

Federal funding is typically directed through state agencies to local governments either in the form of grants or direct appropriations. Federal funding typically requires a local match of five percent to 50 percent, but there are sometimes exceptions; the recent American Recovery and Reinvestment Act stimulus funds did not require a match. The following is a list of possible Federal funding sources that could be used to support construction of pedestrian and bicycle improvements.

### **Moving Ahead for Progress in the Twenty-First Century (MAP-21)**

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

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



FUNDING SOURCE	PLANNING	PROGRAMMING	DESIGN/CONSTRUCTION
<b>FEDERAL FUNDING</b>			
Transportation Alternatives	x	x	x
Surface Transportation Program			x
Highway Safety Improvement Program		x	x
Congestion Mitigation/Air Quality		x	x
FTA Metropolitan Planning Program	x		
FTA Enhanced Mobility of Seniors and Individuals with Disabilities		x	x
Partnership for Sustainable Communities	x	x	x
Land and Water Conservation Fund	x		x
Rivers, Trails, and Conservation Assistance Program	x		
National Scenic Byways Discretionary Grant Program			x
Federal Lands Transportation Program	x		x
Energy Efficiency and Conservation Block Grants	x		x
<b>STATE FUNDING</b>			
NCDOT State Transportation Improvement Program			x
Incidental Projects			x
Spot Safety Program			x
High Hazard Elimination Program			x
Governor's Highway Safety Program			x
Bicycle and Pedestrian Planning Grant Initiative	x	x	
Eat Smart, Move More North Carolina Community Grants		x	x
The North Carolina Division of Parks and Recreation			x
The North Carolina Parks and Recreation Trust Fund (PARTF)			x
Adopt-a-Trail Program			x
Powell Bill Funds			x
Community Development Block Grant	x	x	x
Clean Water Management Trust Fund	x	x	x
Safe Routes to School Program	x	x	x
Urban and Community Forestry Grant	x		x



FUNDING SOURCE	PLANNING	PROGRAMMING	DESIGN/CONSTRUCTION
<b>LOCAL FUNDING</b>			
Capital Reserve Fund			x
Capital Project Ordinance			x
Local Improvement District			x
Municipal Service District			x
Tax Increment Financing			x
Bonds and Loans			x
Revenue Bonds			x
General Obligation Bonds (cities, counties, and service districts)			x
Special Assessment Bonds			x
State Revolving Fund Loans			x
Sales Tax	x		x
Property Tax	x		x
Excise Tax			x
Occupancy Tax			x
Stormwater Utility Fees			x
Streetscape Utility Fees			x
Impact Fees			x
Exactions			x
Installment Purchase Financing			x
In-Lieu-of Fees			x
<b>PRIVATE/NON-PROFIT FUNDING</b>			
The Robert Wood Johnson Foundation	x	x	
North Carolina Community Foundation	x	x	
Walmart State Giving Program	x	x	x
The Rite Aid Foundation Grant		x	x
Z. Smith Reynolds Foundation			x
Bank of America Charitable Foundation	x	x	
Duke Energy Foundation		x	
American Greenways Eastman Kodak Awards	x	x	x
National Trails Fund		x	x
The Conservation Alliance	x	x	
National Fish and Wildlife Foundation	x	x	x
The Trust for Public Land	x	x	
Blue Cross Blue Shield of North Carolina Foundation		x	x
Alliance for Biking and Walking Advocacy Advance Grants			x
Local Trail Sponsors			x
Corporate Donations	x	x	x
Private Individual Donations	x	x	x
Fundraising/Campaign Drives	x	x	x
Volunteer Work	x	x	x



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

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

For more information, visit: <http://www.fhwa.dot.gov/map21/summaryinfo.cfm>

### Transportation Alternatives

Transportation Alternatives (TA) is a new funding source under MAP-21 that consolidates three formerly separate programs under SAFETEA-LU: Transportation Enhancements (TE), Safe Routes to School (SRTS), and the Recreational Trails Program (RTP). These funds may be used for a variety of pedestrian, bicycle, and streetscape projects including sidewalks, bikeways, multi-use paths, and rail-trails. TA funds may also be used for selected education and encouragement programming such as Safe Routes to School, despite the fact that TA does not provide a guaranteed set-aside for this activity as SAFETEA-LU did.

Average annual funds available through TA over the life of MAP-21 equal \$814 million nationally, which is based on a two percent set-aside of total MAP-21 allocations. Note that state DOT's may elect to transfer up to 50 percent of TA funds to other highway programs, so the amount listed on the website represents the maximum potential funding. Remaining TA funds (those monies not re-directed to other highway programs) are disbursed through a separate competitive grant program administered by NCDOT. Local governments, school districts, tribal governments, and public lands agencies are permitted to compete for these funds.

Each state governor is given the opportunity to "opt out" of the Recreational Trails Program. However, as of the writing of this plan, only Florida and Kansas have "opted out" of the RTP. For all other states, dedicated funds for recreational trails continue to be provided as a subset of TA. MAP-21 provides \$85 million nationally for the RTP.

For the complete list of eligible activities, visit:  
[http://www.fhwa.dot.gov/environment/transportation\\_enhancements/legislation/map21.cfm](http://www.fhwa.dot.gov/environment/transportation_enhancements/legislation/map21.cfm)

For funding levels, visit: <http://www.fhwa.dot.gov/MAP21/funding.cfm>



## Surface Transportation Program

The Surface Transportation Program (STP) provides states with flexible funds which may be used for a variety of highway, road, bridge, and transit projects. A wide variety of pedestrian improvements are eligible, including trails, sidewalks, crosswalks, pedestrian signals, and other ancillary facilities. Modification of sidewalks to comply with the requirements of the Americans with Disabilities Act (ADA) is also an eligible activity. Unlike most highway projects, STP-funded pedestrian facilities may be located on local and collector roads which are not part of the Federal-aid Highway System. 50 percent of each state's STP funds are allocated by population to the MPOs; the remaining 50 percent may be spent in any area of the state.

For more information: <http://www.fhwa.dot.gov/map21/stp.cfm>

## Highway Safety Improvement Program

MAP-21 doubles the amount of funding available through the Highway Safety Improvement Program (HSIP) relative to SAFETEA-LU. HSIP provides \$2.4 billion nationally for projects and programs that help communities achieve significant reductions in traffic fatalities and serious injuries on all public roads, bikeways, and walkways. MAP-21 preserves the Railway-Highway Crossings Program within HSIP but discontinues the High-Risk Rural roads set-aside unless safety statistics demonstrate that fatalities are increasing on these roads. Bicycle and pedestrian safety improvements, enforcement activities, traffic calming projects, and crossing treatments for non-motorized users in school zones are eligible for these funds.

For more information: <http://www.fhwa.dot.gov/map21/hsip.cfm>

## Congestion Mitigation/Air Quality Program

The Congestion Mitigation/Air Quality Improvement Program (CMAQ) provides funding for projects and programs in air quality non-attainment and maintenance areas for ozone, carbon monoxide, and particulate matter which reduce transportation related emissions. States with no non-attainment areas may use their CMAQ funds for any CMAQ or STP eligible project. These federal dollars can be used to build bicycle and pedestrian facilities that reduce travel by automobile. Purely recreational facilities generally are not eligible. Communities located in attainment areas who do not receive CMAQ funding apportionments may apply for CMAQ funding to implement projects that will reduce travel by automobile.

For more information: <http://www.fhwa.dot.gov/map21/cmaq.cfm>

## Federal Transit Administration Enhanced Mobility of Seniors and Individuals with Disabilities

This program can be used for capital expenses that support transportation to meet the special needs of older adults and persons with disabilities, including providing access to an eligible public transportation facility when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs.



For more information: [http://www.fta.dot.gov/documents/MAP-21\\_Fact\\_Sheet\\_-\\_Enhanced\\_Mobility\\_of\\_Seniors\\_and\\_Individuals\\_with\\_Disabilities.pdf](http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Enhanced_Mobility_of_Seniors_and_Individuals_with_Disabilities.pdf)

### **Partnership for Sustainable Communities**

Founded in 2009, the Partnership for Sustainable Communities is a joint project of the Environmental Protection Agency (EPA), the U.S. Department of Housing and Urban Development (HUD), and the U.S. Department of Transportation (USDOT). The partnership aims to “improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide.” The Partnership is based on five Livability Principles, one of which explicitly addresses the need for bicycle and pedestrian infrastructure (“Provide more transportation choices: Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation’s dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health”).

The Partnership is not a formal agency with a regular annual grant program. Nevertheless, it is an important effort that has already led to some new grant opportunities (including both TIGER I and TIGER II grants). North Carolina jurisdictions should track Partnership communications and be prepared to respond proactively to announcements of new grant programs. Initiatives that speak to multiple livability goals are more likely to score well than initiatives that are narrowly limited in scope to pedestrian improvement efforts.

For more information: <http://www.sustainablecommunities.gov/>

<http://www.epa.gov/smartgrowth/partnership/>

Resource for Rural Communities: [http://www.sustainablecommunities.gov/pdf/Supporting\\_Sustainable\\_Rural\\_Communities\\_FINAL.PDF](http://www.sustainablecommunities.gov/pdf/Supporting_Sustainable_Rural_Communities_FINAL.PDF)

### **Land and Water Conservation Fund**

The Land and Water Conservation Fund (LWCF) provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. Funds can be used for right-of-way acquisition and construction. The program is administered by the Department of Environment and Natural Resources as a grant program for states and local governments. Maximum annual grant awards for county governments, incorporated municipalities, public authorities, and federally recognized Indian tribes are \$250,000. The local match may be provided with in-kind services or cash.

For more information: [http://www.ncparks.gov/About/grants/lwcf\\_main.php](http://www.ncparks.gov/About/grants/lwcf_main.php)

### **Rivers, Trails, and Conservation Assistance Program**

The Rivers, Trails, and Conservation Assistance Program (RTCA) is a National Parks Service (NPS) program providing technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds and





open space. The RTCA program provides only for planning assistance—there are no implementation funds available. Projects are prioritized for assistance based on criteria including conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments. This program may benefit trail development in North Carolina locales indirectly through technical assistance, particularly for community organizations, but is not a capital funding source.

For more information: <http://www.nps.gov/ncrc/programs/rtca/> or contact the Southeast Region RTCA Program Manager Deirdre “Dee” Hewitt at (404) 507-5691

### **National Scenic Byways Discretionary Grant Program**

The National Scenic Byways Discretionary Grants program provides merit-based funding for byway-related projects each year, utilizing one or more of eight specific activities for roads designated as National Scenic Byways, All-American Roads, State scenic byways, or Indian tribe scenic byways. The activities are described in 23 USC 162(c). This is a discretionary program; all projects are selected by the US Secretary of Transportation.

Eligible projects include construction along a scenic byway of a facility for pedestrians and bicyclists and improvements to a scenic byway that will enhance access to an area for the purpose of recreation. Construction includes the development of the environmental documents, design, engineering, purchase of right-of-way, land, or property, as well as supervising, inspecting, and actual construction.

For more information: <http://www.bywaysonline.org/grants/>

### **Federal Lands Transportation Program (FLTP)**

The FLTP funds projects that improve access within federal lands (including national forests, national parks, national wildlife refuges, national recreation areas, and other Federal public lands) on federally owned and maintained transportation facilities. \$300 million per fiscal year has been allocated to the program for 2013 and 2014.

For more information: <http://www.fhwa.dot.gov/map21/fltp.cfm>

### **Energy Efficiency and Conservation Block Grants**

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

For more information: <http://www1.eere.energy.gov/wip/eecbg.html>



## STATE FUNDING SOURCES

The funding sources covered in this section were updated in the Fall of 2013 and reviewed for accuracy by NCDOT staff. However, at the time of development of this plan, the Strategic Transportation Investment initiative was being reviewed by the Joint Legislative Transportation Oversight Committee. Therefore, the status of future funding sources is subject to change. The availability of these funding resources should be confirmed during the implementation of a project.

### North Carolina Department of Transportation (NCDOT) State Transportation Improvement Program

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 to ensure they provide the maximum benefit to our state. It allows NCDOT to use its existing revenues more efficiently to fund more investments that improve North Carolina's transportation infrastructure, create jobs and help boost the economy.

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

- » Safety
- » Access
- » Demand or density
- » Constructability
- » Benefit/cost ratio

This ranking largely determines which projects will be included in the department's State Transportation Improvement Program (STIP). The STIP is a federally mandated transportation planning document that details transportation improvements prioritized by stakeholders for inclusion in the Work Program over the next ten years. The STIP is updated every two years.

The STIP contains funding information for various transportation divisions of NCDOT including highways, aviation, public transportation, rail, bicycle and pedestrian, and the Governor's Highway Safety Program. Access to many federal funds require that projects be incorporated into the STIP. The STIP is the primary method for allocating state and federal transportation funds. However, beginning July 1, 2015, state funds cannot be used to match federally-funded projects. Only Powell Bill or local funds can be used as a match for federally-funded bicycle and pedestrian projects.



For more information on STIP:  
[www.ncdot.gov/strategictransportationinvestments/](http://www.ncdot.gov/strategictransportationinvestments/)

To access the STIP: <https://connect.ncdot.gov/projects/planning>

For more about the STIP process: <http://www.ncdot.org/performance/reform/>

### Incidental Projects

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 system. Bicycle and pedestrian accommodations such as bike lanes, sidewalks, intersection improvements, widened paved shoulders, and bicycle- and pedestrian-safe bridge design are frequently included as incidental features of highway projects. Most bicycle and pedestrian safety accommodations built by NCDOT are funded with a combination of federal and state roadway construction funds or with a local fund match.

For more information: <http://www.ncdot.gov/bikeped/funding/process/>

### SPOT Safety Program

The Spot Safety Program is a state funded public safety investment and improvement program that provides highly effective low cost safety improvements for intersections, and sections of North Carolina's 79,000 miles of state maintained roads in all 100 counties of North Carolina. The Spot Safety Program is used to develop smaller improvement projects to address safety, potential safety, and operational issues. The program is funded with state funds and currently receives approximately \$9 million per state fiscal year. Other monetary sources (such as Small Construction or Contingency funds) can assist in funding Spot Safety projects, however, the maximum allowable contribution of Spot Safety funds per project is \$250,000.

The Spot Safety Program targets hazardous locations for expedited low cost safety improvements such as traffic signals, turn lanes, improved shoulders, intersection upgrades, positive guidance enhancements (rumble strips, improved channelization, raised pavement markers, long life highly visible pavement markings), improved warning and regulatory signing, roadside safety improvements, school safety improvements, and safety appurtenances (like guardrail and crash attenuators).

A Safety Oversight Committee (SOC) reviews and recommends Spot Safety projects to the Board of Transportation (BOT) for approval and funding. Criteria used by the SOC to select projects for recommendation to the BOT include, but are not limited to, the frequency of correctable crashes, severity of crashes, delay, congestion, number of signal warrants met, effect on pedestrians and schools, division and region priorities, and public interest.

For more information: <https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx>



### **Powell Bill Funds**

Annually, State street-aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways. Beginning July 1, 2015 under the Strategic Transportation Investments initiative, Powell Bill funds may no longer be used to provide a match for federal transportation funds such as Transportation Alternatives.

More information: <https://connect.ncdot.gov/municipalities/state-street-aid/Pages/default.aspx>

### **Highway Hazard Elimination Program**

The Hazard Elimination Program is used to develop larger improvement projects to address safety and potential safety issues. The program is funded with 90 percent federal funds and 10 percent state funds. The cost of Hazard Elimination Program projects typically ranges between \$400,000 and \$1 million. A Safety Oversight Committee (SOC) reviews and recommends Hazard Elimination projects to the Board of Transportation (BOT) for approval and funding. These projects are prioritized for funding according to a safety benefit to cost (B/C) ratio, with the safety benefit being based on crash reduction. Once approved and funded by the BOT, these projects become part of the department's State Transportation Improvement Program (STIP).

For more information: <https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx>

### **Governor's Highway Safety Program**

The Governor's Highway Safety Program (GHSP) funds safety improvement projects on state highways throughout North Carolina. All funding is performance-based. Substantial progress in reducing crashes, injuries, and fatalities is required as a condition of continued funding. This funding source is considered to be "seed money" to get programs started. The grantee is expected to provide a portion of the project costs and is expected to continue the program after GHSP funding ends. State Highway Applicants must use the web-based grant system to submit applications.

For more information: <http://www.ncdot.org/programs/ghsp/>

### **Eat Smart, Move More North Carolina Community Grants**

The Eat Smart, Move More (ESMM) NC Community Grants program provides funding to local communities to support their efforts to develop community-based interventions that encourage, promote, and facilitate physical activity. The current focus of the funds is for projects addressing youth physical activity. Funds have been used to construct trails and conduct educational programs.



For more information:

<http://www.eatsmartmovemorenc.com/Funding/CommunityGrants.html>

### **The North Carolina Division of Parks and Recreation**

The North Carolina Division of Parks and Recreation and the State Trails Program offer funds to help citizens, organizations and agencies plan, develop and manage all types of trails ranging from greenways and trails for hiking, biking, and horseback riding to river trails and off-highway vehicle trails.

For more information: <http://www.ncparks.gov/About/grants/main.php>

### **NC Parks and Recreation Trust Fund (PARTF)**

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

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

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

### **NC Department of Environment and Natural Resources - Recreational Trails and Adopt-a-Trail Grants**

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

### **Community Development Block Grant Funds**

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



### **Clean Water Management Trust Fund (CWMTF)**

This fund was established in 1996 and has become one of the largest sources of money in North Carolina for land and water protection, eligible for application by a state agency, local government, or non-profit. At the end of each year, a minimum of \$30 million is placed in the CWMTF. The revenue of this fund is allocated as grants to local governments, state agencies, and conservation non-profits to help finance projects that specifically address water pollution problems. Funds may be used for planning and land acquisition to establish a network of riparian buffers and greenways for environmental, educational, and recreational benefits.

For more information: <http://www.cwmtf.net/#appmain.htm>

### **Safe Routes to School Program (Managed by NCDOT, DBPT)**

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

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

For more information: <https://connect.ncdot.gov/projects/BikePed/Pages/Safe-Routes-To-School.aspx>

<http://www.ncdot.gov/download/programs/srts/SRTS.pdf>

Or contact DBPT/NCDOT at (919) 807-0774.

### **Urban and Community Forestry Grant**

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. The goal is to improve public understanding of the benefits of preserving existing tree



cover in communities and assist local governments with projects which will lead to a more effective and efficient management of urban and community forests. Grant requests should range between \$1,000 and \$15,000 and must be matched equally with non-federal funds. Grant funds may be awarded to any unit of local or state government, public educational institutions, approved non-profit 501(c)(3) organizations, and other tax-exempt organizations. First-time municipal applicant and municipalities seeking Tree City USA status are given priority for funding.

For more about Tree City USA status, including application instructions, visit: [http://ncforests.service.gov/Urban/urban\\_grant\\_overview.htm](http://ncforests.service.gov/Urban/urban_grant_overview.htm)

## LOCAL GOVERNMENT FUNDING SOURCES

Municipalities often plan for the funding of pedestrian and bicycle 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 capital reserve fund, capital protection ordinances, municipal service district, tax increment financing, taxes, fees, and bonds. Each category is described below. A variety of possible funding options available to North Carolina jurisdictions for implementing pedestrian and bicycle projects are also described below. However, many will require specific local action as a means of establishing a program, if not already in place.

### 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.

### Local Improvement District (LID)

Local Improvement Districts (LIDs) are most often used by cities to construct localized projects such as streets, sidewalks, or bikeways. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as traffic trip generation.



## Municipal Service District

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

## Tax Increment Financing

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

## Other Local Funding Options

- » Bonds/Loans
- » Taxes
- » Impact fees
- » Exactions
- » Installment purchase financing
- » In-lieu-of fees
- » Partnerships

## PRIVATE AND NON-PROFIT FUNDING SOURCES

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

### Land for Tomorrow Campaign

Land for Tomorrow is a diverse partnership of businesses, conservationists, farmers, environmental groups, health professionals, and community groups committed to securing support from the public and General Assembly for protecting land, water, and historic places. The campaign was successful in 2013 in asking the North Carolina General Assembly to continue to support conservation efforts in the state. The state budget bill includes about \$50 million in funds for key conservation efforts in North Carolina. Land for Tomorrow works to 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, and historic downtowns and neighborhoods will be there to enhance the quality of life for generations to come.

For more information: <http://www.land4tomorrow.org/>

### **The Robert Wood Johnson Foundation**

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

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

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

### **North Carolina Community Foundation**

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

For more information: <http://nccommunityfoundation.org/>

### **Walmart State Giving Program**

The Walmart Foundation financially supports projects that create opportunities for better living. Grants are awarded for projects that support and promote education, workforce development/economic opportunity, health and wellness, and environmental sustainability. Both programmatic and infrastructure projects are eligible for funding. State Giving Program grants start at \$25,000, and there is no maximum award amount. The program accepts grant applications on an annual, state by state basis January 2nd through March 2nd.

Online resource: <http://foundation.walmart.com/apply-for-grants/state-giving>

### **Rite Aid Foundation Grants**

The Rite Aid Foundation is a foundation that supports projects that promote health and wellness in the communities that Rite Aid serves. Award amounts



vary and grants are awarded on a one year basis to communities in which Rite Aid operates. A wide array of activities are eligible for funding, including infrastructural and programmatic projects.

Online resource: <https://www.riteaid.com/about-us/rite-aid-foundation>

### **Z. Smith Reynolds Foundation**

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

For more information: [www.zsr.org](http://www.zsr.org)

### **Bank of America Charitable Foundation, Inc.**

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

For more information: [www.bankofamerica.com/foundation](http://www.bankofamerica.com/foundation)

### **Duke Energy Foundation**

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

- » An internal Duke Energy business “sponsor”
- » A clear business reason for making the contribution

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

For more information:

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

### **American Greenways Eastman Kodak Awards**

The Conservation Fund’s American Greenways Program has teamed with the Eastman Kodak Corporation and the National Geographic Society to award small grants (\$250 to \$2,000) to stimulate the planning, design, and development of greenways. These grants can be used for activities such as mapping, conducting ecological assessments, surveying land, holding conferences, developing brochures, producing interpretive displays, incorporating land trusts, and



building trails. Grants cannot be used for academic research, institutional support, lobbying, or political activities.

For more information: [www.conservationfund.org](http://www.conservationfund.org)

### **National Trails Fund**

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

Projects the American Hiking Society will consider include:

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

For more information: <http://www.americanhiking.org/national-trails-fund/>

### **The Conservation Alliance**

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to protect wild and natural areas. Grants are typically about \$35,000 each. Since its inception in 1989, The Conservation Alliance has contributed \$4,775,059 to environmental groups across the nation, saving over 34 million acres of wild lands.

The Conservation Alliance Funding Criteria:

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



For more information: <http://www.conservationalliance.com/grants>

### **National Fish and Wildlife Foundation (NFWF)**

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

The Foundation awards matching grants under its Keystone Initiatives to achieve measurable outcomes in the conservation of fish, wildlife, plants, and the habitats on which they depend. Awards are made on a competitive basis to eligible grant recipients, including federal, tribal, state, and local governments, educational institutions, and non-profit conservation organizations. Project proposals are received on a year-round, revolving basis with two decision cycles per year. Grants generally range from \$50,000-\$300,000 and typically require a minimum 2:1 non-federal match.

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

For more information: <http://www.nfwf.org/pages/grants/home.aspx>

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

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the TPL is the only national non-profit 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.

For more information: <http://www.tpl.org>

### **Blue Cross Blue Shield of North Carolina Foundation (BCBS)**

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

For more information: <http://www.bcbsncfoundation.org/>



### **Alliance for Biking & Walking: Advocacy Advance Grants**

Bicycle and pedestrian advocacy organizations play the most important role in improving and increasing biking and walking in local communities. Advocacy Advance Grants enable state and local bicycle and pedestrian advocacy organizations to develop, transform, and provide innovative strategies in their communities. With sponsor support, the Alliance for Biking & Walking has awarded more than \$500,000 in direct grants, technical assistance, and scholarships to advocacy organizations across North America since the Advocacy Advance Grant program's inception. In 2009 and 2010, these one-year grants were awarded twice annually to startup organizations and innovative campaigns to dramatically increase biking and walking. The Advocacy Advance Partnership with the League of American Bicyclists also provides necessary technical assistance, coaching, and training to supplement the grants.

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

### **Local Trail Sponsors**

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

### **Corporate Donations**

Corporate donations are often received in the form of liquid investments (i.e. cash, stock, bonds) and in the form of land. Municipalities typically create funds to facilitate and simplify a transaction from a corporation's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented.

### **Private Individual Donations**

Private individual donations can come in the form of liquid investments (i.e. cash, stock, bonds) or land. Municipalities typically create funds to facilitate and simplify a transaction from an individual's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented.

### **Fundraising/Campaign Drives**

Organizations and individuals can participate in a fundraiser or a campaign drive. It is essential to market the purpose of a fundraiser to rally support and financial backing. Often times fundraising satisfies the need for public awareness, public education, and financial support.



## **Volunteer Work**

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



# Appendix E: Existing Plans Review

## Appendix Contents:

*Envision 2035 - City of Goldsboro Urbanized Area Comprehensive Plan (2013)*

*Goldsboro Downtown Master Plan (2007)*

*City of Goldsboro Parks and Recreation Comprehensive Plan Update (2012)*

*Goldsboro Urban Area 2035 Long Range Transportation Plan (LRTP) Update (2009)*

*Wayne County Comprehensive Plan (2009)*

*Wayne Community College Fitness & Walking Trail Phasing Plan*

*Wayne County Public Health Department Strategic Action Plan 2009 - 2012*

## ENVISION 2035 - CITY OF GOLDSBORO URBANIZED AREA COMPREHENSIVE PLAN (2013)

Envision 2035 was developed as a creative and dynamic guide for the future long-term growth and development of the Goldsboro urban area. The plan analyzed existing demographic and environmental characteristics, projected future demands on land use and transportation, and included a comprehensive goals and implementing actions section.

Strategies and actions for improved multi-modal mobility are found in multiple sub-sections that include transportation, land use, economic development, health and wellness, and environment. Key, related action steps pulled from the Plan include:

### Economic Development

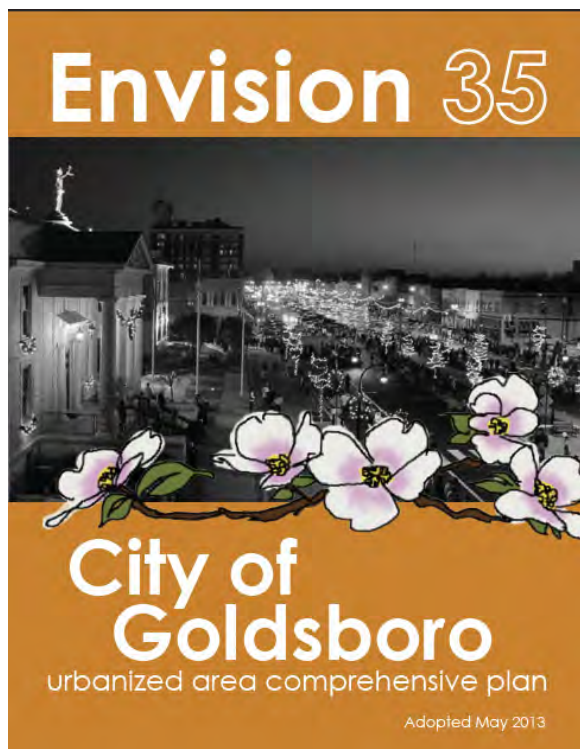
- » The City may actively recruit and retain a younger workforce to the City by enhancing cultural and recreational opportunities and diverse affordable workforce housing.
- » The City and County may market its natural assets, such as the Neuse River natural areas, as regional attractions which will support ecotourism.
- » The City and County should coordinate the development of recreational facilities with the Wayne County school system.
- » The City and County may consider the multiple objectives of natural area conservation, visual enhancement, promotion of cultural and historic preservation, watershed and floodprone area protection in determining future sites for park/recreation facilities.

### Health and Wellness

- » The City and County may consider incentivizing the development of neighborhood based retail and service outlets aimed at addressing the daily needs for residents of adjacent neighborhoods. The City and County should aim to ensure that facilities are developed in a manner that:
  - » Promotes compatibility with neighborhood character.
  - » Helps reduce vehicle trip lengths and frequency.
  - » Encourages convenient and ready access, particularly for pedestrians and bicyclist.



- » Serves as a gathering and meeting place within the community.
  - » Maintains a compact size.
  - » Established in a manner that limits minimum parking requirements.
- » Portions of the Urbanized Area with single land use districts that are conducive to automobile travel should be redeveloped over time into compact areas or nodes, in which many businesses can be easily accessed by pedestrians, bicyclists, and transit.
  - » The City and County may amend their ordinances to include Active Health Design guidelines that require buildings to have: an obvious pedestrian entrance, pedestrian level entrance, pedestrian level windows, and weather protection; are oriented to the street; have architectural details and pedestrian style signage on the street; and emphasize alternative means of transportation.
  - » The City may consider the development and adoption of a complete streets policy. This policy should focus on providing a wide range of transportation options including: access to transit, bicycling lanes and sharrows, and pedestrian access facilities. Increased attention should be given to streets programmed for resurfacing and/or expansion.
  - » The City and County may consider approaching the Goldsboro MPO in order to initiate a process that will result in the creation of a Bicycle and Pedestrian Master Plan.



*Envision 2035 plan cover.*





- » The City and County should consider street and sidewalk improvements adjacent to existing school sites. This effort shall involve the installation of raised crosswalks to help reduce vehicle speeds and improved pedestrian visibility. Curb extensions may also be considered to shorten pedestrian crossing distance, eliminate parking on or near the crosswalk, and improve sight distance for pedestrians.
- » The City and County should consider amending the zoning and subdivision regulations to require the establishment of bicycle parking for new and redeveloped commercial, industrial, and institutional uses. In order to promote alternative means of transportation, the City and County may engage in the following:
  - » Conduct clinics to teach safe cycling to school age children.
  - » Strategically place signs and provide maps outlining existing and proposed pedestrian and bicycle routes.
- » Develop a map of citywide bicycle routes, once installed, and make it available to citizens in hard copy format, as well as on the City's web page.
- » The City of Goldsboro in conjunction with the Wayne County Public Health Department and the Wayne County Parks and Recreation Department may consider establishing new recreation programs and wellness initiatives. These efforts should address a wide range of demographics; however, special attention should be focused in geographic areas with populations vulnerable to chronic disease (Map 26). A summary of example health and wellness programs and initiatives has been provided in Section 6.H.
- » The City and County should partner to create a Community Garden Produce and Education Organization to establish, maintain, and educate residents in areas in need of physical activity and healthy foods.
- » The City may work to promote and encourage the development of a mix of housing choices and land uses to support all income levels in and adjacent to the City center and Webtown to increase the vitality of the area during the morning, daytime, and evening hours. This effort should aim to retain grocery stores, pharmacies, and other convenience retail businesses and services to support the areas residential uses.
- » The City should consider factoring issues relating to the promotion of public safety into the normal review process for development proposals. Themes associated with Crime Prevention through Environmental Design (CPTED) should be utilized to improve upon overall community safety and appearance. This effort should address a range of issues including lighting, building deterioration, increasing "eyes on the street", and open space design.



- » The City and County should consider the development of neighborhood pocket parks in underserved portions of the Urbanized Area.

## Transportation

- » The City and County should support the use of Union Station as a multimodal transportation center. The center will be the hub for GATEWAY's fixed route service, provide Greyhound service, and serve as the station for future passenger and commuter rail service.
- » The City and County may consider funding to complete an "Access Management Guidelines & Implementation Strategy" for the Urbanized Area, focusing on arterial roads and streets.
- » The City and County may identify roadways that promote only vehicular travel and those that are more suited for multi-modal travel.
- » The City may consider conducting a public awareness campaign through radio and the City's website to increase the safety of bicyclists and pedestrians.
- » The City should set measurable goals for increasing pedestrian and bicycle travel mode share. This will involve an initial inventory of bicycle and pedestrian traffic counts at specific locations. The City may utilize the National Bicycle & Pedestrian Documentation Program, developed by the Institute of Transportation Engineers and Alta Planning and Design, to conduct the counts. Based on the traffic count findings, goals should be set to increase the percentage of bicycle and pedestrians at inventoried roadway locations.
- » The City and County may consider incentivizing mixed use and high density residential uses in coordination with GATEWAY Transit stops to promote transit-oriented development.
- » The City should support and implement action items contained in the 2012 Goldsboro Parks and Recreation Plan Update that outline the need for increased trails and non-motorized facilities.
- » The City may consider the development and adoption of a complete streets policy. This policy should focus on providing a wide range of transportation options including: access to transit, bicycling lanes and sharrows, and pedestrian access facilities. Increased attention should be given to streets programmed for resurfacing and/or expansion.
- » The City and County may consider approaching the Goldsboro MPO in order to initiate a process that will result in the creation of a Bicycle and Pedestrian Master Plan.



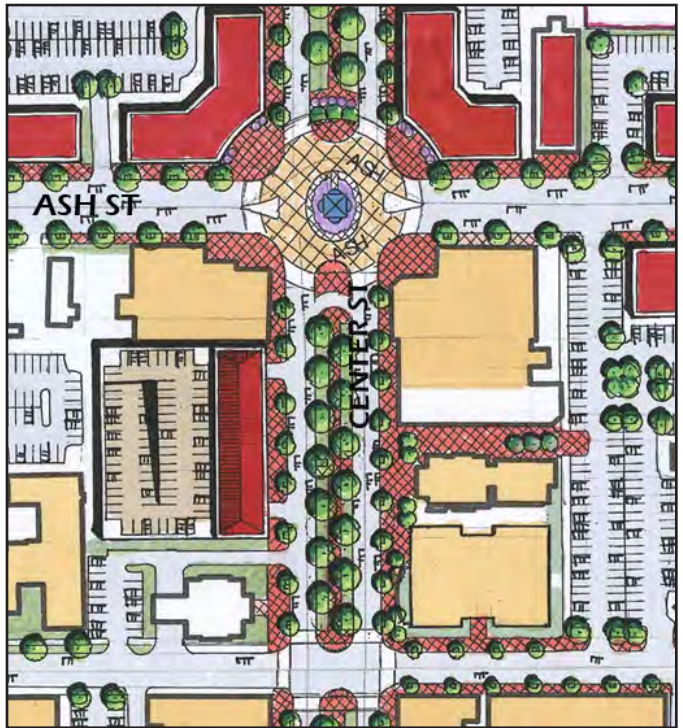
- » The City and County should consider street and sidewalk improvements adjacent to existing school sites. This effort shall involve the installation of raised crosswalks to help reduce vehicle speeds and improved pedestrian visibility. Curb extensions may also be considered to shorten pedestrian crossing distance, eliminate parking on or near the crosswalk, and improve sight distance for pedestrians.
- » The City and County should consider amending the zoning and subdivision regulations to require the establishment of bicycle parking for new and redeveloped commercial, industrial, and institutional uses.
- » In order to promote alternative means of transportation, the City and County may engage in the following:
  - » Conduct clinics to teach safe cycling to school age children.
  - » Strategically place signs and provide maps outlining existing and proposed pedestrian and bicycle routes.
- » Develop a map of citywide bicycle routes, once installed, and make it available to citizens in hard copy format, as well as on the City's web page.

## Environment

- » The City may consider amending its UDO to require a 30' vegetated buffer along all "blueline" streams.
- » The City will discourage improvements of any kind in undisturbed conservation areas (as shown on Map 39) within the 100-year floodplain; designate these areas for open space corridors, greenways, and other low-intensity uses.
- » The City and County may utilize existing information sources to identify and map potential wetlands. Existing wetlands information will be utilized when evaluating rezoning and other development requests; in planning for greenway corridors; and in developing long range land use plans.
- » The City may make wetlands acquisition a priority in future expansion of City parks and recreation areas.
- » The City may amend its UDO to require that site plans and subdivision plats identify natural areas such as wetlands and woodlands.
- » The City may focus planning for open space corridors, greenways, and other low-intensity uses on areas within the 100-year floodplain.

## GOLDSBORO DOWNTOWN MASTER PLAN (2007)

The Downtown Master Plan provides a framework for the revitalization of the downtown and surrounding residential neighborhoods. Economic analyses were performed to test feasibility. Related to this planning effort, strategies included streetscape improvements that calm traffic, increase aesthetic beauty, and improve walkability through and away from downtown. Specific improvements recommended include the Center Street improvement (which is being implemented at the time of this planning effort) which includes a rotary at Center and Walnut. The Plan also addresses improvements to the Train Depot area.

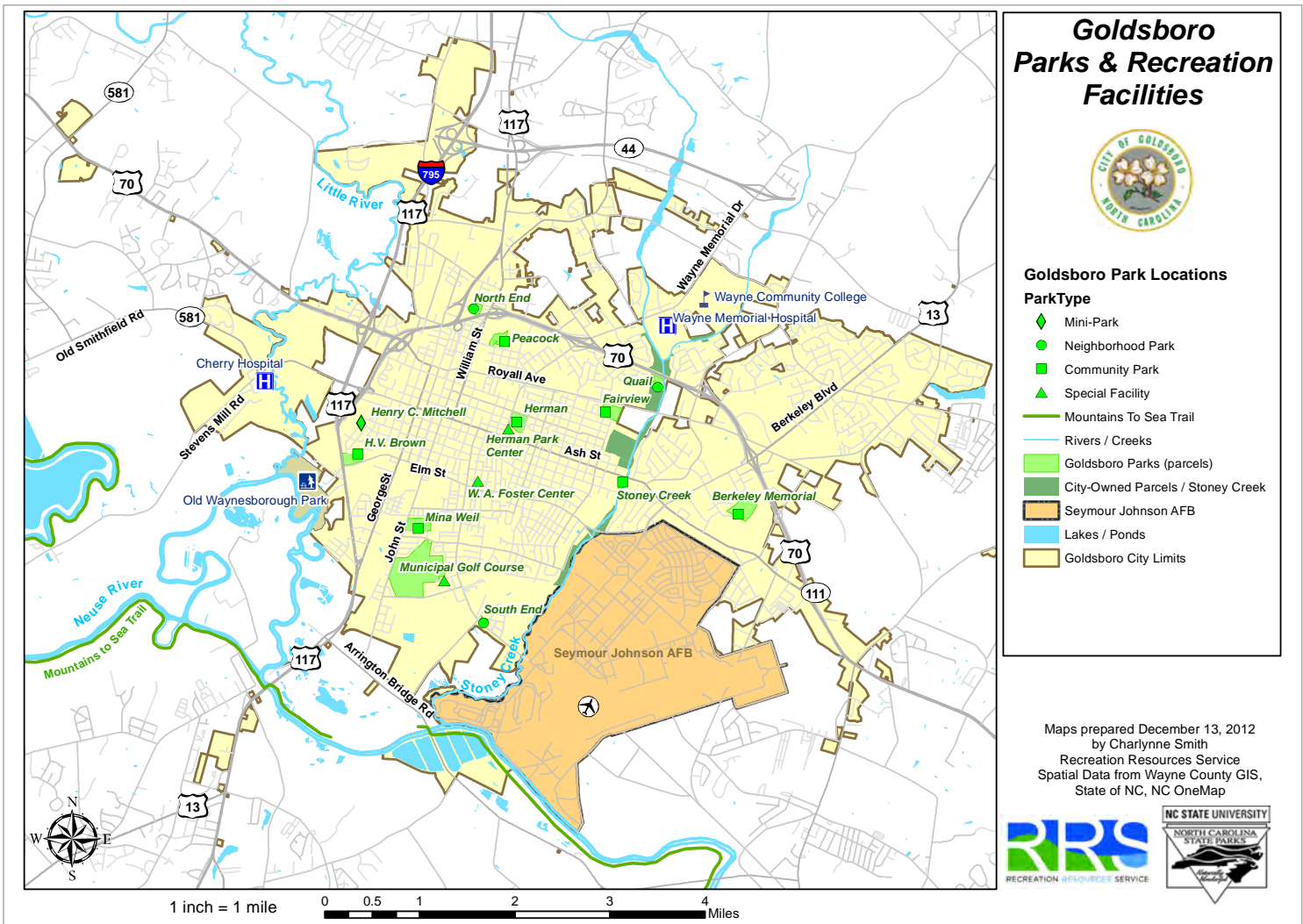


Images from the Goldsboro Downtown Master Plan plan cover.



## CITY OF GOLDSBORO PARKS AND RECREATION COMPREHENSIVE PLAN UPDATE (2012)

The Parks and Recreation Comprehensive Plan addresses future park needs, park maintenance issues, and greenway concepts. The Plan highlights the need for a comprehensive greenway plan that will further promote the Stoney Creek Greenway and the Mountains to Sea Trail. During public engagement, residents desired a greenway along the length of the Stoney Creek.



City of Goldsboro Parks and Recreation Comprehensive Plan Map.

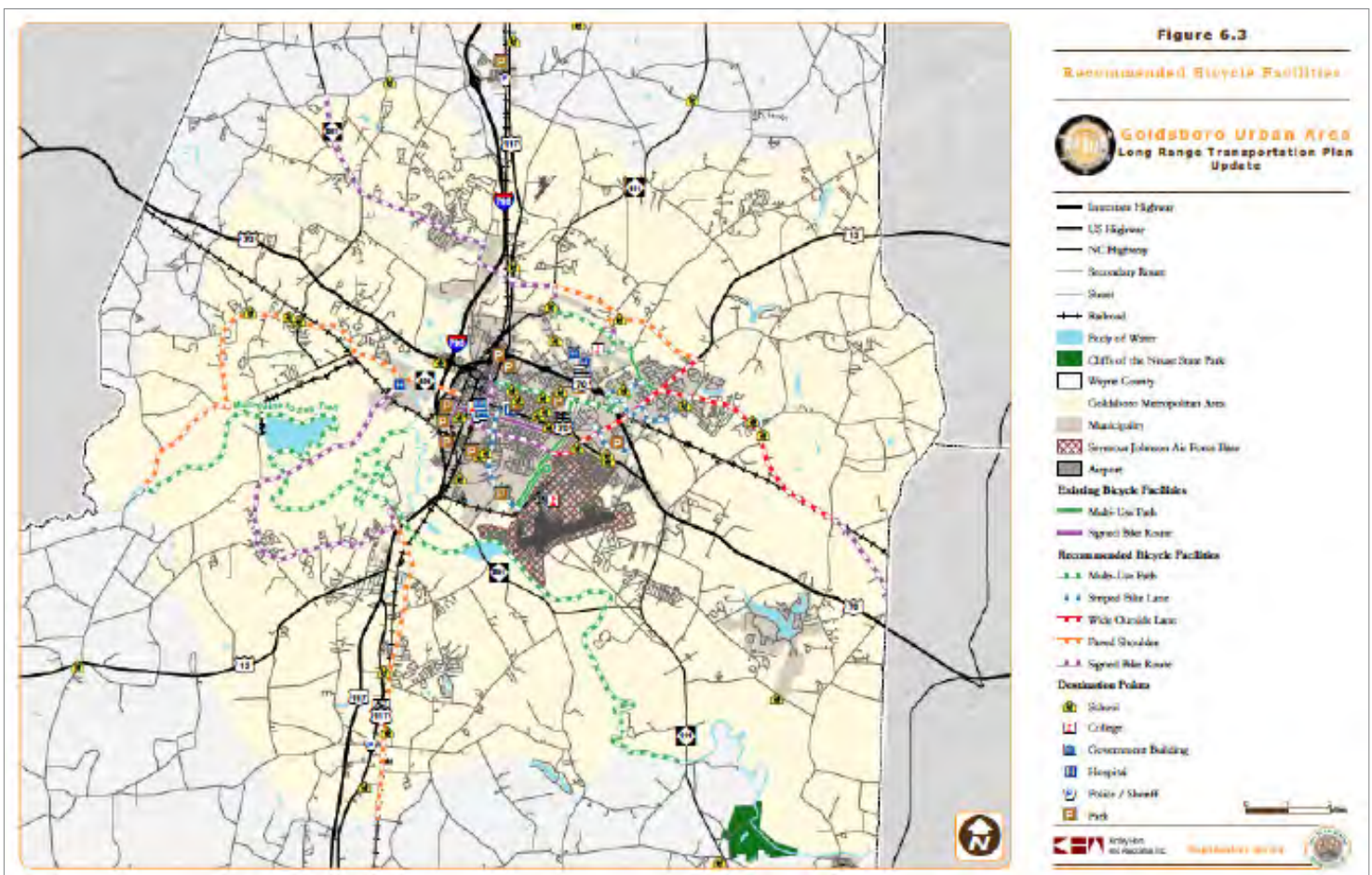
## GOLDSBORO URBAN AREA 2035 LONG RANGE TRANSPORTATION PLAN (LRTP) UPDATE (2009)

The 2035 LRTP focuses on the development of a multimodal transportation system to help the City's continued growth while preserving its appeal and charm. The Plan features tools that attempt to merge smart growth concepts with the demands of roadway users.

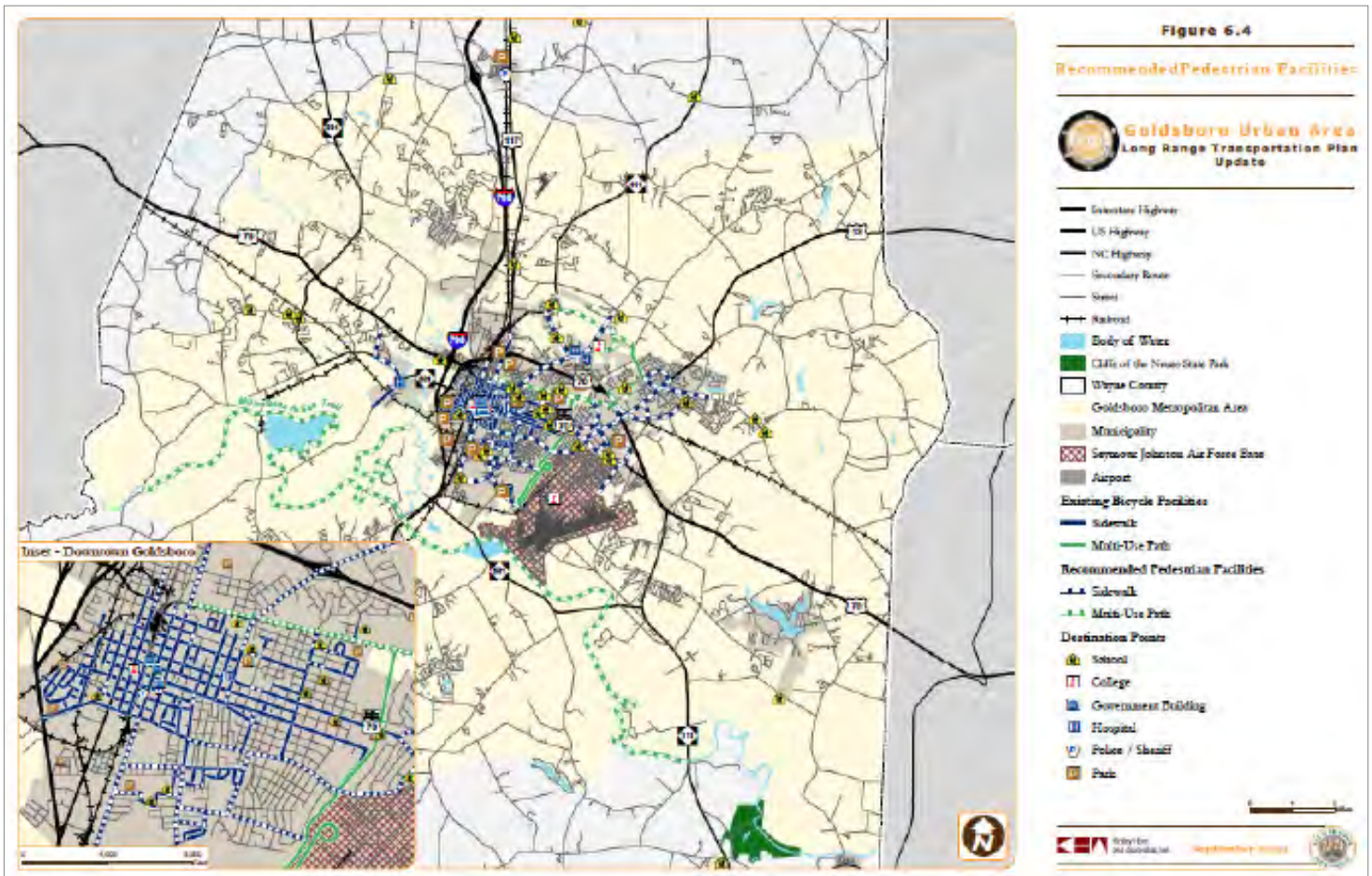
The Plan features a bicycle element and a pedestrian element. Public engagement efforts found that 70% of City respondents felt that bike and pedestrian facilities were fair to poor in the region. The LRTP calls for improvements to the citywide network with a priority in developing walkable neighborhoods and commercial centers. The Plan calls for 25 miles of signed on-street bike routes, 23 miles of paved shoulder, 9.7 miles of wide outside lanes, and 7.4 miles of striped bike lanes. Specifically, bike lanes were proposed for Cashwell Drive, Slocumb Street, South Harding Drive, and Parkway Drive (Since this Plan was adopted, bike lanes were added on Harding and Parkway). It recommends 29 miles of new sidewalk including key improvements along Royall Avenue, Spence Avenue, and Elm Street. It also includes 38.3 miles of greenway recommendations located along



LRTP plan cover.



Goldsboro Urban Area 2035 Long Range Transportation Plan (LRTP) Bicycle Facility Recommendations



Goldsboro Urban Area 2035 Long Range Transportation Plan (LRTP) Pedestrian Facility Recommendations

the Neuse River, New Hope Road, and Stoney Creek. The Plan also recommends a streetscape plan for Ash Street from George to Berkeley.

The Plan provides policy action recommendations for the City and Wayne County. Policy recommendations include access to school, streetscape, development standards, and funding sources.

### WAYNE COUNTY COMPREHENSIVE PLAN (2009)

The Comprehensive Plan contains policy guidance for public decisions at the County level aimed at managing growth and development. The Plan is divided into categories of transportation, economic development, funding, agricultural preservation, water and sewer services, schools, housing/neighborhoods, public safety, Downtown revitalization, parks and recreation, community appearance, and intergovernmental cooperation. Actions recommended in the Comprehensive Plan most strongly related to this Plan include:

#### Transportation

Policy 1.3: **Pedestrian and bikeway facilities** shall be encouraged as energy-efficient, healthful, and environmentally sound alternatives to the automobile. All future road construction and expansion within the county shall consider opportunities for bikeways and pedestrian ways within the project.



Policy 1.4: The mobility needs of all citizens shall be recognized through the provision of **transportation alternatives to the automobile**. Wayne County should work with state and federal governments to create pedestrian, bikeway and transit improvements proportionate to the large number of people benefited.

Action 1.3: Consider expanding Goldsboro's **bikeway master plan** into parts of the unincorporated county. Consider **bike lanes as part of street construction standards** for new developments in locations identified by the plan. **Consider areas adjoining extra-territorial jurisdiction as places to expand bike lanes.**

Action 1.4: Reexamine the County's development standards to evaluate the need for improved **pedestrian systems** (sidewalks, greenways, streetlights etc.) in new residential developments.

Action 1.5: **Seek funding** sources, such as Enhancement Grants, to provide sidewalks and street furniture, streetlights, etc. **to improve pedestrian-oriented areas.**

## Economic Development

Policy 2.9: Local economic development efforts shall protect, enhance and encourage a high **quality of life, image and cultural amenities** as critical factors in business retention, recruitment and economic growth.

Policy 2.12: Activities that bring new people and businesses to the county, including special events, sports tournaments, eco-tourism (e.g. neuse river), heritage tourism, and convention activities shall be encouraged and supported.

## Schools

Policy 6.2: Advanced planning for the location of new public schools shall be supported. School locations should serve to reinforce desirable growth patterns rather than promoting sprawl. New elementary school locations shall be viewed as a cornerstone of the neighborhoods they are intended to serve.

Policy 6.4: School campuses shall be designed to allow safe, secure **pedestrian access from adjacent neighborhoods**. Travel corridors within 1.5 miles of all public schools shall be a priority for construction of sidewalks, bike paths and pedestrian trails.

Action 6.4: In cooperation with the Wayne County Board of Education, prepare site criteria for the placement and development of community-oriented schools, to include priorities for safe pedestrian and bicycle access, transit use, neighborhood connectivity, infrastructure availability, and environmental compatibility.

Action 6.5: Apply for a Safe Routes to School Grant through the North Carolina Department of Transportation. These Federal funds, administered by the State, may be used to construct new bike lanes, pathways, and sidewalks, as well as to launch Safe Routes education and promotion campaigns in elementary and middle schools.





## Neighborhoods

Policy 7.12: **Compact, full service neighborhoods** offering a compatible mixture of appropriately scaled and designed structures (homes, schools, churches, parks, shopping and services, etc.) and less dependency on the automobile, shall be encouraged.

## Downtowns

Policy 9.8: **Pedestrian oriented streetscape improvements** including, but not limited to sidewalks, street trees, landscaping, street lights, street furniture, and signs shall be supported as a means to create and maintain a downtown environment attractive to investment.

Policy 9.10: Efforts to maximize the use of the **public space of the sidewalk** so as to enliven the downtown street space are generally supported. Such use shall be balanced against public safety and other issues as may affect pedestrian movement and other proper uses of the street right of way.

## Parks and Recreation

Policy 10.5: Efforts to develop a system of open space **greenways and hiking trails** in the County shall be encouraged. Natural corridors such as streams and floodplains, and man-made corridors such as utility and transportation rights-of-way and easements may be strategically employed as appropriate.

Policy 10.6: The underutilized value of the **Neuse river and its tributaries** shall be developed through the provision of more and better access to the river and its shores for active and passive recreation.

Action 10.2: Prepare a **Greenways, Trails and Open Space Master Plan** for the entire county. Make a **Neuse River Corridor Conservation and Development Plan** a central feature of the master plan. Include major tributaries of the Neuse in the plan. Include boating as well as pedestrian facilities. Seek federal and state funding.

Action 10.3: Develop guidelines to **preserve and protect natural and man-made corridors** for future greenways, trails and open space.

Action 10.4: Amend the County's subdivision regulations or other appropriate ordinances to allow for **parkland dedication or a proportionate fee in lieu of land dedication**.

## Community Appearance

Policy 11.1: The important economic, tourism, and community image benefits of attractive **major travel corridors** through the county shall be recognized. Such entryway corridors shall receive priority attention for improved appearance and development standards, including landscaping, signage, tree preservation, underground utilities and, in some instances, streetlights, and sidewalks.

Policy 11.7: The significance of **street trees** in providing visual relief, summer cooling, improved air quality and livability shall be recognized through public policies to encourage their planting and maintenance. Highest priority shall be given to gateway travel corridors and urbanized areas. Programs urging



voluntary efforts by property owners shall be preferred. Power companies shall be encouraged not to butcher trees under or near power lines.

Action 11.2: Authorize and approve **design and streetscape standards for gateway corridors** in close cooperation with gateway corridor property owners. Do this in the order of each corridor’s priority. Look at successful examples from other communities.

Action 11.3: Initiate voluntary gateway enhancement programs in close cooperation with gateway corridor property owners. Do this in the order of each corridor’s priority. Emphasize maintenance.

Action 11.4: Amend the zoning ordinance to **require street trees** or other appropriate vegetation, in association with new development along designated gateway corridors.

Action 11.5: Prepare a **landscape ordinance and design guidelines** setting forth rules for tree removal and tree preservation, planting and maintenance. Set forth rules to address clear cutting in different land use activities.

Action 11.7: Prepare a street tree and landscape planting and maintenance booklet.

## WAYNE COMMUNITY COLLEGE FITNESS & WALKING TRAIL PHASING PLAN



**LEGEND**

SYMBOL

	PROPOSED MULTI USE PATH - PHASE I
	FUTURE MULTI USE PATH
	PARCEL LINE

*Wayne Community College  
Fitness & Walking Trail Map*

## WAYNE COUNTY PUBLIC HEALTH DEPARTMENT STRATEGIC ACTION PLAN 2009 - 2012

The number one goal of the Health Department is to reduce the burden of chronic disease among Wayne County residents. Some strategic activities include public education and awareness, local walks, the Obesity Task Force, and work in schools.



# Appendix F: Blueways

## Appendix Contents:

*Overview*

*Existing Blueway Resources*

*Recommended Blueway Facilities*

*Recommended Blueway Programs*

*Blueway Design Guidelines*

*Additional Resources*

## OVERVIEW

A blueway or paddle trail is a river, creek, or body of water that is designated as a water-based trail, featuring launch points, camping locations and points of interest for kayakers, canoeists, and paddle boarders. Blueways are typically developed by state, county or local municipalities to encourage recreation, ecological education and preservation of wildlife resources. Goldsboro's creeks, rivers, and wetland areas offer a variety of blueway opportunities for varying levels of paddling skills. This appendix contains recommendations for new water access points, paddle campgrounds, program recommendations and best practices for designing blueway amenities such as wayfinding, safety information and related environmental education.

## The Paddle Tourism Study for North Carolina

According to a survey of more than a thousand North Carolinians conducted for the 2008 *Paddle Tourism Study* by the North Carolina State Trails Program:

- » North Carolina is a destination for paddlers from surrounding states.
- » Over two-thirds of respondents (70%) feel that paddle trail development is a viable form of economic development for North Carolina.
- » Respondents spent almost one million dollars per year on paddle trips outside their local area, and nearly \$300,000 per year on trips within their local area.
- » The Neuse River was identified as the most popular river to paddle in North Carolina (named by 306 respondents as the body of water they most frequently paddle), followed by the Cape Fear River (255 respondents) and the Nantahala (254 respondents).
- » Respondents were asked about their top concerns when on a paddle trip. Almost three-fourths of respondents reported being concerned with the quality and safety of access sites (73%)

## *Improving Paddling Experience*

When asked about how to improve the paddling experience, the most frequent topic that emerged, cited by nearly 450 respondents, was related to improving and increasing the number of paddle trails and access areas for existing paddle trails. A number of respondents indicated the need for more paddle access and parking at DOT bridges and right-of-ways. Suggestions for paddle access improvements included rest room facilities, signage, and camping opportunities. Many felt that more campsites including platforms for camping along paddle trails would improve their experience.



## EXISTING BLUEWAY RESOURCES

### The N.C. Paddle Trails Association (NCPTA)

Goldsboro and Wayne County should continue working with the NCPTA on the promotion of blueways in the Goldsboro Region. The mission of the NCPTA is to empower communities in the local development, maintenance and restoration of paddle trails in North Carolina thereby nurturing economically and environmentally sustainable communities. The success of hiking and biking trails in attracting new users motivates NCPTA to mirror that approach in growing paddlesports in pursuit of its goals:

- » Work with the state of North Carolina to provide infrastructure for local paddling initiatives to develop, maintain, restore and promote paddle trails.
- » Support continued development of electronic and hard copy trail maps.
- » Help meet informational needs of paddlers and paddling organizations.
- » Coordinate use and access to public water.
- » Provide statewide representation on issues related to the development, use and management of paddle trails.
- » Improve economic and environmentally sustainable communities through paddle trails.
- » Provide state-wide support for paddle trail development at the local level.

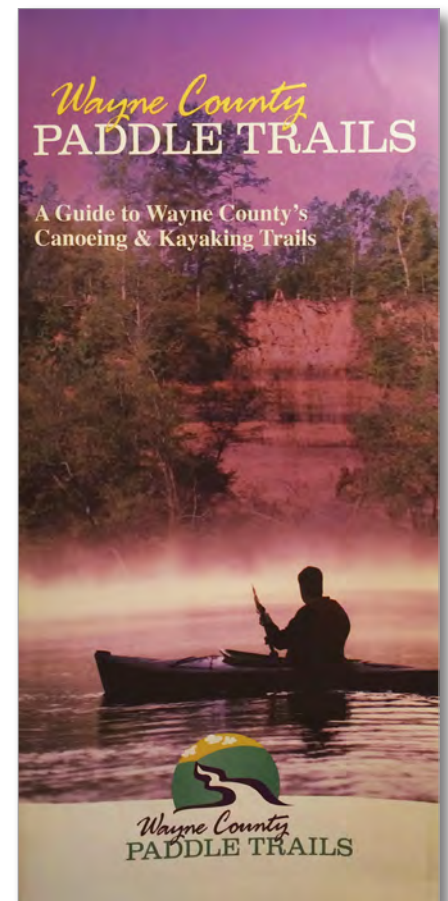
### Wayne County Paddle Trails

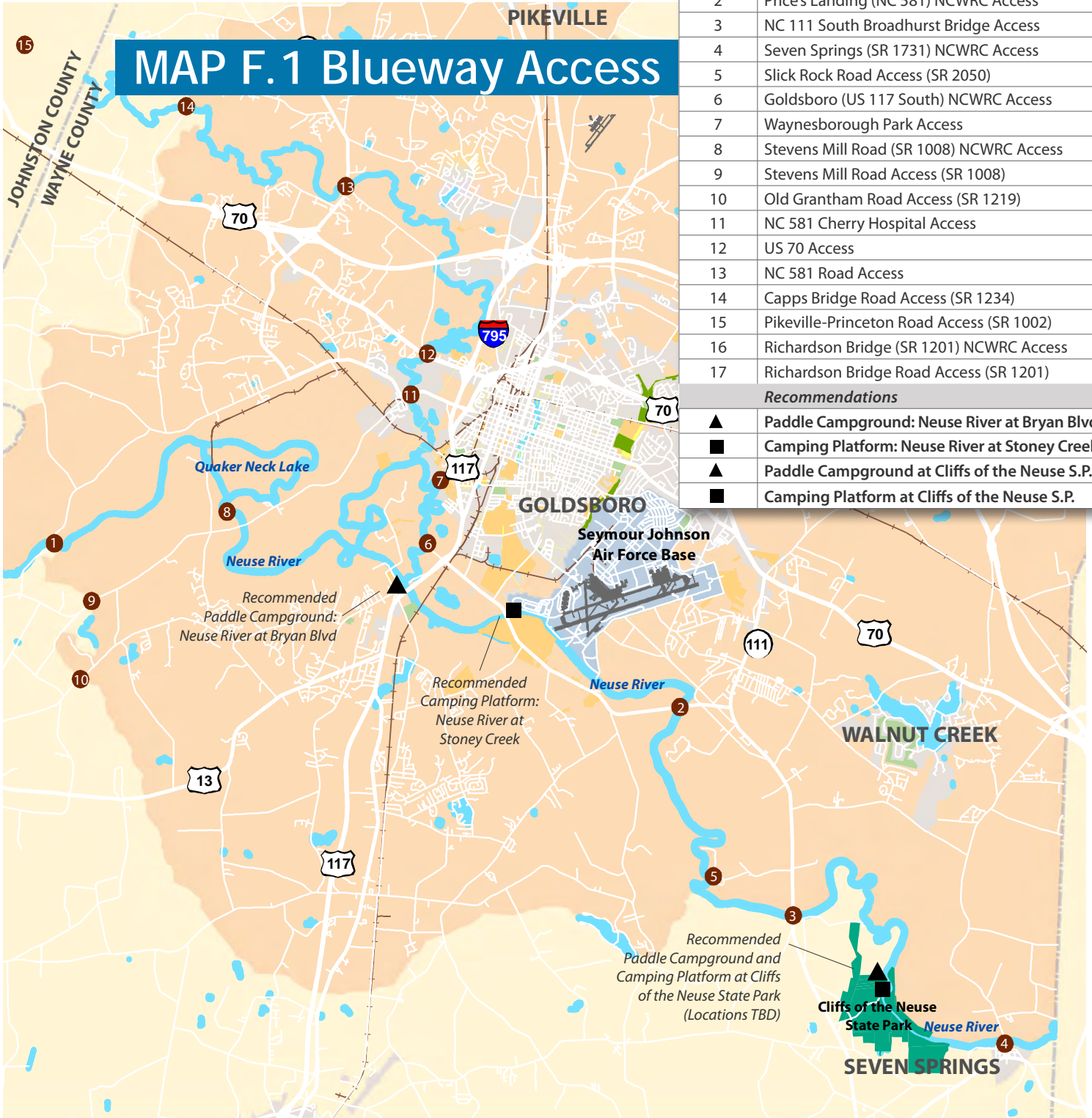
Wayne County Paddle Trails is part of the Statewide System of Paddle Trails being promoted by the NCPTA. The Wayne County Paddle Trails consist of over 70 miles of interconnected rivers, streams, and tributaries that twist and wind through Wayne County. See the map and table on the following page for existing and recommended water access and camping locations near Goldsboro.

The map and brochure, 'Wayne County Paddle Trails: A Guide to Wayne County's Canoeing & Kayaking Trails' has a wealth of information on existing resources in the area and should be consulted in full for details about blueways in this region. The map includes information on:

- » Safety Tips
- » Mill Creek Trail
- » Falling Creek Trail
- » Little River Trail
- » Neuse River Trail
- » Points of Interest along these trails, including:
  - *Cherry Research Farm*
  - *Cherry Hospital Museum*
  - *Waynesborough Historical Village*
  - *Goldsborough Bridge Battlefield*
  - *Seven Springs*
  - *Cliffs of the Neuse State Park*

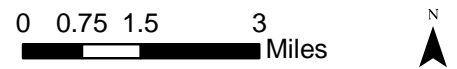
The Wayne County Paddle Trails brochure and map can be found through Goldsboro-Wayne County Travel & Tourism: [www.greatergoldsboro.com](http://www.greatergoldsboro.com)





Map ID	Name
1	Ferry Bridge Road (SR 1224) NCWRC Access
2	Price's Landing (NC 581) NCWRC Access
3	NC 111 South Broadhurst Bridge Access
4	Seven Springs (SR 1731) NCWRC Access
5	Slick Rock Road Access (SR 2050)
6	Goldsboro (US 117 South) NCWRC Access
7	Waynesborough Park Access
8	Stevens Mill Road (SR 1008) NCWRC Access
9	Stevens Mill Road Access (SR 1008)
10	Old Grantham Road Access (SR 1219)
11	NC 581 Cherry Hospital Access
12	US 70 Access
13	NC 581 Road Access
14	Capps Bridge Road Access (SR 1234)
15	Pikeville-Princeton Road Access (SR 1002)
16	Richardson Bridge (SR 1201) NCWRC Access
17	Richardson Bridge Road Access (SR 1201)
Recommendations	
▲	Paddle Campground: Neuse River at Bryan Blvd
■	Camping Platform: Neuse River at Stoney Creek
▲	Paddle Campground at Cliffs of the Neuse S.P.
■	Camping Platform at Cliffs of the Neuse S.P.

## Recommended Blueway Facilities



### Legend

#### Recommended Blueway Facilities

- ▲ Paddle Campground
- Camping Platform

#### Existing Infrastructure

- Paddle Access Point
- Roadway
- Railroad

#### Lands of Interest

- City Greenway Lands
- Park
- State Park
- City Easements
- Other City/County Property

#### Additional Context

- Seymour Johnson Air Force Base
- City Limits
- MPO Limits
- Wayne County Border



## RECOMMENDED BLUEWAY FACILITIES

For this plan, recommended blueway facilities include new water access sites for non-motorized boat launches and camping facilities for paddlers. These should be constructed in a manner that utilizes best practices and minimizes environmental impact. Key facility recommendations are outlined below (refer to the last section of this appendix for Blueway Design Guidelines related to these recommendations).

### Paddle Campground along the Neuse River at Bryan Boulevard

This proposed paddle campground would be located on a former FEMA floodplain property. The site is optimal for use as a paddle campground for several key reasons. First, there is an existing concrete boat ramp and an existing stair access to the Neuse River that could be utilized for canoe and kayak access. Second, the site also has a fireplace structure and water utilities in place that could be retrofitted for use by campers. Finally, the location of the property is situated at the junction of the Little River and the Neuse River, offering views of both waterways, providing a unique opportunity for a regional attraction. Next steps for this site could include:

- » Identify and meet with key stakeholders for this project.
- » Research the potential constraints on use of this property as a campsite (given its history as a former FEMA floodplain buy-out) and identify necessary steps to make the site viable for camping as a Level 5 access site (see page F-12).
- » Obtain necessary easements, permits, purchase and/or transfer of ownership to make the site viable.
- » Develop a site master plan that fits within above constraints and outline an operations and maintenance plan.
- » Fund and develop the site.

Below: Existing and proposed conditions at the Neuse River near Bryan Blvd, including the recommended MST Trail.

For all new Blueway facilities, consider these steps:

1. Look for partners and input from the target user groups.
2. Keep the design as simple as possible while protecting resources with floating docks and boardwalks where necessary.
3. Utilize designers experienced with non-motorized boat users.
4. Contact regulatory agencies before developing plans; regulations will shape design features.
5. Incorporate permits into timelines (3-18 months).

Source: Florida Fish and Wildlife Conservation Commission





### Camping Platform along the Neuse River at Stoney Creek

This proposed camping platform was identified by project stakeholders in interviews conducted as part of this planning process. Next steps for this site could include:

- » Identify and meet with key stakeholders for this project.
- » Research the potential constraints for camping in this area associated with the 'explosive arc' at the southwest corner of the Seymour Johnson Air Force Base.
- » Identify specific locations that could work for this facility.
- » Obtain necessary easements, permits, purchase and/or transfer of ownership to make the site viable.
- » Design the platform(s) and outline an operations and maintenance plan.
- » Fund and develop the site.

### Paddle Campground and Camping Platform along the Neuse River at Cliffs of the Neuse State Park

This section of this region's blueway system is identified by Goldsboro and Wayne County as one of the top attractions for paddlers. There is currently no option for camping for paddlers at the Cliffs of the Neuse State Park. Next steps for this site could include:

- » Identify and meet with key stakeholders for this project, including North Carolina State Parks officials and park managers.
- » Identify specific locations that could work for these facilities and determine the level of access desired (see page F-12).
- » Design the campground and platform(s) and outline an operations and maintenance plan.
- » Fund and develop the site.

TheNeuseRiveratCliffsofthe  
Neuse State Park.





## RECOMMENDED BLUEWAY PROGRAMS

### Coordinate with the Neuse River Keeper Foundation

The vision of the Neuse River Keeper Foundation (NRF) is to be the leading resource and advocate for the entire Neuse River Basin and to develop innovative programs which will foster and sustain education, stewardship and watershed management initiatives and practices. They also envision:

- » A Neuse River that is noted for its clean water which supports healthy fish, wildlife and native plants and is safe for swimming, fishing and recreation.
- » A greater public participation and understanding of all major river and land use issues in the watershed.
- » Groups of volunteers and an expanded membership base ready to actively support and celebrate the river on a continuing basis.
- » Parts of the Neuse River classified as Scenic Waterways to better promote tourism.
- » Communities, businesses and individuals throughout the Basin who recognize its waterways as valuable but vulnerable resources for drinking water, improved tourism and recreation.
- » State and local officials and agencies that care about the river, understand its threats and who are prepared to enact and enforce regulations and legislation to restore and protect the river.
- » Recognition of the NRF as one of the most successful Riverkeeper programs in the country due to the organization, planning and implementation of its key initiatives.

By closely coordinating with the NRF, Goldsboro and Wayne County can help ensure they are developing and enhancing their blueway system in a way that best preserves and promotes the Neuse River as a strong environmental asset of the community. Website: [www.neuseriver.org](http://www.neuseriver.org)

### Develop an Ongoing Adopt-a-Blueway Program

An Adopt-a-Blueway program is similar to 'adopt-a-highway' or 'adopt-a-trail' programs that rely on the coordinated efforts of local organizations and groups of people to regularly clean-up litter and debris found along such corridors. Each adopter focuses on a particular stream or river - maybe even a favorite section. Most people adopt a stream or river near their home or on a river that they regularly paddle or otherwise visit. Most programs take a two-pronged approach - river protection and river enhancement. River adopters watch that waters are in good shape and report problems that arise, such as pollution incidents that can be corrected. They also help to improve rivers through actions such as cleanups and stabilizing eroding streambanks. Adopters may also be trained to conduct one or more stream surveys (including invertebrate samples or water quality samples) each year.



Photo source:  
<http://www.neuseriver.org/>





## Improve Web Interface for Planning Trips

Project partners should develop an online counterpart to Wayne County's Paddle Trails map and brochure (also building upon any existing online blueway mapping data). This website should allow for web interface and trip planning. The online guide should include information on:

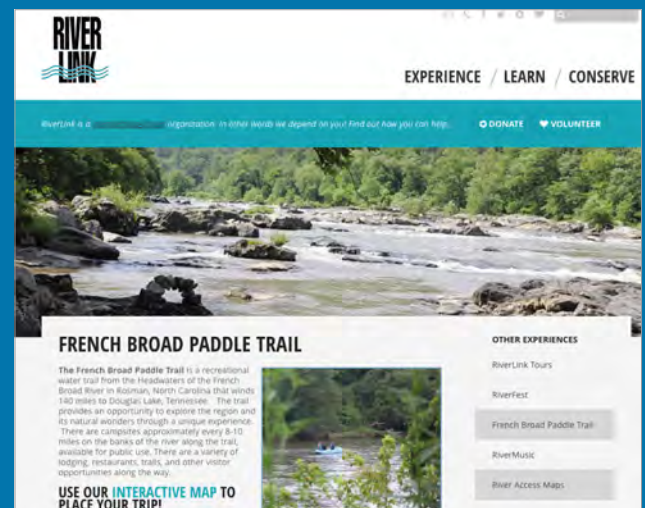
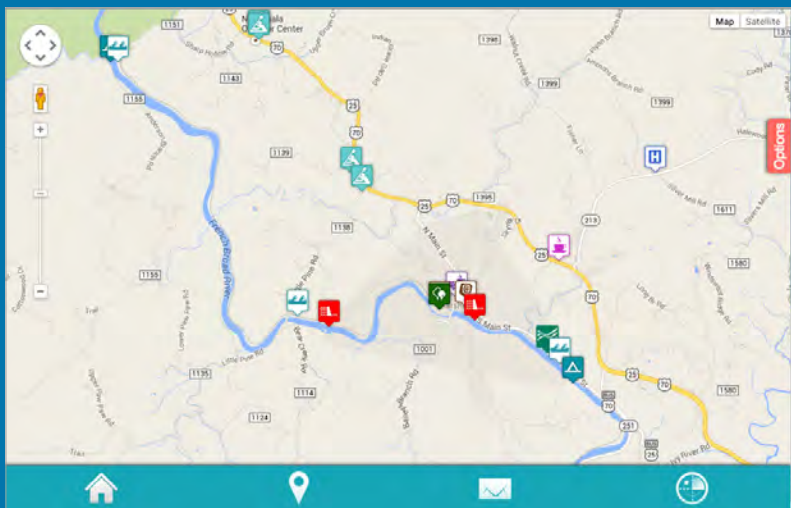
- » Access sites and streamside campsites
- » Routes and approximate travel times
- » Navigation hazards and portages
- » Local trail support facilities
- » Local historical and cultural information
- » Natural features and information on wildlife

### Case Study: The French Broad Paddle Trail

The French Broad Paddle Trail is a recreational water trail from the Headwaters of the French Broad River in Rosman, North Carolina that winds 140 miles to Douglas Lake, Tennessee. The online resources for this trail are exemplary, featuring everything from paddling etiquette to interactive online maps and map apps.

Visit the website for details and ideas: <http://riverlink.org/experience/french-broad-paddle-trail/>

Screenshots of the case study web site.



## Build and Maintain Blueway Partnerships

Blueway planners and designers should coordinate with a variety of interests and stakeholders in the region. These may include, but are not limited to:

- » Private businesses and business groups, such as private canoe and kayak vendors, local chambers of commerce, and large employers, to maximize positive economic impact and build public-private partnerships.
- » Environmental and water protection groups, to catalyze related volunteer efforts and river clean-up efforts.
- » Non-profits to address liability. Roanoke River Partners is an example of a nonprofit that leases blueway property to landowners to take liability then shares some of the camping proceeds to landowners.
- » State, regional, and local government agencies, such as NC State Parks and local parks and recreation departments.
- » Blueway-specific groups such as the N.C. Paddle Trails Association and the Neuse River Keeper Foundation.

## BLUEWAY DESIGN GUIDELINES

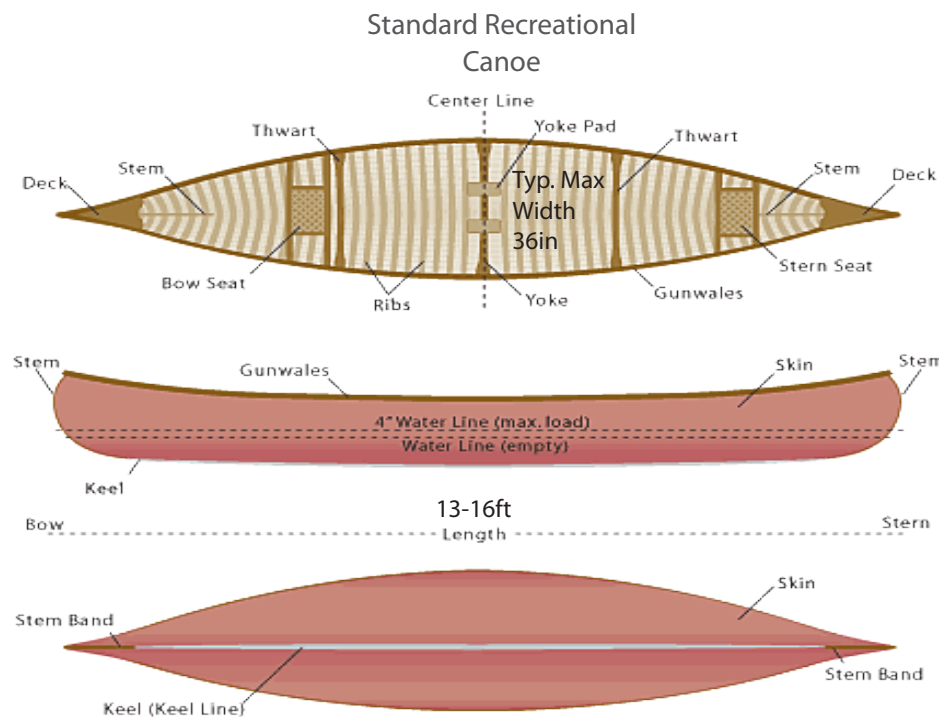
### Design Needs of Paddlers

The purpose of this section is to provide the facility designer with an understanding of how paddlers operate and how a canoe or kayak influences that operation. Paddlers can be more acutely affected by poor trail/facility design and other man-made and natural obstacles than motorized boaters. Paddlers generally lack the protection from the elements and other waterway hazards provided by a motorized boat's larger structure and safety features. By understanding the unique characteristics and needs of paddlers, a facility designer can provide quality facilities and minimize user risk.

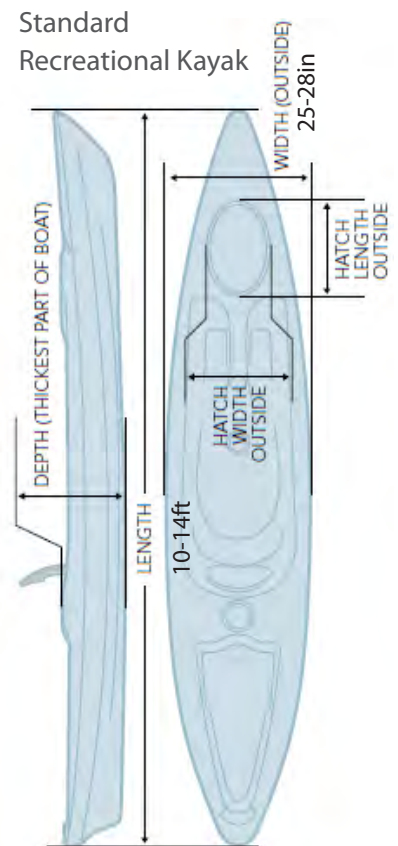
### Canoe and Kayak Design Vehicles

Similar to motor boats, canoes and kayaks exist in a variety of sizes and configurations. These variations occur in the types of canoe or kayak (such as expedition, whitewater) and behavioral characteristics (such as the comfort level of the paddler). The design of a blueway should consider reasonably expected canoe/kayak types on the trail and utilize the appropriate design.

The figure below illustrates physical components of a typical recreational canoe and kayak, which are the basis for typical trail selection and design. In addition to the reach of an oar/paddle, paddlers require clear space to operate within a facility. This is why the minimum operating width will be greater than the physical reach of the paddler.

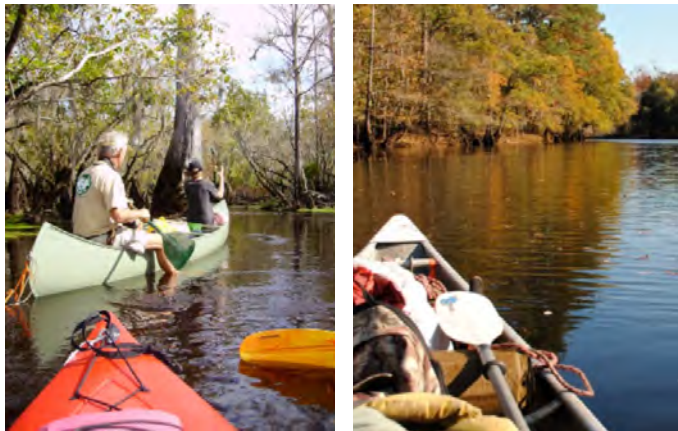


Sources: [www.canoeing.com](http://www.canoeing.com) and [www.wildernesssystems.com](http://www.wildernesssystems.com)





Variations of a typical canoe and kayak also require consideration when planning and designing paddling facilities. Other types of canoes and/or kayaks include expedition/touring, whitewater, and racing. The pictures and tables below summarize these types.



Photos:www.capefearriveradventures.com

Canoe Design Vehicle - Typical Dimensions

Canoe Type	Features	Common Dimensions
<b>Recreational Canoe</b>	Length Max Width	13-16ft 36in+
<b>Expedition/ Touring Canoe</b>	Length Max Width	18-20ft 35-39in
<b>Whitewater Canoe</b>	Length Max Width	12-16ft 25-33in
<b>Racing Canoe</b>	Length Max Width	18-20ft 28-33in

Kayak Design Vehicle - Typical Dimensions

Kayak Type	Features	Common Dimensions
<b>Recreational Kayak</b>	Length Width	10-14ft 25-28in
<b>Expedition/ Touring Kayak</b>	Length Width	13-20ft 20-24in
<b>Whitewater Kayak</b>	Length Width	6-12ft 25-40in



Canoe and Kayak as Design Vehicles - Design Speed Expectations

Type	Typical Speed
<b>Canoe</b>	1-3mph
<b>Kayak</b>	3-5mph

*Design Speed Expectations*

The expected speed that different types of canoes and kayaks can maintain under various conditions also influences the design of facilities such as distances between launch sites. The table to the right provides typical canoe and kayak speeds.

\*Thesenumbersarevariable;manyfactorscanaffectspeed including-wind,currents/tides,boattype,paddlabilitylevel, etc.

Sources:SearchandRescueBritishColumbia;CoastandKayak Magazine

## Blueway Signage

Signage is important in creating a safe, efficient, marketable, and low-impact blueway trail system. Key considerations include:

- » Selecting the appropriate amount, size, color, style, location, and material in balancing the need to be visible with the desire to minimize visual intrusion
- » Other practical factors include cost and availability, weather resistance, installation, and susceptibility to vandalism and theft

Types of signs include:

- » Road signs leading to a launch site - websites, guides, and maps can be useful as well
- » Trailhead signs - kiosks, displays, and bulletin boards are strategic locations to post information because most water trail users will spend some amount of time preparing for their trip here. Displaying the following information can be helpful:
  - Blueway map
  - Safety measures and water trail specific warnings
  - Leave No Trace guidelines
  - Parking locations and rules
  - Interpretation
  - Amenities
- » Campsites and day-use site signs - can be helpful in directing boaters to the appropriate location; trailhead signs can accomplish this as well
- » Wayfinding signs along the trail - these are helpful in directing paddlers to proper channels and streams; they can also be used to identify distances to other launch sites and points of interest, as well as identifying hazards.



Kayaksafetysignageandmobilephone wayfinding/educationalinformationin Charleston, SC.

Positive language should be used in sign wording to encourage appropriate responses from users. For example, say “Camping by written permission only, please” and point users to further information instead of saying “No camping”.\*



Above: Educational signage on the Beaver Pond Paddling Trail in TX, and directional signage on the Great Calusa Blueway Paddling Trail in PA and the Weedon Island Preserve in FL.

\*Source: American Rivers. Promote a Blue Trail: Create Blue Trail Signs. Accessed from: [www.bluetrailsguide.org/promote](http://www.bluetrailsguide.org/promote)



## Paddle Trail Access Sites

Non-motorized canoe and kayak access sites should be simple, low maintenance, and inexpensive. A stable riverbank or shoreline is typically adequate as long as there is a path that is flat and hard enough to carry boats. The following dimensions are recommended for access:

- » 12' wide at the water line
- » Tapered to 9' wide at the top entrance area
- » 15' in length
- » 3:1 slope at the stream bank\*
- » Recommend distances between access sites varies according to user skill levels. Ideally, the blueway system in Goldsboro would accommodate a range of skill levels, requiring at least one section at 1-3 miles apart (for a one-hour beginner-level outing), up to 20 or more miles (for a day-long trip for more experienced paddlers).

The availability of parking at a launch site will depend upon the specific site's accessibility. Remote sites will require less parking while sites located in areas with higher use will require more. Canoe and kayak slips can also be provided at trailheads, allowing more convenient access for frequent visitors.

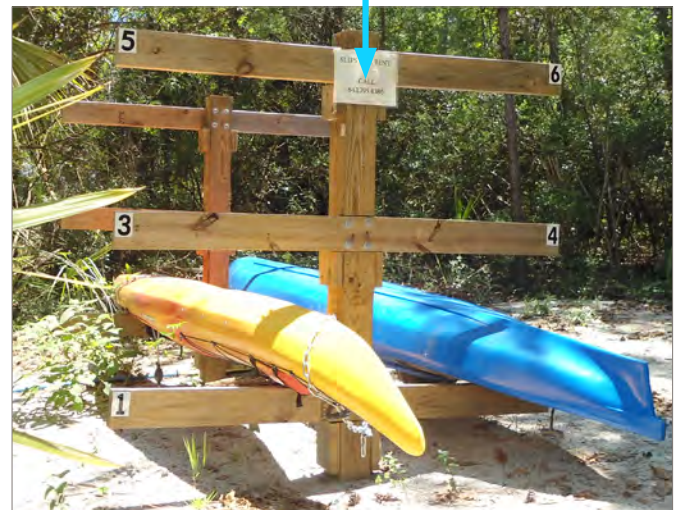
For ecologically sensitive sites, low-impact access points (sometimes only requiring a sign or marker) may be explored to reduce erosion and degradation at multiple sites, caused by a lack of designated access.

\*Source: Openlands. All About Canoe and Kayak Launches. 2012. Accessed from: <http://openlands.org/greenways/how-to-guides/all-about-canoe-and-kayak-launches.html>.

On-site canoe/  
kayak storage  
for rent.



Canoe/kayak pier for high bank access (examples from Charleston, SC).

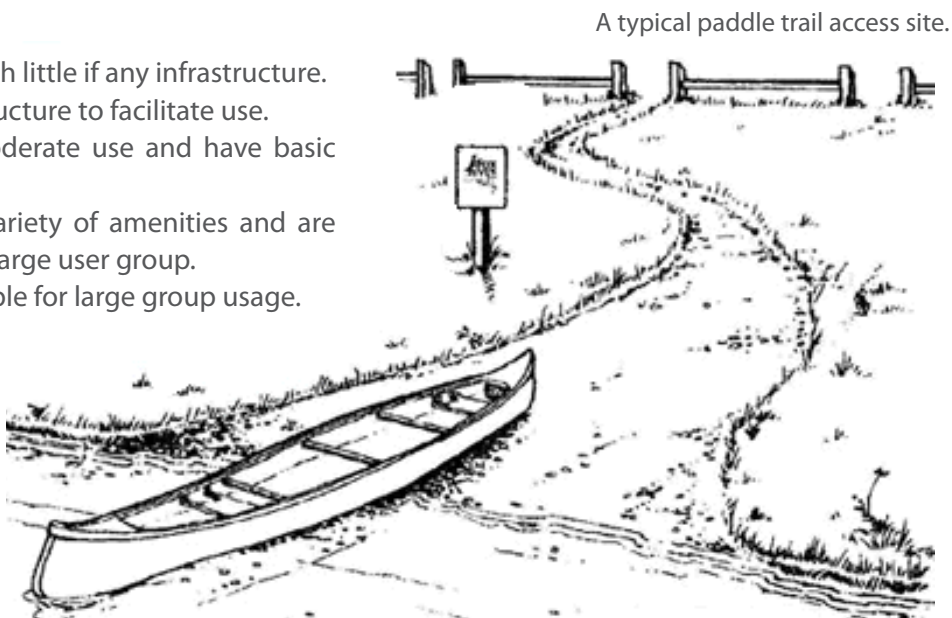


### *NCDENR State Trails Program Standards for Paddle Trail Access Sites*

All access sites designated by the NCDENR State Trails Program must follow certain guidelines and standards. Standards for different types of access sites are highlighted below.

- » A Level I Access site is rustic in nature with little if any infrastructure.
- » A Level II access site has minimal infrastructure to facilitate use.
- » Level III Access sites are geared for moderate use and have basic amenities.
- » Level IV access sites provide a wider variety of amenities and are suitable for moderate to heavy use by a large user group.
- » Level V access sites have amenities suitable for large group usage.

For more information on NCDENR State Trails Program Standards for Paddle Trail Access Sites: [www.ncsu.edu/ncblueways/ncblueways\\_standards.html](http://www.ncsu.edu/ncblueways/ncblueways_standards.html)



A typical paddle trail access site.

### **Blueway Camping Sites and Platforms**

New blueway camping sites and/or platforms in the Goldsboro region should be located at approximately a day-long journey's distance apart (15-20 miles). This would allow more experienced paddlers to camp at successive sites on a multi-day trip. The following campsite guidance is from a national best-practice manual, *Iowa Water Trails: Connecting People with Water and Resources*:

- » Campsites should be located in areas that are difficult to reach except by water and not near dwellings, or be within boundaries of an actively managed public recreation area such as a state or county park.
- » Campsites should be located ¼ mile or more from all roads, or on opposite side of river to discourage non water trail use.
- » Traits of desirable sites:
  - A short hike up a ridge via a sustainably designed trail can provide a drier site with breezes, fewer insects, and a nice view.
  - Low terraces outside of the active floodplain can offer spots for large clusters.
  - View and sound of water
  - Floods infrequently
- » Amenity level should correspond to desired experience type, although often infrequent maintenance and lack of rest rooms may limit the site to more experienced paddlers only.
- » Use care not to disturb sensitive native species



Flatdocks with no roof or wall structure. Source: SeasideWaterTrailCampingPlatformFeasibility.

The images that follow show a variety of camping platform types. These images are from the *Seaside Water Trail Camping Platform Feasibility* report from the Virginia Coastal Zone Management Program.



A Chickee Camp Site in Everglades National Park. Source: Seaside Water Trail Camping Platform Feasibility.



Docks with a shallow sloped roof supported by vertical posts with no wall structure. Source: Seaside Water Trail Camping Platform Feasibility.



Approaching a Floating Camping Platform in Alabama. Source: Seaside Water Trail Camping Platform Feasibility.



Example of Land Camping Structure. Source: Seaside Water Trail Camping Platform Feasibility.

## ADDITIONAL RESOURCES

### National Trails Training Partnership

This webpage has nearly 100 links related to blueways, covering topics such as planning, facilities, training, management, programs, and links to exemplary water trail systems.

Website: [www.americantrails.org/resources/water/index.html](http://www.americantrails.org/resources/water/index.html)



### Iowa Water Trails: Connecting People with Water and Resources

This report is regarded by the national trail advocacy non-profit, *American Trails*, as an exemplary blueway development guide.

Available online:

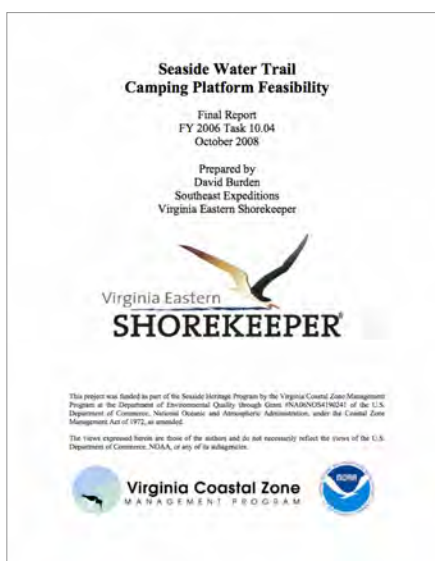
[www.iowadnr.gov/Recreation/CanoeingKayaking/WaterTrailDevelopmentTools/WaterTrailsToolkit.aspx](http://www.iowadnr.gov/Recreation/CanoeingKayaking/WaterTrailDevelopmentTools/WaterTrailsToolkit.aspx)



### Seaside Water Trail Camping Platform Feasibility

This report from the Virginia Coastal Zone Management Program determines the feasibility of creating a water trail system that includes facilities to allow paddlers to start at one end of the study area, and continue uninterrupted through to the other end. The main applicability for Goldsboro is in the report's recommendations and analysis for a variety of camping platforms.

Available online: [www.deq.state.va.us/Portals/0/DEQ/CoastalZoneManagement/task10-04-06b.pdf](http://www.deq.state.va.us/Portals/0/DEQ/CoastalZoneManagement/task10-04-06b.pdf)







# Appendix G: Access to Healthy Food and Recreation Analysis

## Appendix Contents:

Overview

Analysis

Evaluation

Coordination between  
Agencies

**The #1 goal of the  
Wayne County  
Health Department  
is to reduce the  
burden of chronic  
disease among  
County Residents**

GoldsboroComprehensivePlan

## OVERVIEW

Increasingly, communities are recognizing and addressing the significant effects that the built environment has on the public health of a community. The design of our roadways and neighborhoods, the availability of active transportation options such as walking and biking, and the ability to safely access opportunities for healthy living are all factors affecting residents' health and well-being.

According to the *Goldsboro Comprehensive Plan*, the #1 goal of the Wayne County Health Department is to reduce the burden of chronic disease among County residents. Obesity is a leading contributing factor to chronic disease and increases the risk of a variety of chronic diseases, including heart disease, stroke, diabetes, and some types of cancer. An improved diet, regular exercise, and an overall healthier lifestyle from these changed habits helps to reduce the risk of obesity and associated chronic diseases. Unfortunately many citizens do not have access to fresh, healthy food options and recreation opportunities to engage in physical activity.

This analysis builds off of the Health and Wellness Assessment in the Goldsboro Comprehensive Plan to evaluate how well the existing bicycle and pedestrian networks connect residents to healthy food and recreation opportunities, and where gaps exist in the network. The analysis concludes by showing how the proposed bicycle and pedestrian network in this plan will help to fill these gaps, better connect Goldsboro residents to healthy food and recreation options, and contribute to the goal of reducing obesity and chronic disease rates among County residents.



## ANALYSIS

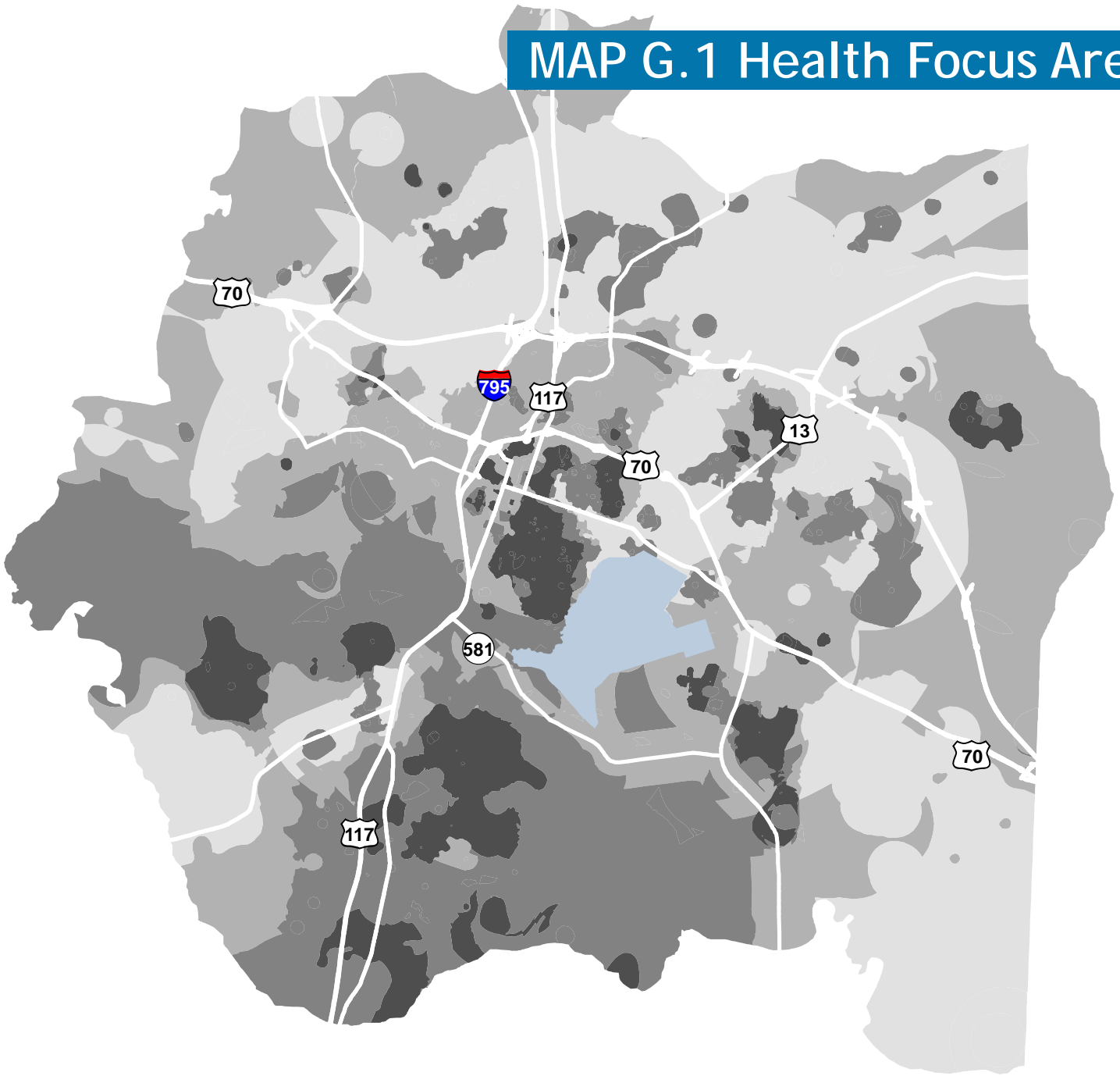
### High-Priority Health Focus Areas

In its Health and Wellness Assessment, the Goldsboro Comprehensive Plan identified a series of high-priority Health Focus Areas in the Goldsboro MPO that are most vulnerable to wellness issues, using spatial data on populations vulnerable to chronic disease, criminal offenses, nutritionally disparate areas, active transportation availability, parks and recreation facility access, socioeconomic status, and population density. Local health officials identified these factors as barriers to a healthy and active lifestyle for Goldsboro area residents. These are the areas where there is the greatest need for public health and wellness investment.

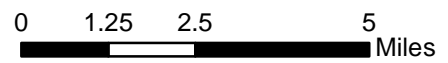
This analysis examines the connections between these high-priority Health Focus Areas and recreation and healthy food options, particularly evaluating residents' ability to access these daily needs by walking or biking. This is especially important in central Goldsboro, identified here as the area east of Interstate 795, west of Seymour-Johnson Air Force Base, and north of NC 581. In this area, as much as 31 percent of the population does not have access to a motor vehicle and must rely on walking, biking, and transit for daily trips. A connected bicycle and pedestrian network that provides access to healthy food and recreation options is therefore a critical aspect of promoting better health and well-being in these areas, in other high-priority Health Focus Areas, and throughout the Goldsboro MPO.



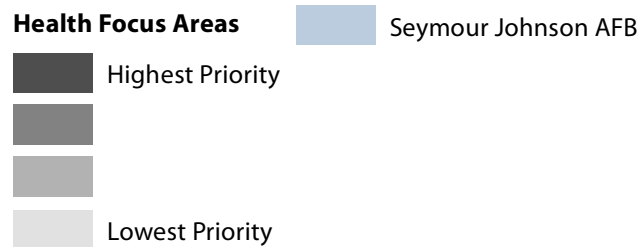
# MAP G.1 Health Focus Areas



## Health Focus Areas



### Legend





### Access to Healthy Food Locations

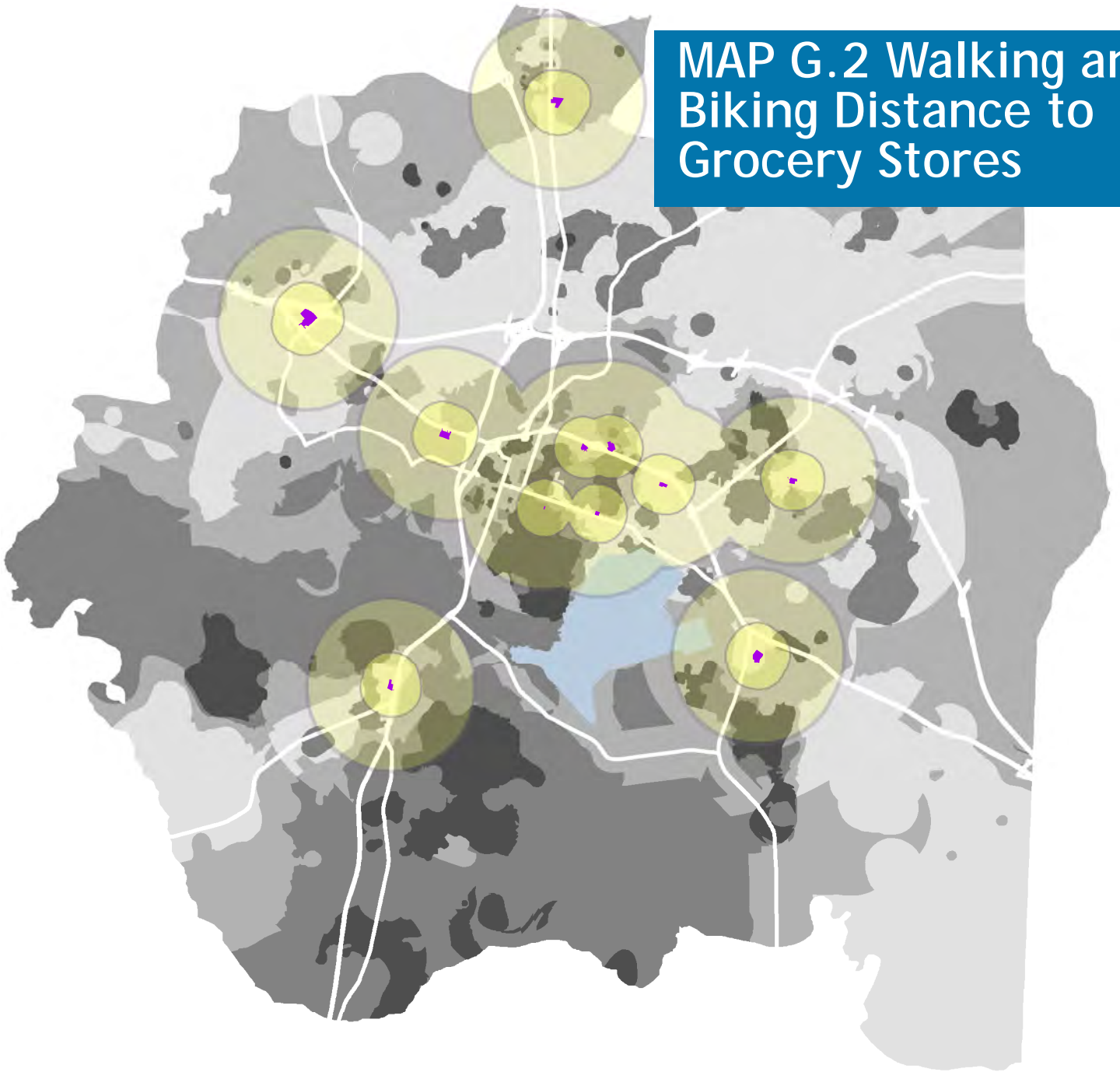
One critical function of a connected bicycle and pedestrian network is to provide access from neighborhoods to grocery stores so that all residents may have access to healthy food options. Many residents of Goldsboro walk or bike to the grocery store by necessity, but do not currently have complete infrastructure on which to safely and comfortably walk or bike. Furthermore, not every grocery store offers healthy food choices, so those that can access stores along sidewalks still may not have access to healthy food options.

Map G.2 shows the locations of all full-service grocery stores in the Goldsboro MPO that sell fresh fruits and vegetables, as opposed to convenience stores and smaller food marts that may offer some food but do not sell fresh fruits and vegetables. Farmers markets and food stand locations were left out of this analysis because their availability varies widely by season, day of week, time of day, weather conditions, and other factors that make them a less regularly reliable source of fresh foods than full-service grocery stores. Map G.2 displays the areas around each full-service grocery store that are within a 1/2-mile walking distance (darker yellow) and 1 1/2-mile biking distance (lighter yellow). Most of the highest priority Health Focus Areas are located within walking or biking distance of at least one grocery store; however, almost all of the full-service grocery stores in Goldsboro are located along a major highway, making them difficult to reach on foot or by bike. A list of full-service grocery stores is shown below.

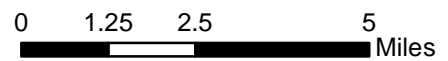
<i><b>Full-Service Grocery</b></i>	<i><b>Address</b></i>	<i><b>City/Town</b></i>
Carlie C’s IGA	1805 Wayne Memorial Drive	Goldsboro
Food Lion	118 Five Points Road	Goldsboro
Food Lion	219 NC 111 Highway S	Goldsboro
Food Lion	553 E New Hope Road	Goldsboro
Food Lion	1809 E Ash Street	Goldsboro
Food Lion	1322 W Grantham Street	Goldsboro
Food Lion	4700 US 117 N	Pikeville
Harris Teeter	2120 Wayne Memorial Drive	Goldsboro
Piggly Wiggly	100 Lionel Street	Goldsboro
Wal-Mart Supercenter	1002 N Spence Avenue	Goldsboro
Wal-Mart Supercenter	2098 US 70	Goldsboro



# MAP G.2 Walking and Biking Distance to Grocery Stores

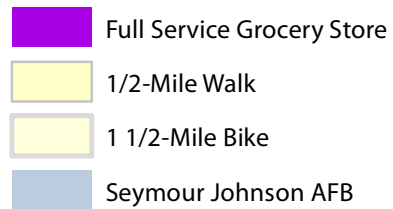
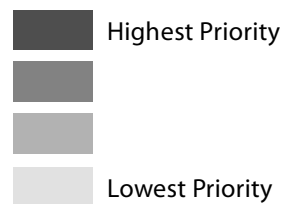


## Healthy Food Locations



### Legend

#### Health Focus Areas





### Access to Park Locations

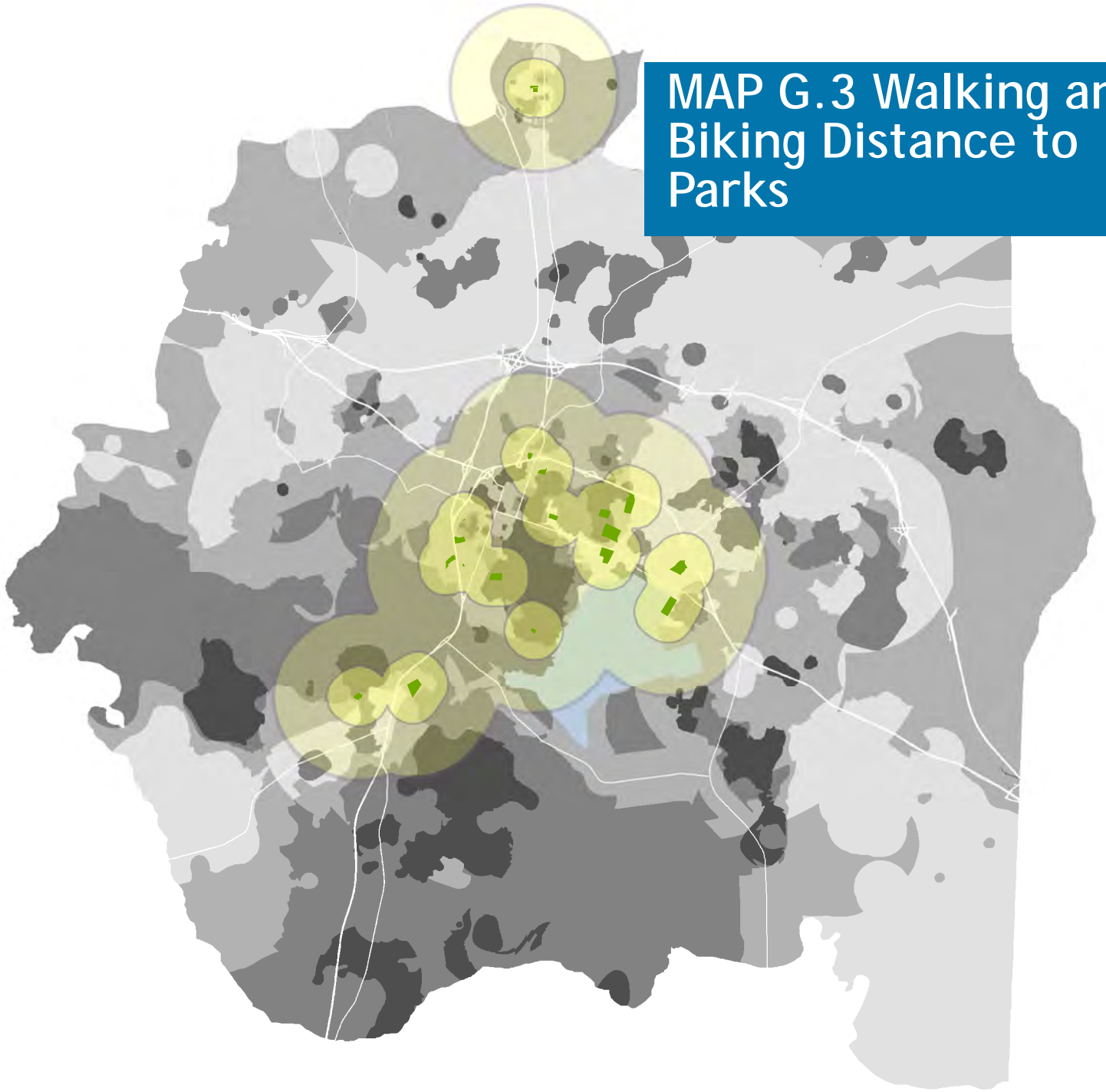
According to the survey developed for this Plan, parks and recreational facilities were the number one desired destination to reach by walking and bicycling. Public parks provide residents with opportunities to be active, socialize, engage in the community, and enjoy the outdoors. They make urban areas more inviting for living, working, and relaxing. Parks include small neighborhood and pocket parks as well as larger planned spaces and regional parks that contain greenways and trails. The pedestrian and bicycle network plays an important role in connecting residents to nearby park facilities so that they can take advantage of local recreation options.

Map G.3 shows the locations of 16 public parks in the Goldsboro MPO and the areas that can access them within a 1/2-mile walk or 1 1/2-mile bike ride. The complete list of public parks in the Goldsboro study area is included below. Most of the highest priority Health Focus Areas are located within walking or biking distance of at least one public park.

<i><b>Park</b></i>	<i><b>City/Town</b></i>
Battlefield Memorial Park	Goldsboro
Berkeley Memorial Park	Goldsboro
City Soccer Park (Future)	Goldsboro
Dees Memorial Park	Pikeville
Fairview Park	Goldsboro
H.V. Brown Park	Goldsboro
Henry C. Mitchell Park	Goldsboro
Herman Park	Goldsboro
Mar Mac Community Park	Goldsboro
Mina Weil Park	Goldsboro
North End Community Park	Goldsboro
Peacock Park	Goldsboro
Quail Park	Goldsboro
South End Neighborhood Park	Goldsboro
Washington Park	Goldsboro
Waynesborough Park	Goldsboro











# MAP G.3 Walking and Biking Distance to Parks



## Park Locations

### Legend

<b>Health Focus Areas</b>	 Park
 Highest Priority	 1/2-Mile Walking Distance
	 1 1/2-Mile Biking Distance
	 Seymour Johnson Air Force Base
 Lowest Priority	





## Existing Connections to Healthy Food

The analysis of existing bicycle and pedestrian connections to healthy food options shows that many of these destinations cannot be safely or comfortably reached by foot or by bike. Map G.4 presents the existing bicycle and pedestrian network within Goldsboro and full-service grocery stores that are near this network. Many of the highest-priority Health Focus Areas in central Goldsboro are located within a 1/2-mile walking distance or 1 1/2-mile biking distance of a full-service grocery store. However, the existing bicycle and pedestrian network does not adequately connect many of these areas to grocery stores. The lack of sidewalks, trails, on-road bike routes, and safe crossings makes it difficult for residents to access healthy food selections.

Of the eleven full-service grocery stores in the Goldsboro MPO, only one is currently accessible by walking or bicycling; the Piggly Wiggly on Lionel Street, near downtown, has a sidewalk connecting to the surrounding neighborhood and high-priority Health Focus Area. The ten other full-service grocery stores either do not have a sidewalk connecting to the surrounding neighborhood, do not have a sidewalk that enters the grocery store site, or both. No grocery stores are currently accessible by trail or on-road bicycle facility.

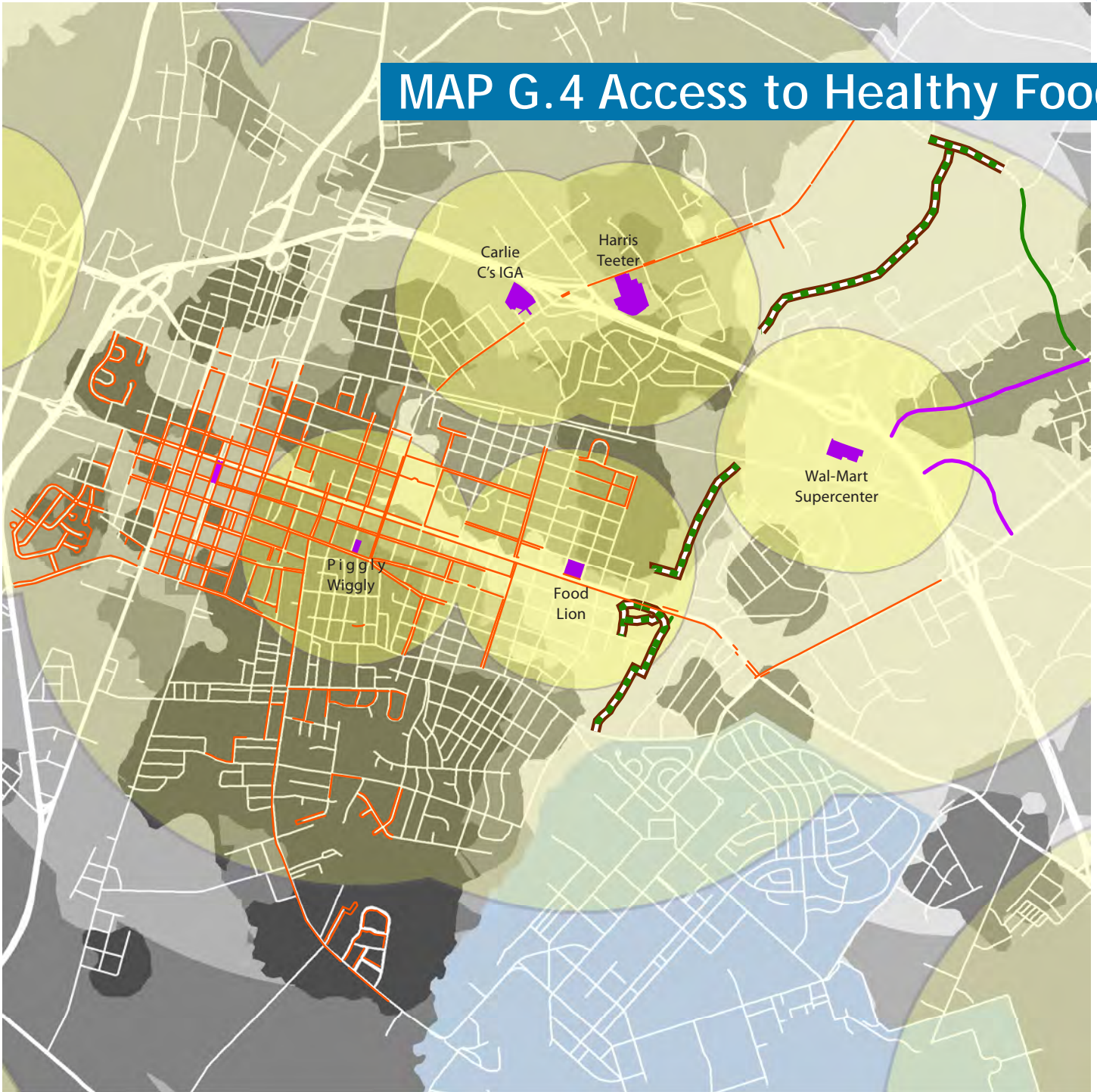
A lack of safe crossings is also a barrier to reaching grocery stores on foot or by bike. While there is a sidewalk on the south side of Ash Street across from the Food Lion, there is no marked crosswalk or pedestrian countdown signal for pedestrians trying to cross Ash to reach the store. The Harris Teeter and Carlie C's IGA on Wayne Memorial Drive are also missing sidewalk connections and safe crossings. The Wal-Mart on Spence Avenue is missing pedestrian facilities altogether, even though it is already a popular walking and bicycling destination and has a transit stop. The lack of facilities has taken its toll on the community; between 2007 and 2011, 1 bicyclist and 6 pedestrians were injured in crashes with motor vehicles in and around the Wal-Mart parking lot.

*Only one of the eleven full-service grocery stores is accessible by sidewalk. None can be reached by trail or on-road bicycle facilities.*





# MAP G.4 Access to Healthy Foods



## Existing Access to Healthy Foods

### Legend

Health Focus Areas		Existing Facilities	
	Highest Priority		Existing Sidewalk
			Existing Bike Lane
			Existing Multi-Use Path
	Lowest Priority		Funded Multi-Use Path
			Full Service Grocery Store
			1/2-Mile Walk
			1 1/2-Mile Bike
			Seymour Johnson AFB





## Existing Connections to Parks

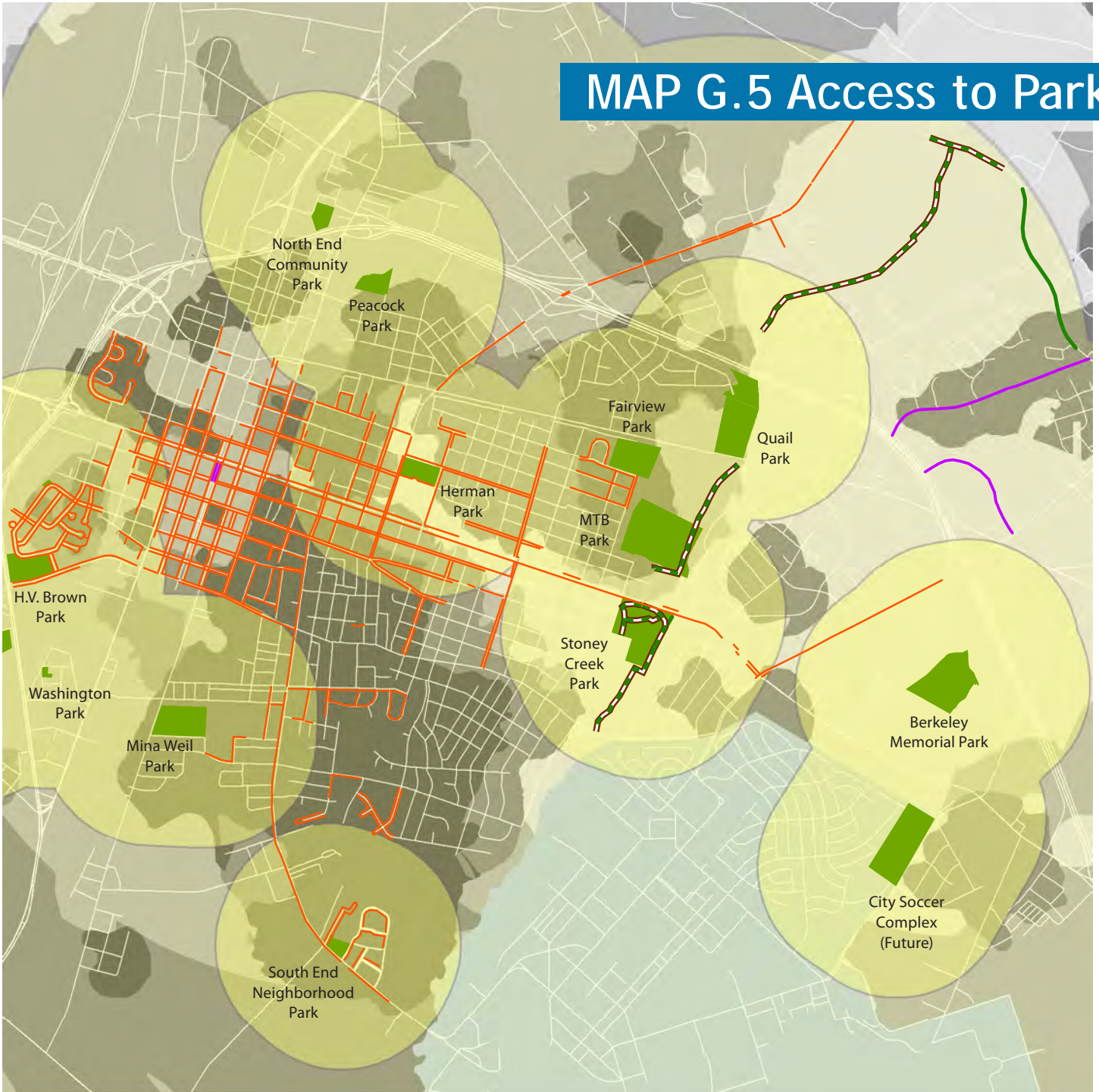
Map G.5 shows Goldsboro's existing pedestrian and bicycle network and areas of Goldsboro that are within a short 1/2-mile walking distance or 1 1/2-mile bicycling distance of at least one public recreation facility. Even though most of central Goldsboro is within walking or bicycling distance of at least one park, many of these locations lack sidewalk, trail, or on-road bicycle connections to surrounding neighborhoods. There is also a lack of safe crossings to help pedestrian and bicyclists across major barriers, such as highways, other major roads with high speeds and traffic volumes, and railroad tracks.

Only seven of the sixteen public parks in the Goldsboro MPO have sidewalk or trail connections to surrounding areas, and none of the parks are connected by on-road bicycle facilities. Even in central Goldsboro where the sidewalk network is mostly complete in some places, there are significant gap areas that prevent residents from walking or bicycling to nearby parks. The lack of sidewalks around several of the parks is apparent in Map G.5. Mina Weil Park is nearly connected to the surrounding high priority Health Focus Area, but is missing a few short sidewalk links to provide safe walking routes. North End Community Park, Peacock Park, Quail Park, Berkeley Memorial Park, and the future site of the city soccer complex are all missing sidewalk connections to surrounding neighborhoods.

*The majority of parks in the Goldsboro MPO cannot be reached by sidewalk, trail, or on-road bicycle facilities.*



# MAP G.5 Access to Parks



## Existing Access to Parks

### Legend

Health Focus Areas		Existing Facilities		Park	
	Highest Priority		Existing Sidewalk		Park
			Existing Bike Lane		1/2-Mile Walking Distance
			Existing Multi-Use Path		1 1/2-Mile Biking Distance
	Lowest Priority		Funded Multi-Use Path		Seymour Johnson Air Force Base





## Proposed Connections to Healthy Food and Parks

The bicycle and pedestrian improvements recommended in this plan would greatly increase safe access to healthy foods and opportunities for recreation for Goldsboro residents. In many locations, small gaps prevent a connection that is nearly complete. This is especially notable in central Goldsboro; multiple full-service grocery stores and parks are located in the central city and several neighborhoods are within walking or bicycling distance of grocery stores and parks, but gaps in the bicycle and pedestrian network prevent a complete connection.

Map G.6 and G.7 show how the proposed bicycle and pedestrian improvements will increase connectivity and access to full-service grocery stores within Goldsboro. The recommended network - including new sidewalks, on-road bike facilities, paved trails, and crossing improvements - will greatly improve residents' ability to walk and bike to full-service grocery stores in Goldsboro, particularly in central Goldsboro. With these improvements, seven of the eleven grocery stores will be directly accessible by sidewalk and safe crossings, compared to one with current sidewalk access. Six grocery stores will be newly linked by on-road bicycle facilities and one by trail. These connections will provide significant improvements to healthy food access for residents in high priority Health Focus Areas and throughout Goldsboro, making it easier, safer, and more comfortable to walk and bike for errands close to home.

Maps G.8 and G.9 present the new connections to recreation areas that will be possible with the proposed bicycle and pedestrian network in place. Currently, only seven of sixteen parks have sidewalk access, one has trail access, and none have on-road bicycle facilities. The recommended improvements will link all parks in the Goldsboro MPO to a connected pedestrian and bicycle network. In central Goldsboro, several parks will be linked by a combination of sidewalks, trails, and bike lanes. Outlying parks are connected to the network by paved shoulders.

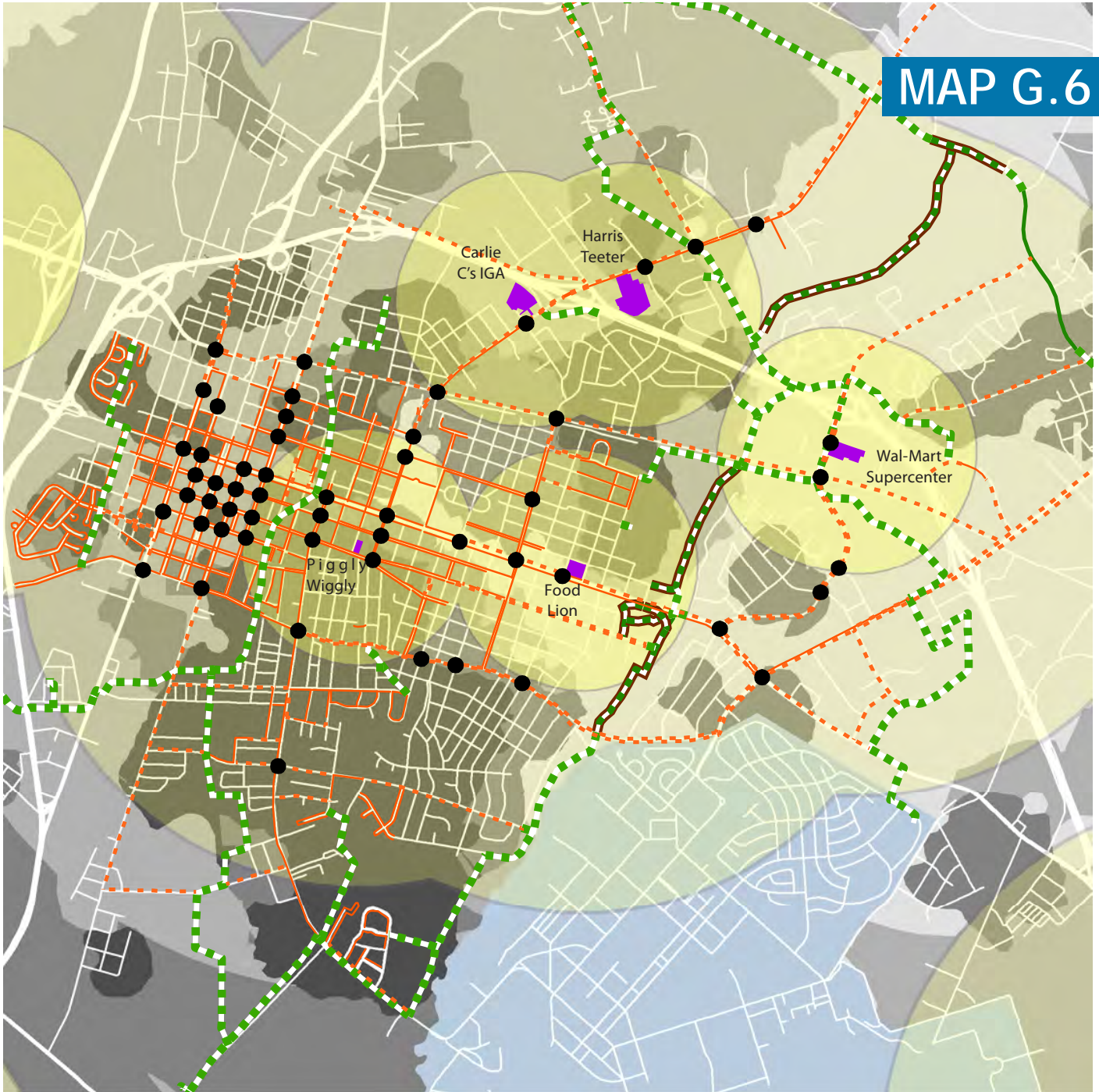
These improvements will allow many more Goldsboro residents to access healthy foods and recreation opportunities without relying on access to a car. This is especially important in central Goldsboro, where as many as 31 percent of residents do not have access to a motor vehicle. Connections to healthy food options and opportunities for active living should be available to all Goldsboro residents. Implementing the improvements recommended in this plan will significantly increase walking and bicycling access to basic needs in Goldsboro.

*The proposed bicycle and pedestrian network will make it possible to walk or bike to the majority of grocery stores in the Goldsboro MPO.*

*All parks in the Goldsboro MPO will be linked to walking and bicycling facilities with the proposed network.*



# MAP G.6



## Proposed Access to Healthy Foods Sidewalks, Crossings & Trails

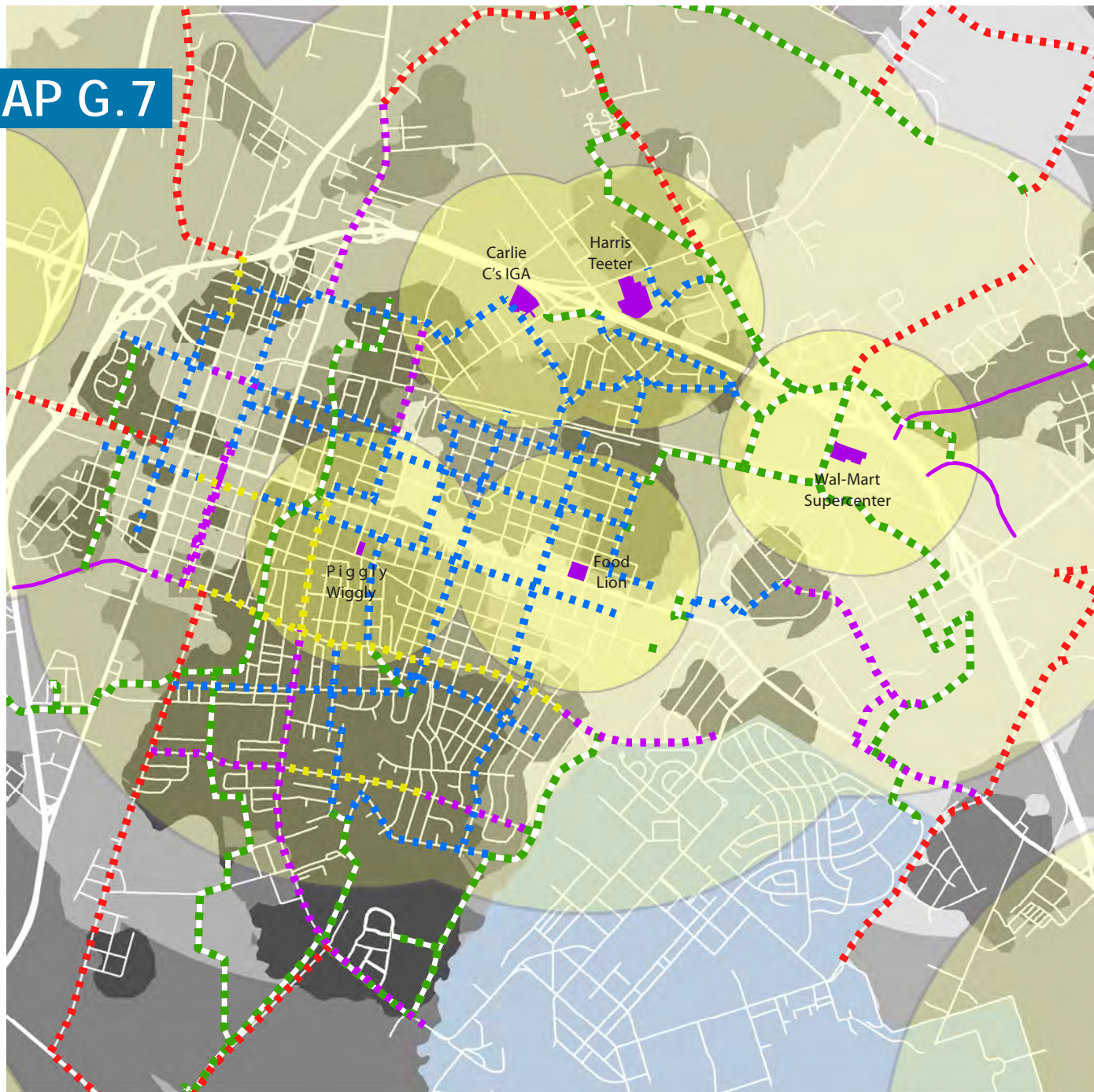


### Legend

<b>Health Focus Areas</b>	<b>Proposed Facilities</b>	Full Service Grocery Store
Highest Priority	Sidewalk	1/2-Mile Walk
	Multi-Use Path	1 1/2-Mile Bike
Lowest Priority	Crossing Improvement	Seymour Johnson AFB
	<b>Existing Facilities</b>	
	Existing Sidewalk	
	Existing Multi-Use Path	
	Funded Multi-Use Path	



# MAP G.7



**Proposed Access to Healthy Foods**  
*On-Road Bike Facilities*



Legend

**Health Focus Areas**

- Highest Priority
- 
- 
- Lowest Priority

**Proposed Facilities**

- Bike Lane
- Bike Boulevard
- Paved Shoulder
- Shared Lane Marking (Sharrow)
- Bike Route Signage
- Multi-Use Path

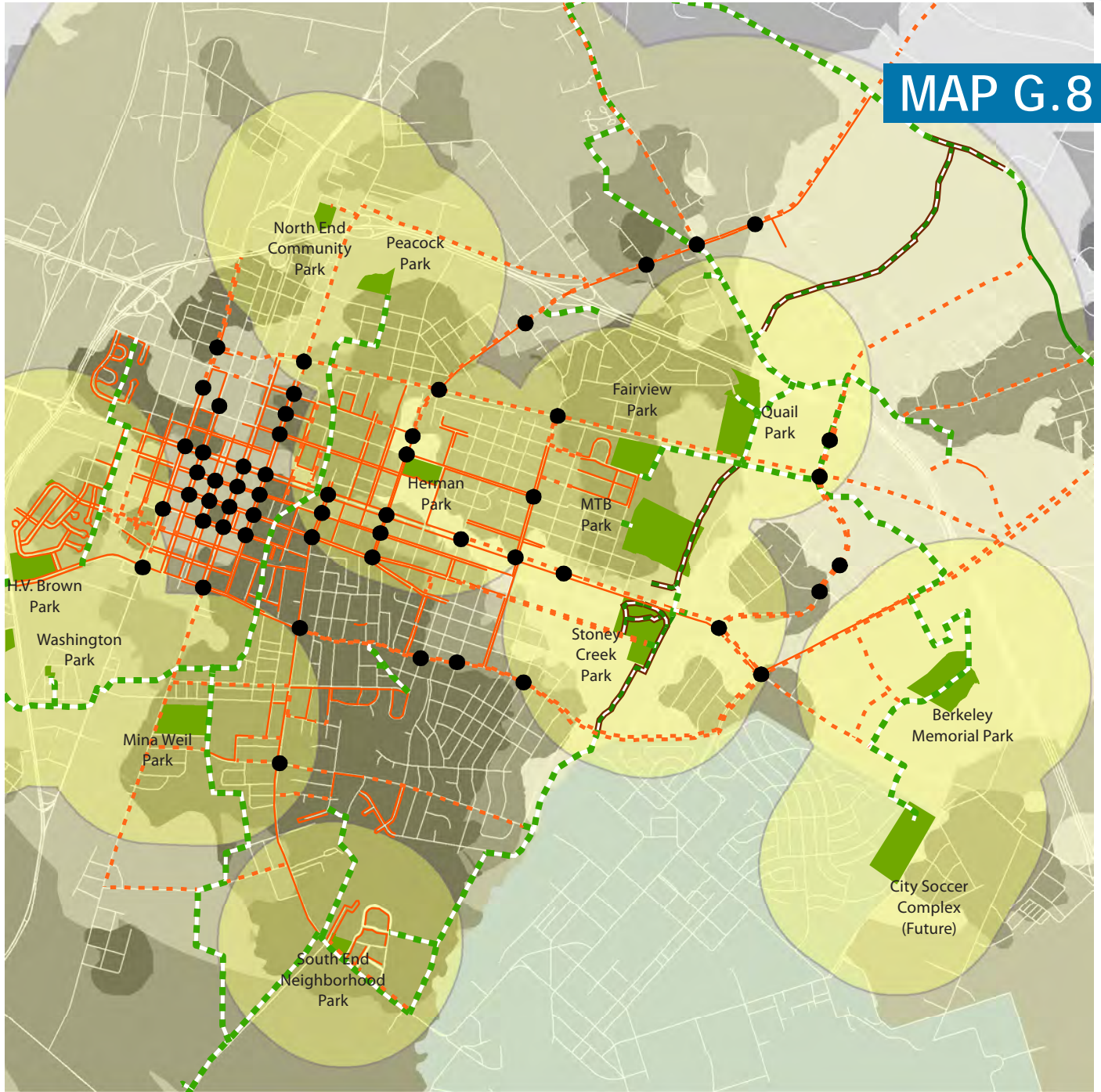
**Existing Facilities**

- Existing Bike Lane
- Full Service Grocery Store
- 1/2-Mile Walk
- 1 1/2-Mile Bike
- Seymour Johnson AFB





# MAP G.8



## Proposed Access to Parks *Sidewalks, Crossings & Trails*



### Legend

#### Health Focus Areas

- Highest Priority
- 
- Lowest Priority

#### Proposed Facilities

- Sidewalk
- Multi-Use Path

#### Existing Facilities

- Existing Sidewalk
- Existing Multi-Use Path
- Funded Multi-Use Path

Park

1/2-Mile Walking Distance

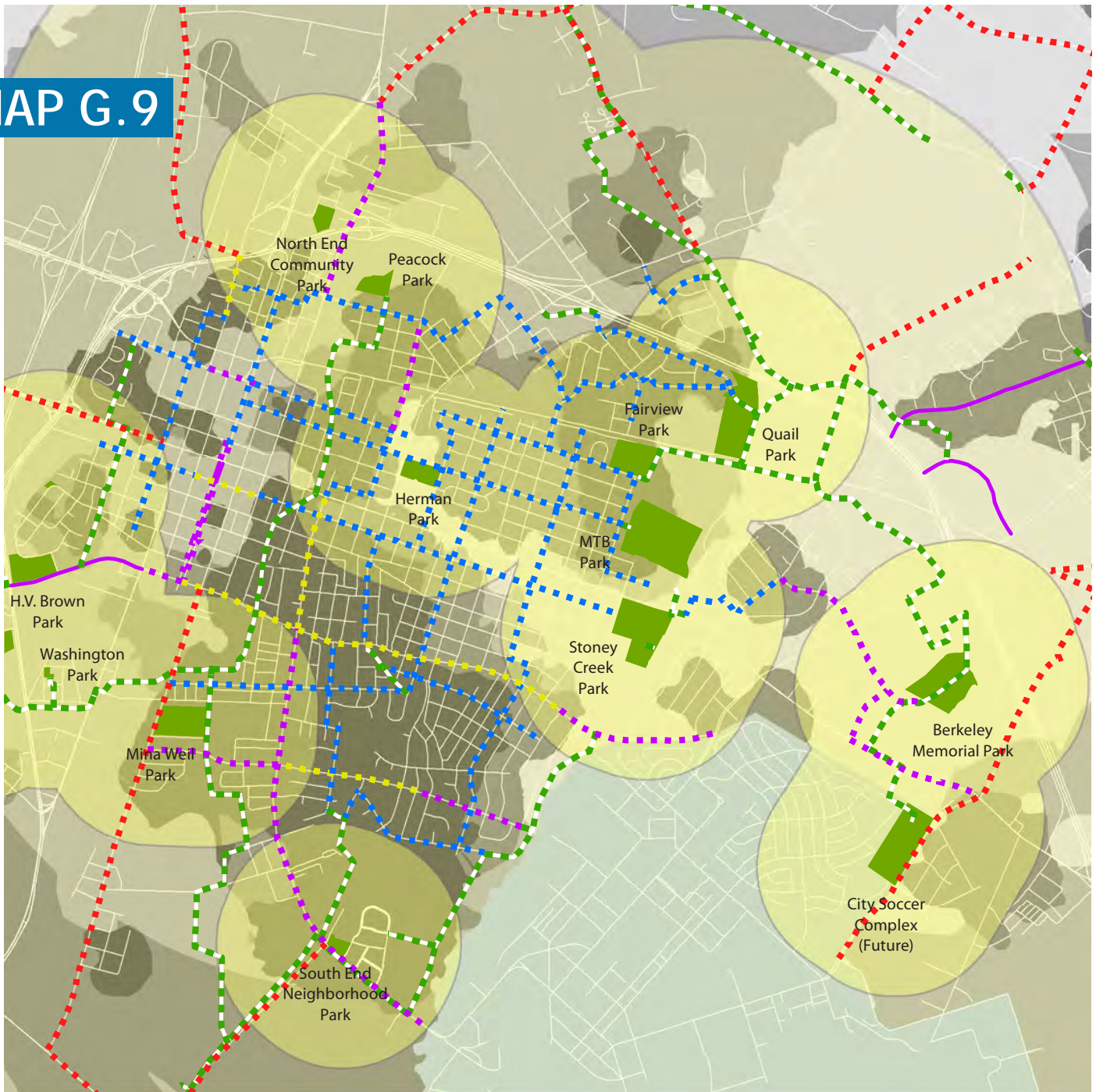
1 1/2-Mile Biking Distance

Seymour Johnson AFB





# MAP G.9



### Proposed Access to Parks On-Road Bike Facilities

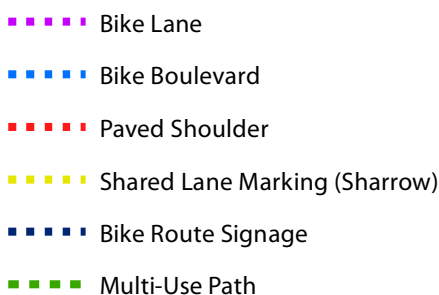


#### Legend

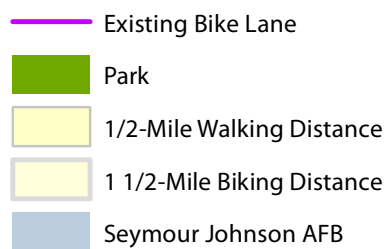
##### Health Focus Areas



##### Proposed Facilities



##### Existing Facilities





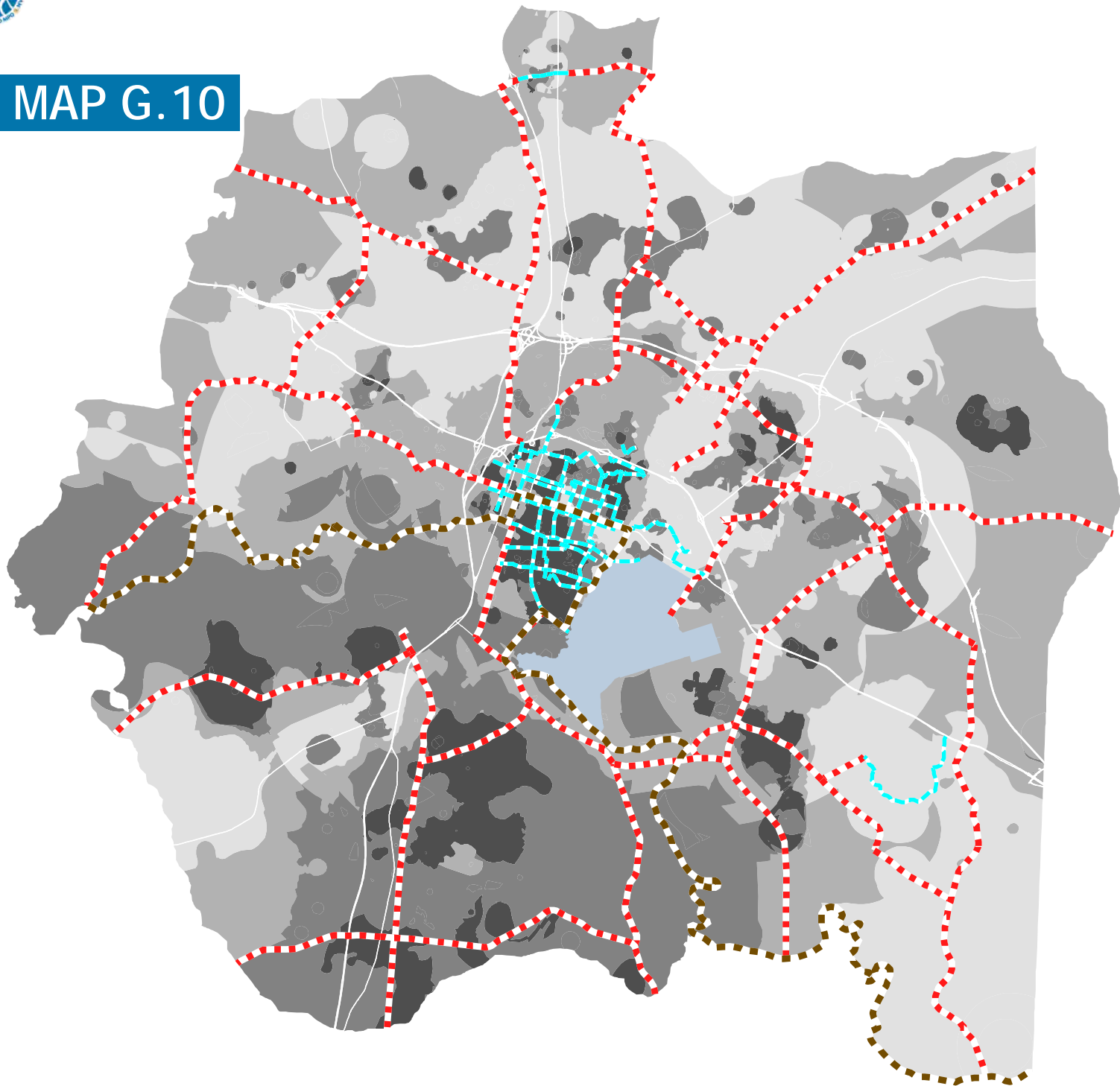


### *Project Prioritization*

High-priority Health Focus Areas, as identified in the Goldsboro Comprehensive Plan, serve as an important factor for choosing where to invest in bicycle and pedestrian facilities. These areas have been identified as the locations that are most vulnerable to health and wellness issues, and should therefore be considered as a priority criterion when forming the bicycle and pedestrian network. Not only can bicycle and pedestrian facilities serve as vital connections to healthy foods and recreation opportunities, as this analysis shows, but they can also promote healthy lifestyles themselves by encouraging people to use active transportation for daily errands and other trips. Map G.10 shows the proposed regional bicycle network of paved shoulders for the Goldsboro MPO and Map G.11 displays the proposed bicycle and pedestrian network for central Goldsboro, overlaid onto Health Focus Areas. These areas were used to help inform the development of the proposed bicycle and pedestrian network. Projects that connect to high-priority Health Focus Areas were scored for priority in project prioritization. See Chapters 3-5 for a complete description of the project prioritization factors and process.










# MAP G.10



## Proposed Regional Bicycle Network

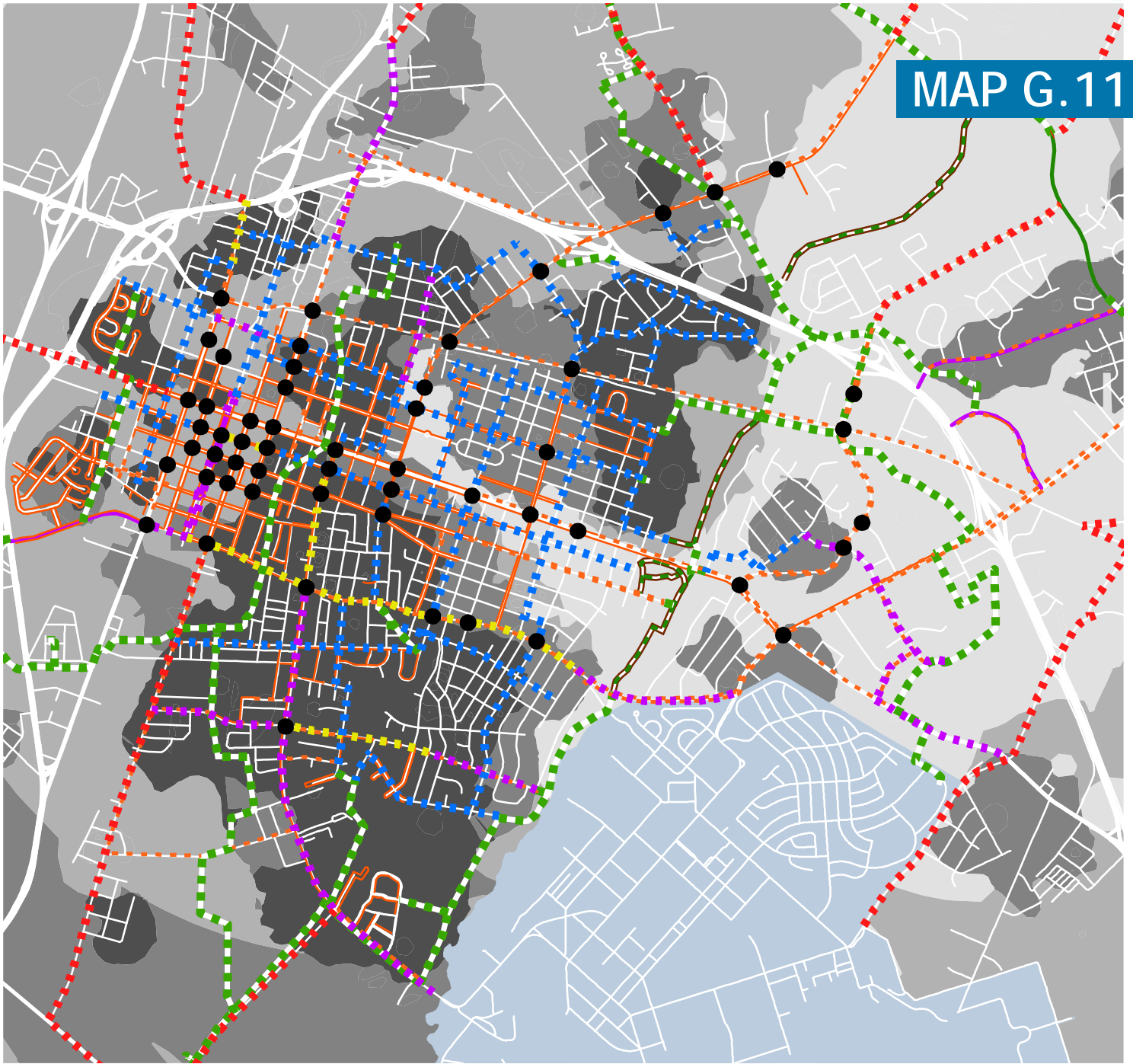
### Legend

- |  |   |
|--|---|
| <b>Proposed Facilities</b>   |  Seymour Johnson AFB |
|  Paved Shoulder        | <b>Health Focus Areas</b>   |
|  MST                   |  Highest Priority    |
|  Other Bike Facilities |                      |
|  |                      |





MAP G.11



Proposed Bicycle and Pedestrian Network



Legend

Health Focus Areas

- Highest Priority
- 
- Lowest Priority

Proposed Facilities

- Bike Lane
- Bike Boulevard
- Paved Shoulder
- Shared Lane Marking (Sharrow)
- Bike Route Signage
- Sidewalk
- Multi-Use Path

Existing Facilities

- Existing Bike Lane
- Existing Multi-Use Path
- Funded Multi-Use Path
- Existing Sidewalk
- Seymour Johnson AFB





## EVALUATION (BENCHMARKING)

Benchmarks help track progress towards attaining goals and objectives. They also help provide information to support decisions, assess the effectiveness of policies and implementation efforts, and improve transparency. Providing more bicycle and pedestrian transportation options, as recommended in this Plan, inherently produces a positive impact on healthy, active living. 70% of users surveyed indicated that they walk and bicycle for exercise (among other reasons) and 70% said improving walking conditions in Goldsboro was “very important.” Looking statewide in North Carolina, 60% said they would increase their level of physical activity if they had better access to trails.

Evaluation and performance measures for this Plan are discussed in Chapter 8: Implementation. All of these measures will indirectly measure an impact to active living. Additional performance measures, more specific to health-related goals, are listed below. These should build upon ongoing efforts by the GoWayneGo Initiative and its partners and be tracked through a partnership between the City of Goldsboro, Goldsboro MPO, Wayne County Health Department, and GoWayneGo.

- GoWayneGo Commitment (diet and physical activity) - Pounds lost (GoWayneGo goal is to lose 1 million pounds by May 2015). Track how many residents made commitment and how much weight lost.
- Number of parks connected by pedestrian or bicycle facility
- Number of grocery stores with fresh foods connected by pedestrian facility
- Number of education and encouragement programs that focus on bicycling and walking
- Number of minutes per day residents spend doing pedestrian and bicycle activity (through GoWayneGo Initiative commitment)
- Physical inactivity rates (North Carolina Behavioral Risk Factor Surveillance System)
- Obesity and diabetes rates (North Carolina Behavioral Risk Factor Surveillance System)

### GoWayneGo Commitment

Great Health for Wayne County

Health is important to me and my family!

#### Our daily goals:

- 5** fruits & vegetables
- 3** balanced meals
- 2** hours of TV/electronics max
- 1** hour of physical activity
- 0** sugary drinks, except on occasion



## COORDINATION BETWEEN AGENCIES

Coordination between public, private, and non-profit agencies will be essential to meet health goals of this Plan (partnerships, education, promotion, outreach) described in Chapter 1. While the Goldsboro MPO, City of Goldsboro, and NCDOT will lead the development of bicycle and pedestrian infrastructure, groups and agencies like GoWayneGo, the Wayne County Health Department, Wayne Memorial Hospital, and the YMCA should lead education and encouragement programming related to active living. There will be opportunities to collaborate and jointly fund projects as well. A comprehensive listing of programs geared towards encouraging safe walking and bicycling can be found in Chapter 7: Programs.

### Partners



Wayne Health  
[www.waynehealth.org](http://www.waynehealth.org)



County Health Department  
[www.waynegov.com](http://www.waynegov.com)



Goldsboro YMCA -  
[www.goldsboroymca.org](http://www.goldsboroymca.org)



—Goldsboro—  
 Pediatrics P. A.  
 Goldsboro Pediatrics  
[goldsboropediatrics.com](http://goldsboropediatrics.com)



Goldsboro Parks and Recreation  
[www.goldsboroparksandrec.com](http://www.goldsboroparksandrec.com)



United Way of Wayne County  
[unitedwaync.org](http://unitedwaync.org)



NC Cooperative



Wayne Co Public Schools



Goshen Medical C



City of Goldsboro

*Above graphic taken from [www.gowaynego.org](http://www.gowaynego.org).*





# Appendix H: Active Transportation Supply, Demand and Benefits Analysis

## Appendix Contents:

*Overview*

*Bicycle Level of Traffic  
Stress Analysis*

*Pedestrian Suitability  
Analysis*

*Estimating Bicycling and  
Walking Demand*

*Estimating Bicycling and  
Walking Benefits*

*Estimating Increased  
Property Values from Trails*

## OVERVIEW

This appendix presents three separate analyses related to bicycle and pedestrian supply and demand that were conducted for this plan: Bicycle Level of Traffic Stress Analysis, Pedestrian Suitability Analysis, and Estimated Bicycling and Walking Demand and Benefits Analysis. All of these approaches were important to gain a better understanding of current bicycling and walking activity in Goldsboro, to inform facility recommendations, and to estimate how improvements to the bicycling and walking environment might affect Goldsboro and the Goldsboro MPO.



## BICYCLE LEVEL OF TRAFFIC STRESS ANALYSIS

### Introduction to Level of Traffic Stress

To understand the potential for bicycling in Goldsboro and where improvements should be targeted, it is important to first understand the current bicycling environment. A Bicycle Level of Traffic Stress Analysis (BLTS) evaluates bicyclist comfort on the existing street network to determine which streets can currently be considered comfortable for all bicyclists.

The methods used for the BLTS Analysis were adapted from the 2012 Mineta Transportation Institute (MTI) Report 11-19: Low-Stress Bicycling and Network Connectivity. The approach outlined in the MTI report uses roadway network data, including posted speed limit, number of travel lanes, and presence and character of bicycle lanes, as a proxy for bicyclist comfort level. Road segments are classified into one of four levels of traffic stress based on these factors. The lowest level of traffic stress, LTS 1, is assigned to roads that would be tolerable for most children to ride, and also to multi-use paths that are separated from motorized traffic; LTS 2 roads are those that could be comfortably ridden by the mainstream adult population; LTS 3 is the level assigned to roads that would be acceptable to current “enthused and confident” cyclists; and LTS 4 is assigned to segments that are only acceptable to “strong and fearless” bicyclists, who will tolerate riding on roadways with higher motorized traffic volumes and speeds. The definitions for each level of traffic stress are shown below.

LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a right-turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians.
LTS 4	A level of stress beyond LTS3.

Level of Traffic Stress (LTS) Definitions. Source: Mineta Transportation Institute Report 11-19.





### Level of Traffic Stress Plus Methodology

The Level of Traffic Stress analysis completed for Goldsboro follows a simplified version of the MTI approach, based on data availability. The scoring of each segment of roadway is based on the number of travel lanes, posted speed limit, and whether or not a bike lane is present. The scoring methodology used for Goldsboro is summarized in the following table.

NUMBER OF TRAVEL LANES	SHARED STREET			STREET WITH BIKE LANE		
	SPEED LIMIT (MPH)					
	<=25	30	>=35	<=30	35	>=40
2-3 lanes	LTS 1 or 2*	LTS 2 or 3*	LTS 4	1	3	4
4-5 lanes	LTS 3	LTS 4	LTS 4	3	3	4
6+ lanes	LTS 4	LTS 4	LTS 4	3	3	4

Segment scoring matrix for BLTS. \*Lower value used for streets without marked centerlines or classified as residential and with fewer than 3 lanes; higher value used otherwise.

The LTS scoring method provides higher scores to segment with a higher number of lanes and posted speed limit. A higher number of lanes is assumed to correlate with higher traffic volumes, a higher number of motor vehicles passing a bicyclist, greater difficulty for the bicyclist to navigate turns, and a need for a greater awareness of surrounding traffic, all of which increase a bicyclist’s level of stress. Higher posted traffic speeds are also assumed to increase the level of stress. The presence of bike lanes can, to a point, mitigate the level of stress caused by a higher number of travel lanes or posted speed by providing some separation between a bicyclist and motor vehicle traffic. This is reflected in the scoring above.

Crossing a higher-stress street also increases stress for bicyclists along otherwise low-stress routes. To reflect this, an intersection level of service analysis was completed to identify and account for unsignalized crossings. The level of traffic stress at an unsignalized crossing increases as the number of lanes and posted speed of the street being crossed increase. At these points, the score of the higher stress street being crossed is applied to the intersecting lower stress route to reflect a difficult crossing along that lower stress route. While median refuges can reduce the stress of an unsignalized crossing, refuges were not included in this analysis because of insufficient data.

NUMBER OF TRAVEL LANES	SPEED LIMIT (MPH)		
	<=30	35	>=35
Up to 3 lanes	LTS 1	LTS 2	LTS 3
4-5 lanes	LTS 2	LTS 3	LTS 4
6+ lanes	LTS 4	LTS 4	LTS 4

Intersection scoring matrix for BLTS. 1 = Lowest Level of Traffic Stress

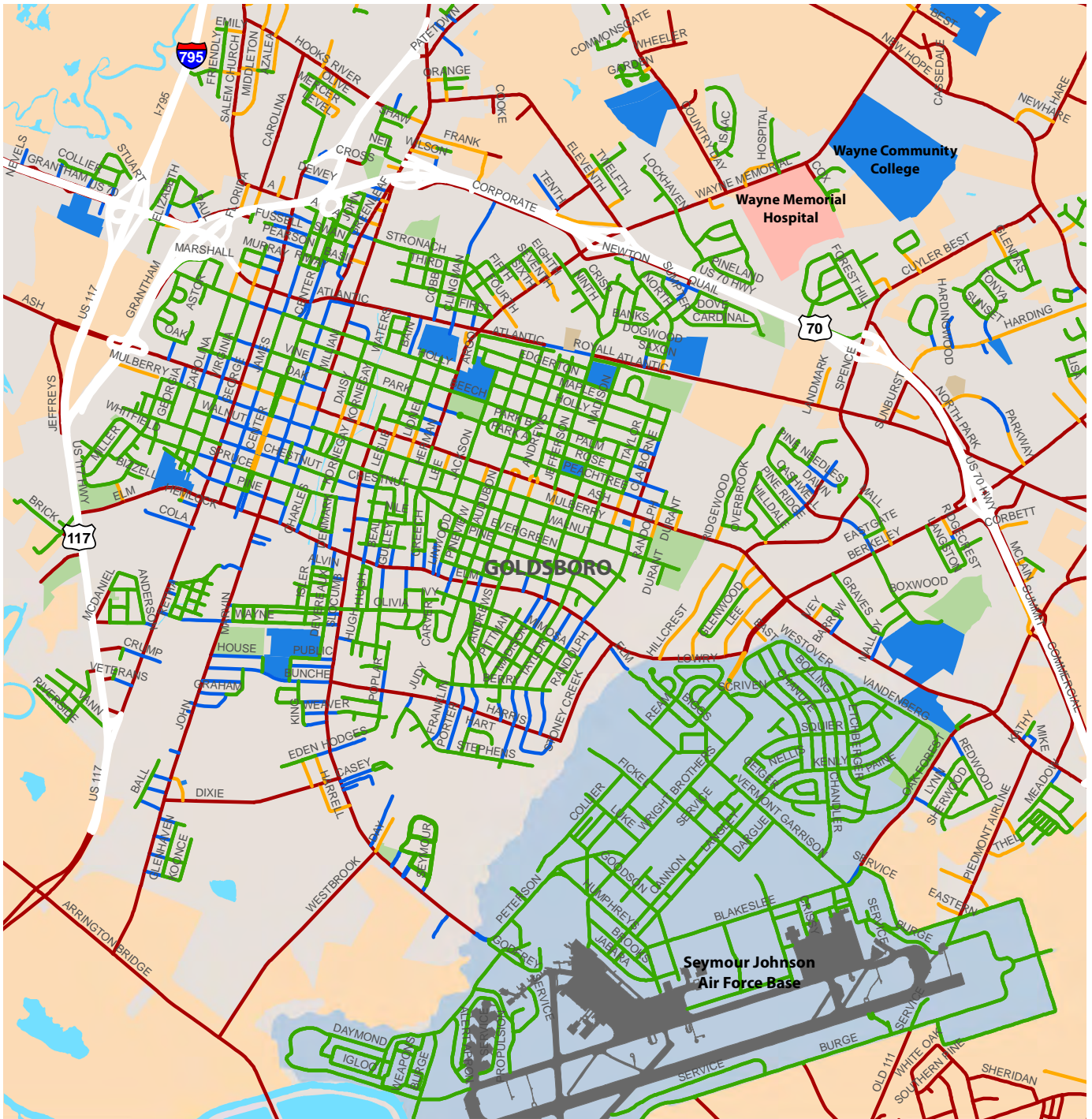


## Bicycle Level of Traffic Stress Analysis Results

The results of the BLTS Analysis are shown on pages H-5 and H-6. Much of the network in central Goldsboro consists of low-stress (LTS 1) streets, shown in green, but these are frequently disrupted by higher stress streets. These barrier streets effectively segment the LTS 1 network into small islands of low-stress streets that are comfortable to ride, but are isolated from one another by larger roads with higher traffic speeds that limit bicycle mobility. The disconnected nature of the low-stress (LTS 1) network can be seen on page H-6. Ash Street, Elm Street, George Street, Royall Avenue, Slocumb Street, US Highway 70, Berkeley Boulevard, and Wayne Memorial Drive, all shown primarily in red, are all high-stress streets (LTS 4) that create highly uncomfortable crossings or prevent people by traveling by bike altogether. Not only do most bicyclists find it challenging or impossible to travel along these roadways; they also find it difficult or impossible to travel across them as well.

Based on the analysis results, the largest clusters of low-stress streets tend to be in residential areas with a grid street network. Large segments of central Goldsboro are currently comfortable for bicycling, and targeting key intersections to improve crossing opportunities for bicyclists would greatly increase bicycle mobility. Adding bike lanes to major roads, such as those recommended on portions of Slocumb Street and Elm Street, would also help to bridge the gaps between low-stress street clusters and provide bicyclists with lower-stress routes through town.

The low-stress network shown on page H-6 was used to help inform the bicycle facility recommendations made in this plan. The bicycle boulevard network recommended in this plan is primarily made up of streets that are already considered low-stress (LTS 1) to moderately low-stress (LTS 2); designating these streets as bicycle boulevards will raise awareness of bicycle-friendly streets and will help to direct bicyclists to low-stress routes and safe crossings. Other facility recommendations, such as bike lanes and paved shoulders, will make travel along larger, higher speed roads less stressful and will also reduce the stress of crossing them. The shared-use paths recommended in this plan will also greatly improve the connectivity of the low-stress bicycle network. Complete separation from traffic makes shared-use paths highly attractive for most bicyclists and can provide essential low-stress linkages between disconnected portions of town.

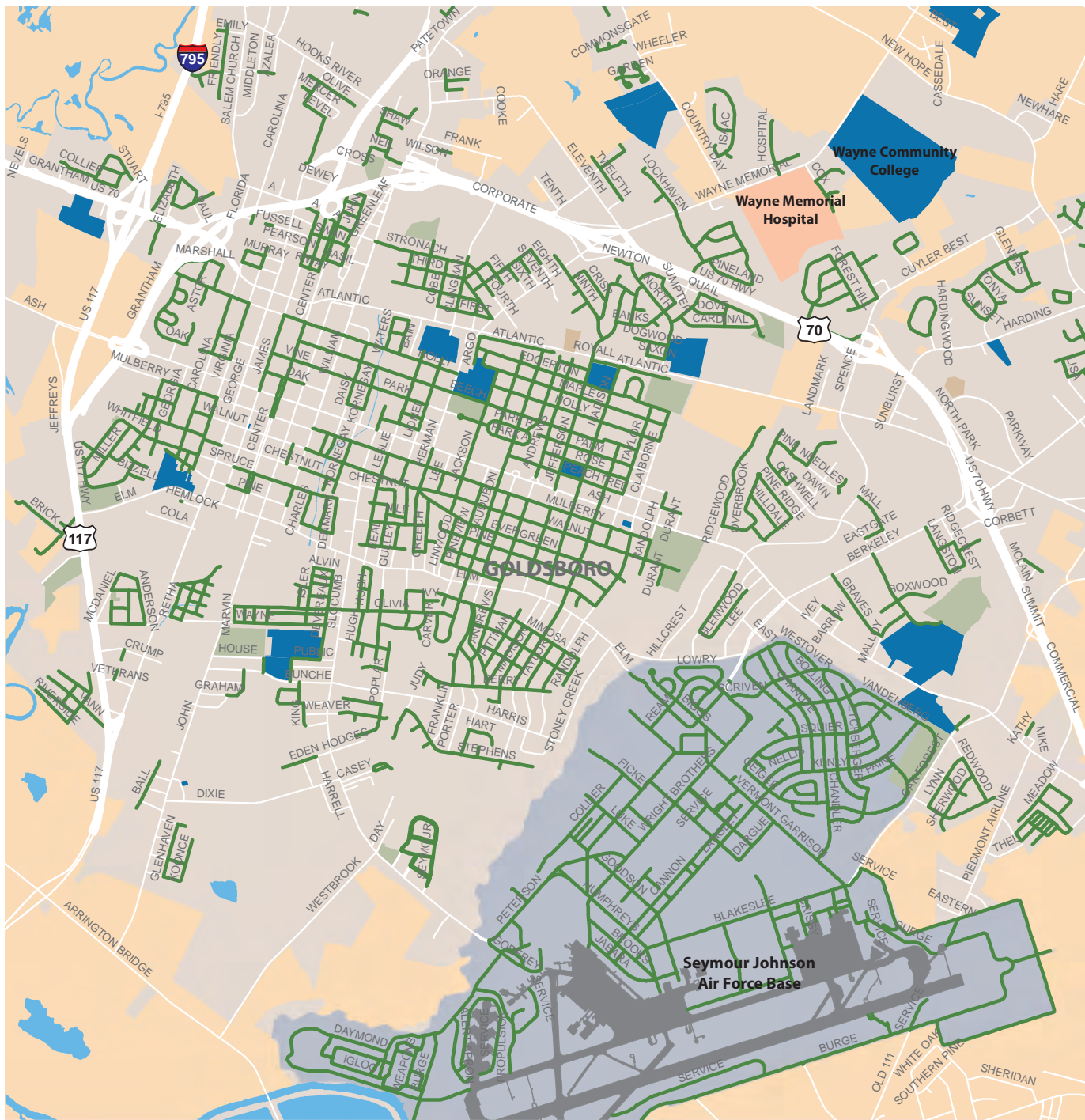


### Level of Traffic Stress - Downtown



Level of Traffic Stress	Lands of Interest	Additional Context
1 - Low Stress	Park	Water Features
2 - Medium Stress	Schools	Seymour Johnson Air Force Base
3 - Medium-High Stress	Hospital	City Limits
4 - High Stress		MPO Limits





### Low Stress Bicycle Corridors - Downtown

#### Legend

- |                         |                   |                                  |
|-------------------------|-------------------|----------------------------------|
| Level of Traffic Stress | Lands of Interest | Additional Context               |
| — 1 - Low Stress        | ■ Park            | ■ Water Features                 |
|                         | ■ Schools         | ■ Seymour Johnson Air Force Base |
|                         | ■ Hospital        | ■ City Limits                    |
|                         |                   | ■ MPO Limits                     |





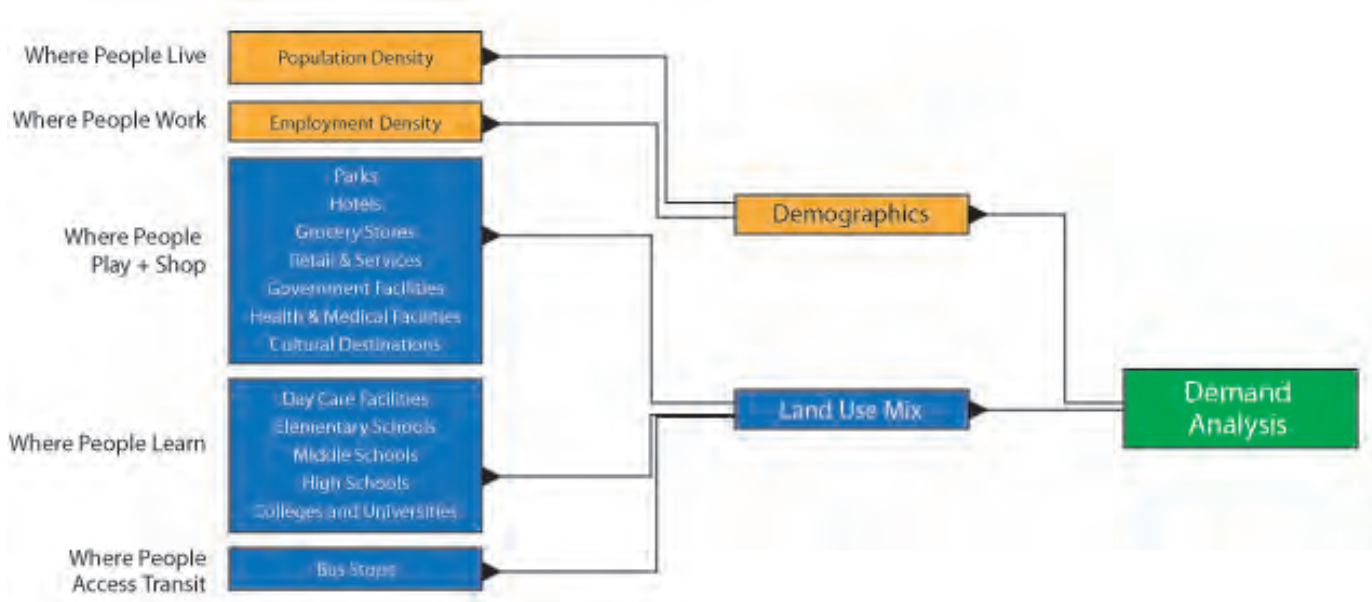
## Conclusion

The BLTS Analysis conducted for Goldsboro provides a picture of how well the current street network serves bicyclists and where gaps in the low-stress bicycling network exist. Bicyclists enjoy a more comfortable, lower stress experience primarily on residential roads in and around the city core, due in large part to low motor vehicle speeds, smaller streets, and a moderate level of connectivity. However, collector and arterial roadways currently present major challenges for non-motorized transportation and likely prevent many Goldsboro residents and visitors from bicycling altogether. The results of this analysis helped provide an idea of where bicycling improvements are needed most and were used to inform the recommendations of this plan. As recommended projects are implemented, the network of low-stress streets for bicycling will become larger and better connected, providing a much more comfortable and inviting environment for riding than what Goldsboro bicyclists experience today.



## PEDESTRIAN SUITABILITY ANALYSIS

A Pedestrian Suitability Analysis (PSA) was conducted for the Goldsboro MPO to identify areas of high pedestrian activity or demand. The potential for walking trips was measured based on the proximity and density of trip generators (such as homes and workplaces) and trip attractors (such as shopping centers and parks). The Pedestrian Suitability Analysis identifies expected pedestrian activity by overlaying the locations where people live, work, play, access public transit, and go to school to create a composite sketch of regional pedestrian demand. The figure below summarizes this approach.



### Data Sources

A number of data inputs were used to estimate pedestrian demand throughout the Goldsboro MPO. The following table displays each variable, its source, and notes on limitations of the available data and assumptions that were made.

MODEL INPUT	SOURCE	NOTES
Total population	2010 US Census	Summarized by census block
Total employment	2010 US Census	Summarized by census block
Day care facility locations	City of Goldsboro	
School locations	City of Goldsboro	Includes elementary, middle, and high schools; colleges
Parks	City of Goldsboro	
Retail & service locations	City of Goldsboro	
Government facilities	City of Goldsboro	
Health & medical facilities	City of Goldsboro	
Grocery stores	City of Goldsboro	
Hotels	City of Goldsboro	
Cultural destinations	City of Goldsboro	
Bus stops	City of Goldsboro	Gateway Transit bus stops



### Scale of Analysis

The demand model used for this analysis relies on spatial consistency in order to generate logical distance and density patterns. For this reason, all scores are aggregated to a central location at the census block level, the census block corner. Census blocks closely represent the street network and therefore Census block corners closely represent street corners, where foot and bicycle traffic is prevalent. This method is based on the Low-Stress Bicycling and Network Connectivity report (Mineta Transportation Institute, May 2012). The report discusses the benefits of using a smaller geographic setting for pedestrian and bicycle demand analyses rather than using more traditional traffic model features such as census block groups, census tracts, or traffic analysis zones. Due to the low speed of pedestrian movement, a much smaller geographic unit of analysis is needed.

### Scoring Method

The demand model's scoring method is a function of density and proximity. Scores are a result of two complementing forces: distance decay – the effect of distance on spatial interactions yields lower scores for features farther away from other features; and spatial density – the effect of closely clustered features yields higher scores. Scores will increase in high feature density areas and if those features are close together. Scores will decrease in low feature density areas and if features are further apart.

Each demand input is scored on a scale of 1 – 5 based on density and proximity and then assigned weighted multipliers to reflect the relative influence categories have on pedestrian activity. The weighting of features is provided at the end of this section.

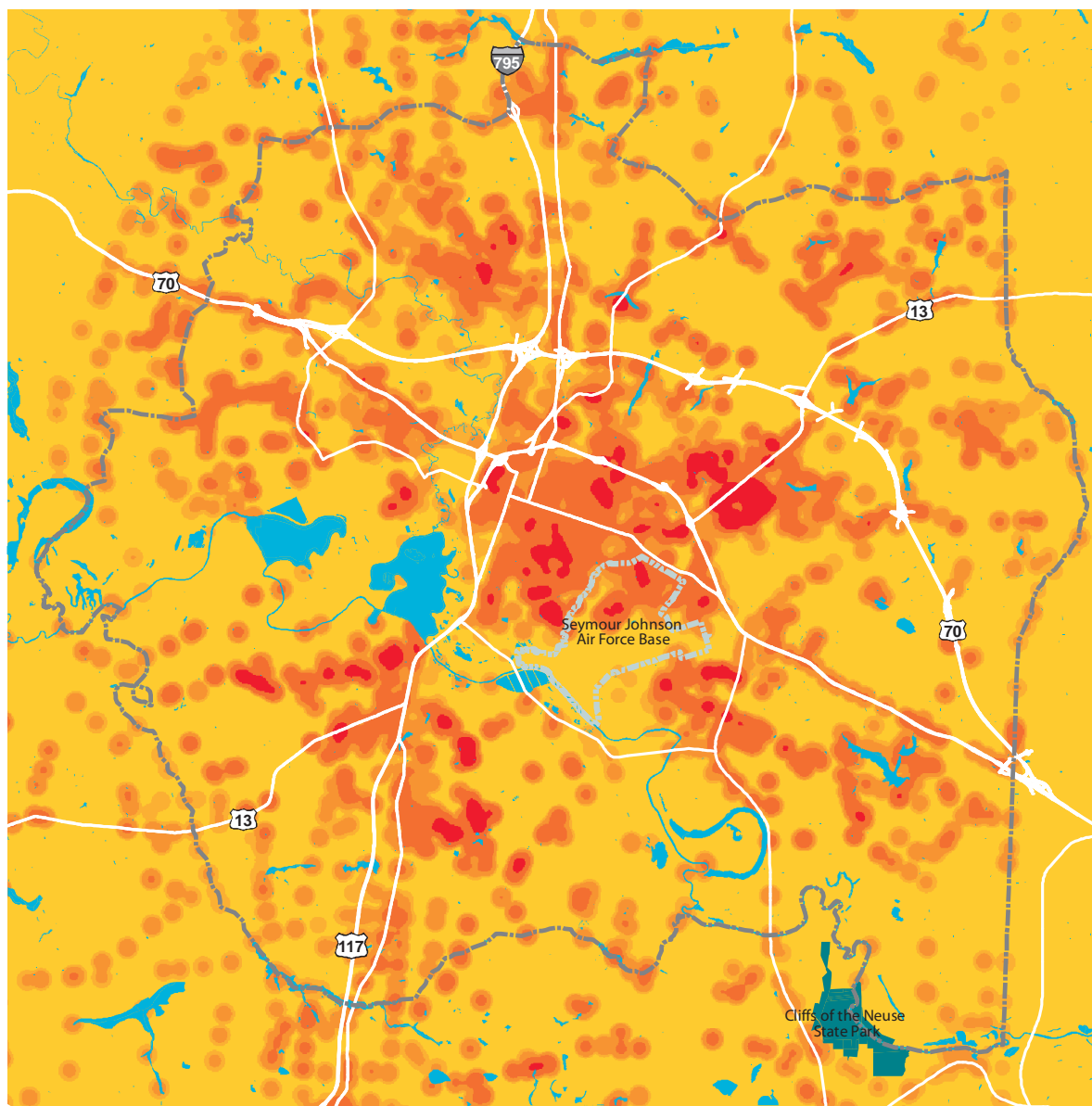
### Pedestrian Suitability Analysis Results

The results of the demand analysis are presented in the following map series.



### Where People Live

This category includes 2010 census block level population density. These locations represent potential trip origin locations. More trips can be made in areas with higher population density if conditions are right. As for all maps, the areas shaded more deeply in red represent higher demand areas relative to other colors on the ramp.






### Where People Live

Where people live includes 2010 census block level population density information. These locations represent potential trip origin locations. More trips can be made in areas with higher population density if conditions are right.

#### Legend

##### Live - Population Density

-  High Density
-  Moderate Density
-  Low Density

-  MPO Boundary
-  SJ Air Force Base
-  State Park

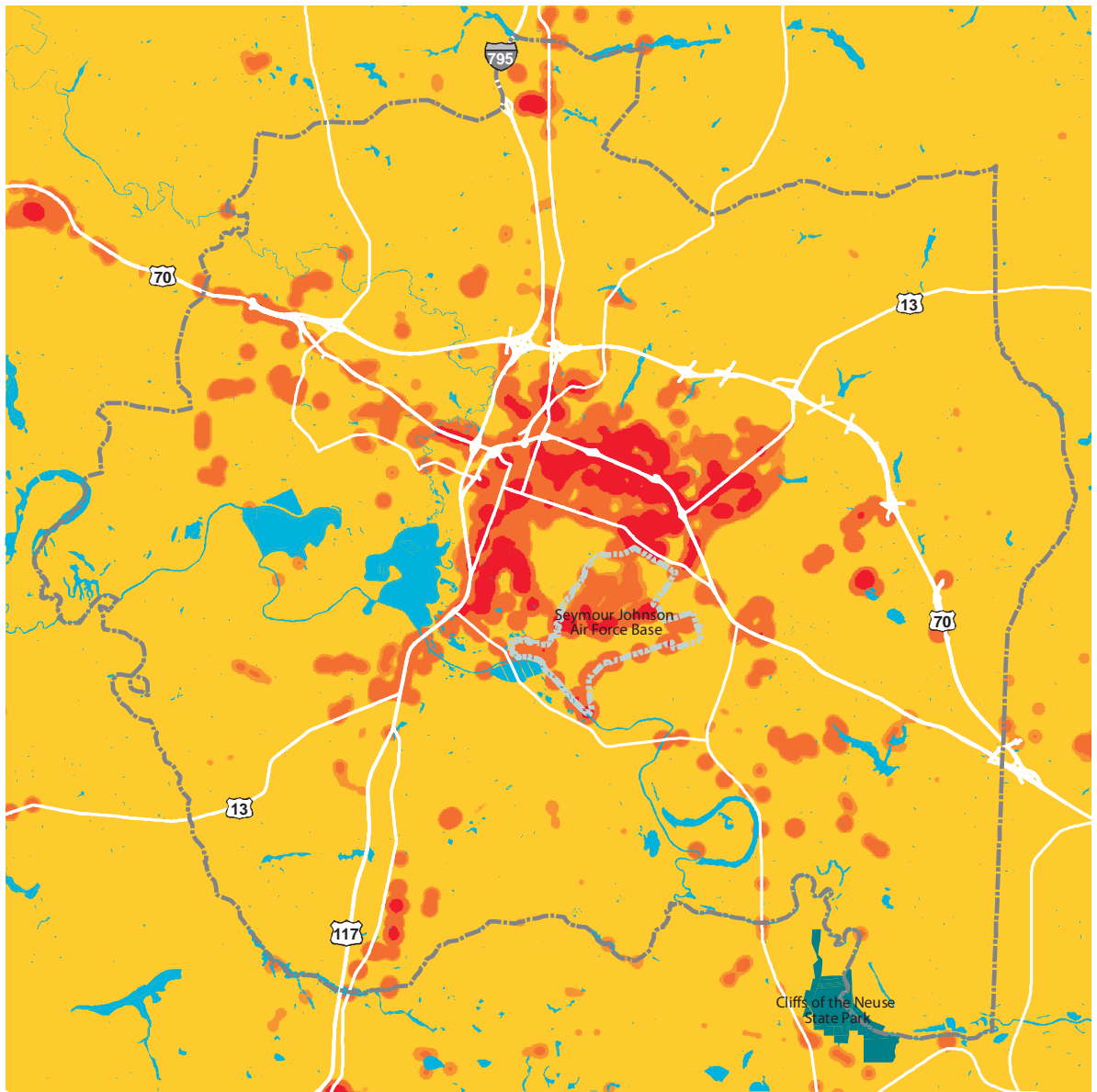






### Where People Work

This category represents trip ends for people working in the Goldsboro MPO regardless of whether they live in the MPO. Its basis is 2010 total employment by census block. Depending on the type of job, employment can act as a trip attractor (i.e., retail stores or cafes) or trip generator (i.e., office parks and office buildings) or both. Specific employment types, such as retail, are therefore also used in the where people play category.



### Where People Work

Where people work includes 2010 census block level total employment density.

#### Legend

##### Work - Employment Density

- High Density
- Moderate Density
- Low Density

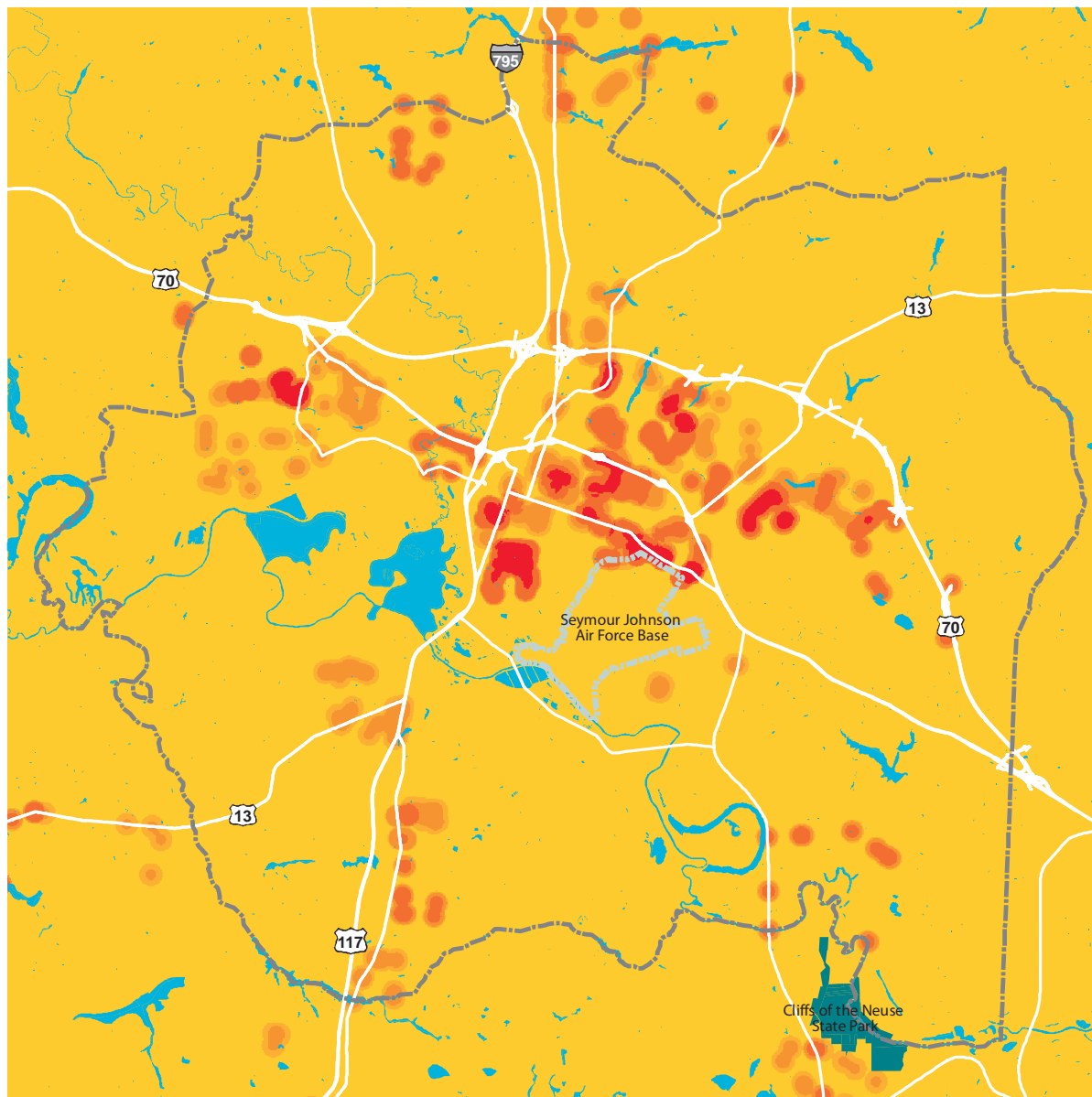
- MPO Boundary
- SJ Air Force Base
- State Park





### Where People Learn

This category shows the locations of all school levels, from elementary schools to universities. See page H-17 for scoring details.



### Where People Learn

Where people learn reflects the locations of colleges, high schools, middle schools, elementary schools, and day care facilities.

#### Legend

##### Learn - Schools and Childcare

- High Density
- Moderate Density
- Low Density

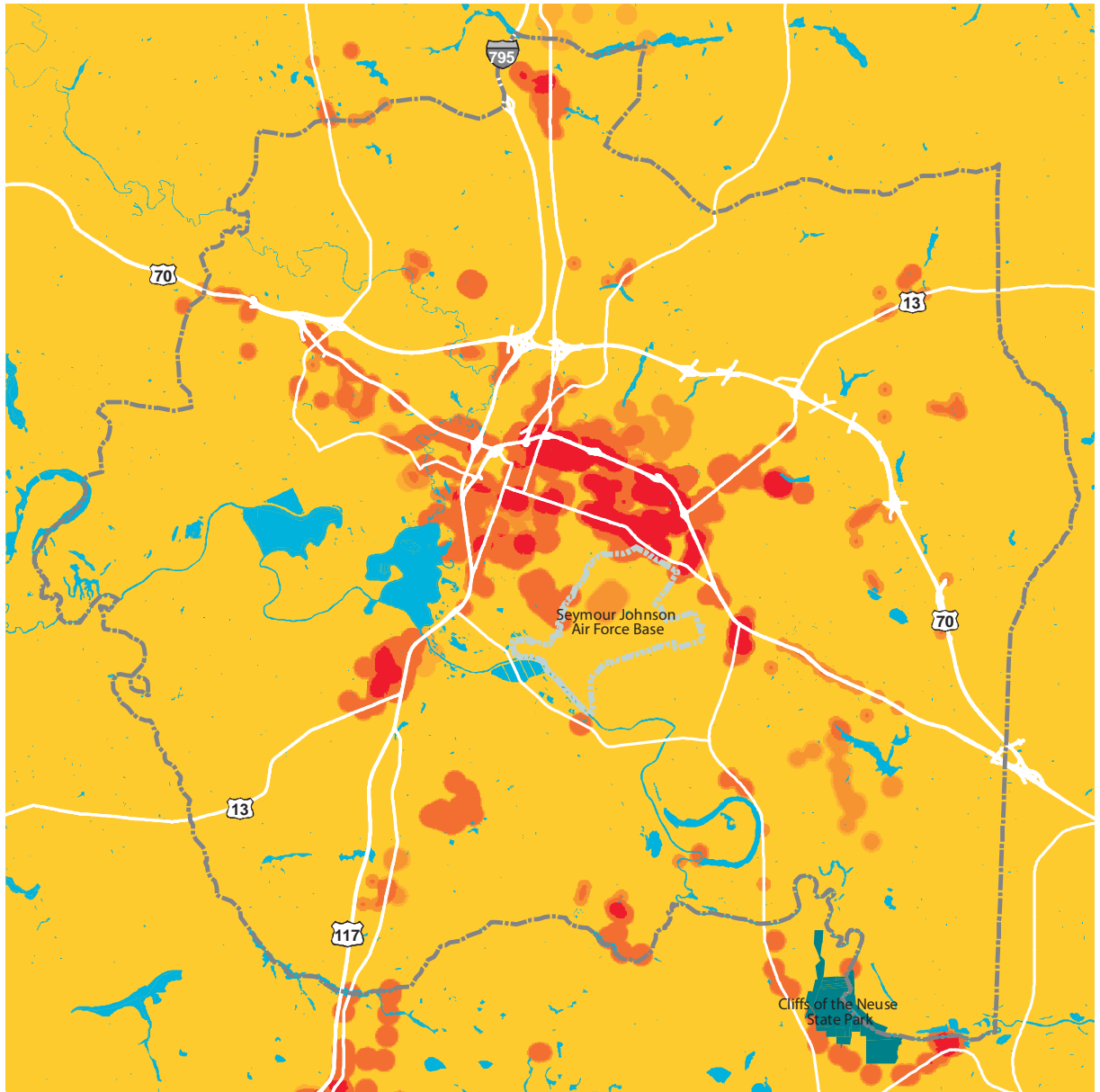
- MPO Boundary
- SJ Air Force Base
- State Park





### Where People Play

This category is a combination of different land use types and destinations. Retail destinations, parks, libraries, health facilities, and hospitals all contribute to this category. While hospitals and health providers are not exactly where one would expect to “play,” these services are still destinations of importance reflected in this category due to the temporary nature of the visit. See page H-17 for scoring details.



### Where People Play

Where people play is a combination of varied land use types and destinations. Parks, grocery stores, retail centers, health facilities, government facilities, cultural destinations, and hotels all contribute to this category. While health and government facilities are not exactly where one would expect to “play,” these civic amenities are still destinations of importance reflected in this category due to the temporary nature of the visit.

#### Legend

**Play - Commercial, Parks, and Civic**

- High Density
- Moderate Density
- Low Density

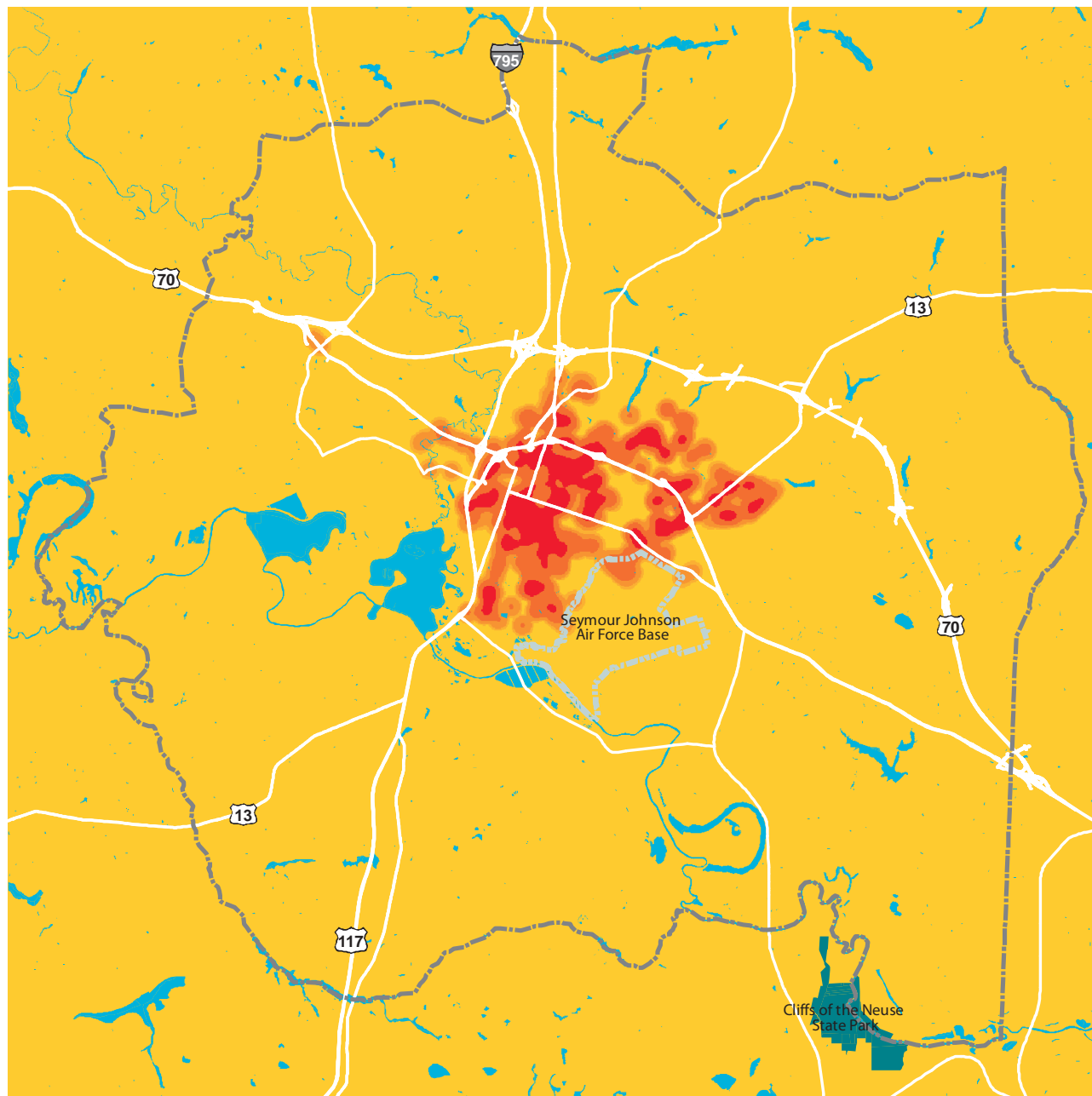
- MPO Boundary
- SJ Air Force Base
- State Park





### Where People Access Transit

This category includes locations of Gateway Transit bus stops operated by the Goldsboro-Wayne Transportation Authority. See page H-17 for scoring details.



### Where People Access Transit

Where people access transit reflects the density of Gateway Transit bus stops that are operated by the Goldsboro-Wayne Transportation Authority.

#### Legend

##### Transit - Gateway Transit Stops

- High Density
- Moderate Density
- Low Density

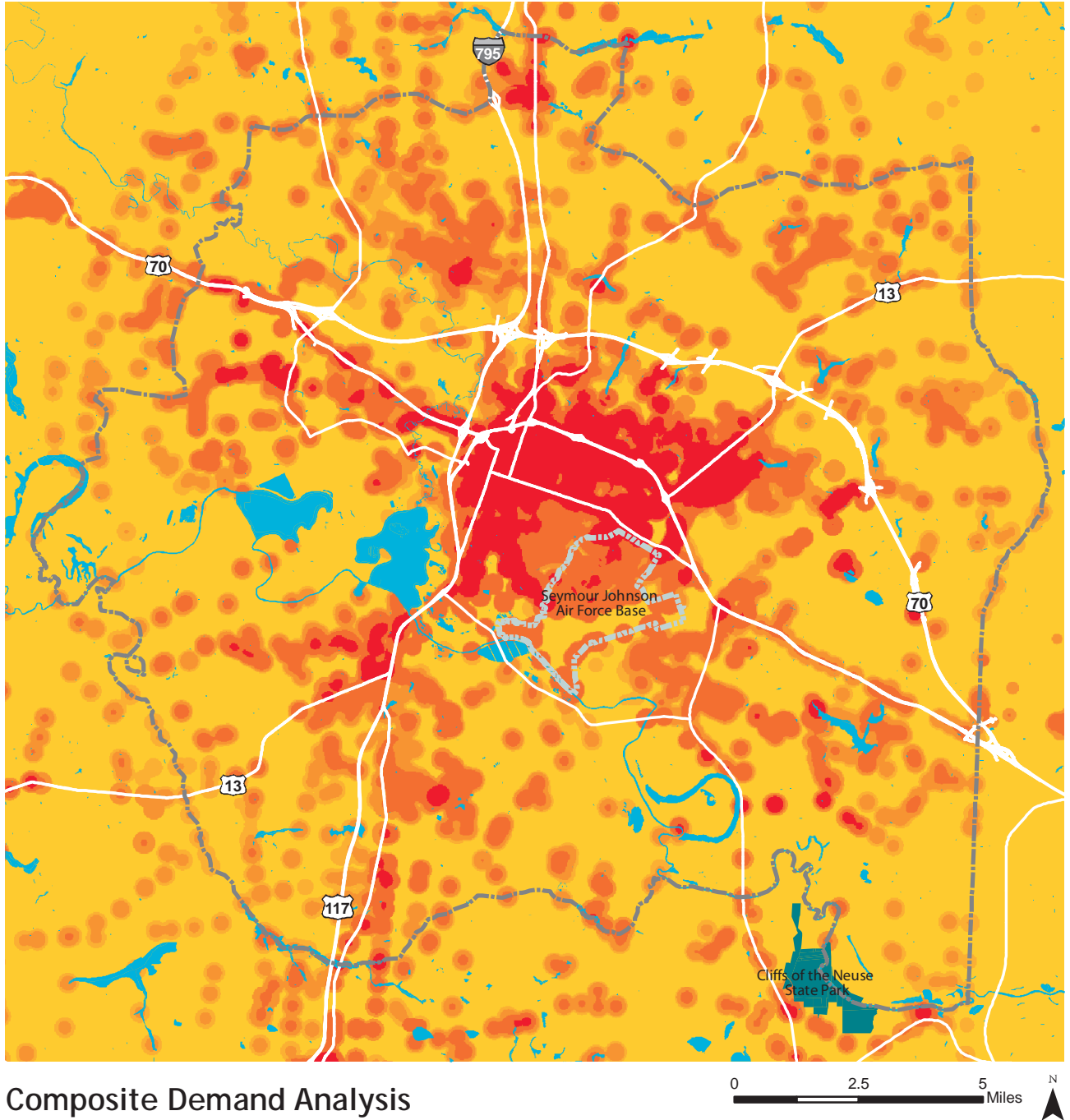
- MPO Boundary
- SJ Air Force Base
- State Park





### Composite Demand

The composite demand map combining all categories is shown below. Demand is concentrated in the downtown core and in northern Goldsboro, as well as along major corridors including Ash Street, US 70, and US 117.



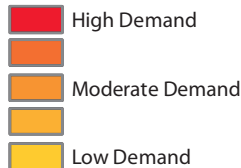
### Composite Demand Analysis

The Composite Demand Map incorporates the following drivers of bicycle and pedestrian activity:

- 1) Where People Live
- 2) Where People Work
- 3) Where People Play
- 4) Where People Access Transit

#### Composite Demand

**Live + Work + Learn + Play + Transit**



#### Legend





## Conclusion

The Composite Map on page H-15 shows that there is a high pedestrian demand in most of central Goldsboro, including downtown, and just north of US 70. While the locations where people live are dispersed throughout the MPO, the places where people work, play, learn, and access transit are much more densely concentrated within Goldsboro. These results suggest that while many people may need to drive to Goldsboro to access jobs and amenities, there is potential to greatly reduce driving within Goldsboro if pedestrian facilities are improved. By better connecting important destinations within central and northern Goldsboro, the City could reduce local residents' need to drive and promote "park once" activity among visitors, whereby people drive into town but then park their cars for the day, moving between different amenities on foot instead.

The Pedestrian Suitability Analysis results were used to help inform the location and types of pedestrian recommendations made in this plan. Filling in sidewalk gaps, improving crossings of arterial and collector streets, and providing shared-use paths are all key to developing a connected pedestrian network that is comfortable and convenient to use. Coupled with high quality wayfinding signage, the pedestrian recommendations in this plan would go a long way towards meeting pedestrian demand and would reduce the reliance on motor vehicles for short trips throughout Goldsboro.



### Weighting of Demand Inputs

CATEGORY	INPUT	WEIGHT	MAXIMUM ITEM SCORE	MAXIMUM CATEGORY SCORE	INFLUENCE
Where People Live	Total Population	4	20	20	6%
Where People Work	Total Employment	5	25	25	8%
Where People Learn	Day Care Facilities			110	33%
	Elementary Schools	5	25		
	Middle Schools	4	20		
	High Schools	3	15		
	Colleges & Universities				
Where People Play	Parks	2.5	12.5	112.5	34%
	Retail & Services				
	Government Facilities	5	25		
	Health & Medical Facilities	5	25		
	Grocery Stores				
	Hotels				
	Cultural Destinations				
Where People Access Transit	Bus Stops	3	15	65	20%



## ESTIMATING BICYCLING AND WALKING DEMAND

Many of the greatest strengths of active transportation projects, such as creating attractive, livable streetscapes and increasing community health through exercise, are not accounted for when evaluating transportation project alternatives. Similarly, many of the external social costs of driving, such as traffic congestion, crashes, and climate change from greenhouse gas emissions, are not sufficiently factored into these calculations. Quantifying the benefits of walking and bicycling for transportation demonstrates the value that these modes provide to the community and to Goldsboro residents. Making trips by bike or on foot helps to mitigate air pollution, congestion, roadway costs, individual travel costs, and individual health costs from lack of physical activity. As walking and bicycling rates increase, so does the collective value that active transportation provides to the community.

For each additional mile traveled by bicycle or by foot instead of by car, about a pound of carbon dioxide emissions are prevented, less money is spent on gas and other driving costs, and more time is spent being physically active. When bicycling and walking become part of people's daily lives, these benefits add up to create a healthier, more livable community. To calculate the current benefits of active transportation in Goldsboro, the first step is to estimate existing bicycling and walking levels.

User counts and user surveys are the two most commonly used tools for measuring bicycling and walking activity. The following section describes the strengths and weaknesses of each of these tools, and presents a methodology for estimating activity across an entire community.

### User Counts

User counts are typically conducted during peak travel hours and capture levels of bicycling and walking activity at a point along a street or path during a short time period. While user counts are helpful for comparing relative levels of use between one street and another, they do not fully capture the spectrum of bicycling and walking activity happening across the community over the length of the year. Counts are well suited to studying where people bike, but do not provide answers to other important questions, such as:

- What destinations are people bicycling or walking to, and where are they coming from?
- How far are they traveling?
- What is the purpose of their trip?
- How often do they make similar bicycling or walking trips?
- How often do they make different kinds of bicycling or walking trips?
- Do other residents also make similar types of trips by bicycling or walking, or do they typically travel by another mode?





Therefore, while user counts are a good tool for measuring bicycling and walking at points of interest, user surveys are needed to estimate the overall role of bicycling and walking in the transportation patterns of residents across the community.

### User Surveys

Transportation user surveys ask respondents about their recent or typical travel behavior, and sometimes ask about their perceptions of travel, e.g., their feeling of safety on a street. The American Community Survey (ACS), an ongoing survey conducted by the US Census Bureau, collects social, economic, and demographic information from respondents, including a question on respondents' commute to work. Sampling over 250,000 households per month, the ACS is the largest survey that asks Americans about their transportation habits and the most widely available source of bicycling and walking data in communities. According to the 2006-2010 ACS, about 0.5% of workers in Goldsboro bicycle to work and 2.2% walk to work. This rate is known as commute mode share: the number of people traveling to work by a certain mode of transportation as a percentage of all people commuting to work.

Although commute mode share data is able to capture wider information about bicycling and walking than user counts alone, work commutes are just one type of trip. Goldsboro residents make many other types of trips, such as going to school, visiting the doctor, or going shopping, by a variety of modes. Detailed household travel surveys can provide more information on travel patterns and help estimate the full spectrum of bicycling and walking trips happening in the community.

Household travel surveys typically interview respondents by phone to complete a travel diary to record all trips made by the respondent during a recent 24-hour period. The survey also collects detailed information on the qualities of each trip, including trip purpose, time of day, duration, length, mode, and more. By collecting this data from a large sample of people across the population, household travel surveys can provide information on where, why, and how far people are bicycling and walking for transportation. Though a recent local household travel survey is not available in Goldsboro, national data from the 2009 National Household Travel Survey (NHTS 2009) are available to stand in to help estimate the number of other types of bicycling and walking trips made in the area in addition to work trips.

### Estimating Overall Activity

Overall bicycling and walking activity can be estimated by combining available local data such as ACS commute mode share with national trip purpose information from NHTS 2009. On average, 1.6 utilitarian bicycle trips are made for every bicycle-to-work trip in the United States, and 4.3 utilitarian walking trips are made for every walk-to-work trip. Trips that serve a necessary purpose are considered to be utilitarian trips, and do not include discretionary trips such as social trips, recreation, or exercise.



Student commute trips to school and college are estimated independently of ACS data, because the populations making those trips are substantially different from the employed workforce surveyed by ACS. Because local college travel survey data is not available, national data on bicycling and walking college trip mode share was used (see tables on the following page). National baseline K-8 school trip data from Safe Routes to School (SRTS) was used to estimate mode share for K-12 school trips.

For each type of trip, average trip distance and vehicle trip replacement multipliers are applied to estimate the total distance traveled by bicycling or walking and the resulting vehicle miles traveled (VMT) reduced. National average trip distance multipliers are sourced from NHTS and SRTS, ranging from 0.36 miles for a K-12 walk to school trip to 3.54 miles per adult bike commute trip. Vehicle trip replacement multipliers assume that for each bicycling or walking trip, the chance of bicycling or walking replacing another mode for that trip is equal to the mode share of that other mode. Vehicle trip replacement multipliers are calculated independently using the mode split for each trip purpose available. For example, commute trip mode split is used for commute vehicle trip replacement, and college trip mode split is used for college vehicle trip replacement. Single-occupancy vehicle trip equivalents are used to estimate VMT reduction; replaced carpool trips are weighted at 50% of replaced single-occupancy vehicle trips.

	Commuter Trip Mode Share	College Trip Mode Share	K-12 Trip Mode Share	Utilitarian Trip Multiplier
<b>Bike</b>	0.5%	1.7%	2.0%	1.6
<b>Walk</b>	2.2%	6.8%	13.0%	4.3
Source	ACS 2008-2012 (Goldsboro)	NHTS 2009 (national data)	SRTS Baseline, 2010 (national data)	NHTS 2009 (national data)

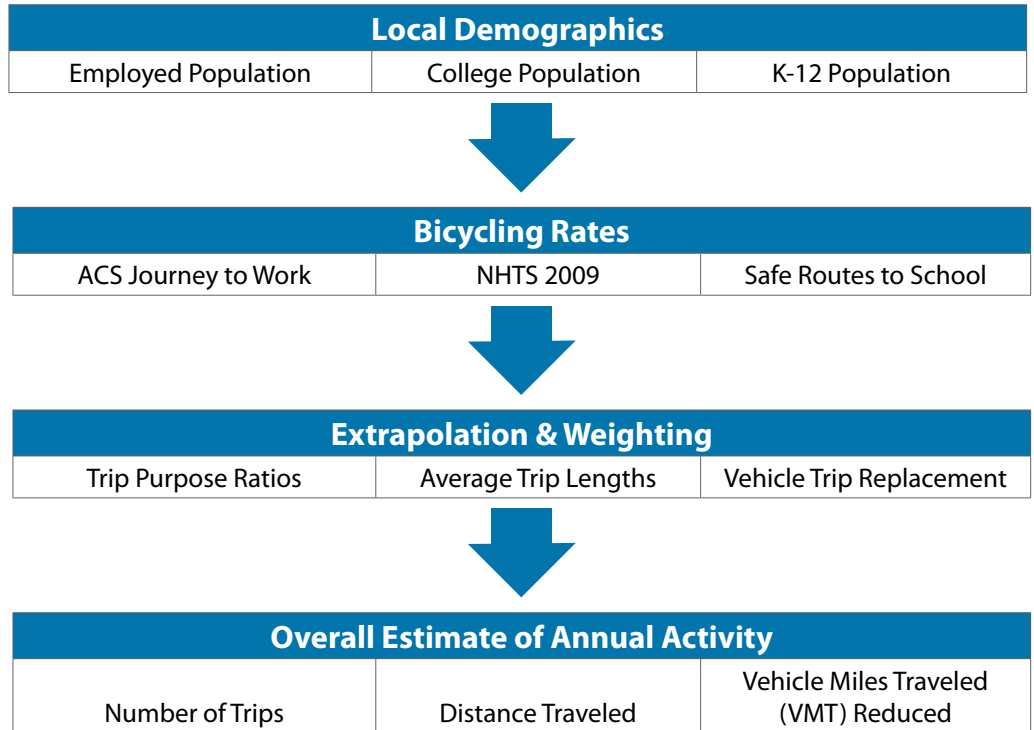
	Annual Work Days	Annual College Class Days	Annual K-12 School Days
<b>Days</b>	251	170	185
Source	261 weekdays - 10 Federal holidays	Wayne County Community College 2013-2014 calendar	North Carolina State Minimum

	Commuter Vehicle Trip Replacement	College Vehicle Trip Replacement	K-12 Vehicle Trip Replacement	Utilitarian Vehicle Trip Replacement
<b>Bike</b>	78.3%	80.1%	40.0%	87.2%
<b>Walk</b>	78.3%	80.1%	40.0%	87.2%
Source	ACS 2008-2012 (Goldsboro)	NHTS 2009 (national)	SRTS Baseline, 2010 (national)	ACS 2008-2012 (Goldsboro)

	Commuter Trip Distance	College Trip Distance	K-12 Trip Distance	Utilitarian Trip Distance
<b>Bike</b>	3.54	2.09	0.77	1.90
<b>Walk</b>	0.67	0.48	0.36	0.68
Source	NHTS 2009	NHTS 2009	SRTS Baseline, 2010	NHTS 2009



The figure below provides a visual depiction of the steps used to translate local and national transportation data into an annual estimate of the bicycling and walking activity currently happening in Goldsboro.



### Key Findings Related to Existing Demand

Census tract level ACS data was the primary source for estimating existing levels of bicycling and walking activity around Goldsboro. Using ACS, NHTS, and Safe Routes to School data sources, **it is estimated that approximately 435,000 miles of trips are being made by walking and bicycling in Goldsboro each year that otherwise would be made by car.**



## ESTIMATING BICYCLING AND WALKING BENEFITS

Benefits of bicycling and walking are based on the number of regular active transportation users and miles traveled developed in the overall demand estimate. Numerous studies have estimated the dollar value of the benefits of bicycling and walking such as reduced pollution from the reduction of motor vehicle travel, improved health from increased physical activity, and other benefits (see tables below). Using figures from these studies, overall levels of active transportation activity can be expressed in terms of their dollar value to local residents and the social benefits to the community at large.

### Key Findings Related to Existing Benefits

Active transportation returns significant benefits to Goldsboro and local residents in the form of improved air quality, reduced transportation costs, and improved health. **Existing rates of active transportation generate an estimated \$1.3 million in annual benefits to Goldsboro and its citizens** (see table on following page).

In addition to making utilitarian trips by bicycling and walking, Goldsboro area residents make many bicycling and walking trips for social and recreational purposes. While these trips may not necessarily replace vehicle trips and therefore are not included in the transportation benefits tables above, social and recreational bicycling and walking activity contributes to healthy living and the livability of the area. **Goldsboro residents make an estimated 400,000 social or recreational bicycling and walking trips annually.**

Reduced Emissions	Lb/VMT	Reduced Emissions Costs	\$/Ton	Reduced Externalities	\$/VMT
Hydrocarbons	0.00300	Volatile Organic Compounds	\$1,839	Traffic Congestion	\$0.07
Particulate Matter	0.00002	Particulate Matter	\$331,617	Vehicle Crashes	\$0.49
Nitrous Oxides	0.00209	Nitrous Oxides	\$7,249	AAA, 2013	
Carbon Monoxide	0.02734	Carbon Monoxide	n/a		
Carbon Dioxide	0.81351	Carbon Dioxide	\$49.20	Road Maintenance	\$0.15
EPA, 2007		EPA, 2007, adjusted to 2013 dollars		Kitamura, Zhao, & Gubby, 1989, adjusted to 2013 dollars	

Physical Inactivity Rate	%	Reduced Healthcare Costs	\$/Year	Vehicle Operating Costs	\$/VMT
North Carolina	24.5%	Savings/Newly Active Person	\$1,119.62	Operational Standard Mileage Rate	\$0.63
BRFSS, 2010 (CDC)		Chenoweth, D., 2005		AAA, 2013	



Category	Total Monetized Benefit
Annual VMT Reduced	435,486
<b>Air Quality</b>	
CO <sub>2</sub> Emissions Cost Reduced	\$8,715
Other Vehicle Emissions Cost Reduced	\$5,944
Total Vehicle Emissions Cost Reduced	\$14,659
<b>Social Benefits</b>	
Reduced Traffic Congestion Costs	\$30,484
Reduced Vehicle Crash Costs	\$213,388
Reduced Road Maintenance Costs	\$65,323
<b>Individual Benefits</b>	
Household Vehicle Operation Cost Savings	\$274,356
Health Care Cost Savings from Active Transportation	\$727,081
<b>TOTAL BENEFITS</b>	<b>\$1,325,292</b>

### Potential Future Benefits of Bicycling and Walking

Goldsboro is taking steps to improve the accessibility, safety, and quality of the bicycling and walking environment. The implementation of this plan will lay the groundwork for higher levels of active transportation and greater recognition in the future. Analysis of current bicycling and walking benefits show how active transportation is already a boon to the health and economy of the region. Investing in improvements to active transportation networks could generate even greater annual benefits.

Future growth in bicycling and walking rates in Goldsboro would generate economic, environmental, and health benefits greater than the current estimate of \$1.3 million in annual benefits to the region. **If bicycle- and walk-to-work rates double to 1.0% and 4.4%, respectively, local benefits from bicycling could reach \$1.9 million per year. If these rates were triple their current levels, with 1.5% of workers commuting by bike and 6.6% walking to work, the benefits would equal nearly \$2.5 million per year in benefits** from improved air quality, social benefits, and individual vehicle cost savings and health care cost savings. The table on the following page shows the monetized annual benefits of bicycling and walking for transportation in the Goldsboro area at these increased rates.

The potential benefits of increased bicycling and walking rates in Goldsboro make a strong case for increased investment in active transportation infrastructure. The new bicycling and walking facilities proposed in this plan will become valuable assets that will increase the health, affordability, and livability of the Goldsboro area.



Category	Benefits at Current Mode Shares	Benefits if Mode Share Doubles	Benefits if Mode Share Triples
Annual VMT Reduced	435,486	776,205	1,116,925
<b>Air Quality</b>			
CO <sub>2</sub> Emissions Cost Reduced	\$8,715	\$15,534	\$22,352
Other Vehicle Emissions Cost Reduced	\$5,944	\$10,595	\$15,246
Total Vehicle Emissions Cost Reduced	\$14,659	\$26,129	\$37,598
<b>Social Benefits</b>			
Reduced Traffic Congestion Costs	\$30,484	\$54,334	\$78,185
Reduced Vehicle Crash Costs	\$213,388	\$380,341	\$547,293
Reduced Road Maintenance Costs	\$65,323	\$116,431	\$167,539
<b>Individual Benefits</b>			
Household Vehicle Operation Cost Savings	\$274,356	\$489,009	\$703,663
Health Care Cost Savings from Active Transportation	\$727,081	\$832,806	\$938,531
<b>TOTAL BENEFITS</b>	<b>\$1,325,292</b>	<b>\$1,899,050</b>	<b>\$2,472,808</b>

## ESTIMATING INCREASED PROPERTY VALUES FROM TRAILS

In addition to the environmental, social, and individual benefits of walking and bicycling, new trails can contribute to the local economy by increasing property values. According to the National Association of Homebuilders, trails are consistently ranked one of the most important community amenities by prospective homebuyers, above golf courses, parks, security, and others.<sup>1</sup> Seventy percent of Americans say that having bike lanes or paths in their community is important to them,<sup>2</sup> and two-thirds of homebuyers consider the walkability of an area in their purchase decision.<sup>3</sup>

This preference for communities that accommodate walking and bicycling is reflected in property values across the country.<sup>4</sup> A study of over 90,000 U.S. home sales found that better walking conditions were correlated with higher housing prices in 13 of the 15 housing markets studied, controlling for other factors that influence housing value. The results showed that houses in walkable neighborhoods have property values \$4,000 to \$34,000 higher than houses in areas with average walkability.<sup>5</sup> In Apex, North Carolina, the Shepard’s Vineyard housing development added \$5,000 to the price of 40 homes adjacent to the regional greenway – and those homes were still the first to sell.<sup>6</sup> A similar study in Ohio found that the Little Miami Scenic Trail increases single-family home property values by \$7.05 for every foot closer a property is located to the trail.<sup>7</sup> These cases show the tangible economic benefits that walking and bicycling projects have for homeowners, and the premium that people are willing to pay to live in places that accommodate walking and bicycling.



The economic benefit of investing in trails, from a property value standpoint, is twofold. First, these investments tend to increase nearby property values, thereby generating household wealth. Second, to the extent that these increased property values are properly accounted for in property assessments, they then result in additional annual property tax revenues to municipalities and school districts. **The literature on trails and property values, including the cases above and others, suggests that the property value increase generated by new trails on nearby residential properties is about 4 to 7 percent of the current property value.**<sup>8,9,10,11</sup> In addition, another non-quantifiable benefit is the retention of current Goldsboro residents and attractiveness for new residents and businesses.

### Calculating Property Value Increases from New Trails in Goldsboro

To estimate the economic impact that the trails proposed in this plan will have on Goldsboro's economy, this analysis assumes that the trails will result in a one-time 4 percent increase in the value of properties located within a one-quarter mile of the new infrastructure.<sup>12</sup> Only residential properties within City of Goldsboro were included in this estimate, since the existing literature does not confirm whether these same increases would be seen in commercial properties. With the proposed 20.4 miles of trail and 3.5 funded miles of trail, the value of approximately 5,500 residential properties in Goldsboro will be affected, generating a total aggregate property value increase of \$21.9 million (see table below). If we assume a 7 percent increase in property values, representing the high end of estimates from existing literature, the total aggregate property value increase for Goldsboro residential properties would be \$38.4 million.

Proposed Trail Miles	Funded Trail Miles	Total Trail Miles	Total Residential Properties Affected	Estimated 4% Property Value Increase	Estimated 7% Property Value Increase
20.4	3.5	23.9	5,564	<b>\$21,924,834</b>	<b>\$38,368,459</b>

**When considering return-on-investment (ROI), the benefit of building greenways (at estimated \$500,000/mile) for property value increase alone is nearly 2:1 (at 4% property value increase) and 3.5:1 (at 7%).** Given the other positive economic impacts of greenways, these numbers are convincing.

### Conclusion

This appendix has discussed the many types of economic benefits that can result from an increase in walking and bicycling rates and new investments in active transportation in Goldsboro. The actual benefits realized will depend on whether, where, and to what degree active transportation infrastructure is implemented throughout Goldsboro and surrounding areas, and how people and organizations respond to the existence of these amenities. Nevertheless, this analysis provides an initial approximation of the type and magnitude of economic impact that Goldsboro can expect to see from increased walking and bicycling infrastructure investments and activity. The results suggest that active transportation can provide very real and very large economic returns to the Goldsboro area and its residents.



## Endnotes

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6. Rails to Trails Conservancy. (2005). Economic benefits of trails and greenways.
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8. Econsult Corporation. (2010). Quantifying the Economic Value of Protected Open Space in Southeastern Pennsylvania.
9. Campbell, and Monroe, . (2004). The Economic Impact of the Catawba Regional Trail.
10. Econsult Corporation. (2007). The Potential Economic Impacts of the Proposed Carolina Thread Trail.
11. Econsult Corporation. (2010). Valuing the Conversion of Urban Green Space.
12. What is meant by this assumption is that, all else equal, properties located within a quarter-mile of the new facilities will increase in value by 4 percent more than other, similar properties not located within a quarter-mile of the trail. Thus, if properties in the area increase in value by 3 percent, then properties located within a quarter-mile of the trail will increase by 7 percent (3 percent + 4 percent), while if properties in the area decrease in value by 3 percent, then properties located within a quarter-mile of the trail will increase by 1 percent (-3 percent + 4 percent). This may turn out to be conservative on one or more of three fronts. First, the one-time property value increase may be larger than 4 percent, as is suggested by the body of literature. Second, there may be a difference in the ongoing appreciation rate over time between properties located within a quarter-mile of the infrastructure and properties not located within a quarter-mile of the trail, such that the property value increase resulting from the implementation of the trail is not just the upfront 4 percent difference but also some ongoing difference that grows over time. Third, some upfront and/or ongoing difference in property value may apply to properties that are not located within a quarter-mile of the infrastructure but are still reasonably close to the trail; for example, properties located between a quarter-mile and a half-mile of the trail may sell for a premium, since such a distance from the trail may still be considered easily covered on foot.





# Appendix I: Demonstration Projects

## Chapter Contents:

*Overview*

*Project List*

*Demonstration Project  
Cutsheets*

## OVERVIEW

This appendix includes advanced concepts and planning-level cost estimates for a selection of the highest priority on-road pedestrian and bicycle projects including a visionary, long-term recommendation for Ash Street road diet. These projects address some of the greatest need in the Goldsboro MPO and many have already been submitted to NCDOT as priorities for funding consideration.

## PROJECT LIST

### Goldsboro

- Royall Avenue Sidewalk #1
- Royall Avenue Sidewalk #2
- Spence Avenue Bicycle and Pedestrian Facilities
- Berkeley Boulevard Bicycle and Pedestrian Facilities #1
- Berkeley Boulevard Bicycle and Pedestrian Facilities #2
- Elm Street Bicycle and Pedestrian Improvements
- Herman Street Sidewalks
- Harris Street/Bunche Drive Bicycle and Pedestrian Facilities
- Ash Street Road Diet (Vision Project)
- Ash Street Sidewalk
- New Hope Road Sidepath
- Wayne Memorial Drive Sidewalks
- New Hope Road and Harding Road Intersection Improvements
- Mulberry Bike Boulevard
- Holly/Beech Bike Boulevard
- Audubon/Olivia Bike Boulevard

### Walnut Creek

- Walnut Creek Drive Sidewalks
- Mill Road Sidewalks

### Pikeville

- Main Street Bicycle and Pedestrian Facilities



## CITY OF GOLDSBORO PROJECTS

### G1: Royall Avenue Sidewalk #1

The section of Royall Avenue between Spence Avenue and Berkeley Boulevard is home to many different commercial and retail land uses. With the railroad paralleling the road along its south side, the north side is the only area that is serving adjacent development. No bicycle or pedestrian facilities currently exist along this road. The recommended treatment is to construct a sidewalk along the north side of Royall Avenue.

**Extents and Facility Type:** Spence Avenue to Berkeley Boulevard: Sidewalk on North Side

#### Overview and Purpose

Providing a sidewalk along the north side of Royall Avenue will create a pedestrian linkage to all the adjacent development. The sidewalk is recommended to be five to six feet wide, with a verge of at least three feet. To fit this within the existing right of way, the shoulder and ditch section on the north side will need to be converted to a curb and gutter section. Drainage improvements made in conjunction with this transition should help alleviate flooding problems experienced at the intersection of Royall Avenue and Spence Avenue. Intersection improvements are recommended at Royall Avenue and Spence Avenue, including high visibility crosswalks and pedestrian countdown signals. The right in-right out movement into the Exxon in the northeast quadrant of the Royall Avenue and Spence Avenue intersection should include an improved “pork chop” area with a sidewalk pulled away from the travel lane. These improvements will interface with the recommended sidepath along the west side of Spence Avenue, discussed further as project G3. The exhibit shows a detail of the intersection of Royall Avenue and Spence Avenue, indicating the positioning of the recommended sidewalk, supporting road crossing improvements, and the linkage with the proposed sidepath along Spence Avenue.

**Planning Level Cost Estimate:** \$330,000



## G2: Royall Avenue Sidewalk #2

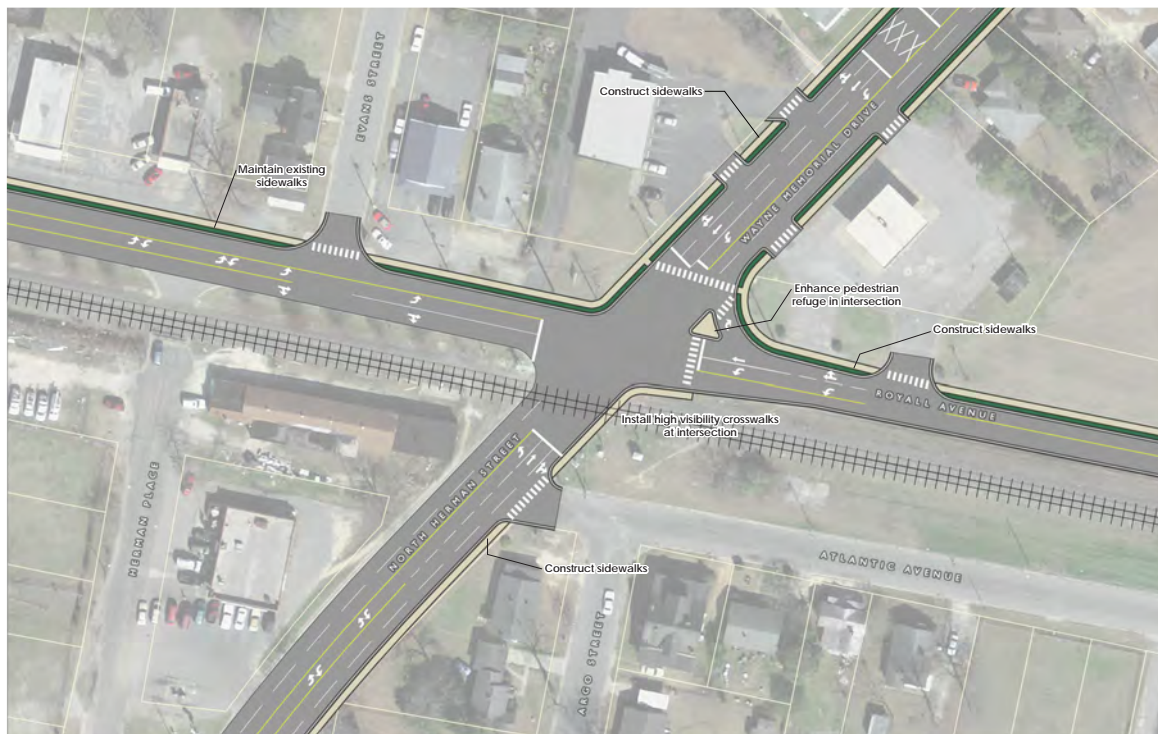
Between Spence Avenue and William Street, Royall Avenue contains a mixture of commercial and residential land uses. The railroad continues to parallel the road on its south side for the entire extents of this project, resulting in Royall predominantly serving development on its north side. There are currently no bicycle facilities along this roadway, and only limited sidewalk connections. The recommended treatment is to construct a sidewalk along the north side of Royall Avenue.

**Extents and Facility Type:** William Street to Spence Avenue: Sidewalk on North Side

### Overview and Purpose

Royall Avenue is a key east-west roadway linkage within the City of Goldsboro that will benefit from the provision of a consistent pedestrian facility. A five to six foot sidewalk is recommended on the north side of the street, with at least a three foot verge area. At the intersection of Royall Avenue and Wayne Memorial Drive, intersection crossing improvements will be needed to assist pedestrians. High-visibility crosswalks are recommended along the southbound and westbound approaches to line up with recommended sidewalks. The current “pork chop” area separating the through and right turning traffic on the westbound approach should be enhanced to provide a true pedestrian refuge. The crosswalk on the southbound approach should be lined up to match curb ramps that currently exist. The exhibit shows a detail of the intersection of Royall Avenue and Wayne Memorial Drive, indicating the positioning of the recommended sidewalk, supporting road crossing improvements, and the linkage with proposed sidewalks along Wayne Memorial Drive/North Herman Street. The exhibit also shows where the proposed sidewalk will cross the railroad tracks south of Royall Avenue. In this location, the sidewalk will run at grade with the roadway rather than being elevated on curb and gutter. Likely consisting of an extended asphalt section (rather than concrete), this treatment still provides a separate space for pedestrians without interfering with the operation of the rail line.

**Planning Level Cost Estimate:** \$840,000





### G3: Spence Avenue Bicycle and Pedestrian Facilities

The section of Spence Avenue between Ash Street and the US 70 Bypass is a primarily commercial corridor, providing connections to many of the major retail destinations in the City of Goldsboro. As a result, the corridor contains many destinations that would be desirable for access by nonmotorized users. Spence Avenue transitions to Cuyler Best Road as a bridge over the US 70 Bypass. No bicycle or pedestrian facilities currently exist along this road. The recommended treatment is to construct a sidepath along the west side of Spence Avenue, along with restriping the roadway to accommodate wide outside lanes.

**Extents and Facility Type:** Ash Street to US 70 Bypass: Sidepath on West Side; Sidewalk on east side; Ash Street to US 70 Bypass: Wide Outside Lanes (Restripe)

#### Overview and Purpose

The sidepath recommended along the west side of Spence Avenue is recommended to be eight to ten feet wide, using the ten foot width wherever possible. In addition, a small verge section is recommended to separate this facility from the vehicle travelway. Laneage along Spence Avenue should be reconfigured to provide 14 foot outside lanes, 11 foot inside lanes, and a 10 foot center turn lane. The exhibit shows a detailed view of the section of Spence Avenue between Royall Avenue and the US 70 Bypass. In this section, high-visibility crosswalks are recommended to traverse driveways intersecting with the sidepath in order to provide a consistent travel experience. The character of the improvements change over the US 70 Bypass bridge. In this area, the bridge should be restriped to provide an eight foot shoulder on the west side and a four foot shoulder on the east side. The wider shoulder on the west side provides the alternative for people using the sidepath to continue on that side of the road, and ultimately link to a future connection to the greenway recommended along the Billy Branch stream. Pedestrian signals should be considered on each end of the bridge to facilitate continued travel along the west side of the road. A small buffer area could also be considered along the bridge’s wide shoulder area, consisting of striping or fold over bollards.

**Planning Level Cost Estimate:** \$1,030,000



## G4: Berkeley Boulevard Bicycle and Pedestrian Facilities #1

Berkeley Boulevard between Ash Street and Elm Street serves not only the large number of commercial developments along either side of the road, but also serves as the primary entry point to Seymour Johnson Air Force Base. This corridor currently has no provisions for bicycles, and only limited sidewalk connections. The recommended treatment is to construct sidewalks along both sides of Berkeley Boulevard, make pedestrian crossing improvements at the intersections with Ash Street and Elm Street, and restripe the roadway to include wide outside lanes.

**Extents and Facility Type:** Ash Street to Elm Street: Sidewalks on Both Sides; Ash Street to Elm Street: Wide Outside Lanes (Restripe)

### Overview and Purpose

The sidewalk proposed along both sides of Berkeley Boulevard should be five to six feet wide, with a three foot verge wherever possible. In light of existing right of way constraints, there may be sections of the sidewalk that will need to be directly on the back of the curb. If possible, the sidewalk should be greater than five feet wide in these locations so pedestrians have a greater potential separation from motorized traffic. The sidewalk on the east side of Berkeley Boulevard should ultimately tie in to the existing sidewalk along the east side of Wright Brothers Avenue. The recommended sidewalk will also tie into the existing sidewalk currently in place along Berkeley Boulevard, creating a continuous pedestrian travelway. High visibility crosswalks with countdown pedestrian signals are recommended at the intersections with Elm Street and Ash Street. The exhibit shows these improvements and indicates the preferred approaches for pedestrian crossings at these intersections, as well as the location of a pedestrian refuge for users crossing Berkeley Boulevard at Ash Street. Wide outside lanes along Berkeley Boulevard will allow bicyclists comfortable with riding in the travel lanes a greater comfort measure while traveling on this road.

**Planning Level Cost Estimate:** \$410,000





## G5: Berkeley Boulevard Bicycle and Pedestrian Facilities #2

As with the section in project G4, this section of Berkeley Boulevard serves primarily commercial uses, notably including the Berkeley Mall. Intersecting roadways provide linkages to nearby single and multifamily residential areas. This area is currently served by a sidewalk on the north side of the street, and very limited sidewalks on the south side. The recommended treatment is to construct sidewalks on the south side of Berkeley Boulevard as well as restriping the roadway to accommodate wide outside lanes.

**Extents and Facility Type:** Ash Street to US 70 Bypass: Sidewalks on Both Sides; Ash Street to US 70 Bypass: Wide Outside Lanes (Restripe)

### Overview and Purpose

Sidewalks along Berkeley Boulevard are recommended to be six feet wide. In order to interface with current sidewalk infrastructure and stay within the available right of way, proposed sidewalks will be located directly on back of curb. The proposed wide outside lanes continue the section recommended in project G4 and provide a more comfortable travel space for on-road bicyclists. The exhibit shows the proposed improvements to the Berkeley Boulevard and Cashwell Drive intersection. Improvements such as high visibility crosswalks at the intersection are shown, which would be complemented by pedestrian countdown signals. Planned bicycle lanes along Cashwell are shown as well. In order to further enhance safety near this intersection and increase driver predictability, there are also driveway closures noted on the westbound approach of Berkeley Boulevard. In both instances these closures affect a parcel with multiple access points along both Berkeley Boulevard and Cashwell Drive. Eliminating these driveway openings will create a more logical traffic pattern and reduce conflict points between vehicles and pedestrians.

**Planning Level Cost Estimate:** \$970,000



## G6: Elm Street Bicycle and Pedestrian Improvements

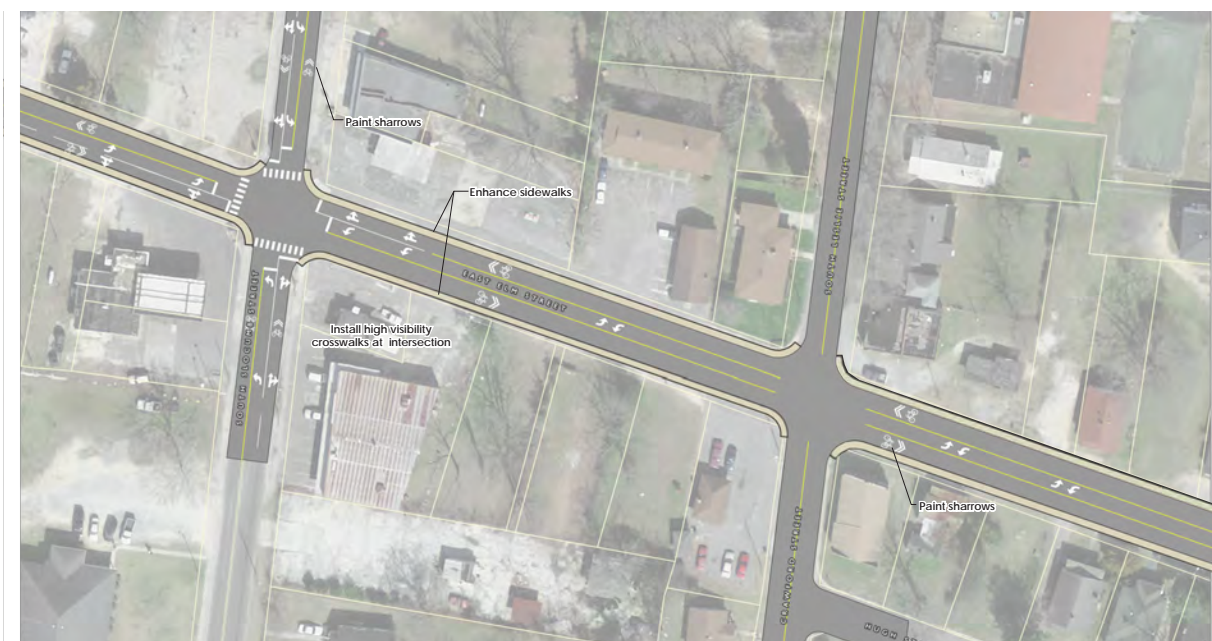
Elm Street is a major east-west corridor through the City of Goldsboro, providing a continuous link between US 13 and Seymour Johnson Air Force Base. However, between Slocumb Street and Berkeley Boulevard this roadway is predominantly residential in nature. There are currently no bicycle or pedestrian amenities serving this area. The recommended improvements would provide sidewalks on both sides of the roadway, and sharrows along all or part of the corridor.

**Extents and Facility Type:** Slocumb Street to Berkeley Boulevard: Sidewalks on Both Sides; Slocumb Street to Berkeley Boulevard: Paint Sharrows

**Overview and Purpose:** Elm Street serves as the major parallel route to Ash Street to the south. While each of these roadways have a variety of specific commercial and residential users, they also both have the potential to serve through traffic. As a result, the recommendations developed for Elm Street (project G6) and Ash Street (projects G9 and G10) were considered together to ensure overall regional mobility needs would still be accommodated. Each of these roadways were explored for the possibility of implementing a road diet. For Elm Street, this road diet would have included the section between Randolph Street and Berkeley Boulevard. For Ash Street, the road diet would include the section between Audubon Avenue and Berkeley Boulevard. After examining existing and 2040 projected travel volumes, each section was shown to be a viable candidate for a road diet. However, it was acknowledged that completing a road diet along both corridors might result in negative ramifications for east-west mobility within the City of Goldsboro, particularly as concerns access to Seymour Johnson Air Force Base. As a result, a road diet is recommended for Ash Street but not for Elm Street.

Recommendations for Elm Street include constructing sidewalks on both sides of the street. Sidewalks will likely remain on back of curb due to right of way constraints. Sharrows are recommended for this roadway to help signal the presence and potential locations of bicyclists. Elm Street was evaluated for inclusion of striped bicycle lanes. However, given the current roadway width of 32 feet, three additional feet of pavement would be needed on each side of the roadway to accommodate these lanes. With the right of way constraints along this corridor, this is likely not a feasible option. The exhibit shows the proposed sidewalk and sharrow improvements at the intersection of Elm Street and Slocumb Street, along with high visibility crosswalk improvements at that location.

**Planning Level Cost Estimate:** \$1,630,000





## G7: Herman Street Sidewalks

The portion of Herman Street between Beech Street and Royall Avenue connects such bicycle and pedestrian friendly destinations as Herman Park, historic Goldsboro High School, and the Wayne Middle High School Academy. Sidewalks exist on a portion of this road near Goldsboro High School, but do not continue northward. The recommended improvements would continue the sidewalk along the east side of the road with pedestrian crossing improvements at major intersections.

**Extents and Facility Type:** Royall Avenue to Beech Street: Sidewalk on East Side

### Overview and Purpose

Near its intersection with Beech Street, Herman Street is a three lane roadway. It widens to a five lane section north of Dortch Street, which results in a significantly more constrained right of way. Where possible, the recommended sidewalk should be separated by a wide verge area consistent with what exists near Goldsboro High School. The exhibit shows the intersection of Herman Street and Beech Street. At this signalized intersection, high visibility crosswalks should be installed along with pedestrian countdown signals. In order to facilitate continuity for the pedestrian, sidewalks should be extended along the east side of Herman Street south of the intersection.

**Planning Level Cost Estimate:** \$260,000





## G8: Harris Street/Bunche Drive Bicycle and Pedestrian Facilities

The corridor of Bunche Drive and Harris Street serves primarily single family residential uses. The Carver Heights Elementary School and Dillard Middle School connect along this corridor off of Stadium Drive. A short section of sidewalk exists along the middle of Harris Street; however, no other bicycle or pedestrian facilities serve this corridor. The recommended improvements would add a sidewalk along one side of this corridor, along with sharrows or striped bicycle lanes where possible.

**Extents and Facility Type:** John Street to Stadium Road: Sidewalk on North Side; Stadium Road to Stoney Creek Parkway: Sidewalk on South Side; John Street to Slocumb Street: Bicycle Lane (Stripe); Slocumb Street to Porter Street: Sharrows (Stripe); Porter Street to Stoney Creek Parkway: Bicycle Lane (Stripe)

**Overview and Purpose:** As mentioned previously, this corridor serves single family residential uses, many of which front the roadway. Right of way constraints, utility locations, and the section of existing sidewalk were all considered when determining the placement of sidewalks in this area. The sidewalk on the north side of Bunche Drive between John Street and Stadium Drive directly serves the needs of the elementary school. Intersection improvements are recommended at Stadium Drive to assist pedestrians with crossing the street as the sidewalk shifts to the south side. Since this is an unsignalized intersection these improvements could include high visibility crosswalks along with amenities such as a rectangular rapid flashing beacon (RRFB), pedestrian hybrid beacon (PHB, formerly known as a HAWK signal), or even a crossing guard during school hours. The sidewalk continues along the south side of the roadway for the remainder of its length, thereby reducing conflicts caused by multiple crossings. The width of the roadway is sufficient within the sections of Bunche Drive between John Street and Slocumb Street as well as Harris Street between Porter Street and Stoney Creek Parkway to restripe for bicycle lanes. In the section between Slocumb Street and Porter Street, sharrows are recommended to continue to provide a higher level of visibility for bicyclists.

**Planning Level Cost Estimate:** \$1,420,000



### G9: Ash Street Road Diet Vision Project

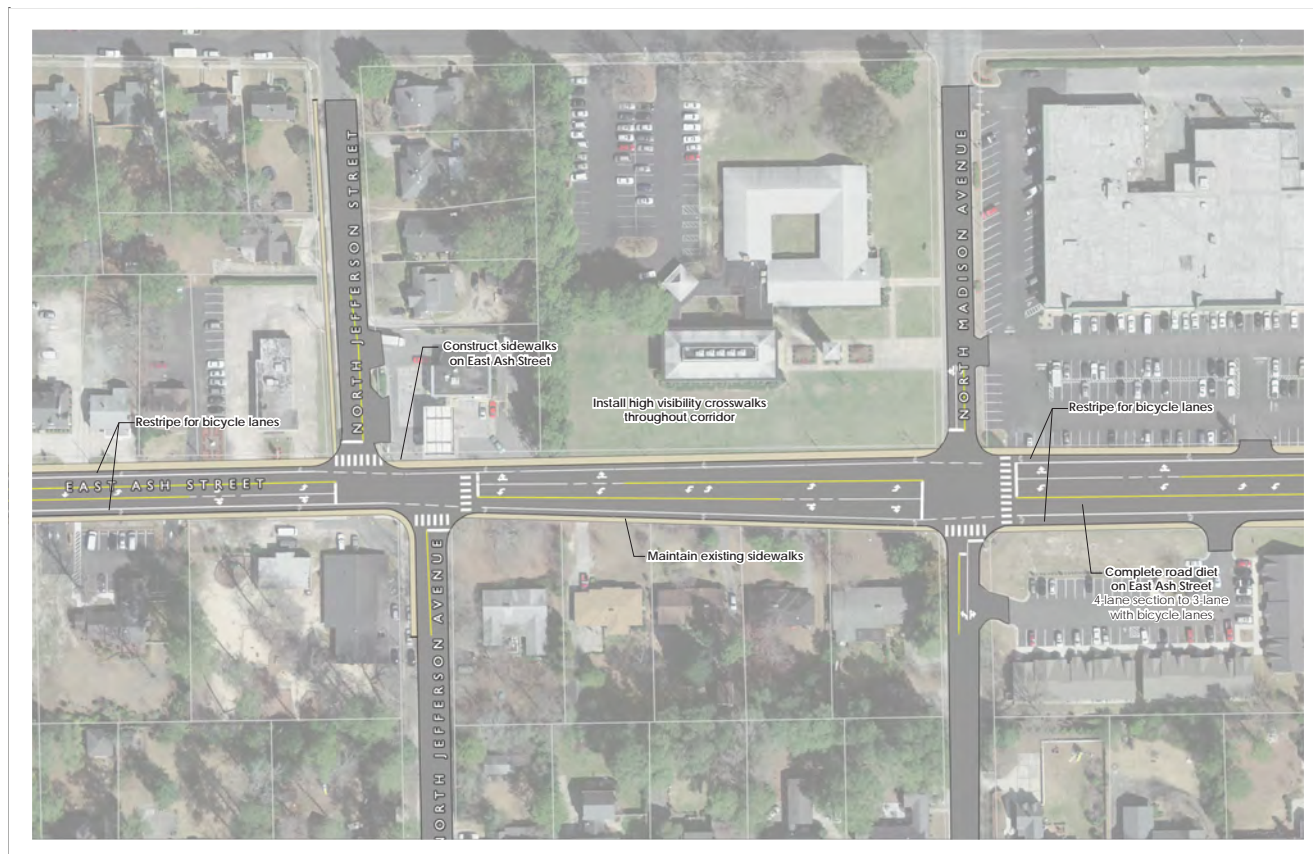
Ash Street, also designated as US 70 Business, is the main east-west corridor within the City of Goldsboro. Ash Street serves a variety of commercial and residential uses and connects to many more residential areas. Ash Street is also a major connection to Stoney Creek Park. There are currently no bicycle amenities along this corridor. Sidewalks run along the south side of the corridor, with only patchy sidewalks to the north. The recommended improvement would use a road diet to stripe bicycle lanes through the entire corridor.

**Extents and Facility Type:** Audubon Drive to Berkeley Boulevard: Bicycle Lanes (Road Diet)

#### Overview and Purpose

As discussed with project G6, both Elm Street and Ash Street were considered as candidates for road diets. Given the high number of potential bicycle and pedestrian trip generators and attractors along Ash Street, this street was identified as the preferred corridor. The road diet includes existing four and five lane sections, taking the entire corridor to three lanes with striped bicycle lanes. The exhibit shows a partial section of Ash Street between Jefferson Street and Madison Avenue. The original cross-section changes from a four to five lane section between these two roadways. The exhibit details how the existing pavement could be used as part of the three lane section. Sidewalk improvements and pedestrian enhancements described as project G10 are also shown in this exhibit.

**Planning Level Cost Estimate:** \$530,000



## G10: Ash Street Sidewalk

Ash Street, also designated as US 70 Business, is the main east-west corridor within the City of Goldsboro. Ash Street serves a variety of commercial and residential uses and connects to many more residential areas. Ash Street is also a major connection to Stoney Creek Park. There are currently no bicycle amenities along this corridor. Sidewalks run along the south side of the corridor, with only patchy sidewalks to the north. The recommended improvement would construct a sidewalk along the north side of the roadway along with intersection crossing improvements at major intersections.

**Extents and Facility Type:** Audubon Avenue to Berkeley Boulevard: Sidewalk on North Side

### Overview and Purpose

In order to create a more accessible pedestrian travelway, this project will result in sidewalks along both sides of Ash Street. Due to right of way restrictions the sidewalk on the north side of Ash Street will likely be located directly on the back of curb. With this in mind, the sidewalk is recommended to be six feet wide, with the added width providing a greater comfort level for pedestrians. In addition, high visibility crosswalks are recommended at major intersections, as detailed in the exhibit. Signalized intersections should also include pedestrian countdown signals. The intersection of Claiborne Street is unsignalized. As a result, this intersection will need a yield to pedestrians in crosswalk sign.

**Planning Level Cost Estimate:** \$890,000





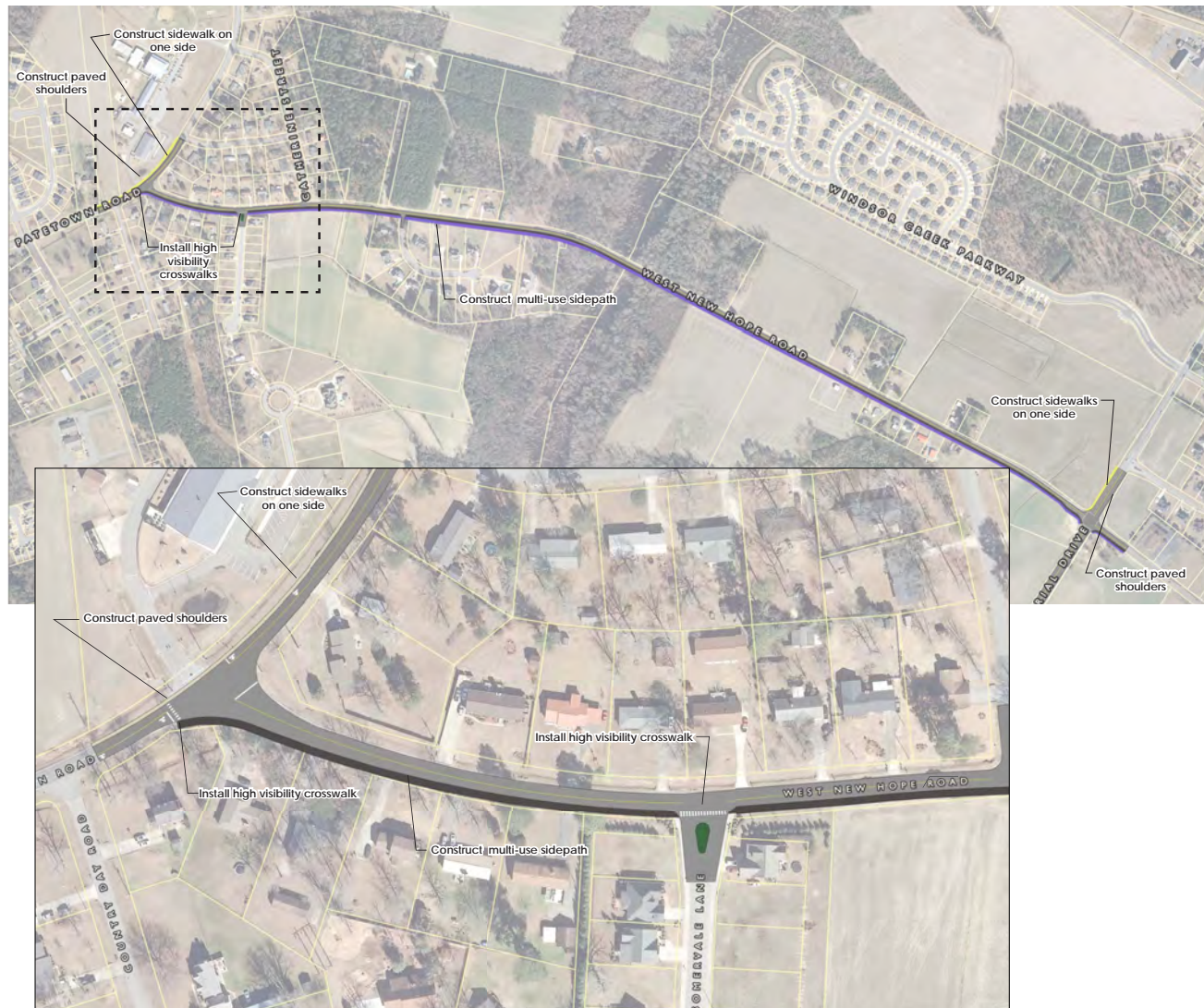
### G11: New Hope Road Sidepath

New Hope Road is a major connecting facility on the north side of the City of Goldsboro. The road serves primarily rural and residential uses. The recommended improvement includes a sidepath along the south side of New Hope Road along with crossing improvements along the way.

**Extents and Facility Type:** Wayne Memorial Drive to Patetown Road: Sidepath on South Side

**Overview and Purpose:** The recommended sidepath will ultimately connect with existing improvements to the east on New Hope Road. The suitability of this roadway was examined to determine the most appropriate location for the sidepath. Based on this assessment, the south side of New Hope Road was determined as the best location for the sidepath. Right of way along the corridor is sufficient to allow for a verge between the sidepath and the roadway. However, at the far western end of the corridor near the Patetown Road intersection, this verge area will be smaller. Curb and gutter will be needed along the south side of the road to accommodate the sidepath and verge within currently available right of way. This project is depicted in two exhibits. The first exhibit shows the overall placement of the sidepath and identifies intersections where crossing improvements will be needed. The second exhibit shows the intersections of Patetown Road and Somervale Lane with New Hope Road, along with the crossing improvements needed to accommodate the sidepath and interface with a proposed sidewalk along Patetown Road.

**Planning Level Cost Estimate:** \$970,000



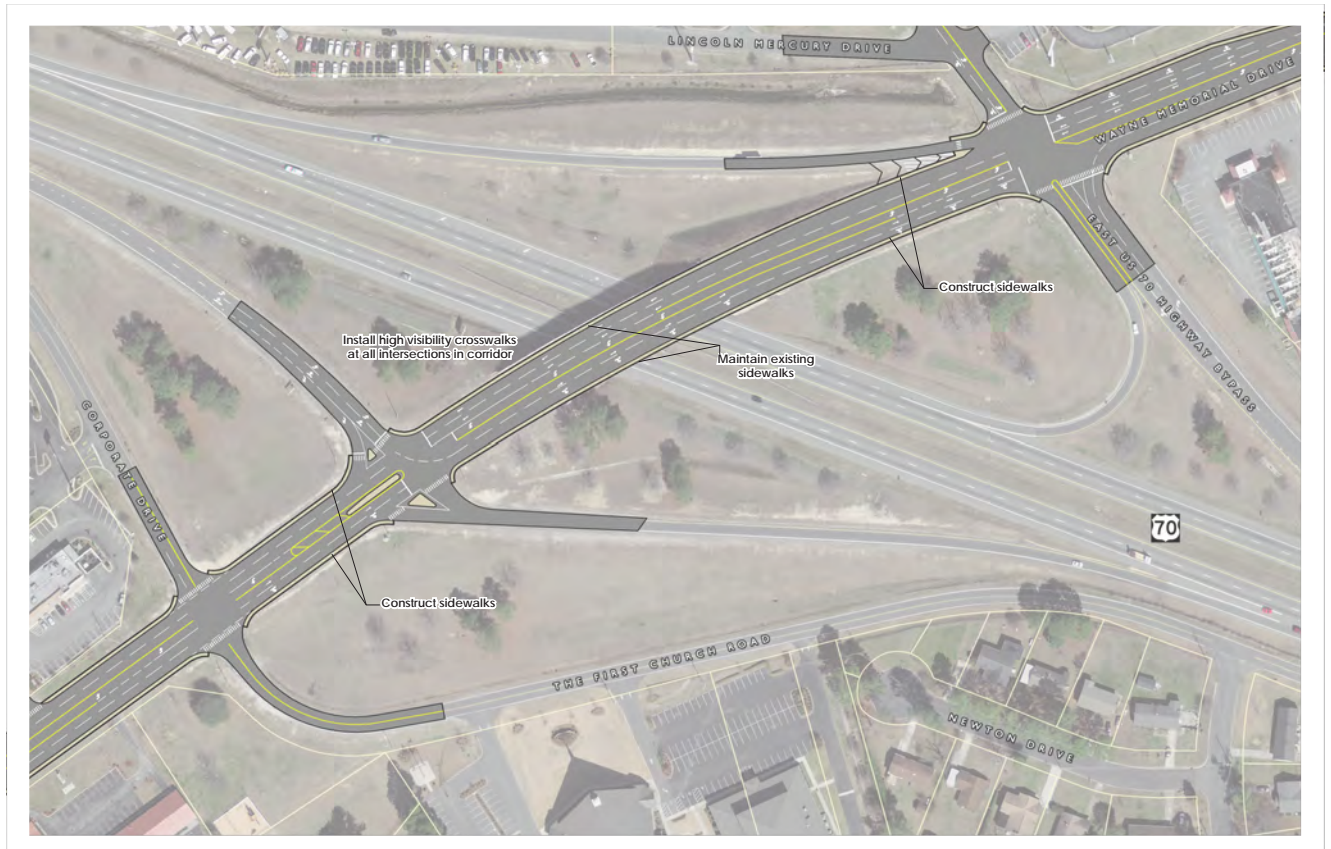
## G12: Wayne Memorial Drive Sidewalks

Wayne Memorial Drive near the US 70 Bypass interchange is a major commercial corridor. Sidewalks currently exist on both sides of the US 70 Bypass overpass, and on the south side of Wayne Memorial Drive to the east of the interchange. The recommended improvement would construct sidewalks along both sides of this roadway as well as intersection crossing improvements.

**Extents and Facility Type:** Royall Avenue to Country Day Road: Sidewalks on Both Sides

**Overview and Purpose:** Wayne Memorial Drive is a heavily traveled and wide roadway. Sidewalks along both sides of the road will provide pedestrians a safer place to travel without unnecessary crossing. However, if sufficient funding is not available to construct sidewalks on both sides at once, this project could be phased. Considering the relative ease of crossing improvements needed as well as the presence of existing sidewalks on the south side with which connections could be made, the south side sidewalks would likely be the best candidates for an interim phase. Intersection crossing improvements along the corridor include high visibility crosswalks and pedestrian countdown signals. At the East US 70 Bypass ramp, a two part crossing will be needed along the north side. Sidewalk connections in that area will likely require fencing or guard rail to separate pedestrians from drop-offs in adjacent terrain.

**Planning Level Cost Estimate:** \$1,000,000





### G13: New Hope Road and Harding Road Intersection Improvements

New Hope Road has an existing sidepath that terminates as a wide shoulder at the intersection with Harding Drive. South Harding Drive currently provides striped bicycle lanes. Some limited signage exists to direct users between the facilities, but crossing locations are unclear. The recommended improvements consider an interim enhancement to striping and signage, as well as a long term improvement to realign the intersection.

**Extents and Facility Type:** New Hope Road at Harding Road: Intersection Improvements

#### **Overview and Purpose**

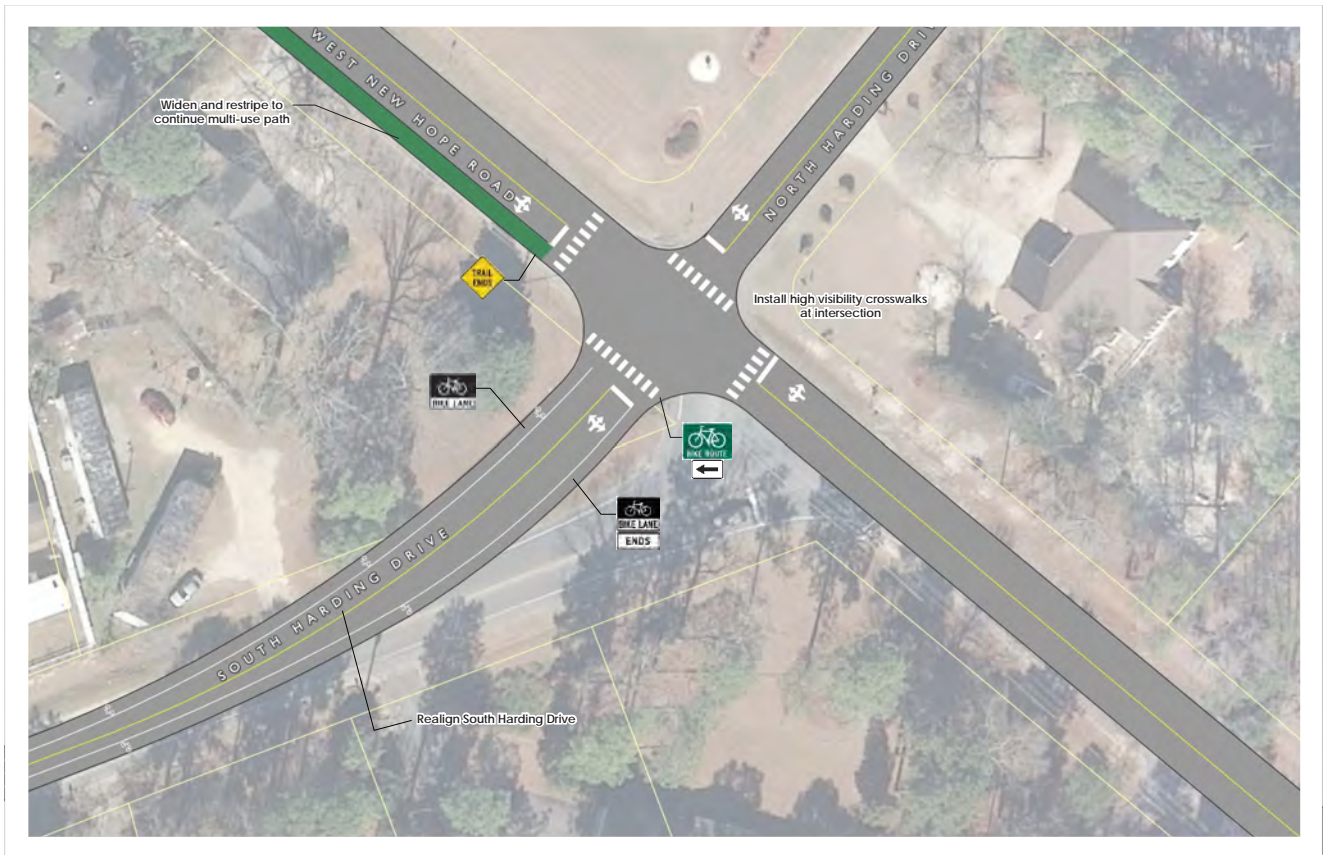
At this time, South Harding Drive and North Harding Drive approach New Hope Road at an offset. This offset leads to confusion and adds conflict points. As a result, realigning the south leg of the intersection to line up with North Harding Drive is the preferred solution in this area. A cursory review of this improvement indicates that minimal right of way will need to be acquired; however, significant cost would be incurred in realigning the intersection. The first exhibit shows the recommended long term intersection realignment. High visibility crosswalks are recommended at all intersection legs. Additional width is recommended to be added to the wide shoulder portion of the sidepath to meet minimum NCDOT width requirements. Added width can also accommodate striped buffer or fold over bollards, thereby providing some separation from motorists. A bicycle route sign should be placed at the intersection guiding bicyclists from the bicycle lanes on Harding Drive onto the New Hope Road sidepath.

The second exhibit shows the recommended interim improvements. These improvements are based around creating a safer and more predictable crossing experience that makes use of the existing pavement. To do this, the section of the sidepath that is a wide shoulder section is recommended to be painted. This paint will help call attention to the unique function of the shoulder in this area. The painting is recommended to be carried through the high visibility crosswalk area. A bicycle route sign should be placed at the intersection guiding users from the bicycle lanes on Harding Drive onto the New Hope Road sidepath.

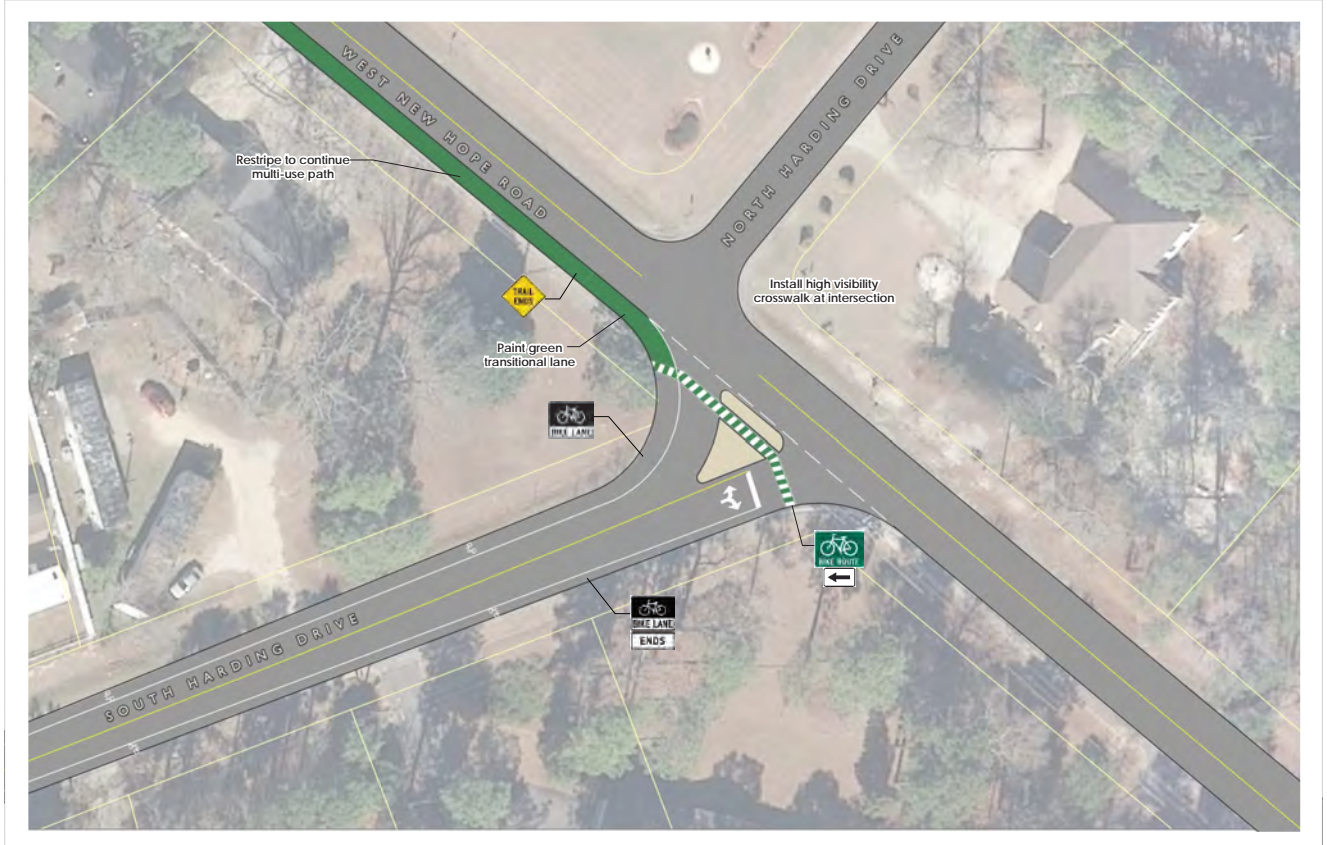
#### **Planning Level Cost Estimate:**

Interim Improvements: \$16,000

Long-Range Improvements: Additional Study Needed



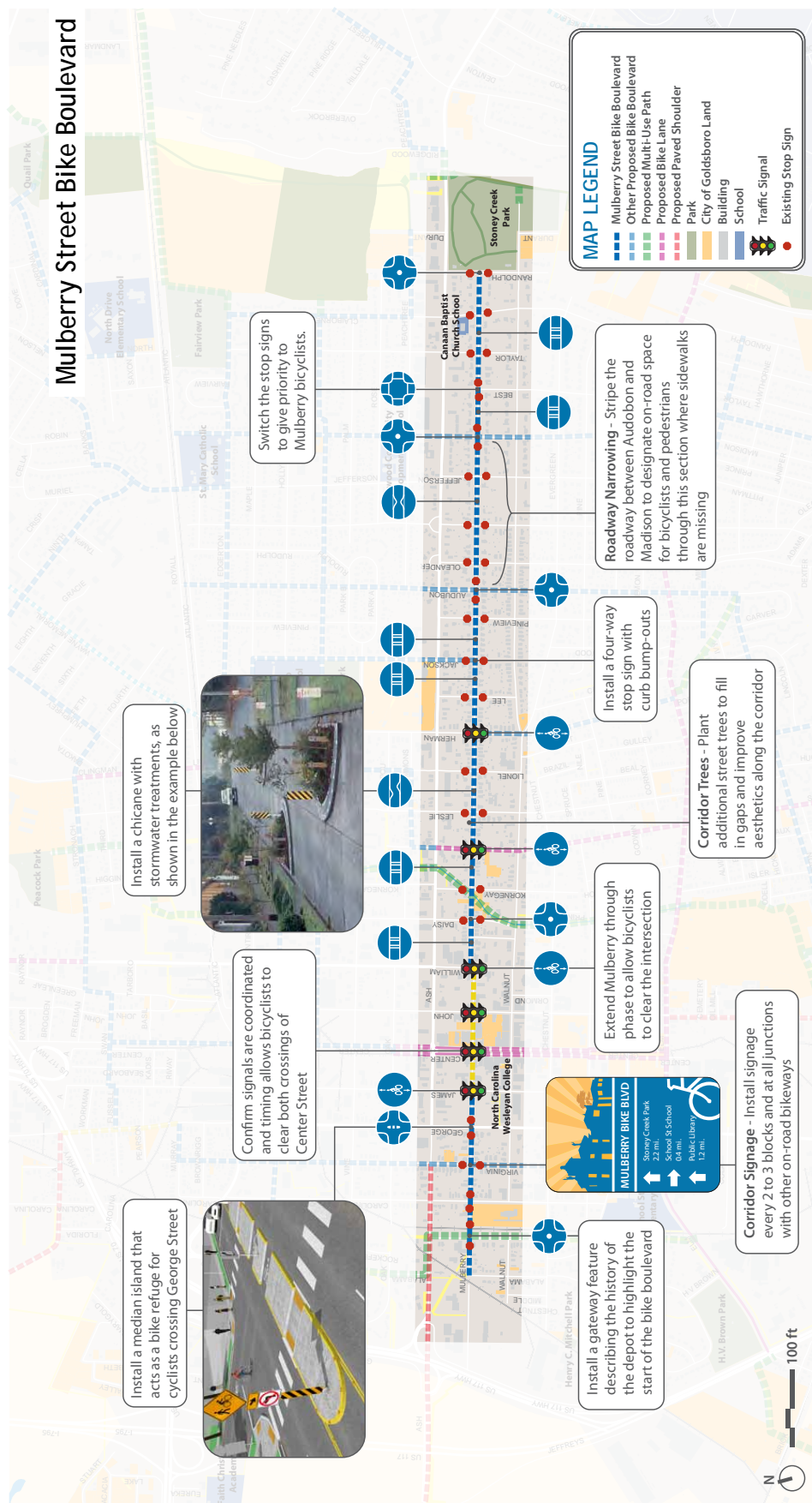
**Exhibit One: Long-Term Improvement**



**Exhibit Two: Interim Improvement**

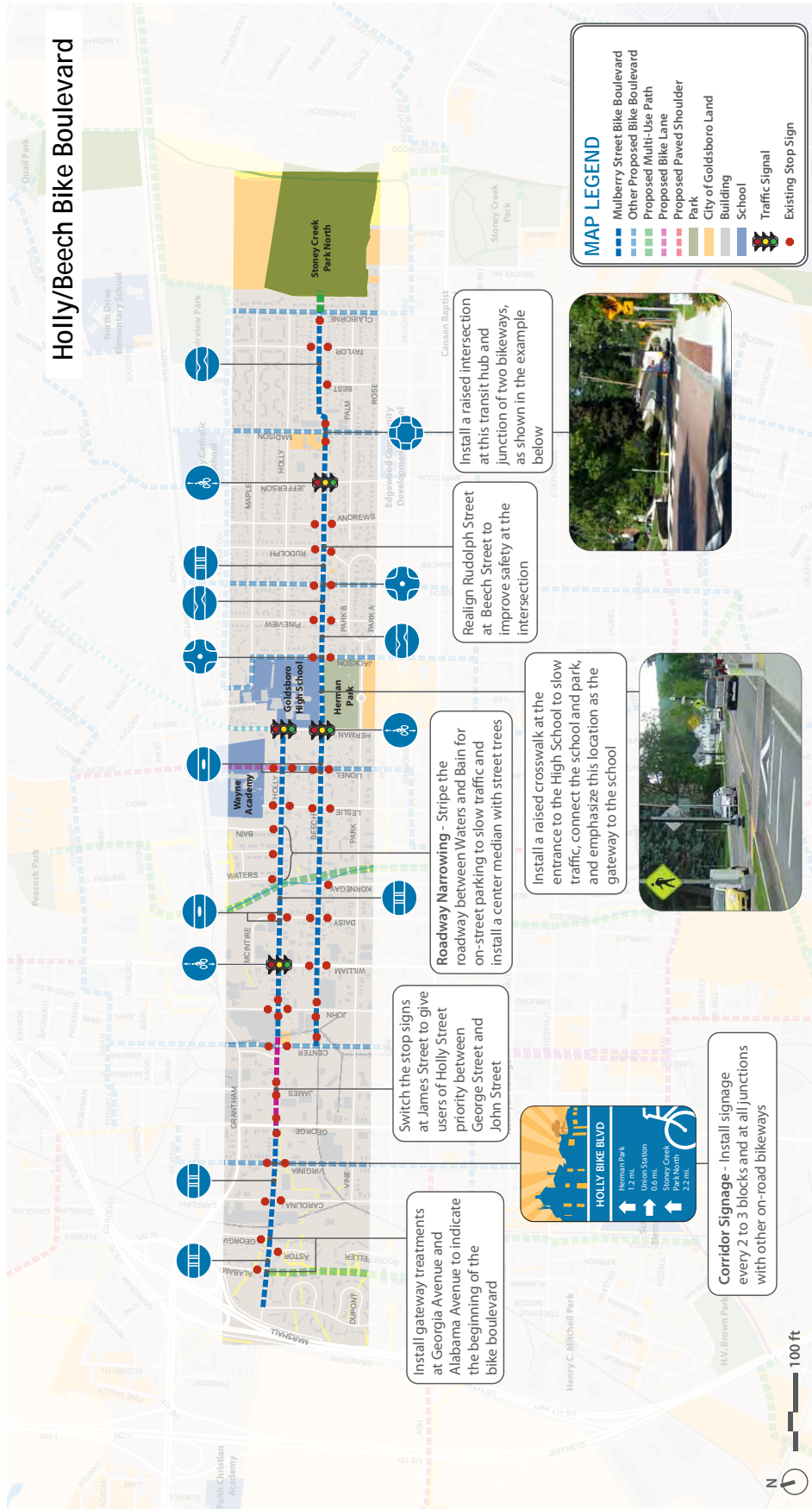
# CITY OF GOLDSBORO BIKE BOULEVARD PROJECTS

The following are conceptual recommendations for selected bike boulevard projects identified in this Plan. Cost estimates were not determined.



- BICYCLE BOULEVARD TREATMENT TOOLBOX**  
 See Design Guidelines Appendix for detailed guidance on this toolkit
- Horizontal Deflection**
    - Traffic Circle** - Raised or delineated islands placed at intersections
    - Chicane** - A series of raised curb extensions, or edge islands on alternate sides of a street
  - Vertical Deflection**
    - Speed Humps** - Raised area 12 to 14" long by 3 to 4 inches high that reduce speeds to 15 to 20 mph
    - Raised Intersection** - Raised area including crosswalk space and the full area of the intersection
  - Major Street Crossings**
    - Bike Detection** - Bicycle-activated detectors that allow the presence of a bicyclist to trigger a traffic signal
    - Median Island** - An island refuge for cyclists crossing multi-lane roadways that restricts vehicle turning movements
  - Choker** - Edge islands placed on either side of the street to narrow the center of the lane
  - Median** - Center island parallel to the bicycle boulevard that causes deflection





# Holly/Beech Bike Boulevard

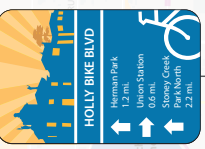
**MAP LEGEND**

- Mulberry Street Bike Boulevard
- Other Proposed Bike Boulevard
- Proposed Multi-Use Path
- Proposed Bike Lane
- Proposed Paved Shoulder
- Park
- City of Goldsboro Land
- Building
- School
- Traffic Signal
- Existing Stop Sign

Install gateway treatments at Alabama Avenue and Georgia Avenue to indicate the beginning of the bike boulevard

Switch the stop signs at James Street to give users of Holly Street priority between George Street and John Street

Roadway Narrowing - Stripe the roadway between Waters and Bain for on-street parking to slow traffic and install a center median with street trees



Corridor Signage - Install signage every 2 to 3 blocks and at all junctions with other on-road bikeways

Install a raised intersection at this transit hub and junction of two bikeways, as shown in the example below

Realign Rudolph Street at Beech Street to improve safety at the intersection



Install a raised crosswalk at the entrance to the High School to slow traffic, connect the school and park, and emphasize this location as the gateway to the school



## BICYCLE BOULEVARD TREATMENT TOOLBOX

See Design Guidelines Appendix for detailed guidance on this toolkit

### Horizontal Deflection

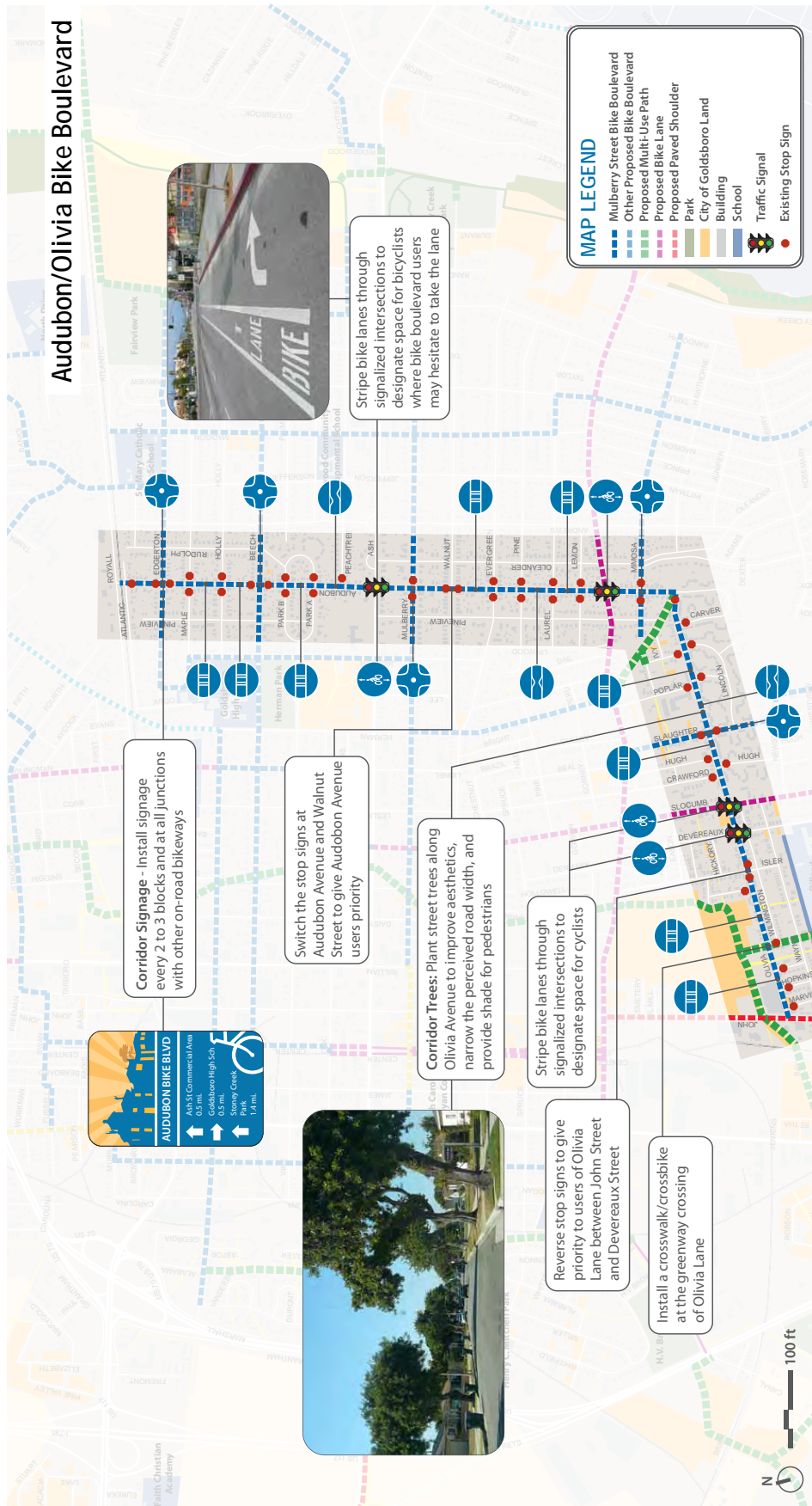
- Traffic Circle**  
Raised or delineated islands placed at intersections
- Chicane**  
A series of raised curb extensions, or edge islands on alternate sides of a street

### Vertical Deflection

- Speed Humps**  
Raised area 12 to 14' long by 3 to 4 inches high that reduce speeds to 15 to 20 mph
- Raised Intersection**  
Raised area including crosswalk space and the full area of the intersection

### Major Street Crossings

- Bike Detection**  
Bicycle-actuated detectors that allow the presence of a bicyclist to trigger a traffic signal
- Median Island**  
An island refuge for cyclists crossing multi-lane roadways that restricts vehicle turning movements



**BICYCLE BOULEVARD TREATMENT TOOLBOX**

See Design Guidelines Appendix for detailed guidance on this toolkit



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## WALNUT CREEK PROJECTS

### WC1: Walnut Creek Drive Sidewalks

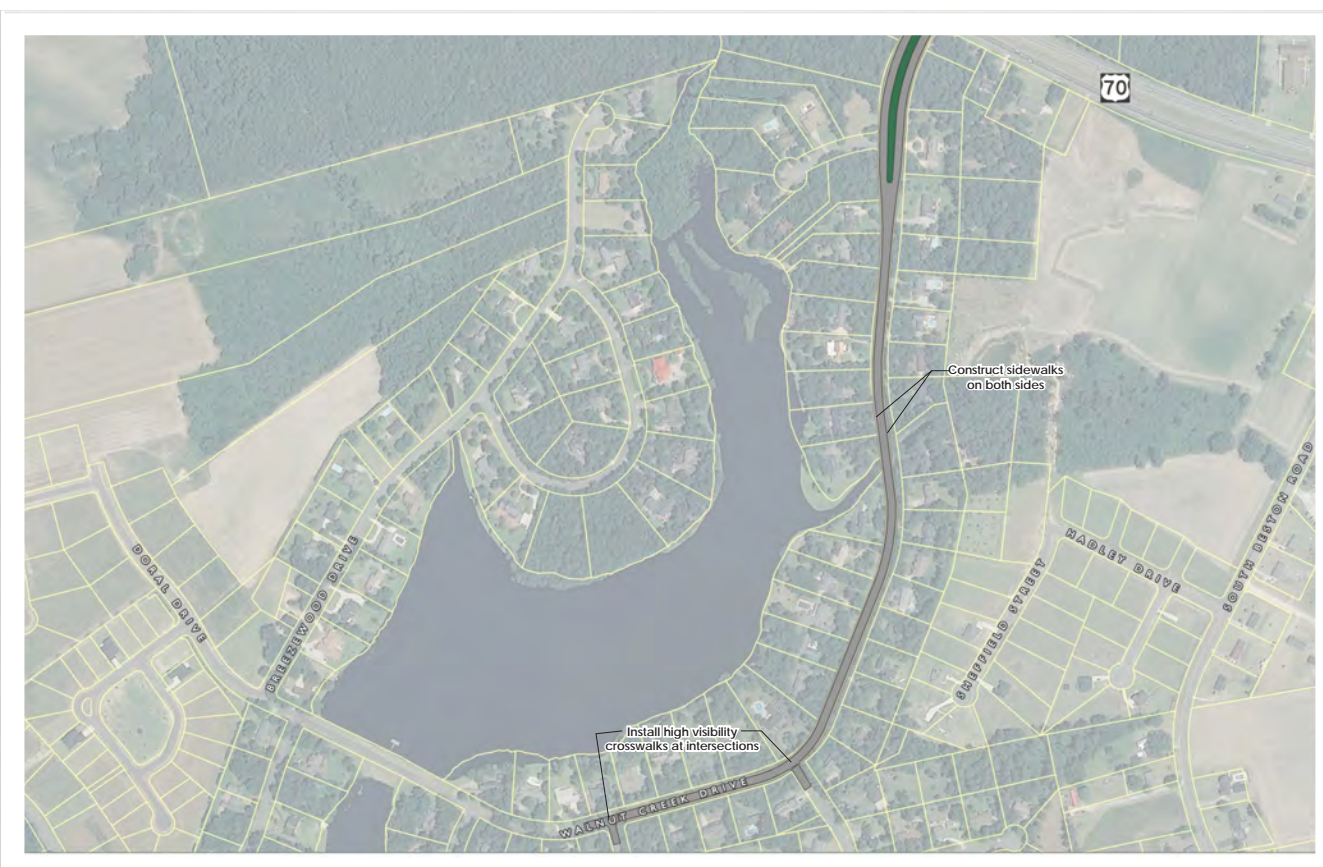
Walnut Creek Drive serves as the main gateway to the Village of Walnut Creek from US 70. This roadway is a two lane facility surrounded by residential uses with a speed limit of 30 miles per hour. There are currently no bicycle or pedestrian facilities along this roadway. The recommended treatment is to construct sidewalks on both sides of the road.

**Extents and Facility Type:** US 70 to Mill Road: Sidewalks on Both Sides

#### Overview and Purpose

The addition of sidewalks on both sides of this roadway will facilitate safer pedestrian travel within the Village of Walnut Creek. Five foot sidewalks are recommended, along with a two to three foot verge area. The restricted right of way of this roadway limits the ability to include a larger verge area. In addition, the current shoulder section would likely need to be converted to curb and gutter to assist in fitting within current right of way. Given the low speed of this roadway, sidewalk could be placed on back of curb where constraints prohibit the inclusion of a verge. High visibility crosswalks should be included at the intersections of Tramway Drive and Mill Road. Mini traffic circles may also be considered in these locations for aesthetic purposes as well as to reinforce the desired travel speed. Due to the low speed of this roadway, bicycles should be able to ride in the travel lanes without special accommodations.

**Planning Level Cost Estimate:** \$430,000





## WC2: Mill Road Sidewalks

Mill Road is a significant connecting road within the Village of Walnut Creek. This road is two lanes with a speed limit of 30 miles per hour. However, it is the only road within the Village limits that connects the northern and southern portions of the Village across Lake Wackena. No bicycle or pedestrian facilities currently exist on this road. The recommended treatment is to construct sidewalks on both sides of the road.

**Extents and Facility Type:** Walnut Creek Drive to Lake Wackena: Sidewalks on Both Sides

**Overview and Purpose:** Five foot sidewalks, along with a two to three foot verge area, are recommended along both sides of Mill Road. In order to accommodate right of way constraints, the existing ditch section would likely need to be converted to curb and gutter. Sidewalk additions along one side of the road could be considered as an alternative treatment in this area. Mini traffic circles may also be considered at the intersections of Mill Road with Walnut Creek Drive and Dogwood Trail for aesthetic purposes as well as to reinforce the desired travel speed. Due to the low speed of this roadway, bicycles should be able to ride in the travel lanes without special accommodations.

**Planning Level Cost Estimate:** \$240,000





## PIKEVILLE PROJECTS

### P1: Main Street Bicycle and Pedestrian Facilities

The Main Street corridor begins as Pikeville-Princeton Road near I-795, a rural two lane roadway. Beginning at Hooks Grove Church Road and heading east, this road assumes a suburban and then small urban character, ultimately coming into the center of Pikeville near Railroad Street. A center turn lane between Russell Drive and Fort Street gives way to a wide two lane section that is signed 20 miles per hour. The recommended treatment is to construct sidewalks along both sides of this roadway, with sharrows in the three lane section transitioning to striped bicycle lanes in the downtown center.

**Extents and Facility Type:** I-795 to Goldsboro Street: Sidewalks on Both Sides; I-795 to Fort Street: Sharrows; Fort Street to Goldsboro Street: Bicycle Lane (Restripe)

#### **Overview and Purpose**

The section of Main Street between Russell Drive and Mill Street is primarily a residential one. However, the proximity of commercial uses between Mill Street and Goldsboro Street create an opportunity for convenient bicycle and pedestrian travel. The sidewalks recommended along this corridor promote pedestrian travel by getting potential users out of the street and onto dedicated facilities. High visibility crosswalks are recommended at all roadway intersections to help promote continuity of the pedestrian facilities. The signalized intersection of Goldsboro Street and Main Street also has recommended pedestrian signals with countdown clocks along all approaches. Curb and gutter already exists along Main Street, so a five foot sidewalk should be placed (where possible) at least two to three feet from the back of curb. Sidewalk on the north side only could be considered as an alternative if utility constraints prove too difficult to overcome. The bicycle recommendations make use of the existing roadway cross-sections. The sharrow between I-795 and Fort Street will help alert motorists that they should expect bicycles in this area. Striped bicycle lanes between Fort Street and Goldsboro Street will help visually reinforce the 20 mile per hour speed limit and provide a dedicated space for bicyclists.

**Planning Level Cost Estimate:** \$640,000





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# Appendix J: Prioritization Tables

## Appendix Contents:

*Overview*

*Sidewalk Prioritization*

*On-Road Bicycle  
Prioritization*

*Shared-Use Path  
Prioritization*

## OVERVIEW

In order to determine the highest priority improvements recommended in this plan, a series of criteria were developed by which to rank each project. Sidewalk, on-road bicycle, and shared-use path recommendations were evaluated individually based on whether the project met the following criteria:

- » Low-income area (Based on Equity Analysis - see Chapter 2)
- » Low vehicle access area (Based on Equity Analysis - see Chapter 2)
- » High density population area
- » High minority population area (Based on Equity Analysis - see Chapter 2)
- » Reported pedestrian or bicycle crash location
- » Connectivity to or from an existing facility
- » Connectivity to or from proposed facilities
- » Top 5 recommendations from the public comment form
- » Park, library, or recreation center is within 1/2 mile radius
- » Elementary, middle, or high school is within 1/2 mile radius
- » Connectivity to major shopping center or business area
- » Connectivity to downtown
- » Community college is within 1/2 mile radius
- » Health focus area from the Goldsboro Comprehensive Plan
- » Connectivity to the Mountains-to-Sea (MST) alignment

Steering committee members ranked each criterion on a scale of 1-5 (1 = "Not Important, 5 = "Very Important"), and the scores from each committee member were aggregated and averaged to develop prioritization weights for each of the above criteria. These scores were then applied to each segment of recommended sidewalk, on-road bicycle facility, and shared-use path to rank projects, with the highest scores signifying the highest priorities for Goldsboro.

The following tables present the results for sidewalk, on-road bicycle, and shared-use path prioritization, ranked from highest to lowest. Projects highlighted in yellow have previously been identified as priorities by the City, separate from this process. They are identified here for reference.



## SIDEWALK PRIORITIZATION

Yellow highlighting = Previously identified as City priority

Roadway	From	To	Side	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Wayne Memorial Dr	US 70	Lockhaven Dr	North	1,864	4.00	4.00	3.80	3.80	4.30
Ash St	Taylor St	Stoney Creek	North	2,080	4.00	4.00	0.00	3.80	4.30
Wayne Memorial Dr	Royall Ave	US 70	West/ North	3,829	4.00	4.00	0.00	3.80	4.30
Elm St	Slocumb St	Berkeley Blvd	North	10,497	4.00	4.00	3.80	3.80	4.30
Elm St	Slocumb St	Berkeley Blvd	South	10,643	4.00	4.00	3.80	3.80	4.30
Ash St	Jefferson Ave	Best St	North	1,145	4.00	4.00	0.00	3.80	4.30
Ash St	Audubon Ave	Jefferson Ave	North	1,343	4.00	4.00	0.00	3.80	4.30
Daisy St	Mulberry St	Magnolia St	East	811	4.00	4.00	3.80	3.80	0.00
Wayne Memorial Dr	Lockhaven Dr	Country Day Rd	North	1,205	4.00	4.00	3.80	3.80	4.30
Royall Ave	William St	Spence St	North	12,532	4.00	4.00	0.00	3.80	4.30
Slocumb St	Newsome St	Olivia Ln	East	650	4.00	4.00	3.80	3.80	0.00
George St	Elm St	Spruce St	East	750	4.00	4.00	0.00	3.80	0.00
Herman St	Beech St	Royall Ave	West	1,679	4.00	4.00	3.80	3.80	4.30
Spruce St	Railroad	George St	South	1,230	4.00	4.00	3.80	3.80	0.00
Spruce St	Railroad	James St	North	1,815	4.00	4.00	3.80	3.80	0.00
Slocumb St	Seymour Dr	Wisteria Rd	North	239	4.00	4.00	3.80	3.80	0.00
John St	Dixie Trail	Elm St	East	7,485	4.00	4.00	3.80	3.80	4.30
George St	Pine St	Spruce St	West	439	4.00	4.00	0.00	3.80	0.00
Carolina Ave	Pine St	Walnut St	East	1,022	4.00	4.00	0.00	3.80	0.00
William St	Atlantic Ave	US 70	East	4,038	4.00	4.00	0.00	3.80	4.30
Walnut St	Jefferson Ave	Stoney Creek Park	North	3,496	4.00	4.00	0.00	3.80	0.00
Slaughter St	Newsome St	Sidewalk	West	212	4.00	4.00	3.80	3.80	0.00



<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Fills an Existing Sidewalk Gap</i>	<i>Community College within 1/2 Mile</i>	<i>Footpath Present</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<b>TOTAL</b>
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4.80	4.40	4.20	0.00	4.10	4.00	0.00	4.30	0.00	4.40	4.44	0.00	<b>54.54</b>
4.80	4.40	4.20	4.30	4.10	4.00	0.00	4.30	0.00	4.40	0.00	3.88	<b>54.48</b>
4.80	4.40	4.20	4.30	4.10	4.00	0.00	0.00	0.00	4.40	4.44	0.00	<b>50.74</b>
4.80	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	4.40	4.44	3.88	<b>50.22</b>
4.80	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	4.40	4.44	3.88	<b>50.22</b>
4.80	4.40	4.20	4.30	4.10	4.00	0.00	4.30	0.00	0.00	0.00	3.88	<b>50.08</b>
4.80	0.00	4.20	4.30	4.10	4.00	0.00	4.30	0.00	4.40	0.00	3.88	<b>50.08</b>
4.80	0.00	0.00	4.30	4.10	4.00	4.60	4.30	0.00	0.00	4.44	3.88	<b>50.02</b>
4.80	0.00	4.20	0.00	4.10	4.00	0.00	4.30	4.10	0.00	4.44	0.00	<b>49.84</b>
4.80	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	4.40	4.44	0.00	<b>46.54</b>
4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	4.40	4.44	0.00	<b>46.34</b>
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4.80	4.40	4.20	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>46.14</b>
4.80	4.40	0.00	4.30	0.00	0.00	0.00	4.30	0.00	4.40	4.44	3.88	<b>46.12</b>
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4.80	4.40	4.20	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>42.34</b>
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4.80	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	4.40	0.00	0.00	<b>42.10</b>
4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	4.40	0.00	3.88	<b>41.98</b>
4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.94</b>



## SIDEWALK PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Side	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Newsome St	Slocumb St	Sidewalk	North	216	N	4.00	4.00	3.80	3.80
Newsome St	Sidewalk	Slaughter St	North	282	N	4.00	4.00	3.80	3.80
Olivia Ln	Deveraux St	Slocumb St	South	318	N	4.00	4.00	3.80	3.80
Jefferson Ave	Edgerton St	Royall Ave	East	769	N	4.00	4.00	3.80	3.80
Jefferson Ave	Edgerton St	Royall Ave	West	771	N	4.00	4.00	3.80	3.80
Edgerton St	Jefferson Ave	Madison Ave	North	817	N	4.00	4.00	3.80	3.80
Edgerton St	Jefferson Ave	Madison Ave	South	817	N	4.00	4.00	3.80	3.80
Wayne Memorial Dr	US 70	US 70	South	483	Y	4.00	4.00	0.00	3.80
Virginia Ave	Pine St	Sidewalk	West	518	N	4.00	4.00	3.80	3.80
Virginia Ave	Pine St	Sidewalk	East	967	N	4.00	4.00	3.80	3.80
Kornegay St	Ash St	Sidewalk	East	200	N	4.00	4.00	0.00	3.80
Kornegay St	Ash St	Magnolia St	West	334	N	4.00	4.00	0.00	3.80
Daisy St	Sidewalk	Park Ave	West	691	N	4.00	4.00	3.80	3.80
Herman St	Holly St	Railroad	East	1,296	Y	4.00	4.00	3.80	3.80
Walnut St	Audubon Avenue	Stoney Creek Park	South	4,808	N	4.00	4.00	3.80	3.80
Ash St	Stoney Creek	Spence St	North	1,011	Y	0.00	0.00	0.00	0.00
Grantham St	George St	William St	North	2,062	N	4.00	4.00	0.00	3.80
Holly St	Leslie Street	Lionel St	North	443	N	4.00	4.00	0.00	3.80
Slocumb St	Day Circle	Seymour Dr	North	445	Y	4.00	4.00	3.80	3.80
Wayne Memorial Dr	Ninth St	US 70	South/ East	1,125	Y	4.00	4.00	0.00	3.80
Wayne Memorial Dr	Hospital Rd	New Hope Rd	West	4,283	N	0.00	4.00	0.00	3.80
Daisy St	Park Ave	Sidewalk	East	131	N	4.00	4.00	3.80	3.80



	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Fills an Existing Sidewalk Gap</i>	<i>Community College within 1/2 Mile</i>	<i>Footpath Present</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<b>TOTAL</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.94</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.94</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.94</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.94</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.94</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.94</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.94</b>
	4.80	0.00	4.20	0.00	4.10	4.00	0.00	4.30	0.00	4.40	0.00	0.00	<b>41.90</b>
	4.80	0.00	4.20	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.74</b>
	4.80	0.00	4.20	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.74</b>
	4.80	0.00	0.00	4.30	4.10	4.00	0.00	4.30	0.00	0.00	4.44	3.88	<b>41.62</b>
	4.80	0.00	0.00	4.30	4.10	4.00	0.00	4.30	0.00	0.00	4.44	3.88	<b>41.62</b>
	4.80	0.00	0.00	4.30	4.10	4.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>41.54</b>
	4.80	0.00	0.00	4.30	4.10	4.00	0.00	4.30	0.00	4.40	0.00	0.00	<b>41.50</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	0.00	3.88	<b>41.38</b>
	4.80	4.40	4.20	4.30	4.10	4.00	0.00	4.30	0.00	4.40	0.00	3.88	<b>38.38</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>38.14</b>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>38.04</b>
	4.80	0.00	0.00	4.30	0.00	0.00	0.00	4.30	0.00	4.40	4.44	0.00	<b>37.84</b>
	4.80	0.00	4.20	0.00	0.00	4.00	0.00	4.30	0.00	4.40	0.00	0.00	<b>37.80</b>
	4.80	4.40	4.20	0.00	4.10	4.00	0.00	4.30	4.10	0.00	0.00	0.00	<b>37.70</b>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>37.54</b>



## SIDEWALK PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Side	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Kornegay St	Magnolia St	Park Ave	East	510	N	4.00	4.00	3.80	3.80
Daisy St	Sidewalk	Holly St	East	664	N	4.00	4.00	3.80	3.80
Public Dr	Sidewalk	Slocumb St	North	791	N	4.00	4.00	3.80	3.80
Holly St	Jefferson Ave	Sidewalk	North	794	N	4.00	4.00	3.80	3.80
Harris St	Ben Brewington Ct	Stoney Creek Pkwy	South	3,995	N	4.00	4.00	3.80	3.80
Olivia Ln	John St	Deveraux St	South	2,426	N	4.00	4.00	3.80	3.80
Slocumb St	Wisteria Rd	Seymour Dr	North	518	N	4.00	4.00	3.80	3.80
Ash St	Spence Ave	Berkeley Blvd	North	1,463	Y	0.00	0.00	0.00	0.00
Berkeley Blvd	Elm St	Ash St	West	1,677	Y	0.00	0.00	0.00	0.00
Berkeley Blvd	Ash St	Cashwell Dr	East/ South	2,211	Y	0.00	0.00	0.00	0.00
Spence Ave	Ash St	US 70	West	7,174	Y	0.00	0.00	3.80	0.00
Spence Ave	Ash St	US 70	East	7,183	Y	0.00	0.00	3.80	0.00
George St	Holly St	Grantham St	East	410	N	4.00	4.00	0.00	3.80
Poplar St	Weaver Pl	Sidewalk	East	80	N	4.00	4.00	0.00	3.80
Bunche Dr	John St	Sycamore St	North	1,316	N	4.00	4.00	0.00	3.80
Dixie Trail	Proposed Shared-Use Path	Slocumb St	North	1,494	N	4.00	4.00	0.00	3.80
Bunche Dr	Stadium Rd	Slocumb St	North	986	N	4.00	4.00	0.00	3.80
Harris St	Slocumb St	Poplar St	South	1,289	N	4.00	4.00	0.00	3.80
Weaver Dr	Slocumb St	Poplar St	North	1,294	N	4.00	4.00	0.00	3.80
William St	McIntire St	Atlantic Ave	East	267	Y	4.00	4.00	0.00	3.80
Pineview Ave	Evergreen Ave	Walnut St	West	488	N	4.00	4.00	3.80	3.80
Pineview Ave	Evergreen Ave	Walnut St	East	494	N	4.00	4.00	3.80	3.80



	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Fills an Existing Sidewalk Gap</i>	<i>Community College within 1/2 Mile</i>	<i>Footpath Present</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<i>TOTAL</i>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>37.54</b>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>37.54</b>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>37.54</b>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>37.40</b>
	4.80	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	4.44	3.88	<b>37.22</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>37.14</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	4.30	0.00	0.00	4.44	3.88	<b>36.92</b>
	4.80	4.40	4.20	4.30	0.00	4.00	0.00	4.30	0.00	4.40	0.00	0.00	<b>34.70</b>
	4.80	4.40	4.20	4.30	0.00	4.00	0.00	4.30	0.00	4.40	0.00	0.00	<b>34.70</b>
	4.80	4.40	4.20	4.30	4.10	4.00	0.00	4.30	0.00	4.40	0.00	0.00	<b>34.50</b>
	4.80	4.40	4.20	4.30	0.00	4.00	0.00	0.00	0.00	4.40	0.00	0.00	<b>34.20</b>
	4.80	4.40	4.20	4.30	0.00	4.00	0.00	0.00	0.00	4.40	0.00	0.00	<b>34.20</b>
	4.80	4.40	0.00	0.00	0.00	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>34.04</b>
	4.80	4.40	0.00	0.00	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>33.84</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>33.84</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>33.84</b>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>33.74</b>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>33.74</b>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.30	0.00	4.40	0.00	0.00	<b>33.70</b>
	4.80	0.00	0.00	4.30	0.00	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>33.44</b>
	4.80	0.00	0.00	4.30	0.00	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>33.44</b>



## SIDEWALK PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Side	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Walnut St	Oleander Ave	Andrews Ave	North	186	N	4.00	4.00	3.80	3.80
Slocumb St	Seymour Dr	Proposed Shared-Use Path	North	900	N	4.00	4.00	3.80	3.80
Berkeley Blvd	Elm St	Ash St	East	1,715	Y	0.00	0.00	0.00	0.00
Cashwell Dr	Berkeley Blvd	Malloy St	South/ West	2,184	Y	0.00	0.00	0.00	0.00
Ash St	Spence Ave	Berkeley Blvd	South	1,463	N	0.00	0.00	0.00	0.00
Main St	Russell Dr	Mill St	South	1,666	N	0.00	0.00	3.80	0.00
Main St	Russell Dr	Mill St	North	1,672	N	0.00	0.00	3.80	0.00
Berkeley Blvd	Cashwell Dr	Langston Dr	West/ North	1,518	N	0.00	0.00	0.00	0.00
Berkeley Blvd	Cashwell Dr	Fallin Blvd	East/ South	6,169	Y	0.00	0.00	0.00	0.00
Berkeley Blvd	Mall Access	New Hope Rd	West/ North	6,850	Y	0.00	0.00	0.00	0.00
George St	Brownrigg St	US 70	East	1,699	N	4.00	4.00	0.00	3.80
Wayne Memorial Dr	New Hope Rd	Cassedale Dr	East	306	N	0.00	4.00	0.00	3.80
Country Day Rd	Patetown Rd	Wayne Memorial Dr	West	6,535	N	0.00	4.00	0.00	3.80
Walnut St	Oleander Ave	Andrews Ave	North	88	N	4.00	4.00	3.80	3.80
US 70 Bypass Side Rd	William St	Eleventh St	North	5,575	N	4.00	4.00	0.00	3.80
Mill St	Main St	Vail St	West	312	N	0.00	0.00	0.00	0.00
Main St	Railroad St	Goldsboro St	North	403	N	0.00	0.00	0.00	0.00
Parkway Dr	Sidewalk	Berkeley Blvd	South	1,417	N	0.00	0.00	0.00	0.00
Ash St	Berkeley Blvd	Greenwood MS	North	3,056	N	0.00	0.00	0.00	0.00
Royall Ave	Spence St	Berkeley Blvd	North	4,577	Y	0.00	0.00	0.00	0.00
George Street	Railroad	US 70	West	3,158	Y	4.00	4.00	0.00	3.80





	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Fills an Existing Sidewalk Gap</i>	<i>Community College within 1/2 Mile</i>	<i>Footpath Present</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<i>TOTAL</i>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.3	0.00	0.00	0.00	0.00	<b>33.10</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	4.44	3.88	<b>32.62</b>
	4.80	4.40	4.20	4.30	0.00	4.00	0.00	4.30	0.00	4.40	0.00	0.00	<b>30.40</b>
	4.80	4.40	0.00	4.30	4.10	4.00	0.00	4.30	0.00	4.40	0.00	0.00	<b>30.30</b>
	4.80	4.40	4.20	4.30	0.00	4.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>30.30</b>
	4.80	0.00	0.00	4.30	0.00	4.00	4.60	4.30	0.00	0.00	4.44	0.00	<b>30.24</b>
	4.80	0.00	0.00	4.30	0.00	4.00	4.60	4.30	0.00	0.00	4.44	0.00	<b>30.24</b>
	4.80	4.40	4.20	4.30	4.10	4.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>30.10</b>
	0.00	4.40	4.20	4.30	4.10	4.00	0.00	0.00	0.00	4.40	0.00	0.00	<b>29.70</b>
	0.00	4.40	4.20	4.30	4.10	4.00	0.00	0.00	0.00	4.40	0.00	0.00	<b>29.70</b>
	4.80	0.00	0.00	4.30	0.00	0.00	0.00	4.30	0.00	0.00	4.44	0.00	<b>29.64</b>
	4.80	4.40	4.20	0.00	4.10	0.00	0.00	0.00	4.10	0.00	0.00	0.00	<b>29.40</b>
	4.80	4.40	0.00	0.00	4.10	4.00	0.00	0.00	4.10	0.00	0.00	0.00	<b>29.20</b>
	4.80	0.00	0.00	0.00	4.10	0.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>28.80</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>28.60</b>
	4.80	4.40	0.00	4.30	0.00	4.00	4.60	4.30	0.00	0.00	0.00	0.00	<b>26.40</b>
	4.80	4.40	0.00	4.30	0.00	4.00	4.60	4.30	0.00	0.00	0.00	0.00	<b>26.40</b>
	4.80	4.40	0.00	4.30	4.10	4.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>25.90</b>
	4.80	4.40	4.20	4.30	4.10	4.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>25.80</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	4.40	0.00	0.00	<b>25.50</b>
	4.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.40	4.44	0.00	<b>25.44</b>



## SIDEWALK PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Side	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
US 117	Big Daddy's Rd	High School	East	4,404	N	0.00	0.00	0.00	0.00
John St	Holly St	Atlantic Ave	West	312	N	4.00	4.00	0.00	3.80
Wayne Memorial Dr	Windsor Creek Pkwy	Tommy's Rd	East	1,527	N	0.00	4.00	0.00	3.80
Eleventh St	Lincoln Mercury Dr	Wayne Memorial Dr	West	163	N	4.00	4.00	0.00	3.80
Wayne Memorial Dr	Cassedale Dr	Best Ave	East	654	N	0.00	4.00	0.00	3.80
US 117	Mt Carmel Church Rd	Big Daddys Rd	East	3,371	N	0.00	0.00	0.00	0.00
Cuylar Best Rd	US 70	New Hope Rd	West/ North	6,475	N	0.00	0.00	0.00	0.00
Holly St	James St	Center St	South	411	N	4.00	4.00	0.00	3.80
Neil St	William St	Tuskegee St	South	645	N	0.00	4.00	0.00	3.80
Dixie Trail	John St	Proposed Shared-Use Path	North	2,198	N	4.00	4.00	0.00	3.80
Central Heights Rd	New Hope Rd	Sidewalk	East	270	N	0.00	0.00	0.00	0.00
Parkway Dr	North Park Dr	Sidewalk	South	880	N	0.00	0.00	0.00	0.00
New Hope Rd	Berkeley Blvd	Central Heights	South	3,761	N	0.00	0.00	3.80	0.00
Harding Dr	Proposed Shared-Use Path	New Hope Rd	North	4,699	N	0.00	0.00	3.80	0.00
Patetown Rd	Country Day Rd	Kearney Ln	West	2,804	N	0.00	4.00	0.00	3.80
Mill St	Vail St	Church St	West	359	N	0.00	0.00	0.00	0.00
Mill St	Church St	School St	West	548	N	0.00	0.00	0.00	0.00
Malloy St	Ash St	Cashwell Dr	East	1,461	N	0.00	0.00	0.00	0.00
Central Heights Rd	New Hope Rd	US 13	West	6,254	N	0.00	0.00	0.00	0.00
Central Heights Rd	New Hope Rd	US 13	East	6,265	N	0.00	0.00	0.00	0.00



	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Fills an Existing Sidewalk Gap</i>	<i>Community College within 1/2 Mile</i>	<i>Footpath Present</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<b>TOTAL</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>25.40</b>
	4.80	0.00	0.00	0.00	4.10	0.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>25.00</b>
	0.00	4.40	4.20	0.00	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>24.80</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>24.60</b>
	0.00	4.40	4.20	0.00	4.10	0.00	0.00	0.00	4.10	0.00	0.00	0.00	<b>24.60</b>
	4.80	4.40	0.00	4.30	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>21.80</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.10	0.00	0.00	0.00	<b>21.70</b>
	4.80	0.00	0.00	0.00	0.00	0.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>20.90</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>20.80</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>20.30</b>
	4.80	4.40	0.00	0.00	4.10	0.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>17.60</b>
	4.80	0.00	0.00	4.30	4.10	0.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>17.50</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>16.60</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>16.60</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>16.30</b>
	4.80	0.00	0.00	4.30	0.00	0.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>13.40</b>
	4.80	0.00	0.00	4.30	0.00	0.00	0.00	4.30	0.00	0.00	0.00	0.00	<b>13.40</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>12.80</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>12.80</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>12.80</b>



## SIDEWALK PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Side	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
New Hope Rd	Central Heights Rd	Food Lion	North	862	N	0.00	0.00	0.00	0.00
Walnut Creek Dr	Dogwood Tr	Mill Rd	South	494	N	0.00	0.00	0.00	0.00
Walnut Creek Dr	Mill Rd	Tramway Dr	South	664	N	0.00	0.00	0.00	0.00
Walnut Creek Dr	Breezewood Dr	Dogwood Trail	South	688	N	0.00	0.00	0.00	0.00
Doral Dr	Pinehurst Ln	Breezewood Dr	East	1,009	N	0.00	0.00	0.00	0.00
Doral Dr	Pinehurst Ln	Walnut Creek Dr	West	1,175	N	0.00	0.00	0.00	0.00
Walnut Creek Dr	Tramway Dr	US 70	East	2,908	N	0.00	0.00	0.00	0.00
Walnut Creek Dr	Breezewood Dr	US 70	West	5,043	N	0.00	0.00	0.00	0.00
Walnut Creek Dr	End of Road	Doral Dr	North/ West	5,273	N	0.00	0.00	0.00	0.00
Lakeshore Dr	Lakeshore Dr	Mill Rd	South/ West	5,353	N	0.00	0.00	0.00	0.00
Lakeshore Dr	Lakeshore Dr	Mill Rd	North/ East	5,439	N	0.00	0.00	0.00	0.00
Walnut Creek Dr	End of Road	Doral Dr	South/ East	5,452	N	0.00	0.00	0.00	0.00
Mill Rd	Lakeshore Dr	Walnut Creek Dr	North/ West	10,860	N	0.00	0.00	0.00	0.00
Mill Rd	Lakeshore Dr	Walnut Creek Dr	South/ East	11,122	N	0.00	0.00	0.00	0.00
Pinehurst Ln	End of Road	Doral Dr	North	1,278	N	0.00	0.00	0.00	0.00
Pinehurst Ln	End of Road	Doral Dr	South	1,301	N	0.00	0.00	0.00	0.00



	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Fills an Existing Sidewalk Gap</i>	<i>Community College within 1/2 Mile</i>	<i>Footpath Present</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<i>TOTAL</i>
	0.00	4.40	0.00	0.00	4.10	4.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>12.50</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>



# ON-ROAD BICYCLE PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Facility Type	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Mulberry St	William St	Randolph St	Bicycle Boulevard	8,973	4.00	4.00	3.80	3.80	4.30
Virginia St	Pine St	Murray St	Bicycle Boulevard	5,656	4.00	4.00	3.80	3.80	4.30
Center St	Spruce St	Mulberry St	Bike Lane	1,510	4.00	4.00	3.80	3.80	4.30
Center St	Spruce St	Mulberry St	Bike Lane	1,511	4.00	4.00	3.80	3.80	4.30
Wayne Memorial Dr	Holly St	New Hope Rd	Wide Outside Lanes	14,136	4.00	4.00	3.80	3.80	4.30
Ash Street/NC 581	Old Smithfield Rd	Virginia St	Paved Shoulders	8,953	4.00	4.00	3.80	3.80	4.30
Mulberry St	James St	William St	Shared Lane Markings	1,635	4.00	4.00	0.00	3.80	4.30
Center St	Ash St	Oak St	Bike Lane	479	4.00	4.00	3.80	3.80	0.00
Center St	Ash St	Oak St	Bike Lane	481	4.00	4.00	3.80	3.80	0.00
Slocumb St	Elm St	Ash St	Shared Lane Markings	3,234	4.00	4.00	0.00	3.80	4.30
Slocumb St	Ash St	Simmons St	Bicycle Boulevard	315	4.00	4.00	0.00	3.80	4.30
Slocumb St	Seymour Johnson AFB	Elm St	Bike Lane	10,962	4.00	4.00	3.80	3.80	4.30
Madison Ave	Laurel St	Atlantic Ave	Bicycle Boulevard	6,237	4.00	4.00	3.80	3.80	4.30
Elm St	Center St	Randolph St	Shared Lane Markings	9,643	4.00	4.00	3.80	3.80	4.30
Audubon Ave	Olivia Ln	Atlantic Ave	Bicycle Boulevard	7,172	4.00	4.00	3.80	3.80	0.00
Herman St	Elm St	Mulberry St	Bicycle Boulevard	2,654	4.00	4.00	3.80	3.80	4.30
Harris St	Slocumb St	Porter St	Shared Lane Markings	3,355	4.00	4.00	3.80	3.80	4.30
Stronach Ave	Greenleaf St	Humphrey St	Bicycle Boulevard	3,418	4.00	4.00	3.80	3.80	4.30
Holly St	Railroad	Herman St	Bicycle Boulevard	3,946	4.00	4.00	3.80	3.80	4.30
Edgerton St	Maple St	Claiborne St	Bicycle Boulevard	4,892	4.00	4.00	3.80	3.80	4.30



	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Community College within 1/2 Mile</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<i>TOTAL</i>
	4.80	4.40	4.20	4.30	4.10	4.00	4.60	0.00	4.44	0.00	<b>54.74</b>
	0.00	4.40	4.20	4.30	4.10	4.00	4.60	0.00	4.44	0.00	<b>49.94</b>
	4.80	4.40	4.20	0.00	4.10	4.00	4.60	0.00	0.00	3.88	<b>49.88</b>
	4.80	4.40	4.20	0.00	4.10	4.00	4.60	0.00	0.00	3.88	<b>49.88</b>
	0.00	4.40	4.20	4.30	4.10	4.00	0.00	4.10	4.44	0.00	<b>49.44</b>
	0.00	4.40	4.20	4.30	0.00	4.00	4.60	0.00	4.44	0.00	<b>45.84</b>
	4.80	4.40	4.20	0.00	4.10	4.00	4.60	0.00	0.00	0.00	<b>42.20</b>
	4.80	4.40	4.20	0.00	0.00	4.00	4.60	0.00	0.00	3.88	<b>41.48</b>
	4.80	4.40	4.20	0.00	0.00	4.00	4.60	0.00	0.00	3.88	<b>41.48</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	4.44	3.88	<b>41.22</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	4.44	3.88	<b>41.22</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	4.44	0.00	<b>41.14</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	3.88	<b>41.02</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	3.88	<b>41.02</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	4.44	3.88	<b>40.72</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>37.14</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>37.14</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>37.14</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>37.14</b>



## ON-ROAD BICYCLE PRIORITIZATION

Yellow highlighting = Previously identified as City priority

Roadway	From	To	Facility Type	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Olivia Ln	John St	Audubon Ave	Bicycle Boulevard	5,700	4.00	4.00	3.80	3.80	4.30
John St	Arrington Bridge Rd	Elm St	Paved Shoulders	11,593	4.00	4.00	3.80	3.80	4.30
Ninth St	Humphrey St	Jefferson Ave	Bicycle Boulevard	2,945	0.00	4.00	3.80	3.80	4.30
Lockhaven Dr	Wayne Memorial Dr	Gloucester Rd	Bicycle Boulevard	982	4.00	4.00	3.80	3.80	4.30
Jackson St	Mulberry St	Maple St	Bicycle Boulevard	3,595	4.00	4.00	3.80	3.80	0.00
Berkeley Blvd	Elm St	Tommy's Rd	Wide Outside Lanes	19,506	0.00	0.00	0.00	0.00	4.30
Harris St	John St	Slocumb St	Bike Lane	3,182	4.00	4.00	0.00	3.80	4.30
Clingman St	Holly St	Stronach Ave	Bike Lane	2,704	0.00	4.00	3.80	3.80	4.30
Best St	Stephens St	Laurel St	Bicycle Boulevard	4,791	4.00	4.00	3.80	3.80	4.30
NC Highway 111	Goldsboro MPO Limits	New Hope Rd	Paved Shoulders	48,471	4.00	0.00	0.00	3.80	4.30
William St	Patetown Rd	Stronach Ave	Bike Lane	4,934	4.00	4.00	0.00	3.80	4.30
Jefferson Ave	Ninth St	Banks Ave	Bicycle Boulevard	575	4.00	4.00	3.80	3.80	0.00
Peachtree St	Claiborne St	Durant St	Bicycle Boulevard	1,130	4.00	4.00	3.80	3.80	0.00
Humphrey St	Fourth St	Ninth St	Bicycle Boulevard	1,802	4.00	4.00	3.80	3.80	0.00
Claiborne St	Edgerton St	Peachtree St	Bicycle Boulevard	2,357	4.00	4.00	3.80	3.80	0.00
Beech St	Center St	Claiborne St	Bicycle Boulevard	9,483	4.00	4.00	3.80	3.80	0.00
George St	Murray St	A St	Shared Lane Markings	1,538	4.00	4.00	0.00	3.80	4.30
Old Mount Olive Rd	Goldsboro MPO Limits	Old Grantham Rd	Paved Shoulders	37,965	4.00	4.00	0.00	3.80	4.30
Nelson Dr	North Dr	Cardinal Dr	Bicycle Boulevard	288	4.00	4.00	0.00	3.80	0.00





	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Community College within 1/2 Mile</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<b>TOTAL</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>37.14</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>37.14</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	4.44	0.00	<b>37.14</b>
	0.00	4.40	0.00	0.00	4.10	4.00	0.00	0.00	4.44	0.00	<b>36.84</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	3.88	<b>36.28</b>
	4.80	4.40	4.20	4.30	4.10	4.00	0.00	0.00	4.44	0.00	<b>34.54</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>33.34</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>33.14</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	0.00	<b>33.04</b>
	0.00	4.40	0.00	0.00	4.10	4.00	0.00	0.00	4.44	3.88	<b>32.92</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	0.00	<b>32.90</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>32.84</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>32.84</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>32.84</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>32.84</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>32.84</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	0.00	<b>29.24</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	0.00	<b>29.24</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>29.04</b>



## ON-ROAD BICYCLE PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Facility Type	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
North Dr	Banks Ave	Nelson Dr	Bicycle Boulevard	319	4.00	4.00	0.00	3.80	0.00
North Dr	Saxon St	Nelson Dr	Bicycle Boulevard	962	4.00	4.00	0.00	3.80	0.00
Simmons St	Slocumb St	Lionel St	Bicycle Boulevard	985	4.00	4.00	0.00	3.80	0.00
Banks Ave	Jefferson Ave	North Dr	Bicycle Boulevard	1,344	4.00	4.00	0.00	3.80	0.00
Cardinal Drive	Nelson Dr	Quail Dr	Bicycle Boulevard	2,375	4.00	4.00	0.00	3.80	0.00
Mulberry St	Alabama Ave	James St	Bicycle Boulevard	2,398	4.00	4.00	0.00	3.80	0.00
Lionel St	Simmons St	Holly St	Bicycle Boulevard	1,662	4.00	4.00	0.00	3.80	4.30
Quail Dr	North Dr	Cardinal Dr	Bicycle Boulevard	3,400	0.00	4.00	3.80	3.80	0.00
Westbrook Rd	Arrington Bridge Rd	Slocumb St	Paved Shoulders	6,166	4.00	4.00	0.00	3.80	0.00
Fussell St	George St	James St	Bicycle Boulevard	655	4.00	4.00	3.80	3.80	0.00
Swan St	James St	Greenleaf St	Bicycle Boulevard	1,202	4.00	4.00	3.80	3.80	0.00
Center St	Holly St	Swan St	Bicycle Boulevard	2,159	4.00	4.00	3.80	3.80	0.00
Newsome St	Slaughter St	Poplar St	Bicycle Boulevard	309	4.00	4.00	3.80	3.80	0.00
Slaughter St	Newsome St	Elm St	Bicycle Boulevard	1,984	4.00	4.00	3.80	3.80	0.00
Elm St	George St	Center St	Buffered Bike Lane	997	4.00	4.00	0.00	3.80	0.00
Jefferson Ave	Edgarton St	Ninth St	Bicycle Boulevard	1,248	4.00	4.00	3.80	3.80	0.00
Center St	Elm St	Spruce St	Bike Lane	1,014	4.00	4.00	0.00	3.80	0.00
Center St	Elm St	Spruce St	Bike Lane	1,014	4.00	4.00	0.00	3.80	0.00
Harris St	Porter St	Stoney Creek Pkwy	Bike Lane	2,643	4.00	4.00	3.80	3.80	0.00
Old Grantham Rd	Goldsboro MPO Limits	Old Mount Olive Hwy	Paved Shoulders	32,128	4.00	4.00	0.00	0.00	4.30



*Connects to Existing Facility*  
*Connects to Proposed Facility*  
*Top 5 Need from Public Comments*  
*Park, library, or recreation center within 1/2 mile*  
*Grade school within 1/2 mile*  
*Connects to Shopping/Business Areas*  
*Connects to Downtown*  
*Community College within 1/2 Mile*  
*Health Focus Area*  
*Connects to MST Alignment*  
**TOTAL**

0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>29.04</b>
0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>29.04</b>
0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>29.04</b>
0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>29.04</b>
0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>29.04</b>
0.00	4.40	4.20	0.00	4.10	0.00	0.00	0.00	4.44	0.00	<b>28.94</b>
0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	<b>28.90</b>
0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>28.84</b>
0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	3.88	<b>28.82</b>
0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	0.00	<b>28.74</b>
0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	0.00	<b>28.74</b>
0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	0.00	<b>28.74</b>
0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	4.44	0.00	<b>28.54</b>
0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	4.44	0.00	<b>28.54</b>
0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	3.88	<b>28.48</b>
0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	<b>28.40</b>
0.00	4.40	4.20	0.00	4.10	0.00	0.00	0.00	0.00	3.88	<b>28.38</b>
0.00	4.40	4.20	0.00	4.10	0.00	0.00	0.00	0.00	3.88	<b>28.38</b>
0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	3.88	<b>28.32</b>
0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	0.00	<b>25.44</b>



## ON-ROAD BICYCLE PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Facility Type	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Sleepy Creek Rd	US Highway 117 Alternate	Goldsboro MPO Limits	Paved Shoulders	31,673	0.00	4.00	0.00	3.80	4.30
Spence St	Cashwell Dr	US 70	Wide Outside Lanes	5,642	0.00	0.00	3.80	0.00	4.30
Greenleaf St	Swan St	Freeman St	Bicycle Boulevard	339	4.00	4.00	0.00	3.80	0.00
Oberry Rd	Goldsboro MPO Limits	US Highway 117 Alternate	Paved Shoulders	14,443	4.00	4.00	0.00	3.80	4.30
North Dr	The First Church Rd	Quail Dr	Bicycle Boulevard	615	4.00	4.00	0.00	3.80	0.00
Gloucester Rd	Lockhaven Dr	Glen Oak Dr	Bicycle Boulevard	1,153	4.00	4.00	0.00	3.80	0.00
Poplar St	Newsome St	Weaver Dr	Bicycle Boulevard	1,950	4.00	4.00	0.00	3.80	0.00
Elm St	Randolph St	Berkeley Blvd	Bike Lane	3,954	4.00	0.00	0.00	3.80	4.30
Murray St	Virginia St	George St	Bicycle Boulevard	505	4.00	4.00	3.80	3.80	0.00
Holly St	Oak St	George St	Bicycle Boulevard	2,340	4.00	4.00	3.80	3.80	0.00
Stephens St	Ben Brewington Ct	End of Road	Bicycle Boulevard	3,577	4.00	4.00	3.80	3.80	0.00
Mimosa St	Pineview Ave	Randolph St	Bicycle Boulevard	3,976	4.00	4.00	3.80	3.80	0.00
Arrington Bridge Rd	John St	Westbrook Rd	Paved Shoulders	3,467	4.00	4.00	0.00	3.80	4.30
Cuyler Best Rd	North Park Dr	New Hope Rd	Paved Shoulders	5,270	0.00	0.00	0.00	0.00	0.00
Main St	Fort St	Mill St	Bike Lane	657	0.00	0.00	3.80	0.00	0.00
Oak Forest Dr	Central Heights Rd	Seymour Johnson AFB	Paved Shoulders	12,155	4.00	0.00	0.00	0.00	4.30
Wayne Memorial Dr	New Hope Rd	Lanetown Rd	Paved Shoulders	43,107	0.00	0.00	0.00	0.00	4.30
Ash St	Malloy St	Oak Forest Rd	Bike Lane	3,370	4.00	0.00	0.00	0.00	0.00
Dollard Town Rd	NC Highway 111	Lake Wackena Rd	Paved Shoulders	10,047	4.00	0.00	0.00	3.80	4.30



	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/ Business Areas</i>	<i>Connects to Downtown</i>	<i>Community College within 1/2 Mile</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<b>TOTAL</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	4.44	0.00	<b>25.04</b>
	0.00	4.40	4.20	4.30	0.00	4.00	0.00	0.00	0.00	0.00	<b>25.00</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	0.00	<b>24.94</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>24.94</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	4.44	0.00	<b>24.74</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	4.44	0.00	<b>24.74</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	4.44	0.00	<b>24.74</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	3.88	<b>24.48</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>24.44</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>24.44</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>24.44</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>24.44</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.88	<b>24.38</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	4.10	0.00	0.00	<b>21.70</b>
	0.00	4.40	0.00	4.30	0.00	4.00	4.60	0.00	0.00	0.00	<b>21.10</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	<b>21.10</b>
	0.00	4.40	4.20	0.00	4.10	0.00	0.00	4.10	0.00	0.00	<b>21.10</b>
	0.00	4.40	4.20	4.30	4.10	0.00	0.00	0.00	0.00	0.00	<b>21.00</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>20.94</b>



## ON-ROAD BICYCLE PRIORITIZATION

Yellow highlighting = Previously identified as City priority

Roadway	From	To	Facility Type	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Cashwell Dr	Berkeley Blvd	Berkeley Memorial Park	Bike Lane	2,655	4.00	0.00	0.00	0.00	0.00
Tommy's Rd	NC Highway 111	Central Heights Rd	Paved Shoulders	21,543	0.00	4.00	0.00	3.80	0.00
Ben Brewington Ct	Stephens St	End of Road	Bicycle Boulevard	677	4.00	4.00	0.00	3.80	0.00
Cashwell Dr	Hillcrest Dr	Berkeley Blvd	Bike Lane	2,285	0.00	0.00	3.80	0.00	0.00
Patetown Rd	William St	New Hope Rd	Paved Shoulders	6,185	0.00	4.00	0.00	3.80	0.00
Pecan Rd	Old Mount Olive Highway	Arrington Bridge Rd	Paved Shoulders	12,426	0.00	4.00	3.80	3.80	0.00
Country Day Rd	Patetown Rd	Wayne Memorial Dr	Paved Shoulders	6,552	0.00	4.00	0.00	3.80	0.00
Arrington Bridge Rd	Westbrook Rd	Bill Lane Blvd	Paved Shoulders	15,004	0.00	4.00	0.00	3.80	4.30
Center St	Oak St	Holly St	Bicycle Boulevard	1,581	4.00	4.00	3.80	3.80	0.00
Main St	Northeast Railroad St	Goldsboro St	Bike Lane	479	0.00	0.00	0.00	0.00	0.00
Main St	Mill St	Northeast Railroad St	Shared Lane Markings	609	0.00	0.00	0.00	0.00	0.00
Big Daddy's Rd	Goldsboro St	Town Limits	Bike Lane	1,047	0.00	0.00	0.00	0.00	0.00
Main St	Interstate 795	Fort St	Shared Lane Markings	2,179	0.00	0.00	3.80	0.00	0.00
New Hope Rd	Berkeley Blvd	Millers Chapel Rd	Paved Shoulders	15,386	0.00	0.00	0.00	0.00	4.30
Bryan Blvd	Old Grantham Rd	Neuse River	Paved Shoulders	2,736	4.00	4.00	0.00	0.00	0.00
NC Highway 581	Rosewood Rd	Buck Swamp Rd	Paved Shoulders	18,784	0.00	0.00	3.80	0.00	4.30
Salem Church Rd	George St	Pikeville-Princeton Rd	Paved Shoulders	36,956	0.00	4.00	0.00	3.80	4.30
NC Highway 111	Mount Carmel Church Rd	New Hope Rd	Paved Shoulders	12,754	0.00	4.00	0.00	3.80	0.00
Holly St	George St	Railroad	Bike Lane	1,143	4.00	4.00	0.00	3.80	0.00



	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Community College within 1/2 Mile</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<b>TOTAL</b>
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	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	0.00	<b>20.80</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	4.44	0.00	<b>20.74</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>20.64</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	0.00	<b>20.60</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	<b>20.60</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>20.44</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	4.10	0.00	0.00	<b>20.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.88	<b>20.38</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>20.00</b>
	0.00	4.40	0.00	4.30	0.00	4.00	4.60	0.00	0.00	0.00	<b>17.30</b>
	0.00	4.40	0.00	4.30	0.00	4.00	4.60	0.00	0.00	0.00	<b>17.30</b>
	0.00	4.40	0.00	4.30	0.00	4.00	4.60	0.00	0.00	0.00	<b>17.30</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	0.00	<b>16.94</b>
	0.00	4.40	0.00	0.00	4.10	4.00	0.00	0.00	0.00	0.00	<b>16.80</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	<b>16.70</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>16.60</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>16.50</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>16.30</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>16.20</b>



## ON-ROAD BICYCLE PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Facility Type	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Bill Lane Blvd	Arrington Bridge Rd	NC Highway 111	Paved Shoulders	10,944	4.00	0.00	0.00	3.80	0.00
Hare Rd	New Hope Rd	Wayne Memorial Dr	Paved Shoulders	9,316	0.00	0.00	0.00	0.00	0.00
Malloy St	Ash St	Cashwell Dr	Bike Lane	1,519	0.00	0.00	0.00	0.00	0.00
Dollard Town Rd	Lake Wackena Rd	St. John Church Rd	Paved Shoulders	9,592	0.00	0.00	0.00	0.00	4.30
Central Heights Rd	Oak Forest Dr	Tommy's Rd	Paved Shoulders	12,785	0.00	0.00	0.00	0.00	4.30
Rosewood Rd	Old Smithfield Rd	Ash St	Paved Shoulders	36,796	0.00	0.00	0.00	0.00	4.30
Ridgewood Dr	Ash St	Peachtree St	Bicycle Boulevard	447	0.00	0.00	0.00	0.00	0.00
Big Daddy's Rd	Pikeville Town Limits	Airport Rd	Paved Shoulders	8,282	0.00	0.00	0.00	0.00	0.00
Ferry Bridge Rd	Old Smithfield Rd	Goldsboro MPO Limits	Paved Shoulders	14,481	0.00	0.00	0.00	0.00	4.30
Piney Grove Church Rd	Beston Rd	Seven Springs Town Limits	Paved Shoulders	25,818	0.00	0.00	0.00	0.00	0.00
Peachtree St	Ridgewood Dr	Hillcrest Dr	Bicycle Boulevard	1,294	0.00	0.00	3.80	0.00	0.00
Hillcrest Dr	Peachtree St	Cashwell Dr	Bicycle Boulevard	1,334	0.00	0.00	3.80	0.00	0.00
Spring Bank Rd	Bill Lane Blvd	NC Highway 111	Paved Shoulders	6,319	4.00	0.00	0.00	3.80	0.00
Lakeshore Dr	Lake Wackena Rd	Mill Rd	Bicycle Boulevard	1,721	0.00	0.00	0.00	0.00	0.00
Walnut Creek Dr	Mill Rd	US 70	Bicycle Boulevard	3,680	0.00	0.00	0.00	0.00	0.00
Mill Rd	Lake Shore Dr	Walnut Creek Dr	Bicycle Boulevard	10,988	0.00	0.00	0.00	0.00	0.00
Gurley Dairy Rd	Capps Bridge Rd	NC Highway 581	Paved Shoulders	11,940	0.00	0.00	0.00	0.00	4.30
Buck Swamp Rd	NC Highway 581	Salem Church Rd	Paved Shoulders	16,901	0.00	0.00	0.00	0.00	4.30
St. John Church Rd	Dollard Town Rd	Piney Grove Church Rd	Paved Shoulders	8,823	0.00	0.00	0.00	0.00	0.00





	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Community College within 1/2 Mile</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<b>TOTAL</b>
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	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.88	<b>16.08</b>
	4.80	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>13.30</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	<b>12.80</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>12.80</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>12.80</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>12.80</b>
	0.00	4.40	0.00	4.30	0.00	4.00	0.00	0.00	0.00	0.00	<b>12.70</b>
	0.00	4.40	0.00	4.30	0.00	4.00	0.00	0.00	0.00	0.00	<b>12.70</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.88	<b>12.58</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	3.88	<b>12.58</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	<b>12.50</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	<b>12.50</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>12.20</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.70</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>8.50</b>



## ON-ROAD BICYCLE PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Facility Type	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
New Hope Road	Millers Chapel Road	Beston Road	Paved Shoulders	13,425	0.00	0.00	0.00	0.00	0.00
Parkstown Road	New Hope Road	Goldsboro MPO Limits	Paved Shoulders	24,275	0.00	0.00	0.00	0.00	0.00
NC 581	Gurley Dairy Road	Buck Swamp Road	Paved Shoulders	2,765	4.00	0.00	0.00	0.00	0.00
Arrington Bridge Road	Bill Lane Boulevard	Sleepy Creek Road	Paved Shoulders	18,594	0.00	0.00	0.00	3.80	0.00
Old Smithfield Road	Ferry Bridge Road	Rosewood Road	Paved Shoulders	1,556	0.00	0.00	0.00	0.00	0.00
Pikeville-Princeton Road	Nahunta Road	Interstate 795	Paved Shoulders	1,987	0.00	0.00	0.00	0.00	0.00
Lake Wackena Road	Dollard Town Road	Lake Shore Drive	Paved Shoulders	4,740	0.00	0.00	0.00	0.00	0.00
Airport Road	Big Daddy's Road	Mount Carmel Church Road	Paved Shoulders	6,937	0.00	0.00	0.00	0.00	0.00
Stoney Creek Church Road	NC Highway 111	Wayne Memorial Drive	Paved Shoulders	11,635	0.00	0.00	0.00	0.00	0.00
Mount Carmel Church Road	Airport Road	NC Highway 111	Paved Shoulders	14,589	0.00	0.00	0.00	0.00	0.00
Beston Road	New Hope Road	Piney Grove Church Road	Paved Shoulders	20,541	0.00	0.00	0.00	0.00	0.00



	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Community College within 1/2 Mile</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<i>TOTAL</i>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>8.50</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>8.50</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>8.20</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>



## SHARED-USE PATH PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Georgia Avenue Trail	Elm St	Holly St	6,092	4.00	4.00	3.80	3.80	0.00
Willow Dale Cemetery-Ash "Ditch" Trail	Willow Dale Cemetery	Ash St	5,445	4.00	4.00	3.80	3.80	4.30
Ash-Peacock Park "Ditch" Trail	Ash St	Peacock Park	5,871	4.00	4.00	3.80	3.80	0.00
Wayne Country Day-Hospital Trail	Wayne Country Day School	Royall Avenue (via Wayne Memorial Hospital & Cuyler Best/Spence)	11,708	4.00	4.00	3.80	3.80	0.00
Slocumb Street Sidepath	Stoney Creek Greenway South	Westbrook Rd	2,844	4.00	4.00	3.80	3.80	4.30
Stoney Creek Greenway Connector	Stoney Creek Greenway North	Stoney Creek Park (across Ash)	744	4.00	4.00	0.00	3.80	4.30
Ash Sidepath	Stoney Creek	Ridgewood Dr	338	4.00	4.00	0.00	3.80	0.00
Westbrook Road Sidepath	Slocumb St	Arrington Bridge Rd	5,073	4.00	4.00	0.00	3.80	4.30
Fairview Park Connector	Fairview Park	Stoney Creek Greenway North	2,950	4.00	4.00	3.80	3.80	0.00
South End Neighborhood Spur	Stoney Creek Greenway South	South End Public Housing	1,169	4.00	4.00	3.80	3.80	0.00
Poplar-Slocumb Connector	Poplar St	Slocumb St	3,644	4.00	4.00	0.00	3.80	0.00
Elm-Olivia Trail	Elm St	Olivia Ln	1,532	4.00	4.00	3.80	3.80	4.30
Walnut-Stoney Creek Connector	Walnut St	Stoney Creek Greenway	222	4.00	4.00	0.00	3.80	0.00
Brick-Elm Connector	Brick St	Elm St	2,121	4.00	4.00	0.00	3.80	0.00
Willow Dale Cemetery-Westbrook Trail	Willow Dale Cemetery	Westbrook Rd	10,827	4.00	4.00	0.00	3.80	0.00
Rocky Branch Greenway Connector	Rocky Branch Greenway	Wayne Country Day-Hospital Trail	306	4.00	4.00	0.00	3.80	0.00



	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Community College within 1/2 Mile</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<i>TOTAL</i>
	4.80	4.40	4.20	4.30	4.10	0.00	4.60	0.00	4.44	3.88	<b>50.32</b>
	4.80	4.40	0.00	4.30	4.10	4.00	0.00	0.00	4.44	3.88	<b>49.82</b>
	4.80	4.40	0.00	4.30	4.10	4.00	0.00	0.00	4.44	3.88	<b>45.52</b>
	0.00	4.40	4.20	4.30	4.10	4.00	0.00	4.10	4.44	0.00	<b>45.14</b>
	4.80	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	3.88	<b>41.72</b>
	4.80	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	3.88	<b>41.58</b>
	4.80	4.40	4.20	4.30	4.10	4.00	0.00	0.00	0.00	3.88	<b>41.48</b>
	4.80	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	3.88	<b>37.92</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>37.64</b>
	4.80	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	3.88	<b>37.42</b>
	4.80	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	3.88	<b>33.62</b>
	4.80	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>33.54</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	3.88	<b>33.28</b>
	4.80	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	3.88	<b>33.28</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	3.88	<b>32.92</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	4.10	0.00	0.00	<b>32.70</b>



## SHARED-USE PATH PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Stoney Creek-Berkeley Boulevard Trail	Stoney Creek Greenway North	Berkeley Blvd	6,959	0.00	0.00	0.00	0.00	4.30
Beech-Mountain Bike Park Connector	Beech St	Mountain Bike Park	277	4.00	4.00	0.00	3.80	0.00
George Street-Willow Dale Cemetery Trail	George St	Willow Dale Cemetery	3,288	4.00	4.00	0.00	3.80	0.00
Stoney Creek Greenway South	Elm St	Slocumb St	9,007	4.00	4.00	0.00	3.80	0.00
Stoney Creek Greenway North Extension	Royall Ave	US Highway 70	2,477	4.00	4.00	0.00	3.80	0.00
Quail Park Spur	Quail Dr	Stoney Creek Greenway North Extension	715	4.00	4.00	0.00	3.80	0.00
New Hope Road Sidepath	Patetown Rd	Cassedale Dr	8,852	0.00	4.00	0.00	3.80	0.00
Mountains to Sea Trail-George Street Connector	Mountains to Sea Trail (west of Brick Street)	George St (via Waynesborough Park)	5,063	4.00	4.00	0.00	3.80	0.00
Quaker Neck Lake-Brick Road Trail	Quaker Neck Lake	Brick Rd	12,560	4.00	4.00	0.00	3.80	0.00
Gloucester-Hospital Spur	Gloucester Rd	Wayne Country Day-Hospital Trail	457	4.00	4.00	0.00	3.80	0.00
Cuyler Best-YMCA Connector	Cuyler Best Rd	YMCA	3,709	0.00	0.00	0.00	0.00	0.00
New Hope Road Sidepath	Existing sidepath	Berkeley Blvd	2,681	0.00	0.00	3.80	0.00	4.30
East End Spur	Elm-Olivia Trail	East End Cir	179	4.00	4.00	0.00	3.80	0.00
The First Church Road-Wayne Memorial Drive Connector	The First Church Rd	Wayne Memorial Dr	1,387	4.00	4.00	0.00	3.80	0.00
Westbrook-Neuse River MST Trail Segment	Westbrook Rd	Neuse River	3,483	4.00	4.00	0.00	3.80	0.00



	<i>Connects to Existing Facility</i>	<i>Connects to Proposed Facility</i>	<i>Top 5 Need from Public Comments</i>	<i>Park, library, or recreation center within 1/2 mile</i>	<i>Grade school within 1/2 mile</i>	<i>Connects to Shopping/Business Areas</i>	<i>Connects to Downtown</i>	<i>Community College within 1/2 Mile</i>	<i>Health Focus Area</i>	<i>Connects to MST Alignment</i>	<i>TOTAL</i>
	4.80	4.40	4.20	4.30	4.10	4.00	0.00	0.00	0.00	0.00	<b>30.10</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>29.04</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	4.44	0.00	<b>29.04</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	4.44	3.88	<b>28.82</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	0.00	<b>28.60</b>
	0.00	4.40	0.00	4.30	4.10	0.00	0.00	0.00	0.00	0.00	<b>24.60</b>
	0.00	4.40	0.00	0.00	4.10	4.00	0.00	4.10	0.00	0.00	<b>24.40</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	3.88	<b>24.38</b>
	0.00	4.40	0.00	4.30	0.00	0.00	0.00	0.00	0.00	3.88	<b>24.38</b>
	0.00	4.40	0.00	0.00	4.10	4.00	0.00	0.00	0.00	0.00	<b>24.30</b>
	4.80	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	0.00	<b>21.60</b>
	4.80	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>21.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.00	<b>20.64</b>
	0.00	4.40	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	<b>20.20</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.88	<b>20.08</b>



## SHARED-USE PATH PRIORITIZATION

*Yellow highlighting = Previously identified as City priority*

Roadway	From	To	Length (Feet)	Low-Income	Low Vehicle Areas	High Density Population	Minority Population	Pedestrian/Bicycle Crash Location
Little River Trail Segment 2	Windy Ridge Drive	Mountains to Sea Trail (via Cherry Experimental Farm property)	44,228	4.00	4.00	0.00	3.80	0.00
New Hope Road Sidepath	Existing sidepath	New Hare Drive	669	0.00	0.00	0.00	0.00	0.00
Berkeley-Greenwood-Meadow Lane Trail	Berkeley Boulevard	Meadow Lane Elementary/Future Soccer Park (via Berkeley Memorial Park & Greenwood Middle School)	9,905	0.00	0.00	0.00	0.00	0.00
Wayne Christian Academy-Wayne Country Day Connector	Wayne Christian Academy/Patetown Road	Wayne Country Day School	5,139	0.00	4.00	0.00	3.80	0.00
Little River Trail Segment 1	County Line	Windy Ridge Drive	59,822	0.00	0.00	0.00	0.00	0.00
Little River Trail - Salem Church Road Spur	Little River Trail Segment 2	Salem Church	7,181	0.00	0.00	0.00	0.00	0.00





*Connects to Existing Facility*  
*Connects to Proposed Facility*  
*Top 5 Need from Public Comments*  
*Park, library, or recreation center within 1/2 mile*  
*Grade school within 1/2 mile*  
*Connects to Shopping/Business Areas*  
*Connects to Downtown*  
*Community College within 1/2 Mile*  
*Health Focus Area*  
*Connects to MST Alignment*  
**TOTAL**

	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.88	<b>20.08</b>
	4.80	4.40	0.00	0.00	4.10	0.00	0.00	4.10	0.00	0.00	<b>17.40</b>
	0.00	4.40	0.00	4.30	4.10	4.00	0.00	0.00	0.00	0.00	<b>16.80</b>
	0.00	4.40	0.00	0.00	4.10	0.00	0.00	0.00	0.00	0.00	<b>16.30</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>
	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>4.40</b>

