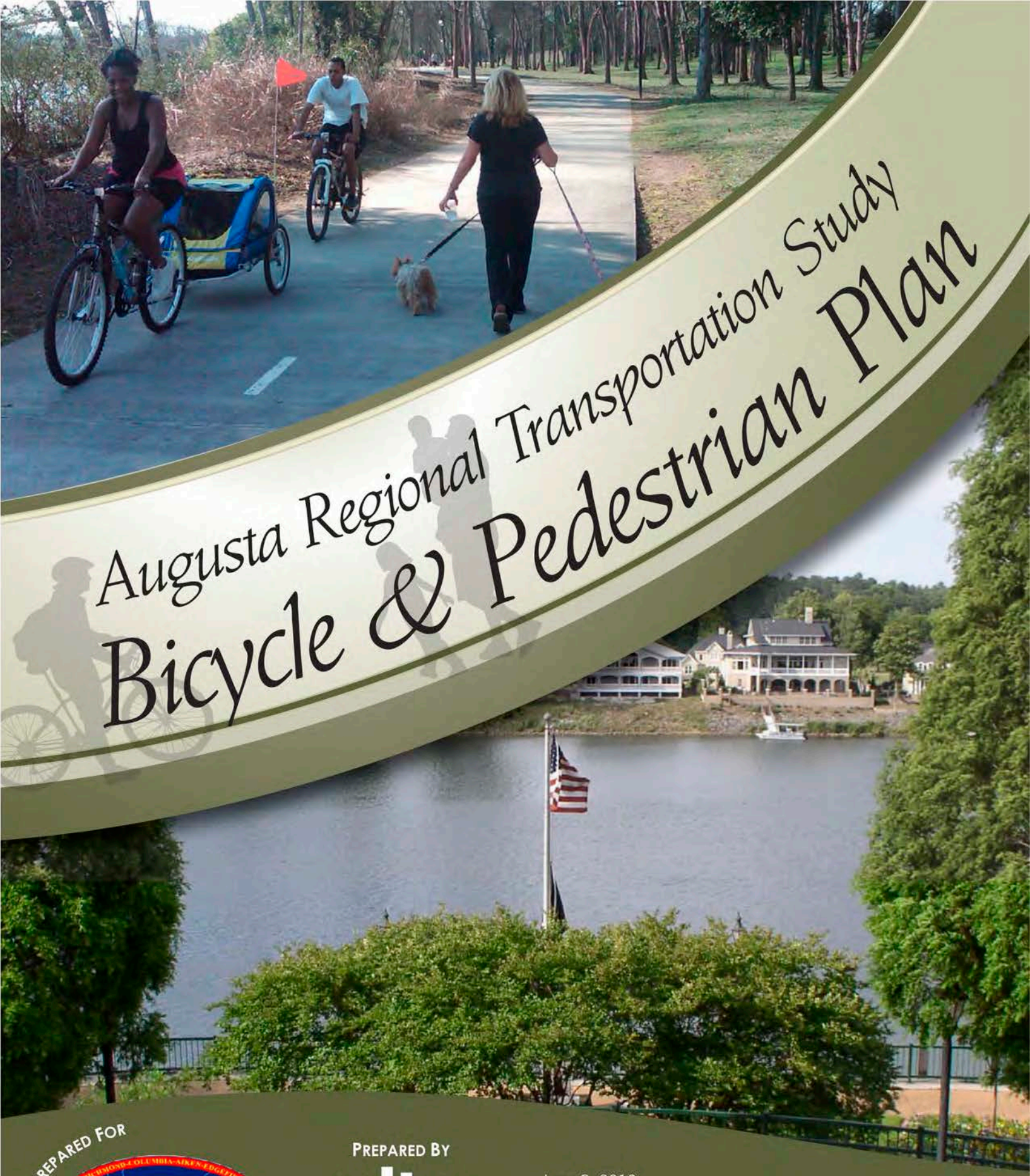

Augusta Regional Transportation Study
Bicycle & Pedestrian Plan

PREPARED FOR

RICHMOND-COLUMBIA-AIKEN-EDGEFIELD
AUGUSTA REGIONAL TRANSPORTATION STUDY
GEORGIA-SOUTH CAROLINA

PREPARED BY

alta GREENWAYS

June 8, 2012

PREPARED IN ASSOCIATION WITH:
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Aiken, Augusta-Richmond, Columbia, and Edgefield Counties

Acknowledgements

The Augusta Regional Transportation Study (ARTS) and its member municipalities appreciate the efforts of the stakeholders who participated in the development of this Plan. Their creativity, energy, and commitment to the future of the ARTS region are the driving force behind this planning effort. ARTS, Aiken County, and the City of Aiken provided funding for this effort and all member counties, including Augusta-Richmond County, Columbia County, and Edgefield County, provided staff time. The following citizens, staff, and other agency and organization members contributed to the development of the ARTS Regional Bicycle and Pedestrian Plan.

Local Project Steering Committee

- Aiken Bicycle Club
- Aiken City Parks, Recreation & Tourism
- Aiken County Planning & Development
- Aiken County Recreation
- Aiken County Schools
- Aiken Public Safety
- Aiken Sidewalk Appreciation Society
- Aiken Vocational Rehab
- Aiken's Mom Club
- Andy Jordan's Bicycle Warehouse
- Augusta Public Transit
- Augusta Sports Council
- Augusta State University
- Augusta Striders
- Augusta-Richmond County Board of Education
- Augusta-Richmond County Planning Commission
- Augusta-Richmond County Recreation, Parks & Facilities
- Augusta-Richmond County Traffic Engineering
- Columbia County Construction & Maintenance
- Columbia County Planning & Engineering
- Columbia County Recreation Department
- Columbia County Schools
- Columbia County Traffic Engineering
- CSRA Regional Commission
- The Federal Highway Administration
- GDOT
- Healthy Augusta
- Lower Savannah Council of Governments
- Outspokin' Bicyclists
- Randonneurs USA
- SC Department of Public Safety
- SC Highway Patrol
- SCDOT
- Wheel Movement

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CDM Smith

FUSS & O'NEILL Disciplines to Deliver

M·P·H & associates, inc.

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Executive Summary

Augusta Regional Transportation Study Bicycle and Pedestrian Plan - 2012

"Nationally, such issues as unstable gas prices, environmental concerns, and a growing interest in health and wellness are demonstrating the need for bicycle and pedestrian-friendly communities. On a local level, this Plan represents a strong commitment to take on such issues, transforming them into new opportunities for biking and walking: affordable personal mobility, carbon-free transportation, and healthy, active lifestyles for ARTS area residents."

The Augusta Regional Transportation Study Bicycle and Pedestrian Plan:

- Sets region-wide goals and benchmarks for improving biking and walking **(chapter 2)**

- Thoroughly examines existing conditions for bicyclists and pedestrians in the region through studies of existing planning documents, public surveys and outreach, GIS analysis, and field observations **(chapters 3-5)**

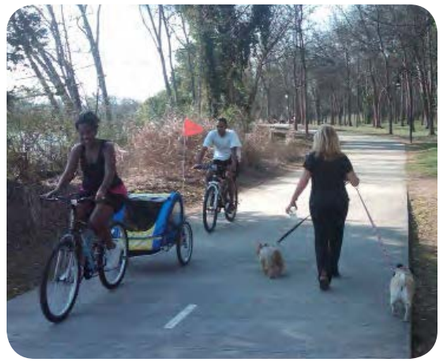
- Investigates safety issues, future demand, and potential benefits of increased bicycle and pedestrian use **(chapter 4)**

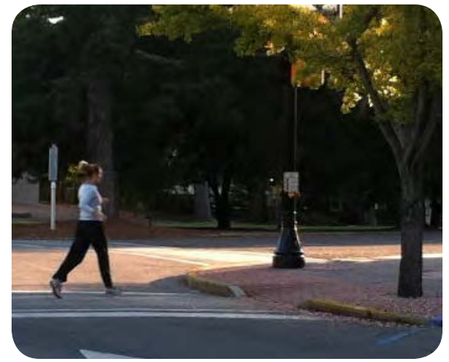
- Recommends programs, policies, and partner organizations to help support and grow walking and bicycling in the region **(chapter 6)**

- Presents the region-wide plan for a comprehensive bicycling and walking transportation network **(chapter 7)**

- Identifies potential funding sources and strategies for implementation including prioritization of network projects **(chapter 8 and appendix F)**

- Provides region-specific design guidelines for improving bicycle and pedestrian facilities in the region **(appendix E)**





Project Overview

The Augusta Regional Transportation Study (ARTS) commissioned this regional Bicycle and Pedestrian Plan with an intent to improve the area's bicycling and pedestrian environment. **The chief outcome of the Plan is an integrated, seamless framework to facilitate walking and biking as viable transportation choices throughout the entire region.** A vision, goals, and objectives were formed for the ARTS Bicycle and Pedestrian Plan based on goals and objectives of existing local and regional plans, stakeholder input, the project purpose, and relevant project examples in the US. The Plan provides program, policy, and infrastructure recommendations.

Program Recommendation Examples

Education and Enforcement: police training programs, professional driver training, Safe Streets Save Lives Programs

Encouragement: Safe Routes to School, car-free street events, weekend walkabouts, bike month activities

Evaluation: regional bicycle and pedestrian committee, regional plan for bicycle and pedestrian collision reduction, dedicated funding source, annual bicycle and pedestrian count program

Policy Recommendations Summary

Policy recommendations of the ARTS Bicycle and Pedestrian Plan are based on a review and assessment of development requirements related to bicycle and pedestrian facilities for five jurisdictions within the ARTS study area. In evaluating the existing policies, it is evident that ARTS could provide guidance and direction to its member municipalities to significantly strengthen policy related to **a) complete streets, b) bicycle parking, c) and pedestrian facility requirements and enhancements within the context of development ordinances**. Additional guidance geared toward retrofit of existing facilities is also recommended. The full policy review is provided in Appendix B.

Engineering Recommendations

The Plan assesses existing conditions for bicyclists and pedestrians and recommends a network of infrastructure improvements, including:

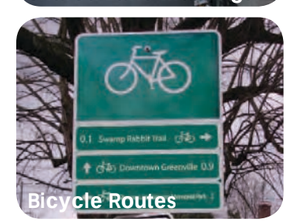
On-Road Bicycle Facilities (below): shared lane markings (sharrows), bike lanes, signed bicycle routes, and paved shoulders

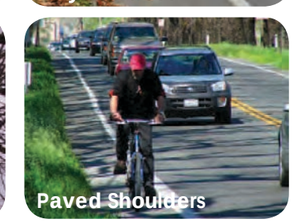
Off-Road Bicycle and Pedestrian Facilities: multi-use paths, greenways, and sidewalks

Ancillary Improvements: bicycle parking, speed limit reductions, access to transit, and intersections

Shared Lane Markings

Bicycle Lanes


Bicycle Routes


Paved Shoulders

The Plan also prioritizes proposed projects based on numerous factors identified as priorities by local stakeholders. Planning-level cost estimates were calculated for fifty highly ranked projects. High priority areas for pedestrian improvements (right) were identified as well as priority bikeway and greenway projects (shown on map).

Priority Walkway Network Improvement Zones	
County	**Priority Zone**
Augusta-Richmond County	W.S. Hornsby School Zone
	South Central Augusta
	Wrightsboro Road Corridor
	West Central Augusta
	Hephzibah School Zones
Columbia County	Westmont Elementary Zone
	Columbia Road Corridor
	Furys Ferry Road
	Southeast Grovetown
	Flowing Wells Road
	Washington Road Corridor
Aiken County	York Street – Rutland Crossing
	Northwest Aiken School Zone
	Virginia Acres Park Zone
	South Aiken
	West Central North Augusta
	Burnettown Central

Project Stakeholders:

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Consultant Team:

With:
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- Fuss & O'Neill
- MPH and Associates Inc.

ARTS Region Recommended Network

2012 ARTS Recommended Bicycle Facilities

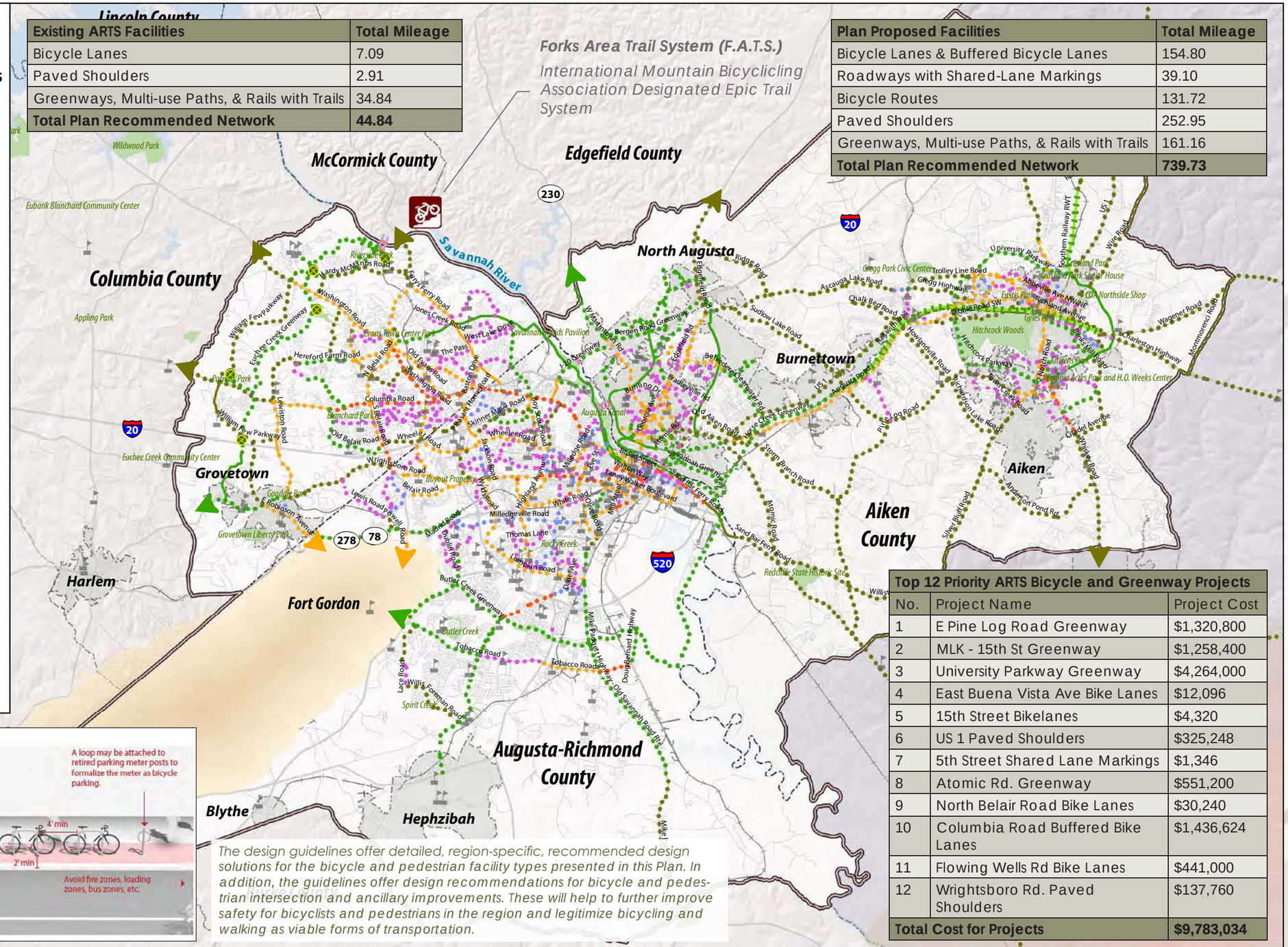
- Greenway/Multi-Use Path
- Rail with Trail
- Buffered Bike Lane
- Striped Bike Lane
- Paved Shoulder
- Shared-Lane Marking
- Bike Route
- Bike/Pedestrian Bridge

Existing Bicycle Facilities

- Greenway
- Striped Bike Lane
- Paved Shoulder
- Bike Route
- Railroads
- TrailHeads
- Schools
- Parks
- ARTS MPO Boundary
- LSCOG MPO Boundary
- Fort Gordon
- Savannah River Site
- County Boundary

Existing ARTS Facilities	Total Mileage
Bicycle Lanes	7.09
Paved Shoulders	2.91
Greenways, Multi-use Paths, & Rails with Trails	34.84
Total Plan Recommended Network	**44.84**

Plan Proposed Facilities	Total Mileage
Bicycle Lanes & Buffered Bicycle Lanes	154.80
Roadways with Shared-Lane Markings	39.10
Bicycle Routes	131.72
Paved Shoulders	252.95
Greenways, Multi-use Paths, & Rails with Trails	161.16
Total Plan Recommended Network	**739.73**



The design guidelines offer detailed, region-specific, recommended design solutions for the bicycle and pedestrian facility types presented in this Plan. In addition, the guidelines offer design recommendations for bicycle and pedestrian intersection and ancillary improvements. These will help to further improve safety for bicyclists and pedestrians in the region and legitimize bicycling and walking as viable forms of transportation.

Top 12 Priority ARTS Bicycle and Greenway Projects		
No.	Project Name	Project Cost
1	E Pine Log Road Greenway	$1,320,800
2	MLK - 15th St Greenway	$1,258,400
3	University Parkway Greenway	$4,264,000
4	East Buena Vista Ave Bike Lanes	$12,096
5	15th Street Bikelanes	$4,320
6	US 1 Paved Shoulders	$325,248
7	5th Street Shared Lane Markings	$1,346
8	Atomic Rd. Greenway	$551,200
9	North Belair Road Bike Lanes	$30,240
10	Columbia Road Buffered Bike Lanes	$1,436,624
11	Flowing Wells Rd Bike Lanes	$441,000
12	Wrightsboro Rd. Paved Shoulders	$137,760
Total Cost for Projects		**$9,783,034**

Source: Data obtained from ARTS, LSCOG, SCDOT, Georgia CGIS and USC GIS Data Server
Date: February 22, 2012
Author: Tony Salomone

ARTS/Aiken County Regional Bicycle and Pedestrian Study
- Recommended Bicycle Facilities-

0 2 4 Miles

"Nationally, such issues as unstable gas prices, environmental concerns, and a growing interest in health and wellness are demonstrating the need for bicycle and pedestrian-friendly communities. On a local level, this Plan represents a strong commitment to take on such issues, transforming them into new opportunities for biking and walking: affordable personal mobility, carbon-free transportation, and healthy, active lifestyles for ARTS area residents."

Chapter One

Introduction

Introduction

The Augusta Regional Transportation Study (ARTS) commissioned this regional Bicycle and Pedestrian Plan with an itent to improve bicycle and pedestrian accommodations in the area. The Plan will serve as an update to the 2003 ARTS Regional Bicycle and Pedestrian Plan. **The chief outcome of the Plan will be an integrated, seamless framework to facilitate walking and biking as viable transportation choices throughout the entire region.** The Plan will integrate bikeway and walkway improvements into the regional planning process; identify gaps in the active transportation network; propose improved connectivity of communities, neighborhoods, and activity centers; identify policies and infrastructure needs for safe routes to transit, schools, and parks; and develop a framework for complete streets policies and standards. The Plan offers recommendations for infrastructure improvements, education and encouragement programs, and policies that will make ARTS communities more walk- and bike-friendly.

The development of this Plan included an open, participatory process, with area residents providing input through public workshops, stakeholder meetings, the project Steering Committee, and an online comment form.

Nationally, such issues as unstable gas prices, environmental concerns, and a growing interest in health and wellness are demonstrating the need for bicycle and pedestrian-friendly communities. On a local level, this Plan represents a strong commitment to take on such issues, transforming them into new opportunities for biking and walking: affordable personal mobility, carbon-free transportation, and healthy, active lifestyles for ARTS area residents.

Background

ARTS functions as a bi-state MPO and is responsible for transportation planning in accordance with the federal metropolitan planning requirements for Richmond County, Georgia and portions of Columbia County, Georgia and Aiken and Edgefield Counties in South Carolina. The Georgia cities of Augusta, Grovetown, Hephzibah and Blythe, the South Carolina cities of Aiken, North Augusta, and Burnettown, and the Fort Gordon Military Reservation are all within the ARTS area.

Like every MPO, ARTS is required to work cooperatively with federal, state, and local governments and local transportation service providers within the context of a well-defined metropolitan transportation planning process. Since ARTS is a bi-state MPO, staff coordinates directly with the Georgia Department of Transportation (GDOT) and the South Carolina Department of Transportation (SCDOT). ARTS does not lead the implementation of transportation projects, but rather serves as the lead agency for planning and programing transportation improvements within the ARTS area, which are eventually implemented by local and state jurisdictions. Furthermore, as required by federal legislation, **ARTS provides the public and interested stakeholders with opportunities to be involved in the transportation planning process.**

Setting

The scenic landscapes and urban development of the bi-state region are tied together by the wide and winding Savannah River, which provides a dramatic natural landmark for the entire area. The central business districts of the region benefit from historic development patterns that represent living models for walkable communities. The historic Augusta Canal and the equestrian amenities of Aiken serve as regional and national attractions as well. Since 1934, during the first week in April, thousands of golf patrons from around the world travel to Augusta to watch The Masters Tournament. Additionally, in recent years, the region has hosted Ironman Triathlon events, USA Cycling championship races, and the International Mountain Bike Association conference. **Offering active transportation opportunities to citizens and tourists in the ARTS area will continue to enhance the area's sense of place and will fuel the local economy.**

The equestrian amenities of Aiken serve as regional and national attractions for the bi-state region.

The Six E's

Research has shown that a comprehensive approach to bicycle and walk-friendliness is more effective than a singular approach that would address infrastructure issues only.[1] Recognizing this, the national Bicycle Friendly Community program, administered by the League of American Bicyclists, and the Walk Friendly Community program, administered by the National Center for Walking and Bicycling, recommend a multi-faceted approach based on the following five 'E's: Engineering, Education, Encouragement, Enforcement, and Evaluation. For the purposes of this Plan, a sixth 'E', Equity, is included in order to fulfill the goals and vision of this Plan. This Plan has been developed using the "6 Es" approach with an intent to provide action steps in each arena that each community can take towards becoming more bicycle and pedestrian-friendly.

Engineering

Designing, engineering, operating, and maintaining quality roadways and pedestrian and bicycle facilities is a critical element in producing a pedestrian-friendly and bicycle-friendly environment. Safe and connected infrastructure for bicyclists and pedestrians is one crucial piece of a comprehensive approach to increasing bicycling and walking activity. This category may include adding new bicycle and pedestrian specific infrastructure, improvements to street crossings, traffic calming, trail design, traffic management, school zones, or other related strategies.

Education

Providing bicycle and pedestrian educational opportunities is critical for bicycle and pedestrian safety. Education should span all age groups and include motorists as well as cyclists and pedestrians. The focus of an educational campaign can range from information about the rights and responsibilities of road users to tips for safe behavior; from awareness of the community-wide benefits of bicycling and walking to technical trainings for municipality staff.

Encouragement

Encouragement programs are critical for promoting and increasing walking and bicycling. These programs should address all ages and user groups from school children, to working adults, to the elderly and also address recreation and transportation users. The goal of encouragement programs is to increase the amount of bicycling and walking that occurs in a community. Programs can range from work-place commuter incentives to a "walking school bus" at an elementary school; and from

bicycle- and walk-friendly route maps to a bicycle co-op.

Enforcement

Enforcement is critical to ensure that motorists, bicyclists, and pedestrians are obeying common laws. It serves as a means to educate and protect all users. The goal of enforcement is for bicyclists, pedestrians, and motorists to recognize and respect each other's rights on the roadway. In many cases, officers and citizens do not fully understand state and local laws for motorists, bicyclists, and pedestrians, making targeted education an important component of every enforcement effort.

Evaluation

Evaluation methods can include quarterly meetings, the development of an annual performance report, update of bicycle and pedestrian infrastructure databases, pedestrian and bicycle counts, assessment of new facilities, and plan updates. ARTS, its partners, and municipalities will monitor implementation of this Plan on a regular basis and establish policies that ensure long-term investment in the bikeway and walkway network. Monitoring progress of implementation will facilitate continued momentum and provide opportunities for updates and changes to process if necessary. Additionally, ARTS communities will adopt policies that promote investment in and improvements to the bicycling and walking environment in accordance with the recommendations of this Plan.

Equity

Equity in transportation planning refers to the distribution of impacts (benefits and costs) and whether that distribution is considered appropriate. Transportation planning decisions have significant and diverse equity impacts. Equity in bicycle and pedestrian planning decisions should reflect community needs and values. Communities may choose to give special attention to variances in age, income, ability, gender, or other characteristics. ARTS and its partner implementation agencies will target outreach with a diversity of programs and events, and ensure appropriate geographic distribution of bike facilities, programs and educational programs.

Encouragement and education programs are important tools for promoting bicycling and walking safety and awareness.

The Value of Walkable and Bicycle-Friendly Communities

Given the commitment of time and resources needed to fulfill the goals of this Plan, **it is important to keep in mind the immense value of bicycle and pedestrian transportation**. Increased rates of bicycling and walking will help to improve people's health and fitness, improve livability of our communities, enhance environmental conditions, decrease traffic congestion, and contribute to a greater sense of community.

Scores of studies from experts in the fields of public health, urban planning, urban ecology, real estate, transportation, sociology, and economics have supported such claims and affirm the substantial value of supporting bicycling and walking as active living and transportation choices. Communities across the United States and throughout the world are implementing strategies for serving the bicycling and walking needs of their residents. They do this because of their obligations to promote health, safety and welfare, and also because of the growing awareness of the many benefits outlined in this section.

Economic Benefits - Community

In a 2011 Community Preference Survey conducted by the National Association of

Realtors (NAR), 66 percent of respondents selected being within walking distance of stores and other community amenities as being important. Additionally, the 2011 NAR survey reflected changes in priorities compared to 2004, the last time the survey was conducted. Interest in walkability increased, with 46 percent saying their community had too few shops and restaurants within easy walking distance, compared to 42 percent in 2004. In the 2011 survey, 40 percent said their community needed more sidewalks, compared to 36 percent in the 2004 survey. A 2010 study by CEOs for Cities looked at data for more than 90,000 recent home sales in 15 different markets around the Nation. While controlling for key characteristics that are known to influence housing value, the study showed a positive correlation between walkability and housing prices in 13 of the 15 housing markets studied.[2]

Destinations located within easy walking distance create the basis for a walkable community.

Trails can play a part in making communities more walkable, and they too have a positive economic impact. In a survey of homebuyers by the National Association of Realtors and the National Association of Home Builders, trails ranked as the second most important community amenity out of a list of 18 choices.[3] Additionally, the study found that 'trail availability' outranked 16 other options including security, ball fields, golf courses, parks, and access to shopping or business centers.

From a tourism perspective, cyclists can add real value to a community's local economy. For example, in the Outer Banks, NC, bicycling is estimated to have a positive annual economic impact of $60 million; 1,407 jobs are supported by the 40,800 visitors for whom bicycling was an important reason for choosing to vacation in the area. The annual return on bicycle facility development in the Outer Banks is approximately nine times higher than the initial investment. The quality of bicycling in the Outer Banks region positively impacts vacationers' planning—it is not all about the beaches:

- 12% report staying three to four days longer to bicycle
- 43% report that bicycling is an important factor in their decision to come to the area
- 53% report that bicycling will strongly influence their decision to return to the area in the future[4]

The ARTS region is already achieving positive economic gains through its own attractions. The economic impact of cycling-related sporting events in just the last three years (2009-2011) totals $15.5 million. The Ironman 70.3 event, which Augusta has hosted since 2009 and will continue to host through 2014, brings $4.5 million in economic impact each year. The USA Cycling championship events (Juniors, U23, Elite & Paralympic Road National Championships) totaled $1.5 million in economic benefits in 2011 and is expected to have a similar or greater impact in 2012. The ARTS region was also fortunate to host the 2010 International Mountain Bike Association (IMBA) Summit in 2010, which brought nearly $0.5 million in local economic gains.[5]

Tourists are already attracted to the walkable downtowns and historic districts in the region. **As the ARTS region continues its success in creating an attractive network of trails and bicycle routes and events, the bicycle- and active lifestyle- related tourism that it already attracts will grow.**

Economic Benefits - Individual

Walking is an affordable form of transportation. A walkable community directly benefits a citizen's transportation costs. The Pedestrian and Bicycle Information Center (PBIC), explains "When safe facilities are provided

for pedestrians and bicyclists, more people are able to be productive, active members of society. Car ownership is expensive, and consumes a major portion of many Americans' income." A study cited by the Victoria Transport Policy Institute's 2011 "Transportation Affordability" found that households in automobile-dependent communities devote 50% more to transportation (more than $8,500 annually) than households in communities with more accessible land use and more multi-modal transportation systems (less than $5,500 annually).

Bicycling is also an affordable form of transportation. According to the PBIC, the cost of operating a bicycle for a year is approximately $120, compared to $7,800 for operating a car over the same time period.[6] Bicycling becomes an even more attractive transportation option when the unstable price of gas is factored into the equation.[7] Replacing automobile trips with bicycle trips, even if it is for only one trip a week will reduce overall gas consumption and save money. Transportation is second to housing as a percentage of household budgets, and it is a top expense for many low income families.

Transportation Costs by Mode

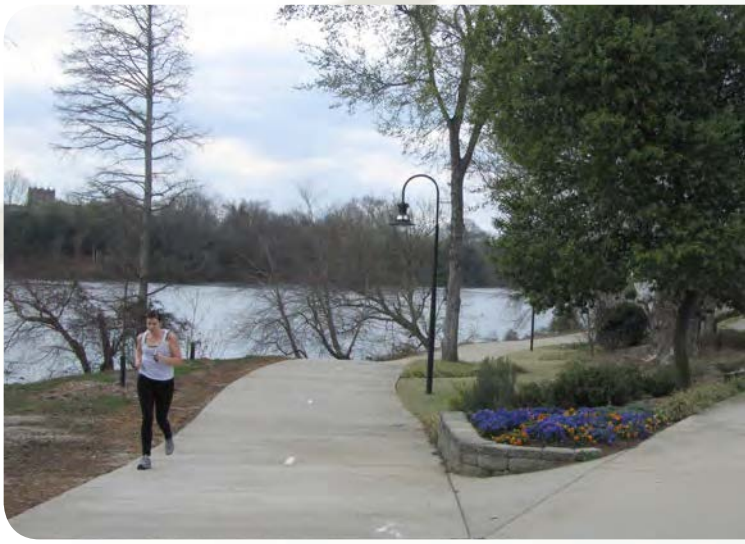
Mode	Cost
Car	$0.59/mile
Transit	$0.24/mile
Bike	$0.05/mile
Walking	$0.0/mile

(Source IRS, ATA, RTC)

Health Benefits

A growing number of studies show that the design of our communities—including neighborhoods, towns, transportation systems, parks, trails and other public recreational facilities—affects people's ability to reach the recommended daily 30 minutes of moderately intense physical activity (60 minutes for youth). The increased rate of disease associated with inactivity reduces quality of life for individuals and increases medical costs for families, companies, and local governments. **The Centers for Disease Control (CDC) has 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.[8]** 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 transportation network that offers opportunities for bicycling will 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".[9]

Today, 32 percent of American adults are obese, and 67 percent are overweight or obese. America's weight problem doesn't spare our youth either: 19 percent of all teenagers and 17 percent of all children between ages 6 and 11 are overweight.[10] The childhood obesity rate has almost tripled since 1980 and the adolescent rate has more than quadrupled.[11]



Creating places for active transportation and recreation results in more healthy communities.

In the ARTS region, the CDC estimates that 21 to 28 percent of adults are physically inactive and 26 to 33 percent of adults are obese. Table 1-1 shows the most recent health statistics for each county in the ARTS region.

Table 1-1. Centers for Disease Control Rates of Adult Physical Inactivity and Obesity in the ARTS Region

	Aiken County	Augusta-Richmond County	Columbia County	Edgefield County
Adult Physical Inactivity	24.0%	28.9%	21.6%	25.4%
Adult Obesity	31.7%	33.1%	26.7%	33.5%

(Source: Centers for Disease Control, 2008)

Offering more opportunities for children, adolescents and adults to safely and conveniently bicycle and walk in their community will encourage citizens to exercise more frequently, increasing their levels of physical activity and impacting the obesity epidemic.

Environmental Benefits

As demonstrated by the Southern Resource Center of the Federal Highway Administration, when people get out of their cars and walk, or ride their bicycles, they reduce measurable volumes of pollutants.[12] Bicycles and foot traffic produce absolutely no pollution and to make a bicycle requires only a fraction of the materials and energy needed to make a car.

Greenways protect rivers and lakes, preventing soil erosion and filtering pollution carried by stormwater runoff.

A bicycle commuter who rides five miles to work, four days a week, avoids 2,000 miles of driving a year—the equivalent of 100 gallons of gasoline saved and 2,000 pounds of CO2 emissions avoided. CO2 savings of this magnitude reduce the average American's carbon footprint by about 5 percent. To achieve equivalent CO2 reductions by public transportation one would have to shift approximately 30 miles of daily commuting from car to transit. A citizen who lives in a community that allows him or her to run most errands by bicycling or walking can save about 500 gallons of fuel, or 10,000 pounds of CO2 each year.

Trails and greenways also convey unique environmental benefits. Greenways protect and link fragmented habitat and provide opportunities for protecting plant and animal species. Trails and greenways connect places without the use of emission-producing vehicles, while also reducing air pollution by protecting large areas of plants that create oxygen and filter pollutants such as ozone, sulfur dioxide, carbon monoxide and airborne particles of heavy metal. Finally, greenway corridors can improve water quality by creating a natural buffer zone that protects streams, rivers and lakes, preventing soil erosion and filtering pollution caused by agricultural and road runoff.

Increased levels of walking and bicycling for transportation reduces the need for car infrastructure, such as parking lots and roads. A reduction in these facilities equates to a reduction in impervious surfaces: materials such as concrete or asphalt that are impenetrable to water. This can have immense environmental benefits for communities. A reduction in impervious surfaces reduces the amount of stormwater runoff and improves the filtration of stormwater runoff by allowing it to filter as it runs over and percolates through the soil. A reduction in impervious surfaces also reduces the "heat island effect": a local increase in average temperature due to high concentrations of heat-absorbing materials, such as concrete and asphalt.[13]

Safety Benefits

Conflicts between bicyclists and motorists and pedestrians and motorists result from poor riding, walking and/or driving behavior as well as insufficient or ineffective facility design. **Encouraging development and redevelopment in which bicycle and foot travel are fostered improves the overall safety of the roadway environment for all users.** Well-designed bicycle facilities improve safety and security for current cyclists and also encourage more people to bike, which in turn, can further improve bicycling safety. Studies have shown that the frequency of bicycle collisions has an inverse relationship to bicycling rates – more people on bicycles equates to fewer crashes.[14] Likewise, well-designed walkway facilities improve safety and security for pedestrians. Providing information and educational opportunities about safe and lawful interactions between bicyclists, pedestrians and other roadway users also improves safety.

Community/Quality of Life Benefits

Fostering conditions where bicycling and walking are accepted and encouraged increases a city's livability from a number of different perspectives, that are often difficult to measure but nevertheless important. The design, land use patterns, and transportation systems that comprise the built environment have a profound impact on quality of life issues. Studies have found that people living in communities with built environments that promote bicycling and walking tend to be more socially active, civically engaged, and are more likely to know their neighbors.[15, 16] Settings where walking and riding bicycles are viable also offer greater independence to the elderly, the disabled, and people of limited economic means who are unable to drive automobiles for physical or economic reasons. The aesthetic quality of a community also improves when visual and noise pollution caused by automobiles is reduced and when green space is reserved for facilities that enable people of all ages to recreate and commute in pleasant settings.

Summary of Existing Documents

The documents listed in Table 1-2 were carefully reviewed to ensure that the goals and recommendations developed in this Plan are consistent with the goals and recommendations identified during these previous planning efforts. A thorough review of the documents listed in this section was prepared and is included in Appendix A.

Existing planning documents, such as the recently completed North Augusta Greeneway Plan, were reviewed to ensure that the recommendations developed in this Plan are consistent with those of previous planning efforts.

The 18 regional and local planning documents reviewed offer overlapping goals relevant to the entire region. In particular, the *ARTS Long Range Transportation Plan* (2010) included a public survey with questions related to transportation priorities and spending for the region. The survey found that when asked "to select two responses as to those elements of the ARTS system they most desired for the future", nearly 50 percent chose sidewalks and crosswalks (49.2 percent) and bike lanes and multi-use trails (45.8 percent) and only 13 percent chose highways. Additionally, in a hypothetical spending scenario, survey respondents answered that with $100 available for transportation, nearly 30 percent (or $30) should be spent on future bike lane, sidewalk, and multi-use path construction.[17]

Bicycle and pedestrian network recommendations and programmed roadway projects included in the plans are addressed in the proposed network of this Plan. The following themes from existing planning documents are incorporated into in the Vision, Goals, and Objectives of this Plan, as well as the infrastructure and non-infrastructure recommendations:

Themes from existing planning documents incorporated into this Plan:
Provide and promote transportation mode choices.
Integrate transportation with land use.
Provide bicycle and pedestrian connectivity between residential areas to destinations.
Promote quality growth and protect natural resources.
Establish interagency and interjurisdictional coordination and planning.
Leverage the region's tourism and recreation-retirement potential.
Connect greenways, bikeways and walkways.

Table 1-2. List of Documents Reviewed for this Study

Document Name	National	Regional	Local
United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations Press Release Summary, March 11, 2010	x		
Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, August 25, 2005	x		
GDOT Designs and Policy Manual Chapter Nine – Bicycle and Pedestrian Accommodations, March 2011		x	
SCDOT Complete Streets Resolution, 2003		x	
SCDOT Engineering Directive Memorandum 22 (EDM 22), 2003		x	
CSRA Regional Bicycle and Pedestrian Plan, June 2005		x	
ARTS Regional Bicycle and Pedestrian Plan, 2003		x	
ARTS 2035 Long Range Transportation Plan, 2010		x	
Aiken County SC Comprehensive Plan			x
Augusta Richmond GA County Comprehensive Plan, 2008			x
Columbia County GA 2025 Long Range Transportation Plan, 2004			x
Columbia County Growth Management Plan: Partial Update, 2011-2016			x
Edgefield County SC Comprehensive Plan			x
The Westobou Vision Master Plan (Augusta and North Augusta Urban Area), 2009			x
Augusta Public Transit Development Plan, 2009			x
Realizing the Garden City: The Augusta Sustainable Development Agenda, 2010			x
North Augusta Riverfront Redevelopment District Master Plan, 1996			x
North Community Needs Assessment, 2003			x
North Augusta Parks and Recreation Facilities Master Plan, 2003			x
City of North Augusta Comprehensive Plan, 2005			x
North Augusta Greeneway, Pedestrian and Bicycle Master Plan, 2011			x
City of Aiken 2010 Strategic Plan			x
City of Aiken Greenways Plan, 1994			x

Endnotes

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

2 CEOs for Cities. (2010) Walking the Walk: How Walkability Raises Home Values in U.S. Cities.)

3 National Association of Realtors and National Association of Home Builders. (2002). Consumer's Survey on Smart Choices for Home Buyers.

4 NCDOT and ITRE. (2006). Bikeways to Prosperity: Assessing the Economic Impact of Bicycle Facilities.

5 Augusta Sports Council, phone interview (December 8, 2011)

6 Pedestrian and Bicycle Information Center. (2010). Economic Benefits: Money Facts. Retrieved 1/20/2010 from www.bicyclinginfo.org/why/benefits_economic.cfm

7 King, Neil. (2/27/08). The Wall Street Journal: Another Peek at the Plateau

8 U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. (2002). Guide to Community Preventive Services

9 Rails-to-Trails Conservancy. (2006) Health and Wellness Benefits

10 Centers for Disease Control and Prevention, Overweight and Obesity 2008 http://www.cdc.gov/nccdphp/dnpa/obesity

11 National Center for Health Statistics, Prevalence of Overweight Among Children and Adolescents: United States, 2003-2004. 2007

12 Federal Highway Administration, Southern Resource Center. (1999)

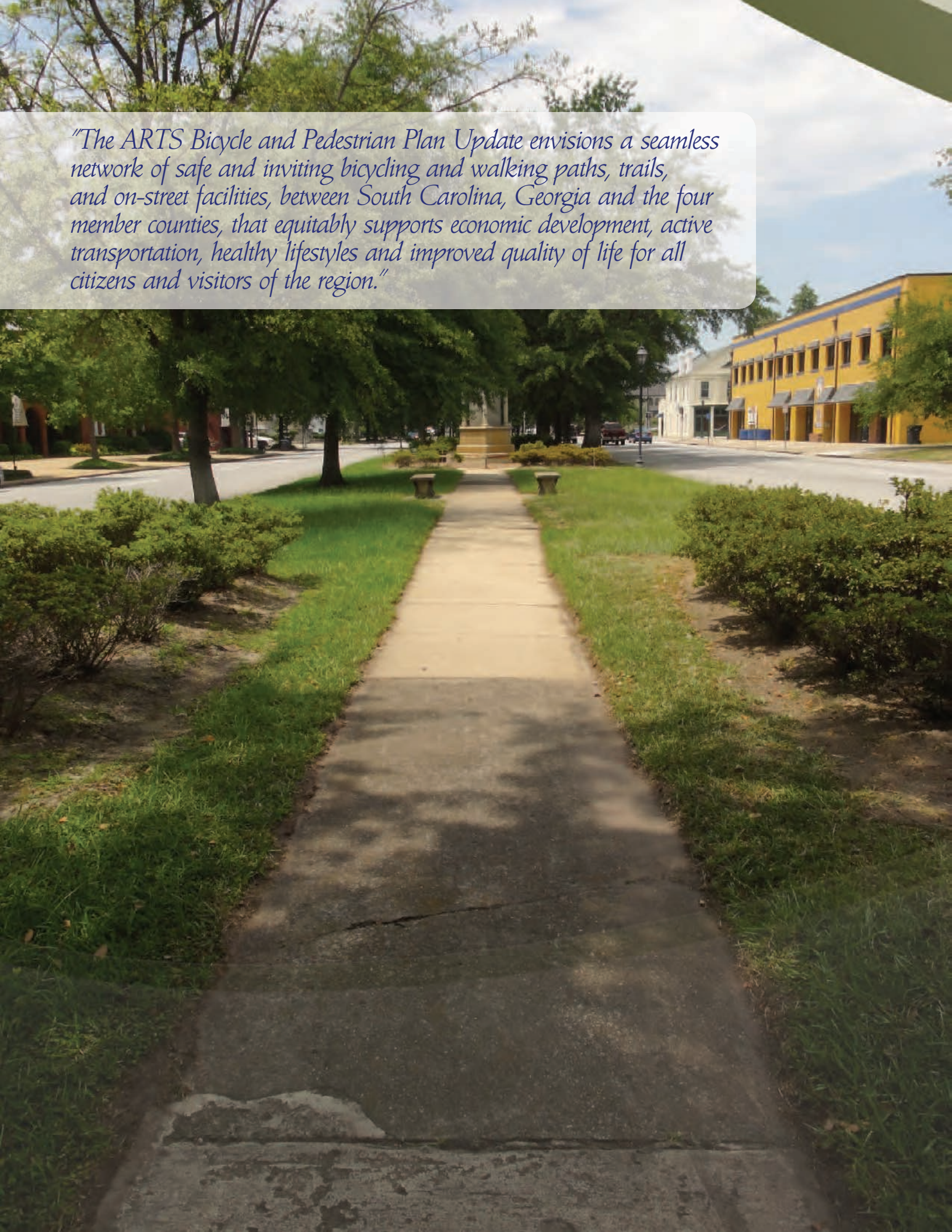
13 Environment: Reducing Impervious Surfaces. <http://www.pednet.org/benefits/impervious-surface.asp>

14 Jacobsen, P. "Safety in Numbers: More Walkers and Bicyclists, Safer Walking and Bicycling". Injury Prevention, 9: 205-209. 2003.

15 Frumkin, H. 2002. Urban Sprawl and Public Health. Public Health Reports 117: 201–17.

16 Leyden, K. 2003. "Social Capital and the Built Environment: The Importance of Walkable Neighborhoods." American Journal of Public Health 93: 1546–51.

17 ARTS 2035 Long Range Transportation Plan. 2010. Chapter 3: Public Participation: 67-68. < http://appweb.augustaga.gov/Transporation/docs/ARTS2035.pdf>



"The ARTS Bicycle and Pedestrian Plan Update envisions a seamless network of safe and inviting bicycling and walking paths, trails, and on-street facilities, between South Carolina, Georgia and the four member counties, that equitably supports economic development, active transportation, healthy lifestyles and improved quality of life for all citizens and visitors of the region."

Chapter Two

Vision, Goals, and Objectives

Introduction

Based on goals and objectives of existing local and regional planning documents, the input of the Project's steering committee, the project purpose, and relevant examples from around the country, vision, goals, and objectives are listed below. The goals and objectives are categorized by five of the six E's associated with bicycle- and walk-friendly community designations. **The five E's are: Engineering, Education, Encouragement, Enforcement, and Evaluation.** Equity is considered a sixth E and is interwoven within the goals and objectives provided. Objectives 1.6, 1.7, and 3.3 give particular attention to equity, though it should be addressed within the implementation of each objective.

Vision

The ARTS Bicycle and Pedestrian Plan Update envisions a seamless network of safe and inviting bicycling and walking paths, trails, and on-street facilities, between South Carolina, Georgia and the four member counties, that equitably supports economic development, active transportation, healthy lifestyles and improved quality of life for all citizens and visitors of the region.

Goals & Objectives

ARTS, member jurisdictions, and related agencies, including GDOT, SCDOT, and local transit agencies will work collaboratively to achieve the following goals and objectives.

Engineering

1. **Goal: Increase and improve the quality of bicycle and pedestrian access between Augusta and Aiken, within local municipalities, and across the ARTS region.**

1.1. Objective: Ensure that accommodations for bicyclists and pedestrians are provided on all appropriate infrastructure projects where pedestrians and bicyclists are permitted to travel.

1.2. Objective: Integrate bicycle and pedestrian facilities in their projects, including, but not limited to, transit, development, public works, infrastructure, and recreation facilities.

1.3. Objective: Improve the level of service for existing bicycle and pedestrian facilities in the member counties.

1.4. Objective: Increase the mileage of bicycle and pedestrian facilities by fifteen percent in each of the region's four counties within the next 5 years.

1.5. Objective: Prioritize bikeway and walkway projects that create connectivity for bicyclists and pedestrians, such as closing gaps in the sidewalk network.

1.6. Objective: Improve integration of public transportation with bicycle and pedestrian facilities by creating safe routes to and from transit stops and convenient means for transporting bicycles via transit.

1.7. Objective: Prioritize bicycle and pedestrian projects and programs that improve access to jobs and services for citizens who walk and bike out of necessity rather than by choice.

1.8. Objective: Prioritize bicycling and walking facilities that provide access to schools.

1.9. Objective: Maintain and improve the network through inventory and assessment of existing pedestrian and bicycle routes.

1.10. Objective: Improve integration of public transportation with bicycle and pedestrian facilities by creating safe routes to and from transit stops and convenient means for transporting bicycles via transit.

2. **Goal: Improve the bicyclist and pedestrian experience within the ARTS region.**

2.1. Objective: Promote the ARTS area's natural beauty, character and sense of place by connecting bicycle and pedestrian facilities along scenic and inviting corridors.
2.2. Objective: Increase the number and quality of support facilities in the ARTS region to complement the bicycle and pedestrian network, including, but not limited to, way-finding signage, bus shelters, pedestrian lighting and end-of-trip facilities, such as bicycle parking.
2.3. Objective: Establish on-going maintenance programs for bicycle and pedestrian facilities at the regional and community levels.
2.4. Objective: Promote community stewardship of bicycle and pedestrian facilities, including transit stops, through beautification and public art programs.
2.5. Objective: Develop specific solutions for improving bicyclist and pedestrian safety at bridge underpasses and at-grade railroad crossings.

One objective of the Plan is to improve bicyclist and pedestrian safety at bridge underpasses.

Education

3. Goal: Establish a broad base of public engagement in and ongoing dialogue about bicycle, pedestrian and transit facilities, accessibility and activity.

3.1. Objective: Work with private sector partners to create educational, informative and fun community events as tools for outreach and encouragement.
3.2 Objective: Work with private sector partners to generate frequent and ongoing media attention for both issues and opportunities related to bicycling and walking.
3.3. Objective: Promote the viability of walking and biking as a practical transportation option throughout the region for all potential users, whether a person does so out of necessity or by choice.
3.4. Objective: Promote bicycling and walking as healthy transportation options that improve physical fitness and significantly impact rising rates of childhood obesity.
3.5. Objective: Provide bicyclist and pedestrian safety training and education to children and youth through schools and community programs such as presentations and "bicycle rodeos."
3.6. Objective: Work with local businesses and partners to educate employees about the benefits and ease of bicycling, walking and taking transit to work.

Encouragement

4. Goal: Increase the popularity and number of bicycle and pedestrian trips in the ARTS region.

4.1. Objective: Conduct bicycle and pedestrian counts every two years at a minimum of fifteen locations throughout the region as part of the National Bicycle and Pedestrian Documentation Program.
4.2. Objective: Participate in the statewide Safe Routes to School program and promote the benefits of bicycling and walking to school.
4.3. Objective: Increase each year the number of events within the region that involve bicycling and walking.
4.4. Objective: Host competitive or fund raising sporting events related to bicycling and running (such as downtown cycling races and Ironman triathlons) for the purpose of economic development, positive promotion of healthy lifestyles and fitness and to encourage community members to engage in bicycling and walking.
4.5. Objective: Profile individuals who walk or bike and/or describe the benefits of walking and bicycling through utility newsletters, radio, newspaper and other media.
4.6 Objective: Publish and distribute print and digital materials that show the region-wide bicycle and transit network and how both

modes can be combined for greater car-free mobility. Google's public transportation and bicycle route mapping services are good examples of digital mapping for bicycle and transit services.

Enforcement

5. Goal: Improve bicycle and pedestrian safety in the ARTS region

5.1. Objective: Provide bicyclist and pedestrian safety training and education to all age groups through schools, community programs, and workplaces.
5.2. Objective: Analyze bicycle and pedestrian collision data every two years to identify regional trends and locate intersections and corridors needing safer infrastructure.
5.3. Objective: Partner with local law enforcement agencies to develop targeted enforcement programs based on the primary contributing factors of bicycle and pedestrian collisions, as determined by the bi-annual review of collision data completed by ARTS.
5.4. Objective: Reduce the percentage of bicycle and pedestrian collisions that result in injuries or fatalities, with a goal of zero fatalities within 10 years.

Evaluation

6. Goal: Obtain a Bicycle-Friendly Community designation, from the League of American Bicyclists, and a Walk-Friendly Community designation, from the Pedestrian and Bicycle Information Center, for each city within the ARTS area.

6.1. Objective: Implement the recommendations of the updated ARTS Bicycle and Pedestrian Plan, including the Bicycle- and Walk-Friendly Community designation action plans.
6.2. Objective: Establish citizen-advisory committees in each member city to spearhead the local Bicycle-Friendly and Walk-Friendly Community designation campaigns.
6.3. Objective: Annually review and assess progress in implementing the Bicycle- and Walk-Friendly Community designation action plans and develop recommendations for further action.
6.4. Objective: Apply for Bicycle- and Walk-Friendly Community status of each member city in or before the year 2017.

Citizen advisory committees will spearhead the local Bicycle-Friendly and Walk-Friendly Community designation campaigns.

7. Goal: Develop bicycle and pedestrian projects that are financially feasible with broad public support.

7.1. Objective: Identify appropriate and adequate funding for the development and maintenance of regional and local bicycle and pedestrian systems
7.2. Objective: Prioritize bicycle and pedestrian projects for Transportation Enhancement funding.
7.3. Objective: Prioritize multimodal transportation projects that positively impact congestion management and improve air quality.
7.4. Objective: Incorporate sidewalk development into all reconstruction or new construction roadway projects.
7.5. Objective: Require land developers to provide adequate right of way for bicycle and pedestrian facilities as new developments occur along priority multi-modal corridors.

8. Goal: Establish long-term, institutional support and evaluation criteria for bicycle and pedestrian activity in the ARTS region.

8.1. Objective: Prioritize bicycle and pedestrian planning within the work responsibilities of agency staff to ensure a multi-disciplinary approach to design, safety, and programs.

8.2. Objective: Adhere to Federal Highway Administration (FHWA) guidelines and other nationally recognized resources (such as the National Association of City Transportation Officials' Urban Bikeway Design Guide, the American Association of State Highway and Transportation Officials Bicycle and Pedestrian Design Guidelines, and the SCDOT Complete Streets Policy) in the design of the bikeway and walkway network for the purpose of creating an innovative and context-sensitive network and to qualify for federal funding, when appropriate.

Adopting complete streets policies establishes long-term, institutional support for bicycle and pedestrian activities.

8.3. Objective: Identify ARTS and local agency staff persons to serve as the primary points of contact for matters related to bicycle and pedestrian planning and to serve as liaisons for local bicycle and pedestrian matters.

8.4. Objective: Establish a permanent, regional Bicycle and Pedestrian Advisory Committee charged with facilitating interagency dialogue and collaboration regarding policies, programs, and projects that impact bicyclists and pedestrians.

8.5. Objective: Pursue bicycling, pedestrian and health related policies for every division within local and regional government.

8.6. Objective: Adopt complete streets policies at the municipal, county, and regional levels.

8.7. Objective: Build upon existing bicycle and pedestrian planning efforts, such as the ARTS Long Range Transportation Plan, the South Carolina State Trails Plan, and others.

8.8. Objective: Team with regional transit providers to provide bicycle and pedestrian support facilities at transit centers and transit stops such as secure bicycle parking and benches.

8.9. Objective: Record the use of bicycle racks on busses and ensure that adequate bicycle support facilities and busses with racks are available in high-use areas.

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"The region is giving attention to pedestrian friendly concerns. In particular, Columbia County has begun the process of inventorying sidewalks and promoting walkable nodal developments. The Augusta and Aiken communities have taken steps to preserve and improve the pedestrian friendliness of their central business districts and North Augusta has implemented an impressive network of pedestrian friendly Greeneways."

Chapter Three

Existing Conditions

Overview

This chapter provides an overview of the major components of the bicycling and walking environments of the ARTS region. The data required to assess existing conditions was collected primarily by gathering existing regional geographic information systems (GIS) data, requesting input from the region's jurisdictions, conducting field work, and soliciting public input. Provided data was synthesized into regional databases, mapped with GIS, and analyzed. Additional analysis of existing conditions is provided in Chapters 4 and 5 which summarize the quantitative and qualitative needs of bicyclists and pedestrians in the region.

Figures 3-1 and 3-2 depict the existing bicycling and walking conditions in ARTS.

Data Inventory and Background Review

Local agencies were sent a request to provide data related to the bicycling and walking environment of the entire ARTS region. Each jurisdiction was asked to provide specific data related to the following broad categories of existing conditions:

- Transportation (such as streets, bus stops, sidewalks, and traffic signal locations)
- Land use and ownership (such as parcel boundaries, and zoning designations)
- Points of interest (such as schools, parks, airports, and retail centers)
- Physical geography (such as wetlands and topography)
- Administrative and jurisdictional boundaries (such as city and county borders)
- Additionally, the data inventory was supplemented by a review of all relevant plans or planning documents related to bicycle and pedestrian activity in the region. Appendix A provides the full review of documents and other information obtained from local governments across the region.

Field Investigation

The project team identified priority corridors and locations for field review, totaling more than 100 miles of roadway. Field work allows for review of corridor characteristics that may present opportunities or constraints for bicycle and pedestrian facilities, such as pavement width, shoulders, right of way, and driveways, to be inventoried and mapped. Areas targeted for field investigation were corridors and locations with:

- high bicycle and/or pedestrian traffic,
- key connectors between areas of high bicycle and/or pedestrian traffic,
- areas of high bicycle and/or pedestrian collisions,
- and primary corridors for accessing destinations, such as commercial land uses, transit centers, parks, trails, and schools or colleges.

At the project kick-off meeting, the steering committee noted a strong interest in providing connectivity between Augusta, GA and Aiken, SC. The corridors and locations prioritized for field review addressed the need for establishing regional connectivity among the project's member cities and counties, as well as the need for localized connectivity in urban environments.

Public Outreach

Extensive public outreach is essential to developing a regional bicycle and pedestrian

plan that addresses the needs of community members. For this report public input acquired during multiple public workshops, targeted focus groups, booths at community events, and via the project website was analyzed to identify issues and constraints to bicycling walking in the ARTS region. Chapter 5 summarizes the results of the public outreach process.

BFC and WFC Audits

Filling out the applications to receive the national designation as a Bicycle Friendly Community (BFC) or Walk Friendly Community (WFC) is an education in itself. The detailed questions of the applications allow communities to recognize their strengths and opportunities in each category of the five E's. Stakeholder interviews were used, in conjunction with the data collection methods already described, to complete the BFC and WFC applications for three ARTS communities. The applications provide a useful tool for understanding the communities' existing conditions for biking and walking.

Bicycle and Walk Friendly Community Assessment

Overview of Bicycle and Walk Friendly Community Designations

The Bicycle Friendly Community (BFC) and Walk Friendly Community (WFC) programs are two national initiatives intended to encourage cities and towns across the country to improve the bicycling and pedestrian environments in their community and to recognize communities who are successfully doing this. The programs provide communities with invaluable resources related to bicycle and pedestrian planning and also generate positive media attention at the national and local level for communities who earn a designation.

The BFC program is administered by the League of American Bicyclists, a national bicycling advocacy organization based in Washington, D.C. Since the program began, the League has received 490 applications and awarded 190 communities with "bicycle-friendly" status. In 2011, the Pedestrian and Bicycle Information Center, based in Chapel Hill, NC, announced the development of the WFC Program. There are currently 21 "walk-friendly" designated communities around the country (as of November 2011). Table 3-1 lists BFC and WFC designated communities in Georgia and South Carolina.

Table 3-1. Designated communities near the ARTS region.[1]

State	Bicycle Friendly Communities	Walk Friendly Communities
South Carolina	Bronze: Charleston, Columbia, Greenville, Spartanburg Silver: Hilton Head	None
Georgia	Bronze: Athens-Clarke County, Roswell, Tybee Island	Silver: Decatur

Both the WFC and BFC program use the five "E's" of bicycle and pedestrian planning as the framework for identifying successful biking and walking communities. The five "E's" are: Engineering, Encouragement, Education, Enforcement, and Evaluation. Each program has its own detailed questionnaire that a city or town must complete online in order to apply for recognition. Four levels of award designation are possible: Bronze, Silver, Gold, and Platinum. Both programs offer an Honorable Mention category, as well.

Currently, there are no BFC or WFC designated communities in the ARTS region. Opportunities to apply for designation are shown in Table 3-2.

Table 3-2. Review cycles and due dates for BFC and WFC programs.

Review Cycle	Bicycle Friendly Community Due Dates	Walk Friendly Community Due Dates
Spring Awards	February 17, 2012	January 19, 2012
Fall Awards	July 2012[1]	June 15, 2012

1 List of designated communities is current, as of January 2012.
2 A specific application due date for July 2012 is not yet available, as of January 2012.

Achieving Bicycle and Walk Friendly Community Designations

A BFC is described as a community that "welcomes cyclists by providing safe accommodation for cycling and encouraging people to bike for transportation and recreation."[3] In order to achieve Bronze level status as a BFC, a community is expected to show a strong commitment to bicycling, even if that commitment is in its early stages. Bronze communities have "room to grow" and show potential for more successes in bicycle friendliness, but important steps in the right direction are already being taken.

The League of American Bicyclists offers the following summary of characteristics that can be found in a Bronze level BFC:

- Engineering Community recently implemented a policy to engineer streets with the consideration of bicyclists and/or is beginning to develop a trail network. Facilities conform to the currently recognized safety standards.
- Education Community holds bicycle safety events, provides opportunities for bicycle education.
- Encouragement Community hosts a Bike to Work Day or community ride.
- Enforcement Officers are familiar with laws relating to bicyclists.
- Evaluation & Planning The community is familiar with and responsive to the needs of cyclists. A bicycle master plan or chapter in another document has been developed and approved. Bicycle mode share is above average for U.S. communities.[4]

To achieve a designation level higher than Bronze, significant advances within each of the five E's must occur. An honorable mention may be awarded to a community that shows its potential to fit the characterization of a Bronze community in the near future. In particular, a community that has not yet had time to realize the full impact of important recent successes would be a likely candidate for an honorable mention award.

3 Source: http://www.bikeleague.org/programs/bicyclefriendlyamerica/communities/bfc_about.php
4 Source: League of American Bicyclists, Scoring Guidelines for Local Reviewers, 2010.

While there is no clear benchmark that identifies communities within the four levels of BFC designation, Table 3-3 outlines the average bicycle mode share found among designated BFCs around the country.

Table 3-3. Average bicycle mode share among designated Bicycle Friendly Communities[5]

BFC Award Level	Average Bicycle Mode Share
Platinum	9.71%
Gold	5.20%
Silver	2.82%
Bronze	1.10%

Similarly, a WFC is described as "a city or town that has shown a commitment to improving walkability and pedestrian safety through comprehensive programs, plans and policies."[6] A community seeking Bronze level status as a WFC should fit a characterization similar to that of a Bronze level BFC, though relevant to pedestrian programs and infrastructure.

Assessment of ARTS Communities

This Plan includes completed applications for the BFC and WFC programs for the ARTS communities of Columbia County, Augusta-Richmond County, and the City of Aiken. Copies of the blank BFC and WFC applications are located in Appendix C. By design, the process of filling-out the detailed questionnaires is an educational tool for communities seeking a national designation. Communities not only learn the variety of programmatic, policy, and infrastructure initiatives that contribute to becoming bicycle- and walk-friendly, but also learn the areas in which the community excels or needs improvement. Table 3-4 outlines strengths and opportunities for each of the three ARTS communities.

The infrastructure and non-infrastructure recommendations of the Plan, provided in Chapters 6 and 7 respectively, are based on the BFC and WFC assessments, as well as other analysis. Chapter 8 includes prioritized action steps and a timeline for ARTS communities to pursue the BFC and WFC designations.

5 Source: League of American Bicyclists, staff report.
6 Source: www.walkfriendly.org.

Table 3-4. Assessment of three BFC and WFC applications

ARTS Community	Bicycle Friendly Community Application Highlights	Walk Friendly Community Application Highlights
Augusta-Richmond County		
Successes	The Augusta Wheel Movement and local bicycle retailers are an asset to the Augusta-Richmond County bicycling community and are committed to advocacy. Georgia Bikes! is an invested partner in the community by way of a grant to Augusta Wheel Movement. Augusta-Richmond has multiple community groups who support bicycling. Recently constructed bicycling facilities in the County create an important starting point for growing the bikeway network. The Augusta Canal Trail and Riverwalk Trail provide important existing infrastructure and help to evidence demand for trails and greenways. High-profile athletic events are generating interest in physical activity and evidencing the economic development potential that bicycling can bring.	Augusta-Richmond County has a very high walking mode share. Street trees and landscape strips adjacent to curbs are supported and, at times, required by the municipal code. Design guidelines for sidewalks are specified in the municipal code. High-profile athletic events are generating interest in physical activity and evidencing the economic development potential that investment in "active lifestyle" image can bring.
Opportunities	Improvements are needed within all five E's. While the County has the necessary community infrastructure needed to generate a broad base of support for bicycling infrastructure and programs, many groups are not yet working together. Augusta-Richmond County has significant potential to garner private sector support for improvements.	Improvements are needed within all five E's. The high mode share for walking in Augusta-Richmond County will benefit the County's WFC application. Identifying where pedestrian activity occurs and creating a targeted program to address pedestrian infrastructure needs in those areas should be a priority.

ARTS Community	Bicycle Friendly Community Application Highlights	Walk Friendly Community Application Highlights
City of Aiken		
Successes	The Aiken Bicycle Club is an asset to the City of Aiken and recreational cycling is a relatively popular form of exercise in the area. Aiken's Public Safety Office ensures that all officers receive bicycle training and maintains a bike patrol program, which has participated in bicycle rodeos. A local chapter of Eat Smart Move More SC and Safe Routes to School are active programs in the community, and a board member of Palmetto Cycling Coalition also serves as an advocate in Aiken. A League Cycling Instructor lives in Aiken. The local option sales tax provides an important source of funding that is already in place.	The City of Aiken has a base of citizens supportive of walking and pedestrian infrastructure. Additionally, Aiken is successfully engaging the senior citizen and retired populations of the community. A local chapter of Eat Smart Move More SC and Safe Routes to School are active programs in the community. The downtown has a well-designed pedestrian wayfinding signage program. The infrastructure of downtown and nearby neighborhoods is friendly to pedestrians. The municipal code supports a walkable environment in downtown and requires sidewalks in many new road projects. The local option sales tax provides an important source of funding that is already in place.
Opportunities	Improvements are needed within all six E's. The City of Aiken has the necessary institutional infrastructure needed to excel in each category.	Improvements are needed within all six E's. The City of Aiken has the necessary institutional infrastructure needed to excel in each category.

ARTS Community	Bicycle Friendly Community Application Highlights	Walk Friendly Community Application Highlights
Columbia County		
Successes	Recently constructed bicycling facilities in the County create an important starting point for growing the bikeway network. The County has invested in two multi-use paths and a four-mile "complete street." Several roadway projects are currently being designed to include bicycle facilities. Columbia County partners with Central Savannah River Area to promote Safe Routes to School.	Columbia County is creating walkable, pedestrian-friendly nodes of development throughout the community, such as Evans Town Center. The County has invested in two-multi-use paths and a four-mile "complete street." Columbia County partners with Central Savannah River Area to promote Safe Routes to School.
Opportunities	Improvements are needed within all five E's. Columbia County's investment in bicycling infrastructure and efforts to include bikeways in new projects is significant, but needs to be backed by policy to ensure long-term impact. Columbia County currently lacks organized, community-level bicycle advocacy.	Improvements are needed within all five E's. Columbia County's investment in walkable development nodes and multi-use paths is significant, but needs to be backed by policy to ensure long-term impact. Columbia County currently lacks organized, community-level pedestrian advocacy.

1 A specific application due date for July 2012 is not yet available, as of January 2012.

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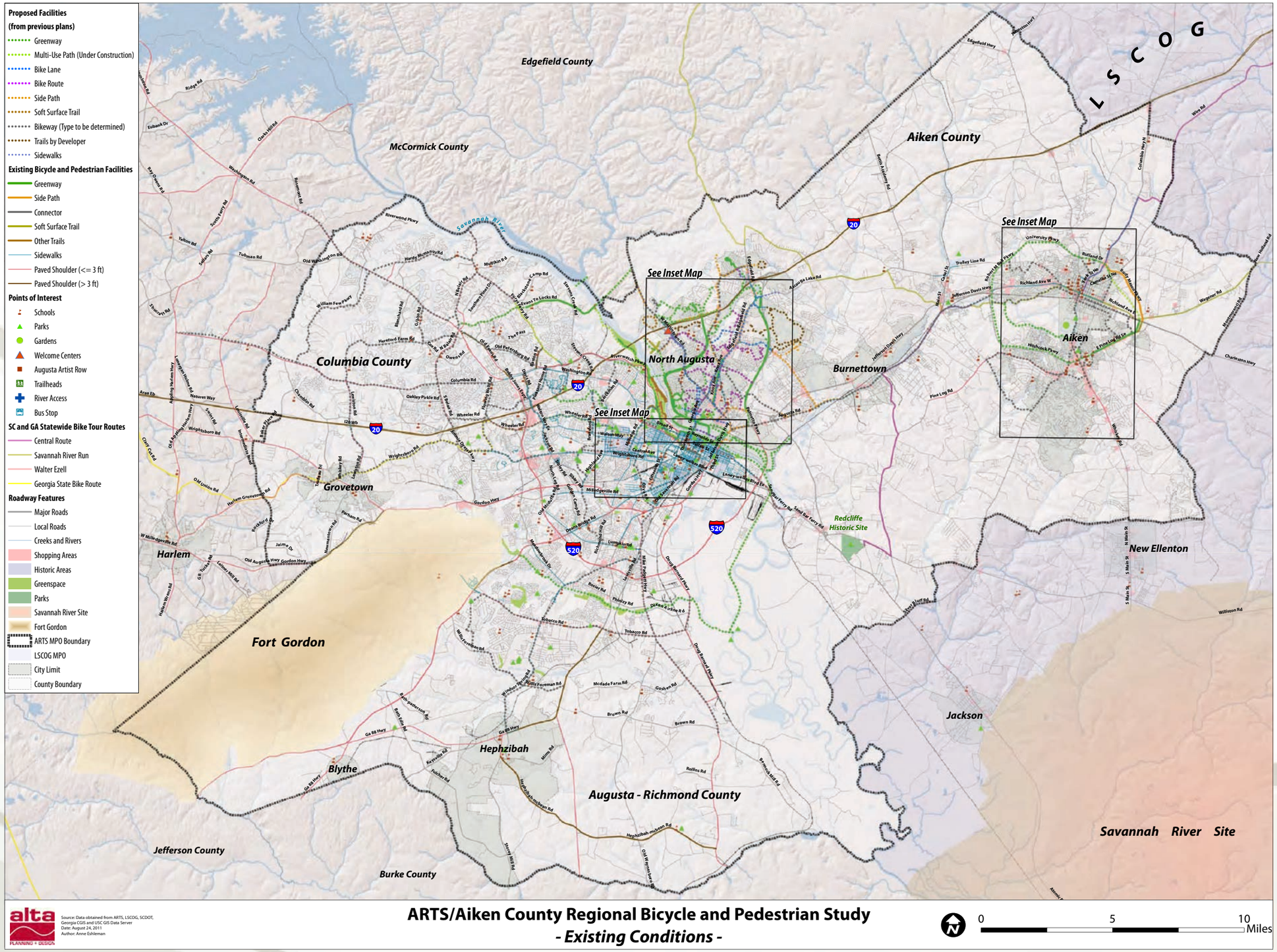
Figure 3-1: ARTS Existing Conditions



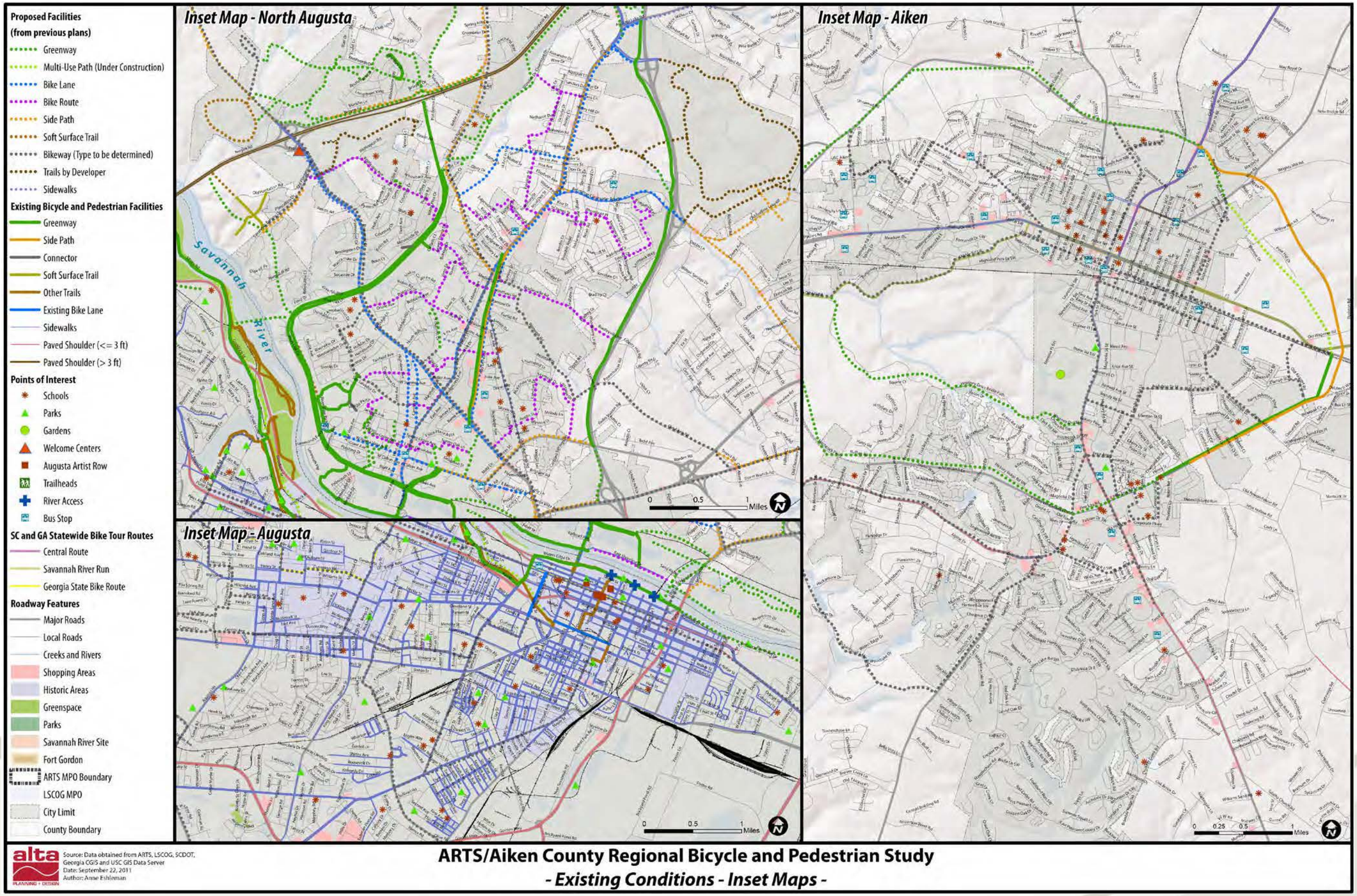
alta PLANNING + DESIGN

Source: Data obtained from ARTS, LSCOG, SCDOT, Georgia CGIS and USC GIS Data Server
Date: August 24, 2011
Author: Anne Eshleman

ARTS/Aiken County Regional Bicycle and Pedestrian Study
- Existing Conditions -

0 5 10 Miles

Figure 3-2: ARTS Existing Conditions Inset Maps



Engineering Assessment

Maps 3-1 and 3-2 depict the current physical environment for walking and bicycling in ARTS. The region currently has a limited network of bicycling and walking facilities that includes sidewalks, paved shoulders, bicycle lanes, multi-use paths, and greenways. While the design guidelines provided in Appendix E of this Plan offer detail descriptions of each of these types of facilities, it is important to note that not all of the existing facilities within ARTS meet the standards of guidelines. The following section describes the existing opportunities and constraints of bicycling and walking infrastructure in the ARTS region.

Bicycle Infrastructure

Overview

ARTS and its member jurisdictions, in partnership with GDOT and SCDOT, have taken several proactive steps to make the region and its communities more bicycle-friendly by installing bicycle lanes, shoulders, and sidepaths in conjunction with roadway construction and reconstruction projects. A number of trails and multi-use paths are also provided throughout the region for recreation and transportation uses. These facilities provide a good foundation for a bicycle facility network. However, a majority of the roads in the study area pose numerous dangers to bicyclists as they travel to and from destinations. Some of these hazards include commercial corridors that are designed solely for motorized transportation, multiple lane high-speed roadways, narrow roadways with little or no shoulders, and dangerous railroad and driveway crossings. Furthermore, little to no connectivity is currently provided between existing facilities and numerous barriers to connectivity exist, such as streets that dead-end at a major highway or interstate crossing and cul de sacs that do not connect adjacent neighborhoods.

Strengths of Existing Bicycle Conditions

Existing on-road bicycle facilities (Figure 3-3): There are currently 7.1 miles of bicycle lanes in the ARTS region. All existing bicycle lanes are within the Columbia County and Augusta-Richmond County portion of ARTS.

Multi-use paths: The region's 34.8 miles of greenways (including the Greeneways of North Augusta) provide bicycling and walking opportunities for both recreation and transportation and have led to increased public support for investment in bicycling and walking infrastructure.

Roadway Network Opportunities

Downtown grid network: Streets within the downtown areas of Augusta, North Augusta, and Aiken are on a good grid system for all transportation modes and many have low automobile speeds which contributes to a comfortable bicycling environment.

Roadway/lane widths (Figure 3-4): Many roadways throughout the region are wide enough to offer bicycle lanes or other bicycle facilities without the need to add additional pavement width.

Low-volume roads (Figure 3-5): The ARTS region has numerous residential areas with low-volume streets, low-speed travel, and inviting streetscapes. This type of existing network is suitable for bicycling activity, in particular, and often, walking, as well.

Deficiencies of Existing Bicycle Conditions

Lack of connectivity (Figure 3-6): As a whole, the existing bicycle facilities are often disconnected which makes it difficult to find adequate routes to destinations. The development of parkways through the region has, in many cases, disconnected existing roadways, split neighborhood connections, and precluded at-grade crossing opportunities. The development of residential subdivisions that do not have a connected street grid has added further challenges to connectivity.

Maintenance issues: Some existing bicycle facilities retain stormwater debris, which can pose a hazard for bicyclists. For example, Fenwick Street in Augusta collects significant amounts of plant and trash materials.

Lack of signage: Limited to no signage is available to direct bicyclists from one existing bicycle facility to another or to identify preferable routes for bicyclists.

Roadway Network Constraints

Connectivity issues: There is a lack of connectivity between existing facilities and destinations.

Photo Inventory of Existing Bicycling Conditions

Figure 3-3: *There are currently 6.8 miles of bicycle lanes in the ARTS region. All existing bicycle lanes are within the Columbia County and Augusta-Richmond County portion of ARTS.*

Figure 3-6: *As a whole, the existing bicycle facilities in the ARTS region are often disconnected which makes it difficult to find adequate routes to destinations.*

Figure 3-4: *Many roadways throughout the region are wide enough to offer bicycle lanes or other bicycle facilities without the need to add additional pavement width.*

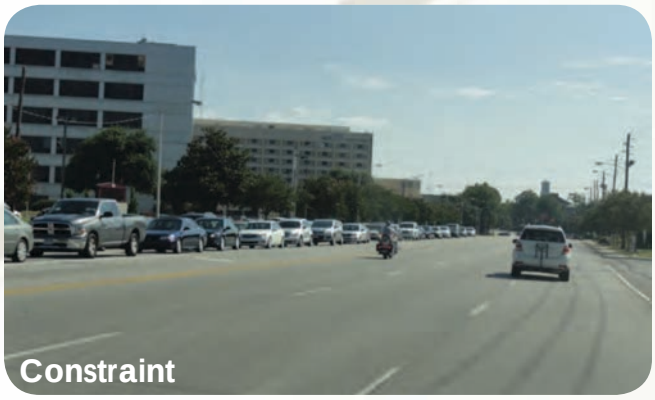


Figure 3-7: *There are many wide high-volume commercial roadways throughout the region with high speeds and little shoulder space for cyclists.*

Figure 3-5: *The ARTS region has numerous residential areas with low-volume streets, low-speed travel, and inviting streetscapes.*

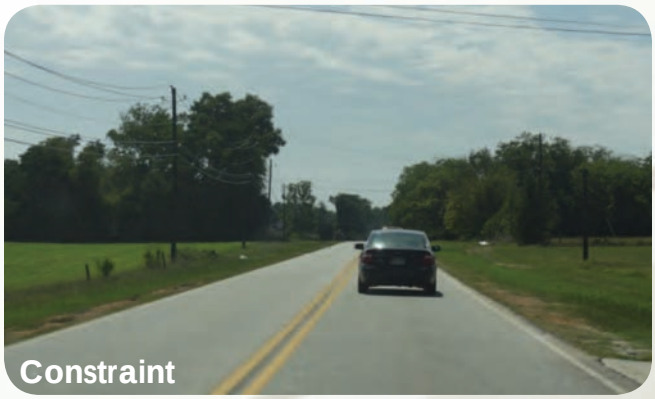


Figure 3-8: *There are also many roadways throughout the region that are too narrow for bicyclists and motorists to comfortably share the road.*

High-volume, high-speed roadways (Figure 3-7): There are many wide high-volume commercial roadways throughout the region with high speeds and little shoulder where bicyclists are not safe. These roadways are, at times, the only connection to numerous commercial, retail, and office destinations. Examples include Washington Road in Augusta-Richmond and Columbia Counties and Whiskey Road in Aiken County.

Narrow roadways and lanes (Figure 3-8): There are also many roadways throughout the region that are too narrow for comfortable bicycle travel. These roads have little or no shoulder and have relatively high vehicle travel speeds which pose multiple hazards for bicyclists. Examples of this can be seen on portions of Belair Road in Augusta and Banks Mill Road in Aiken.

Railroad crossing access issues: There is poor access across railroad tracks. At-grade crossings are common throughout the region and many of these are dangerous for bicyclists because of the uneven surfaces with the roadway and tracks (in addition to the hazards they cause for people with strollers, wheelchairs, or walkers). Laney Walker Boulevard, Old Evans Road, Evans to Locks Road and Dibble Road all provide examples.

Driveway access management: High frequency of driveways and parking lot curb-cuts present repeated hazards to cyclists as the automobile crosses the cyclists' path of travel. Additionally, curb-cuts that stretch beyond standard ingress and egress width add to the hazardous conditions, making it difficult for a bicyclist to predicate motor vehicle turning movements.

Roadways currently designed for automobile only: Many roads were designed around the automobile and need to be redesigned to be more bicycle friendly. Narrowing existing lanes and adding planted medians, sidewalks, and shade trees could also help reduce speeding and the hazards that speeding presents to cyclists, pedestrians, and drivers.

Pedestrian Infrastructure

Overview

The ARTS region features some areas that are pedestrian-friendly, and many areas that are not. On any given day, hundreds of pedestrians can be observed throughout the central areas of Aiken and Augusta in particular. Sidewalks and crosswalks have existed in the downtown areas in many cases since the early history of the cities. The portion of Columbia County within the ARTS region has experienced rapid growth in development in recent years and has not had the benefit of building on established, historic walkable community patterns. While some neighborhoods in the region have adequate pedestrian facilities, a majority, unfortunately contain little to none.

The region is giving attention to pedestrian friendly concerns. In particular, Columbia County has begun the process of inventorying sidewalks and promoting walkable nodal developments. The Augusta and Aiken communities have taken steps to preserve and improve the pedestrian friendliness of their central business districts and North Augusta has implemented an impressive network of pedestrian friendly Greeneways. Additionally, many intersections in the region have countdown signals and ADA accessible curb ramps. This is not the case for all intersections, however.

Strengths of Existing Pedestrian Conditions

Sidewalks (Figure 3-9): Downtown environments have a pedestrian-friendly sidewalk infrastructure and buffered sidewalks exist near some schools.

Some enhancements in place: Many intersections already contain functional pedestrian elements including pedestrian-activated countdown signals. Streetscape improvements that affect the pedestrian environment are in place in many areas, as well.

Downtown (Figure 3-10): The downtown environments of Augusta and Aiken, in particular, provide very pedestrian-friendly infrastructure. Sidewalks are wide and allow space for streetscape amenities, and pedestrian refuges exist at many downtown street crossings. Moreover, active storefronts and first-floor retail create inviting destinations for pedestrians.

Multi-use paths (Figure 3-11): The region has begun to significantly invest in greenways (and Greeneways) to provide transportation and

Photo Inventory of Existing Pedestrian Conditions

Figure 3-9: *Buffered sidewalks exist near some schools and other destinations.*

Figure 3-12: *Numerous gaps in the sidewalk system exist, especially in more recently developed areas.*

Figure 3-10: *The downtown environments of Augusta and Aiken, in particular, provide very pedestrian-friendly infrastructure.*

Figure 3-13: *Unfriendly crossing facilities are commonplace lacking high-visibility crosswalks, adequate curb ramps, and countdown signals.*

Figure 3-11: *The region has begun to significantly invest in greenways (and Greeneways) to provide transportation and recreation options for areas of existing and future development.*

Figure 3-14: *Many commercial corridors feature long, wide, and multiple driveway entrances which creates safety hazards for pedestrians and other roadway users.*

recreation options for areas of existing and future development.

Deficiencies of Existing Pedestrian Conditions

Lack of overall connectivity (Figure 3-12): Numerous gaps in the sidewalk system exist, especially extending away from downtown areas. This leaves some neighborhoods and destinations disconnected from other areas. Many school areas are lacking adequate pedestrian infrastructure.

Inadequate crossing facilities (Figure 3-13): Incomplete crossing facilities are commonplace lacking high-visibility crosswalks, adequate curb ramps, and countdown signals.

Sidewalk condition: Existing sidewalks, in many locations, are cracking, overgrown, or otherwise in need of repair.

Railroad crossing access issues: At-grade railroad crossings are common throughout the region and many of these are dangerous for pedestrians (particularly persons with strollers, wheelchairs, or walkers) because of the uneven surfaces with the sidewalks and tracks. Also, the crossings also do not have pedestrian-specific automatic gates. Laney Walker Boulevard and 9th Street-James Brown Boulevard serve as examples of this issue.

Driveway access management (Figure 3-14): There are numerous locations along commercial corridors that feature long, wide, and multiple driveway entrances for parking which creates hazards for pedestrians and other roadway users.

Policy Review

The existing conditions for bicycling and walking in the ARTS region is impacted by existing codes, ordinances, and regulations. Appendix B of this Plan provides a comprehensive review of development requirements related to bicycle and pedestrian facilities for five jurisdictions within the ARTS study area. The jurisdictions evaluated were Augusta/Richmond County (GA), Columbia County (GA), City of North Augusta (SC), City of Aiken (SC), and Aiken County (SC). Each of these communities is a member of the ARTS community and representative of the "state of the practice" within the ARTS region. The review was not limited to land development ordinances of each jurisdiction; some of these jurisdictions also have design guidelines associated with streets and North Augusta has a recently-completed Greeneway, Pedestrian, and Bicycle Master Plan, which was reviewed, as well.

Key findings of the review are as follows:

- None of the jurisdictions researched have a Complete Streets Policy nor guidelines specific to Complete Streets, although North Augusta includes Complete Streets principles in its Comprehensive Development Ordinance (CDO)
- Both North Augusta and Aiken incorporate some Form Based coding in their development standards– citywide in North Augusta and in the Downtown District for Aiken
- All communities have design guidelines geared primarily toward the movement of motor vehicles; however, North Augusta includes Complete Streets principles in text and tables, though has not yet provided design details or illustrative sections
- None of the jurisdictions have explicit state-of-the-art guidance on the design and implementation of bicycle and pedestrian facilities in the form of design guidelines, although the topic is referenced in several of the documents reviewed
- While four of the five jurisdictions (excepting Augusta/Richmond) regulate block size and connectivity (motorized and non-motorized), only the guidelines written by North Augusta would consistently result in walkable communities, and only in TND "use pattern" areas. In Columbia County and the City of Aiken, adding additional pedestrian-scale connectivity within long blocks is left to the discretion of planning and zoning staff rather than being required. The allowable maximum length of dead-end streets is also problematic for all but the City of North Augusta, where it has not been specified. However, Columbia County, Aiken, County, and North Augusta do discourage the building of cul-de-sacs wherever possible
- None of the jurisdictions reviewed considered elements such as multi-modal level of service as criteria for development

review, although North Augusta does prioritize traffic mitigation measures for new development approvals that includes multi-modal measures

- None of the jurisdictions reviewed included any strategy for sidewalk or bicycle facility retrofits on existing facilities
- The jurisdictions have variable approaches to regulating automobile and bicycle parking. In no location is bicycle parking required, and in all but North Augusta, minimum automobile parking requirements appear to be excessive. Waivers to these minimums, tend to be limited to very small geographies

The policy evaluation indicates that ARTS could provide guidance and direction to its member municipalities to significantly strengthen many areas regarding complete streets, bicycle, and pedestrian facility requirements and enhancements within the context of their development ordinances. Additional guidance geared toward retrofit of existing facilities is also recommended. Policy recommendations to address these opportunities are provided in Chapter 6.

"To the extent that bicycling and walking trips replace single-occupancy vehicle trips, they reduce emissions and have tangible economic impacts by reducing traffic congestion, crashes, and maintenance costs. In addition, the reduced need to own and operate a vehicle saves families money."

Chapter Four

Quantitative User Needs Analysis

Introduction

To better understand bicyclist and pedestrian needs, the consulting team conducted a detailed analyisis investigating the current safety, suitability, and demand for bicycling and walking in the ARTS region. This analysis is divided into four parts within this chapter:

- An analysis of current bicyclist and pedestrian suitability in the region.
- A demand and benefit analysis of bicycling and walking in the region.
- Bicyclist and pedestrian count results and their implications.
- A safety analysis which includes an investigation of crashes involving bicyclists and pedestrians in the region.

Suitability Analysis

This section summarizes the inputs and methods of the Augusta Regional Transportation Study (ARTS) Bicycle and Pedestrian Sustainability Analyses (BSA and PSA, respectively). The analysis was completed using Geographic Information Systems (GIS). The Bicycle and Pedestrian Suitability Analysis models use a quantitative overlay approach discussed in detail in this report to identify areas with the greatest potential to produce cyclist and pedestrian trips, as well as the roadways most suitable for such trips. In combination, these results aid in the prioritization of the investments needed to produce an effective cyclist and pedestrian regional network.

Bicycle and Pedestrian Suitability Analysis Overview

The BSA and PSA models were developed to evaluate potential bicycle and pedestrian activity levels in areas covered in the ARTS. These areas include portions of Aiken County in South Carolina and Columbia and Richmond-Augusta Counties in Georgia.

The analyses:

- Quantify factors that impact bicycle and pedestrian activity.
- Locate bicycle and pedestrian network gaps as potential projects.
- Identify potential regional bicycle and pedestrian corridors.
- Guide the development of new pedestrian and bicycle trip generation tools that enhance the user experience and maximize bikability and walkability.

BSA and PSA identify areas where cyclists and pedestrians are most likely to be. The analyses assign weighted values to available mapped data (metrics) based on the data's relative impact on cycling and walking. Impacts take the form of both trip generators and attractors, collectively approximating network **demand**, or infrastructure suitability, representing network **supply**. BSA and PSA demand scores are assigned to areas throughout the region based on the density of generator variables and the proximity to attractors. Demand scores are then overlaid on top of supply to understand roadway quality in areas with high potential demand. Roadway quality incorporates characteristics that make cycling and walking viable, such as traffic speed and volume. The results of this technique can therefore be used to prioritize projects in areas with high demand. Where that demand meets suitable infrastructure, cost-effective investments can help to create a safe and direct network for cyclists and pedestrians. In areas with low suitability, interventions may help to improve conditions, or off-road facilities may provide an alternative for cyclists and pedestrians.

Metrics are divided into five sub categories: **live, work, play, transit, and roadway quality**. The live, work, and play categories represent the destinations that will generate and attract walking and cycling trips, such as homes, workplaces, and recreational amenities. Transit is also considered an attractor category, since transit stops are destinations in themselves providing wider regional access to cyclists and pedestrians. Roadway quality represents trip supply. It includes characteristics of the road network (like shoulder width, traffic, and connected intersections) that allow cyclists and pedestrians to reach each of the other destinations. Table 4-1 presents the metrics by category.

Combining these metrics into one map enables the prioritization of projects that will have the greatest impact on the greatest number of people. Since demand metrics are mapped at different scales, (e.g. points of interest are mapped as nodes and population density is mapped by U.S. Census block group), each metric was converted to a similar scale so that values could be summed. Specifically, a square grid of 100 feet by 100 feet was laid across the entire ARTS region and each metric was converted to this grid. The composite demand values were then compared to the roadway quality scores. Since every community is different, the inputs and scoring methods used in the BSA and PSA are tailored to local needs and values.

This analysis is based on data obtained from ARTS and its municipalities, the Georgia Department of Transportation, the South Carolina Department of Transportation and the University of South Carolina's GIS Data Server. Data was selected based on its availability and regional significance. The following sections present the inputs and analysis for each category examined, as well as the final composite results.

Data Inputs

BICYCLE AND PEDESTRIAN GENERATORS

The datasets described in this section approximate the potential trip generation of homes and workplaces throughout the region. The data extent covers the entire region, and thus provides a composite score for every space within the region for each category. Scores are assigned based on factors affecting the likelihood of trips to and from home and work. Figure G-1, Figure G-2, Figure G-6, and Figure G-7 in Appendix G summarizes these scores.

Live

BSA and PSA utilize a variety of demographic data to indicate where potential volumes of cycling and pedestrian activity will be generated. Base population density, percentage of households without immediate access to a car, and the percentage of people already biking and walking to work are all contributors to this category. Demographic datasets were derived from the 2000 US Census and synthesized into a spatial database in GIS.

Work

Another key indicator of trip volume is the density of places of employment and college student populations. Employment density was obtained via the Longitudinal Employment and Household Dynamics (LEHD), a program conducted by the US Census Bureau. This data was broken down into two sub-categories based on the North American Industry Classification System (NAICS). These categories were separated into service and commercial/manufacturing jobs. The service industry was assigned a higher weight than the commercial/manufacturing industry since these locations tend to draw in customers and generate foot traffic and are therefore both a trip generator and attractor. College student body totals were obtained from a variety of sources

Table 4-1: BSA and PSA Metrics Overview

Category	Metric
Live	Population density, vehicle ownership inventory and journey to work mode
Work	Employment density by job sector and college enrollment density
Play	Proximity to points of interest and schools
Transit	Proximity to bus stops
Roadway Quality	Speed limit, connected/disconnected intersections, slope, etc.

and were included in this category because students typically spend the same number of hours on campus as workers do in a typical day.

BICYCLE AND PEDESTRIAN ATTRACTORS

The datasets described in this section approximate the potential of destinations and transit facilities throughout the region to attract cyclists and pedestrians and thus generate trip demand in areas surrounding them. Unlike the generators described previously, each of these datasets does not cover the entire region but is rather represented as point or polygon nodes distributed throughout the region. Like the colleges described above, these nodes are buffered before overlaying the datasets so that areas closer to the attractor receive higher scores than those farther away. Figure G-3, Figure G-4, Figure G-8, and Figure G-9 in Appendix G illustrate attractor scores in the ARTS region.

Transit

Transit stops act as attractors to cyclists and pedestrians, because they provide potential access to and from many of the other generators (e.g., workplaces, homes) and attractors (e.g., parks, schools) that might otherwise be too far away to bike or walk. In the ARTS region, buses are the only available public transit option, thus bus stops are used as the only data input to the transit map. It is assumed that cyclists will travel up to three miles to access a bus stop, and pedestrians will walk up to one mile. Within these 3-mile and 1-mile areas, scores are assigned, decreasing with increasing distance from the stop, to approximate the decreasing attractiveness of bus stops the farther they lie from a traveler's starting point or destination.

Play

The features in this category represent destinations other than homes and workplaces that are likely to attract cyclists and pedestrians. While cycling and walking are different in nature, the features that attract this activity are quite similar. Varying scores were assigned to each of the features comprising the "play" category, recognizing that some features are more likely to attract cycling and walking than others. Features of regional significance, such as parks, campgrounds, and hotels, are given higher scores, though schools and retail corridors also play a significant role in this category and are scored accordingly.

BICYCLE AND PEDESTRIAN INFRASTRUCTURE SUITABILITY

While all the generator and attractor categories described previously collectively demonstrate potential bicycle and pedestrian trip demand throughout the region, this section describes the potential of road infrastructure to meet that demand. Figure G-5 and Figure G-10 in Appendix G illustrate roadway quality in the ARTS region.

Roadway Quality

Various roadway characteristics collectively comprise the "roadway quality" category. This category is used to understand the quality of available infrastructure supporting cyclist and pedestrian travel between destinations within the generator and attractor categories. Roadway quality is defined by looking at connectivity, safety (collision history from 2008 - 2010), bicycle and pedestrian infrastructure, average daily traffic (ADT), vehicular speed and slope. A majority of the categories are broken into five divisions by their respective units and scored 1 to 5 according to those divisions. The divisions used for average daily traffic and traffic speed are both based on the London Cycling Design Standards.

BSA and PSA Composite Activity Models

Development of the Composite Activity Model followed two steps:

Combine bicycle and pedestrian attractor and generator composite datasets to produce a composite activity score dataset of the region, approximating **demand**. Figure 4-2 and Figure 4-3 illustrate this potential activity for the BSA and PSA respectively.

Overlay the appropriate composite roadway quality score, approximating **supply**, to create a Composite Activity Model.

The Composite Activity Model can be used in several ways to identify areas for improvement and to prioritize projects. These are summarized below.

- Areas with high demand for cycling and walking and high supply of suitable infrastructure can benefit from innovative programs and capital projects that further

support cycling and walking, closure of key gaps, and should be considered showcase areas where best practices can be modeled for the region. These areas provide cost-effective opportunities for improvements and should be high priority for investment.

- Areas with high demand for cycling and walking and low supply of suitable infrastructure can benefit from infrastructure improvements to improve cycling and walking conditions. These areas may require off-road facilities for conditions such as high traffic volume or speed. They should also be high priority for investment.
- Areas with low demand for cycling and walking and high supply of suitable infrastructure can benefit from programs to encourage cycling and walking, and land use changes or development to increase the density of attractors and generators. These areas should be medium priority for investment.
- Areas with low demand for cycling and walking and low supply of suitable infrastructure can benefit from basic infrastructure improvements. These areas should be low-priority for investments.

Composite Activity Models were developed for the entire ARTS region, which includes portions of Aiken County and Edgefield County, in SC, and portions of both Columbia and Richmond-Augusta County, in GA. Independent Composite Activity Models were also developed for Aiken County. Areas of Aiken County that are included in both models have consistent scores but are scaled to the geographic extents of each region (ARTS and Aiken County). This has an effect on only the ranges of values but the streets receive consistent values.

Figure 4-1 describes the recommendation development concept in matrix form. Figure 4-4 and Figure 4-5 on the following pages show the Composite Activity Model results for the ARTS Region.

Figure 4-1: Composite Activity Model Recommendation Summary

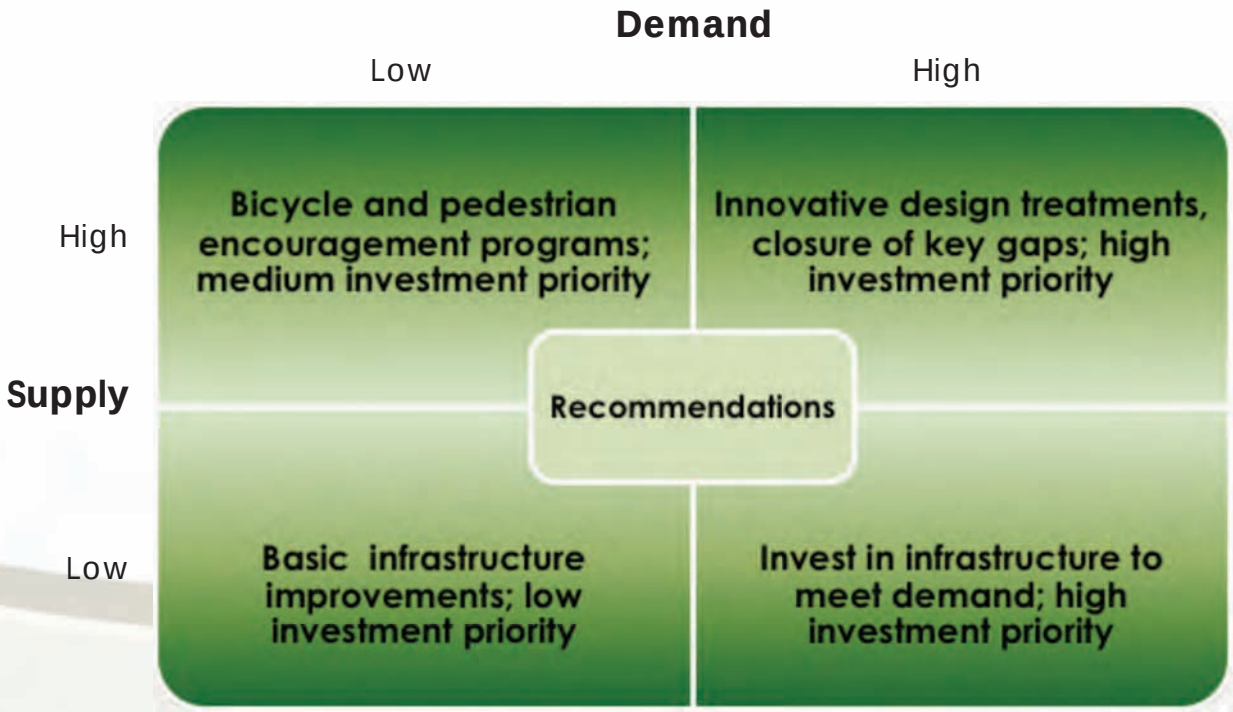


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Figure 4-2: ARTS Demand Composite Map – Bicycle

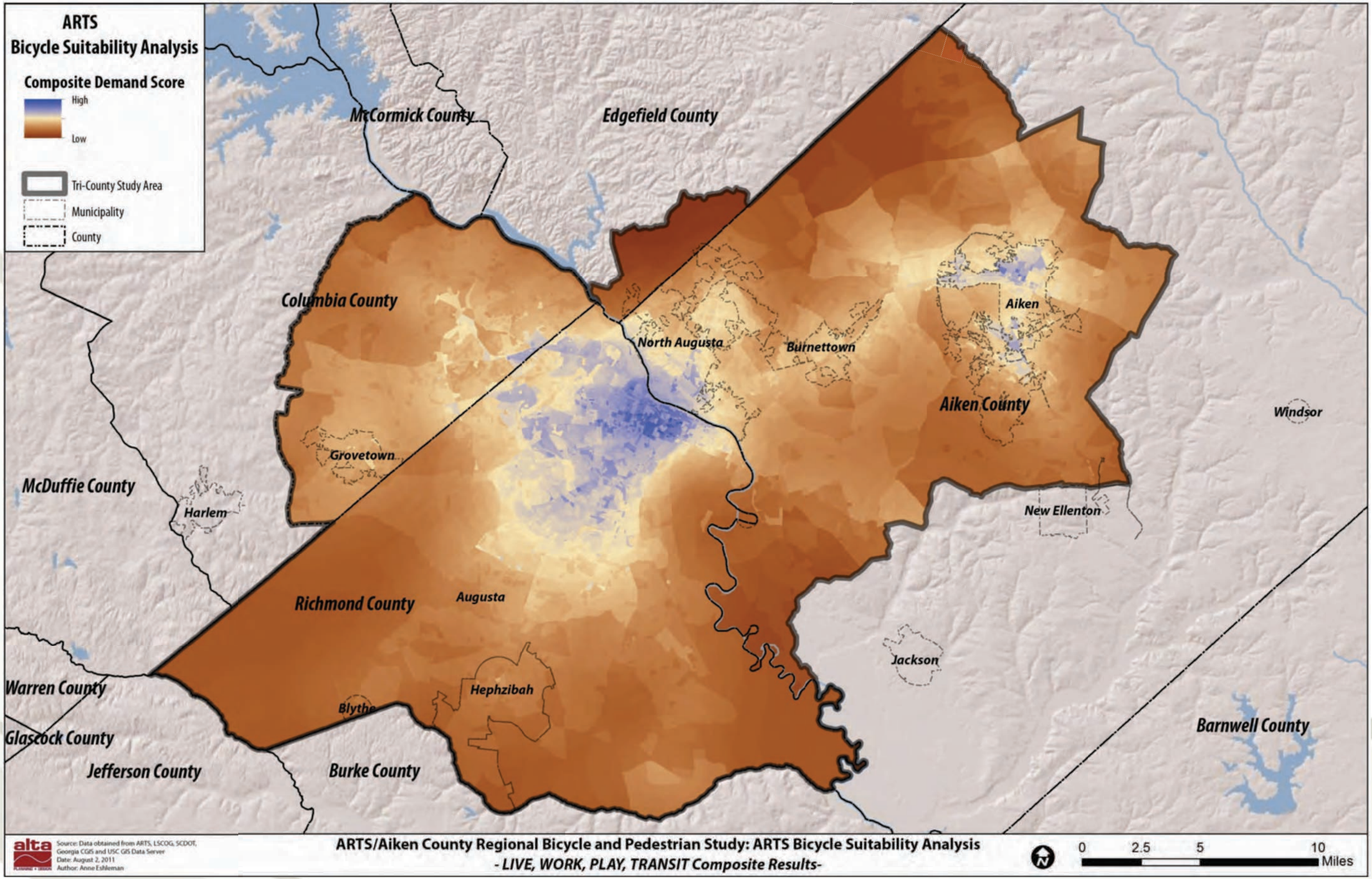


Figure 4-3: ARTS Demand Composite Map – Pedestrian

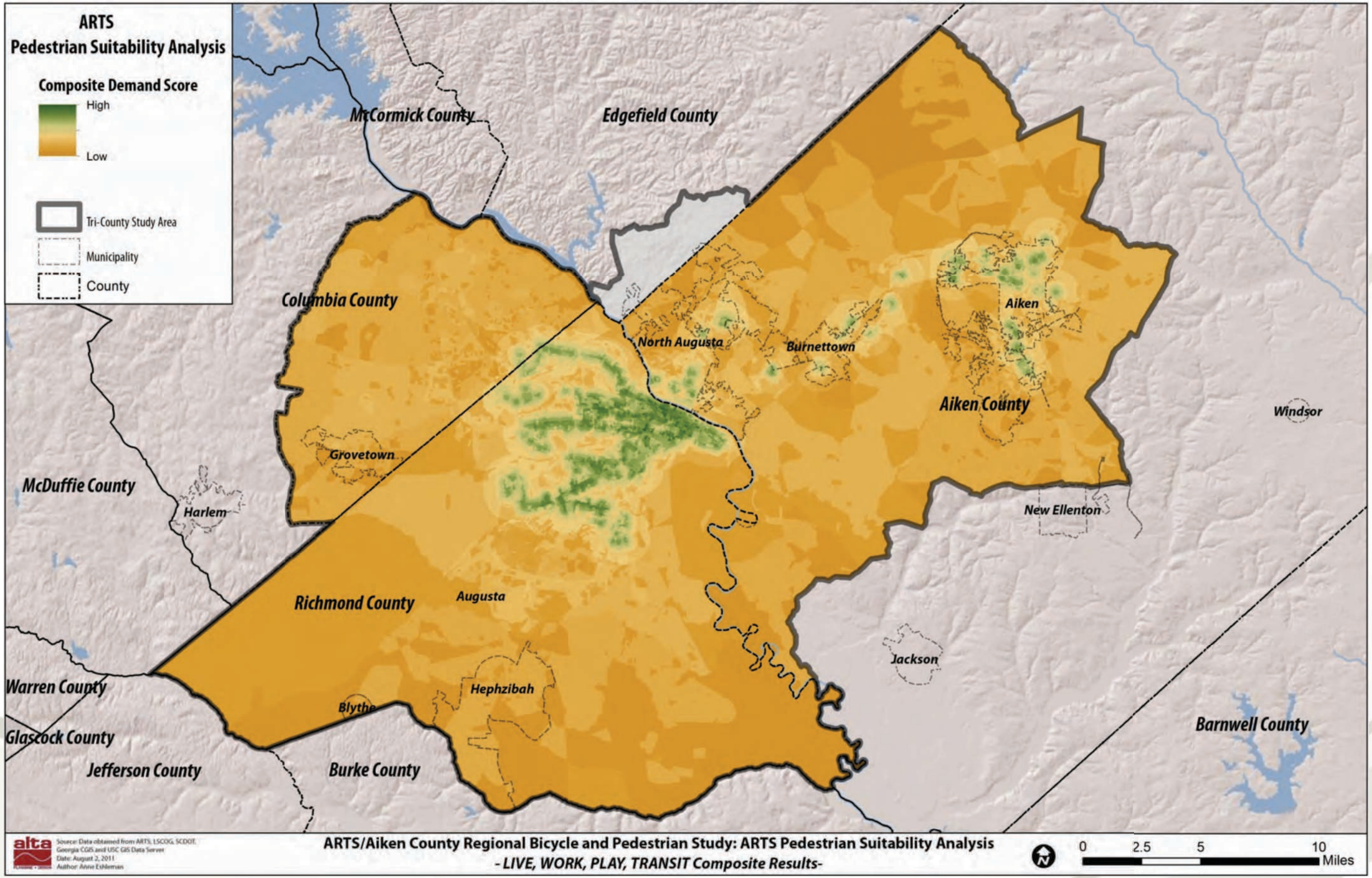


Figure 4-4: ARTS Composite Activity Model Map – Bicycle

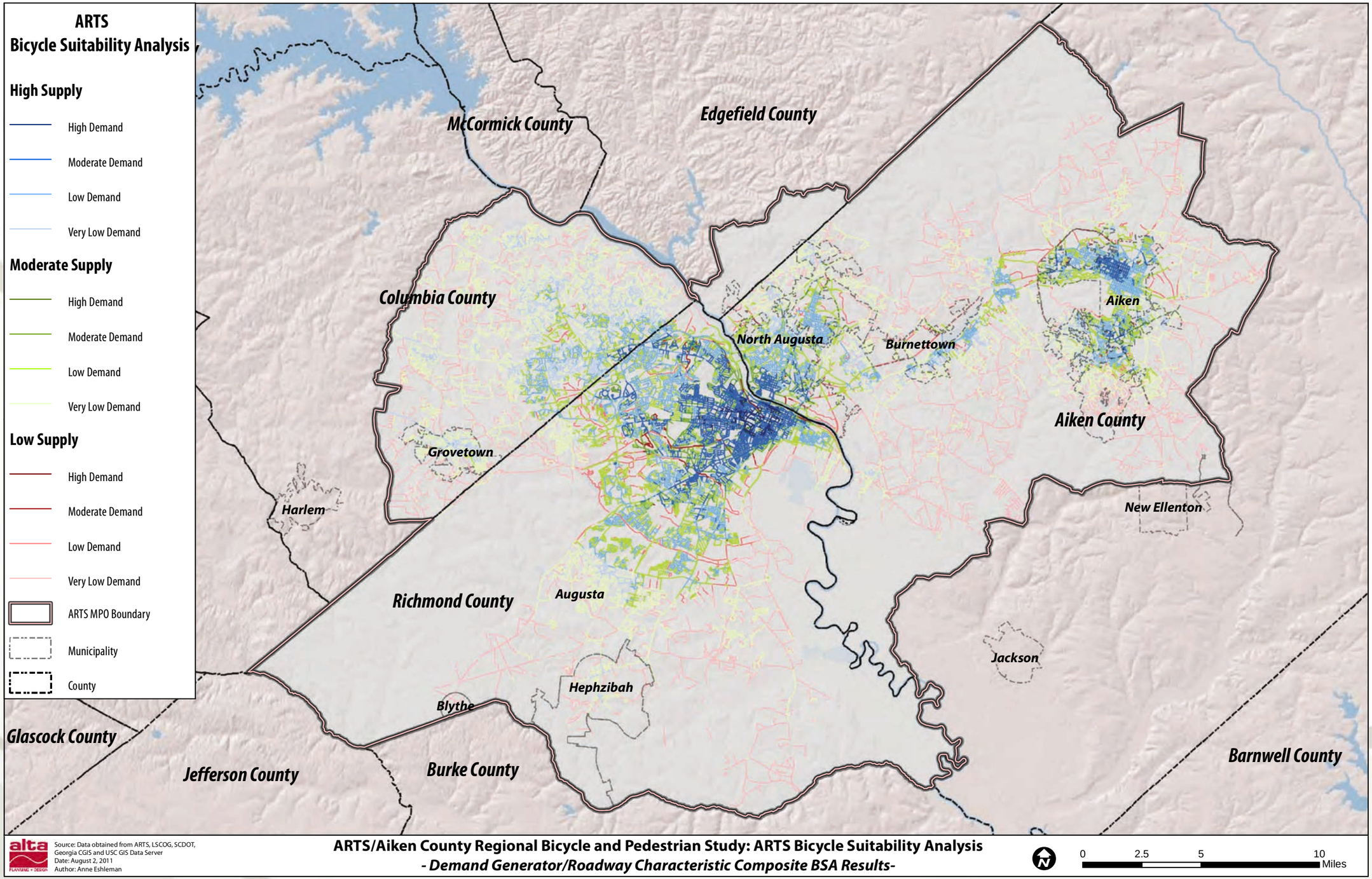
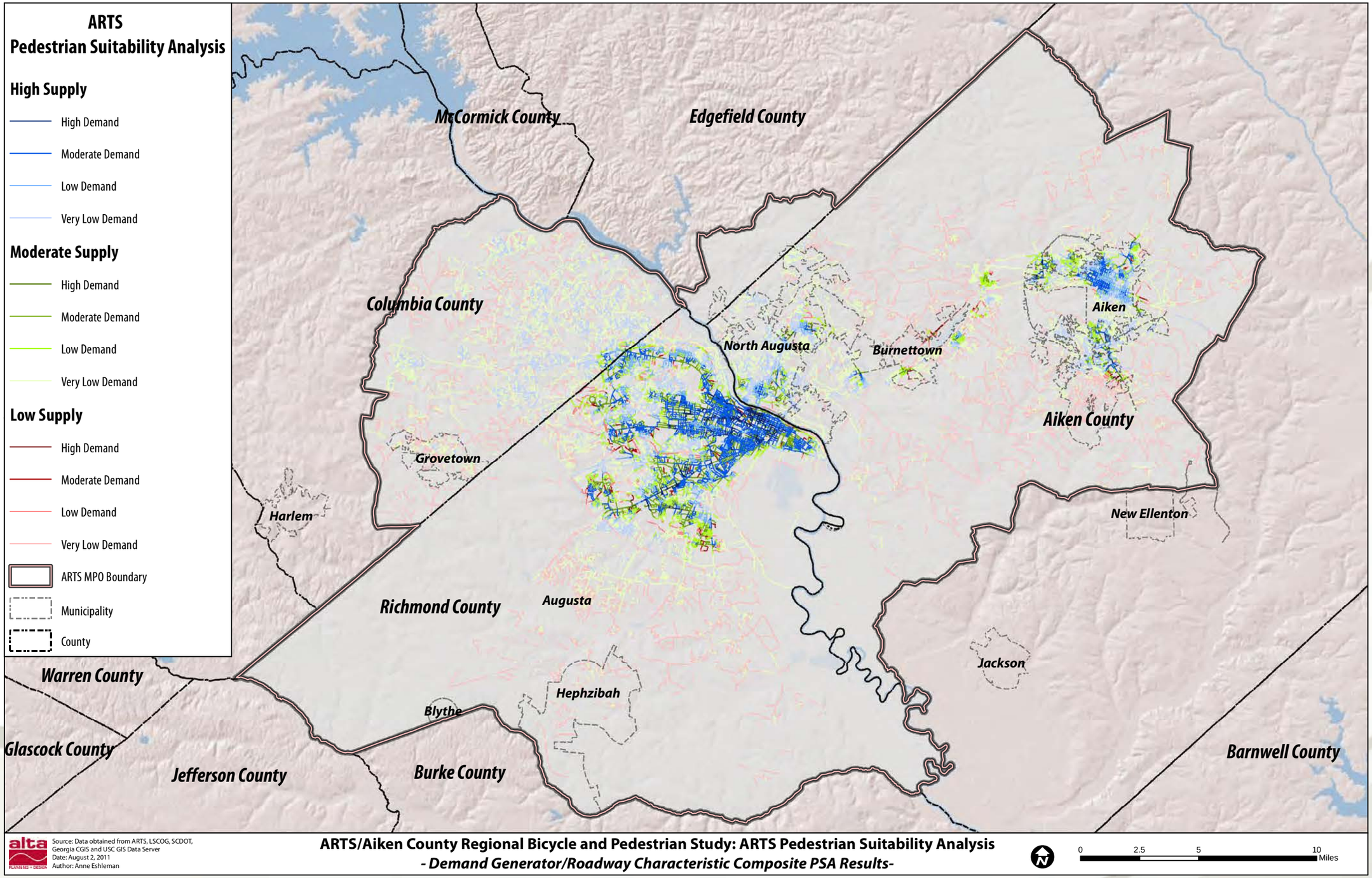


Figure 4-5: ARTS Composite Activity Model Map – Pedestrian



Bicycle and Pedestrian Demand and Benefits Analysis

Investments in bicycle and pedestrian facilities result in a myriad of benefits, including economic, environmental, health and fitness, convenience, and quality of life. The Demand and Benefits Model detailed in this section offers specific projections of existing and future bicycle and pedestrian demand. The assumptions used in the demand model to estimate the number of current and future bicycling trips in the Augusta Regional Transportation Study (ARTS) area and the results of the model are included in this section.

The model uses a market segment approach to estimate the number of bicycling or walking trips taken by populations that traditionally have a higher bicycling/walking mode split than work commuters (such as elementary school and college students). National transportation surveys, in particular the *National Household Travel Survey* (NHTS, 2009), have shown that work commute trips are only a fraction of total trips an individual takes on a given day. The model uses the NHTS findings to estimate the number of non-work, non-school trips taken by commuters to determine the number of walking or bicycling trips that occur in a day.

Data Used in the Model

Journey-to-work information collected by the US Census Bureau's *American Communities Survey* (ACS) is the foundation of this analysis. The most recent ACS data available for the ARTS region and Aiken County is the 2005-2009 five-year estimate. Because the ARTS region is not divided along county lines, Census tracts were used. A few of the tracts are partially within the ARTS jurisdiction. The area south of North Augusta, near the Savannah River Site, is relatively rural and the population was assumed to be evenly distributed (e.g., if 30 percent of a tract is within the ARTS boundary, it was assumed that only 30 percent of the total population for that tract is within the ARTS boundary). For the tracts to the northwest near the Augusta Suburbs and to the northeast near North Augusta, it was assumed that the population is concentrated within the ARTS boundary, and a multiplier of 1.5 was added to the proportional area within ARTS.

Model variables for the ARTS region from the ACS include: total population (412,800 people), employed population (179,277 people), school enrollment (70,014 students grade K-12; 28,748 college/university students), and travel-to-work mode split (see Table 4-2).

Richmond County has the highest walking mode split by a large margin, although Aiken has a large number of commute pedestrians compared to other counties. None of the other counties have mode splits higher than the Georgia state average of 1.7 percent or the South Carolina average of 1.9 percent walking. Richmond County also has the highest bicycling mode share at 0.36 percent, which is the only county with a higher rate than the Georgia Average of 0.2 or the South Carolina average of 0.3 percent bicycling.

The 2009 NHTS provides a substantial national dataset of travel characteristics, particularly for trip characteristics of bicycling and walking trips. Data used from this survey include:

- Student mode split, grades K-12
- Trip distance by mode by trip purpose
- Ratio of walking/bicycling work trips to utilitarian trips
- Ratio of walking/bicycling work trips to social/recreational trips

Table 4-2: Commute Mode Share in ARTS Counties

	Aiken	Columbia	Edgefield	Richmond	All Counties	Georgia	South Carolina
Drive Alone	82.8%	85.0%	79.8%	77.3%	80.6%	89.7%	92.2%
Walk	1.4%	0.8%	0.6%	6.0%	3.33%	1.7%	1.9%
Bicycle	0.2%	0.2%	0.0%	0.4%	0.3%	0.2%	0.3%

Source: ACS 2005-2009 Five-Year Estimates
Note: analysis excludes areas of counties outside the ARTS boundary.

Several of these variables are trip type multipliers that provide an indirect method of estimating the number of walking and bicycling trips made for other reasons, such as shopping and running errands. NHTS 2009 data indicates that for every bicycle work trip, there are slightly more than two utilitarian bicycle trips made. Although these trips cannot be directly attached to a certain group of people (not all of the utilitarian bicycling trips are made by people who bicycle to work) these multipliers allow a high percentage of the community's walking and bicycling activity to be captured in an annual estimate.

The *Safe Routes to School Baseline Data Report* (2010) was used to determine the distance of school trips using parents' estimate of distance as well as the frequency of carpooling for trip replacement.

Disclaimer

As with any modeling projection, the accuracy of the result is dependent on the accuracy of the input data and other assumptions. Effort was made to collect the best data possible for input to the model, but in many cases national data was used where local data points were unavailable. Examples of information that could improve the accuracy of this exercise include the detailed results of local Safe Routes to School parent and student surveys, a regional household travel survey, and a student travel survey of college students.

Existing Walking and Bicycling Trips

Table 4-3 shows the results of the walking demand model, which estimates that almost 140,000 walking trips occur in the ARTS region each day. The majority of these occur in Richmond County, with the fewest in Edgefield County (which has only one Census tract within the study area). Table 4-4 shows the bicycling trip model, which estimates that over 9,000 bicycling trips occur in the region each day. Fifty-nine percent of all bicycling trips in the ARTS region occur in Richmond County.

Based on the model assumptions, the majority of trips are social/recreational trips, followed

Table 4-3: Model Estimate of Current Walking Trips

	Aiken	Columbia	Edgefield	Richmond	All Counties
Commute Trips					
Walking commuters[1]	713	356	6	4,899	5,975
Weekday walking trips	1,425	711	11	9,798	11,945
School Trips					
K-12 walking commuters[2]	2,013	1,923	38	3,428	7,402
Weekday K-12 walking trips	4,026	3,847	76	6,856	14,805
College Trips					
College walking commuters[3]	98	50	0	911	1,060
Weekday walking college trips	196	101	1	1,822	2,120
Daily adult walking commute trips[4]	1,621	812	12	11,620	14,065
Utilitarian Trips					
Daily walking utilitarian trips[5]	5,698	2,853	42	40,849	49,442
Social/Recreational Trips					
Daily walking social/ recreational trips[6]	6,834	3,422	50	48,994	59,301
Total Current Daily Walking Trips	18,179	10,935	181	108,319	137,613

1 Employed population multiplied by ACS commute mode split.

2 School children population multiplied by NHTS 2009 mode split for school/daycare/religious trips by individuals age 5-18.

3 Assumes same mode split as employed population.

4 Number of walking commute trips plus number of walking college trips.

5 Utilitarian walking trips multiplied by ratio of utilitarian to work trips from NHTS 2009 (4.92 utilitariwalking trips to walking commute trips). Distributed weekly trips over entire week (vs. commute trips over 5 days).

6 Social/recreational walking trips multiplied by ratio of social/recreational trips to work trips from NHTS 2009 (5.90 social/ recreational walking trips to walking commute trips). Weekly trips distributed over entire week (vs. commute trips over 5 days).

Table 4-4: Model Estimate of Current Bicycling Trips

	Aiken	Columbia	Edgefield	Richmond	All Counties
Commute Trips					
Bicycling commuters[7]	115	82	0	294	491
Weekday bicycling trips	230	164	0	588	982
School Trips					
K-12 bicycling commuters[8]	128	122	2	218	471
Weekday K-12 bicycling trips	256	245	5	436	942
College Trips					
College bicycling commuters[9]	16	12	0	55	82
Weekday bicycling college trips	32	23	0	109	164
Daily adult bicycling commute trips[10]	262	187	0	697	1,146
Utilitarian Trips					
Daily bicycling utilitarian trips[11]	410	293	0	1,092	1,795
Social/Recreational Trips					
Daily bicycling social/ recreational trips[12]	1,204	862	0	3,211	5,278
Total Current Daily Bicycling Trips	2,132	1,587	5	5,437	9,161

7 Employed population multiplied by ACS commute mode split.

8 School children population multiplied by NHTS 2009 mode split for school/daycare/religious trips by individuals age 5-18.

9 Assumes same mode split as employed population.

10 Number of walking commute trips plus number of walking college trips.

11 Utilitarian bicycle trips multiplied by ratio of utilitarian to work trips from NHTS 2009 (2.19 utilitarian bicycle trips to bicycle commute trips). Distributed weekly trips over entire week (vs. commute trips over 5 days).

12 Social/recreational bicycling trips multiplied by ratio of social/recreational trips to work trips from NHTS 2009 (6.45 social/ recreational bicycling trips to bicycling commute trips). Weekly trips distributed over entire week (vs. commute trips over 5 days).

by non-work utilitarian trips, which include trips for medical/dental services, shopping/ errands, family personal business, obligations, transporting someone, meals, and other trips.

The maps on the following pages show the distribution of mode split for walking and bicycling, respectively. They show the data by Census tract, rather than aggregated by county, and therefore display slightly different mode splits than the average mode split for the county, as shown in Table 4-2. The dots on the map indicate the trip generation based on the analysis shown in Table 4-3 and Table 4-4. Several tracts have relatively high rates of walking and/or bicycling, but most of these have low population numbers and therefore do not generate a substantial number of walking or bicycling trips. One particular tract in Richmond County has the highest walking mode split in the region and a high bicycling mode split. Fort Gordon and the Dwight David Eisenhower Army Medical Center are located in this tract, which has a relatively dense, walkable street grid.

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Figure 4-6: ARTS Walking Trips Demand Model

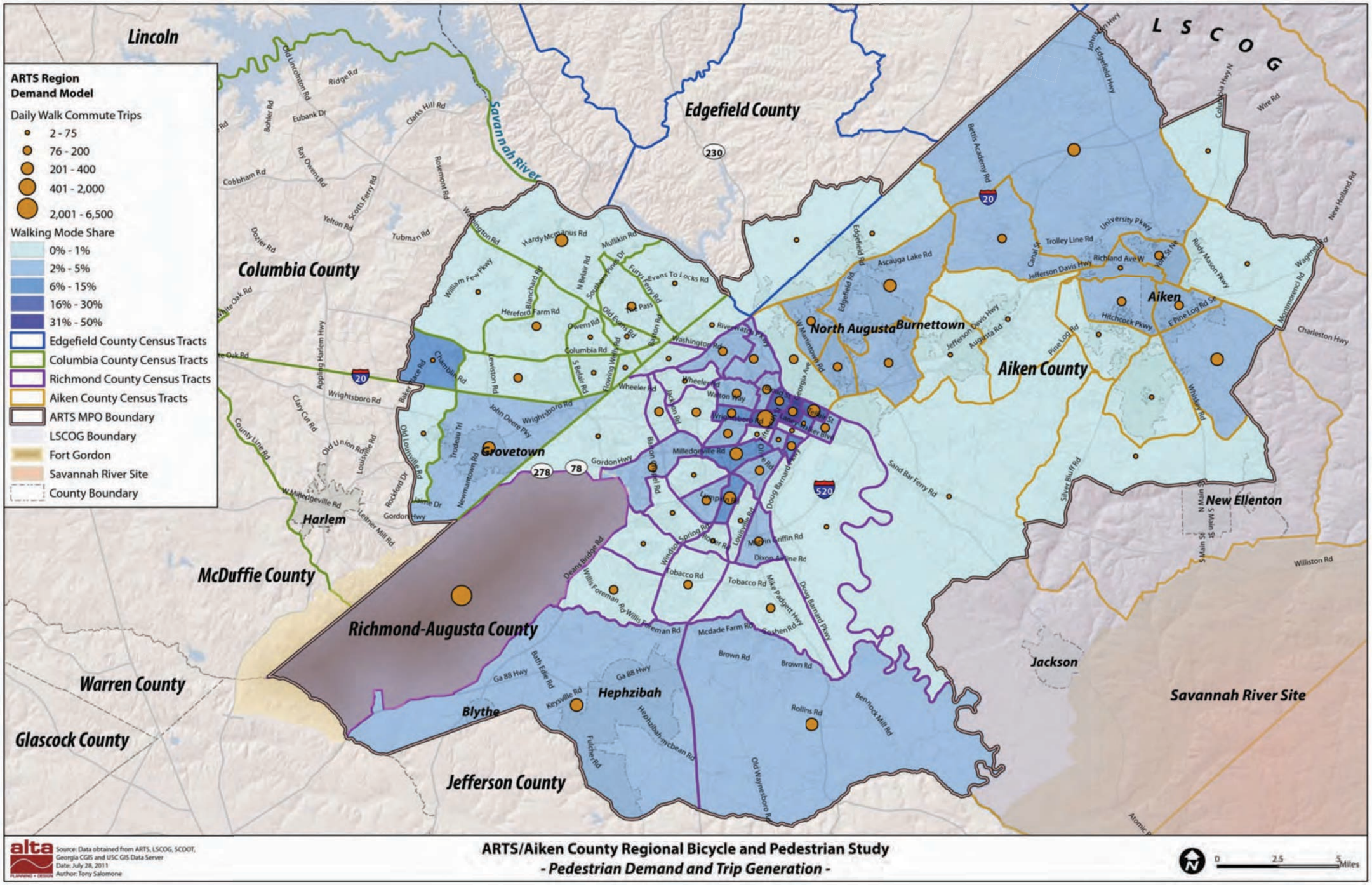


Figure 4-7: ARTS Bicycling Trips Demand Model

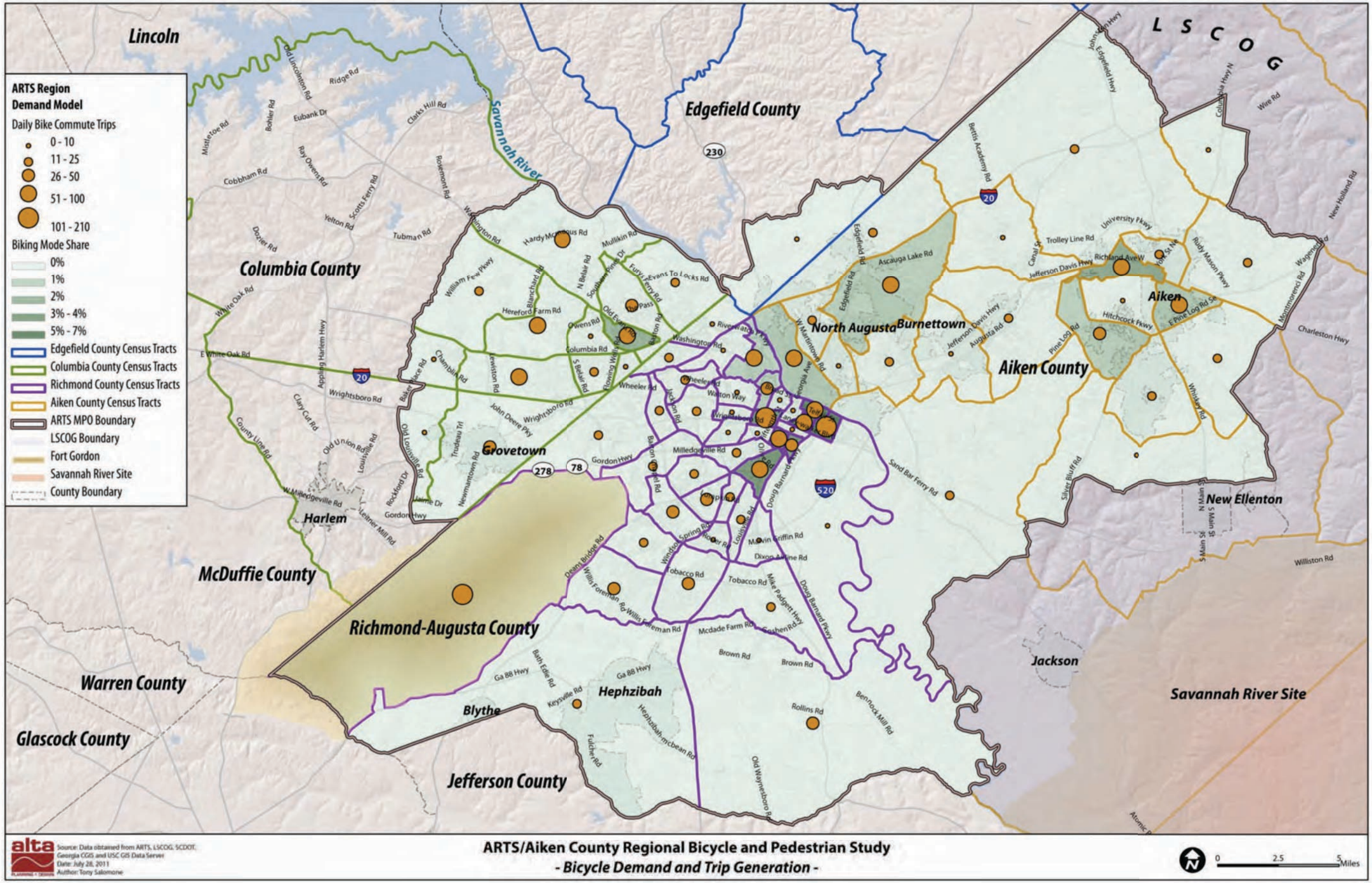


Figure 4-8: Augusta and North Augusta Walking Trips Demand Model

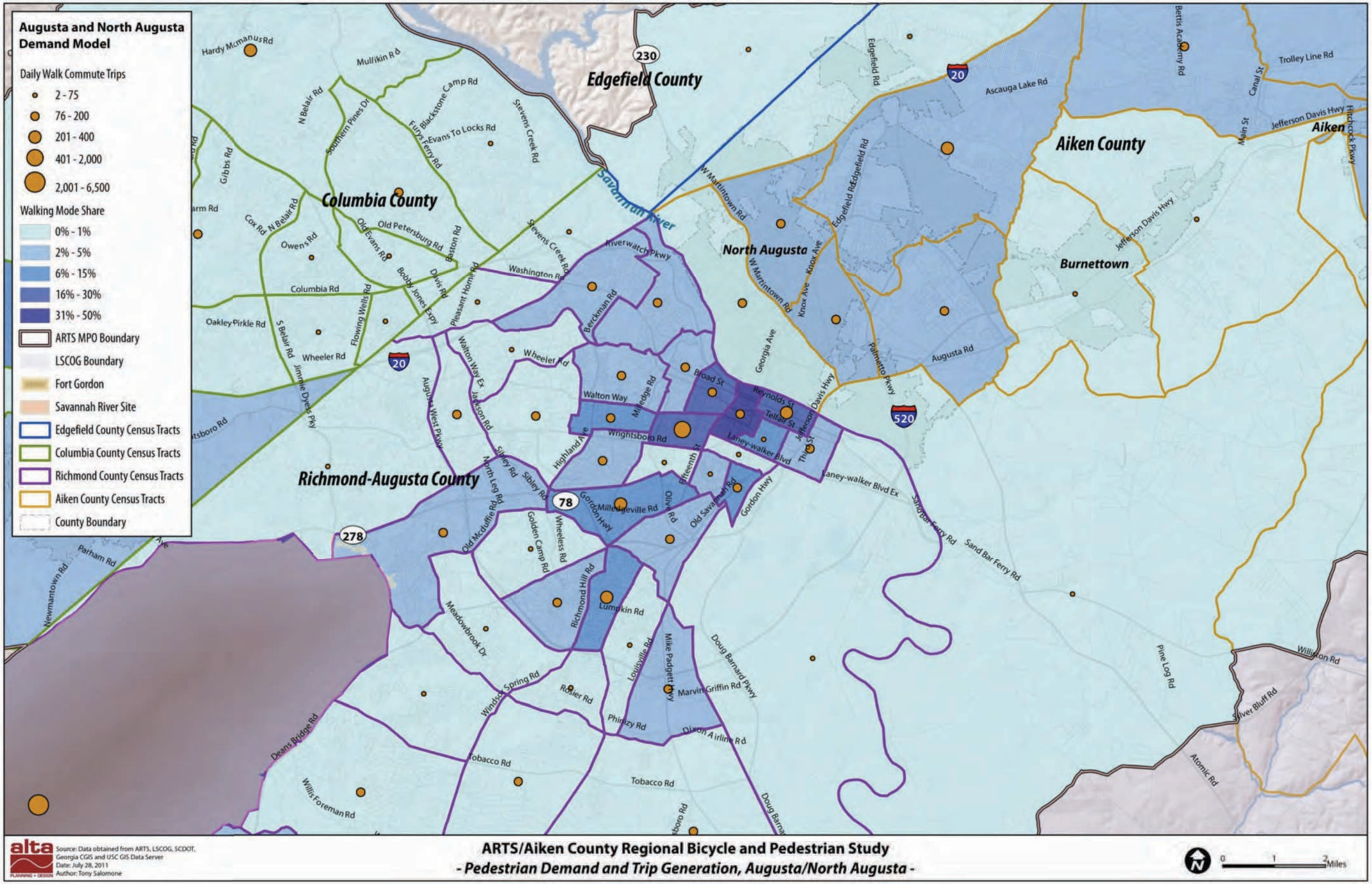


Figure 4-9: Augusta and North Augusta Bicycling Trips Demand Model

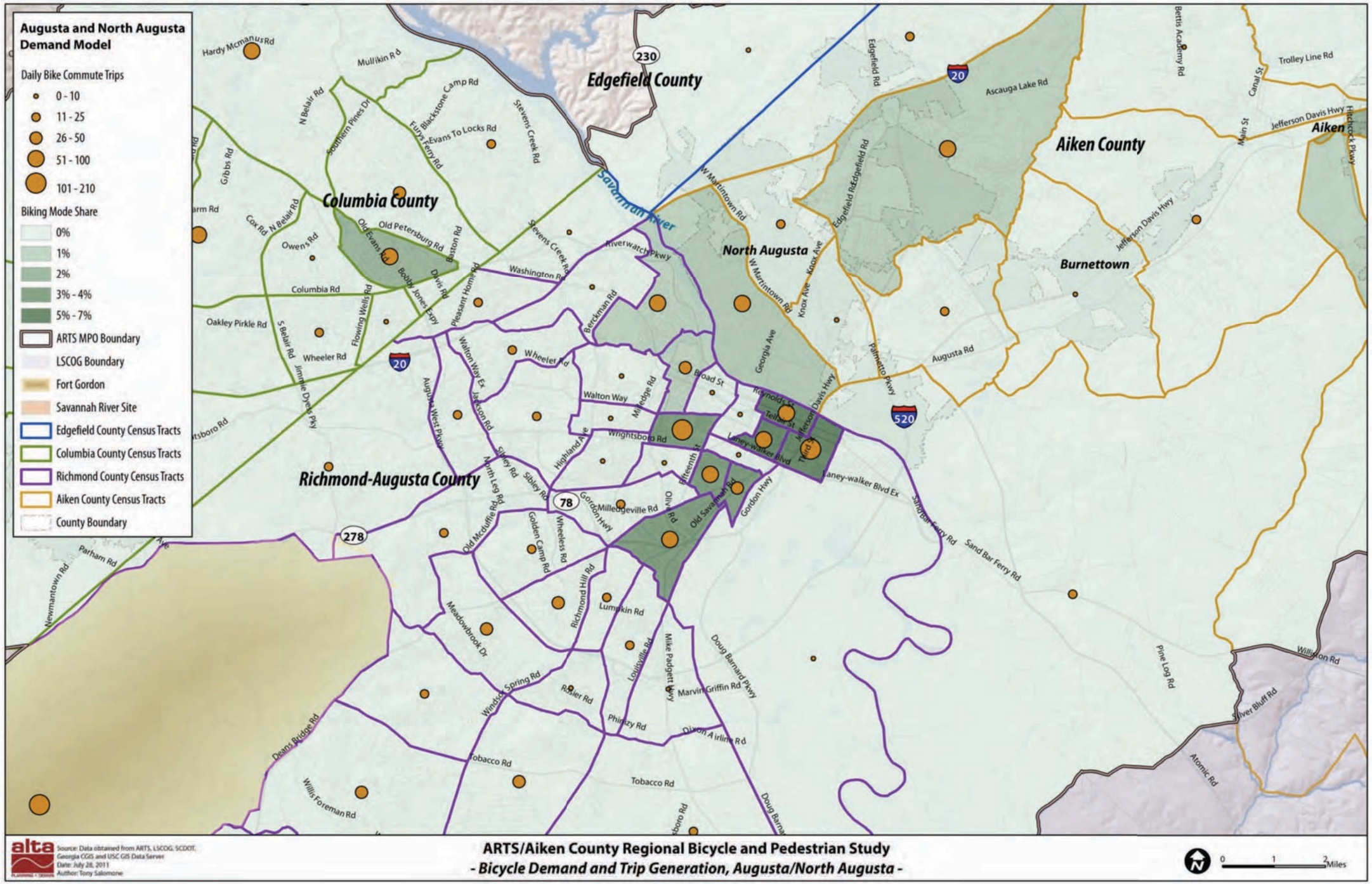


Figure 4-10: Columbia County Walking Trips Demand Model

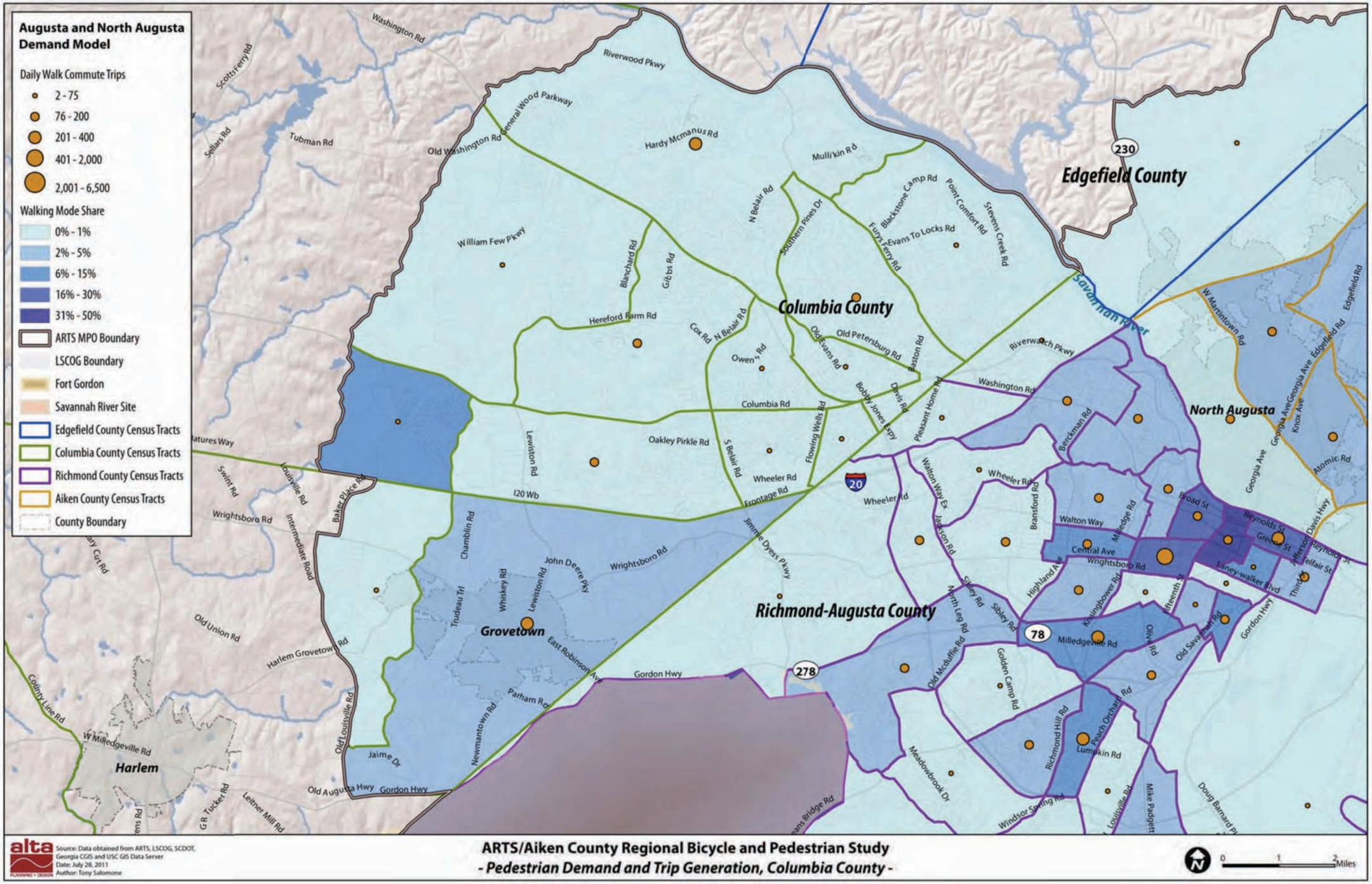
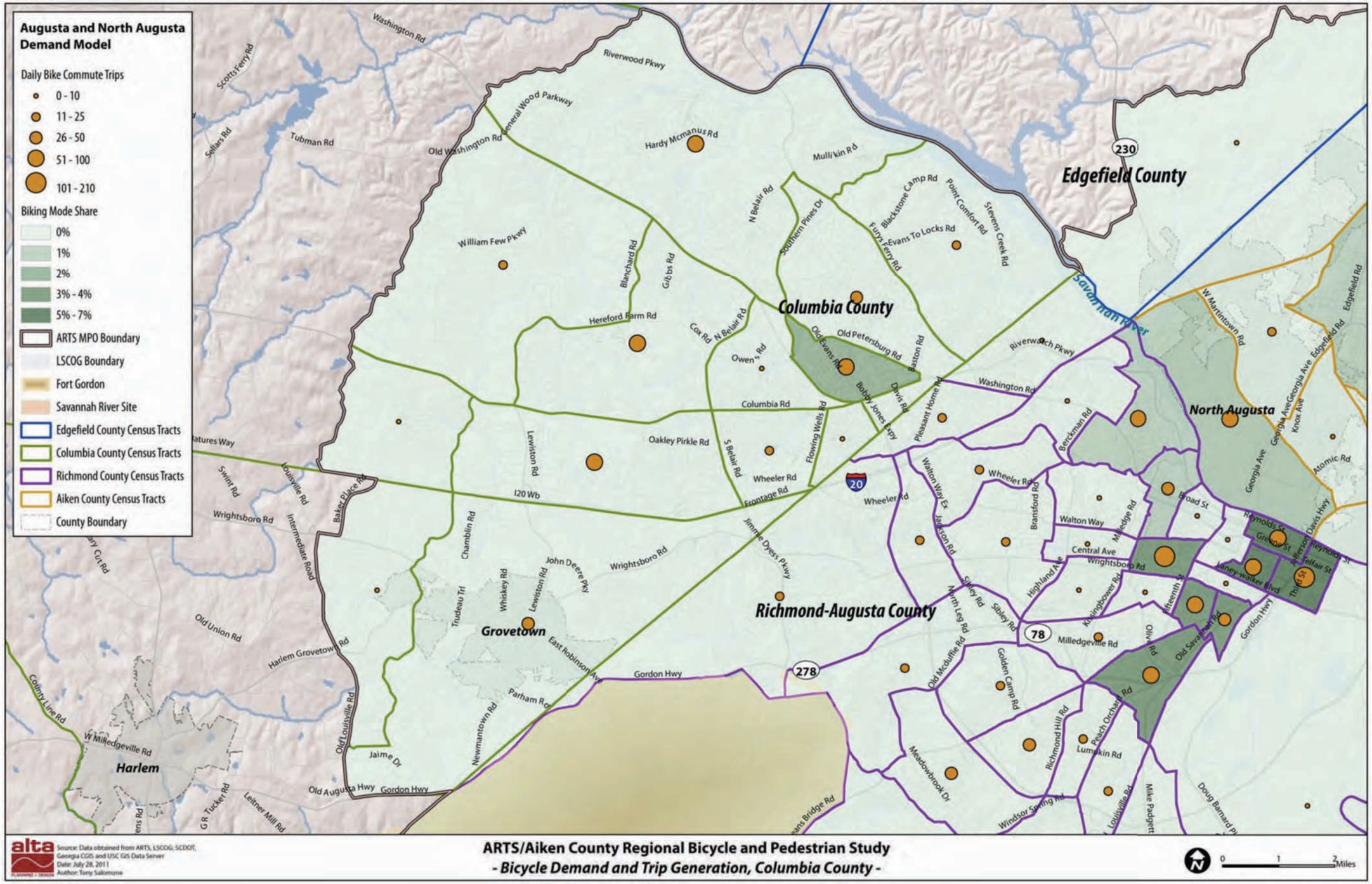


Figure 4-11: Columbia County Bicycling Trips Demand Model



Trip Replacement

Some of these daily walking and bicycling trips are essential trips that individuals would have to take regardless of whether they can walk or bicycle for the trip. If walking or bicycling had not been an option for commute, school/college, and utilitarian trips, some of these trips would have been made by driving. The model estimates that the proportion of these trips that would have been made by driving is equivalent to the drive alone mode split for each county.

To estimate the total distance walking and bicycling trips taken by ARTS residents replace vehicular trips, the model applies trip distance information for walking and bicycling trips by trip purpose from NHTS 2009.

Shown in Table 4-5 and Table 4-6, the model estimates that the estimated 25.5 million commute, school, and other utilitarian walking and bicycling trips each year replace more than eight million vehicle trips, removing more than 6.5 million vehicle miles traveled each year.

Current Benefits

To the extent that bicycling and walking trips replace single-occupancy vehicle trips, they reduce emissions and have tangible economic impacts by reducing traffic congestion, crashes, and maintenance costs. In addition, the reduced need to own and operate a vehicle saves families money.

The Georgia Department of Human Resources estimated that the state's obesity costs are $2.1 billion annually, which is $250 per Georgian each year. The Department also estimates that only 55 percent of middle school students and 44 percent of high school students in Georgia meet the CDC requirements for recommended physical activity. The South Carolina Department of Health and Environmental Control and the South Carolina Coalition for Obesity Prevention Efforts estimated that in 2003, South Carolina's obesity-attributable

Table 4-5: Current Walking Trip Replacement

	Aiken	Columbia	Edgefield	Richmond	All Counties
Commute Trips					
Weekday vehicle trips replaced[1]	1,179	604	6	7,570	9,360
Weekday miles walked[2]	790	405	4	5,072	6,271
School Trips					
Weekday vehicle trips reduced[3]	1,166	1,114	22	1,985	4,286
Weekday miles walked[4]	895	855	17	1,524	3,292
College Trips					
Weekday vehicle trips reduced[5]	162	86	0	1,408	1,656
Weekday miles walked[6]	91	48	0	789	927
Utilitarian Trips					
Daily vehicle trips reduced[7]	1,341	690	6	8,978	11,016
Daily miles walked[8]	894	460	4	5,985	7,344
Yearly Results					
Yearly walking trips	3,279,011	2,000,174	33,313	19,174,417	24,486,916
Yearly vehicle trips reduced	1,057,356	644,410	8,266	5,918,086	7,628,118
Yearly miles walked	725,658	450,423	5,942	3,961,928	5,143,951

1 Trips multiplied by drive alone commute trip ratio to determine automobile trips replaced by walking trips.
2 Number of vehicle trips reduced multiplied by average walking work trip length (NHTS 2009).
3 Trips multiplied by school commute drive alone proportion to determine automobile trips replaced by walking trips (NHTS 2009).
4 Number of vehicle trips reduced multiplied by average trip length to/from school (SRTS 2010).
5 Trips multiplied by drive alone trips to determine automobile trips replaced by walking trips.
6 Number of vehicle trips reduced multiplied by average walking school/daycare/religious trip length (NHTS 2009).
7 Number of daily utilitarian trips multiplied by drive alone trips.
8 Number of vehicle trips reduced multiplied by average utilitarian walking trip length (NHTS 2009; does not include work or home trips).

Table 4-6: Current Bicycling Trip Replacement

	Aiken	Columbia	Edgefield	Richmond	All Counties
Commute Trips					
Weekday vehicle trips replaced[9]	190	139	0	454	784
Weekday miles biked[10]	674	494	0	1,608	2,775
School Trips					
Weekday vehicle trips reduced[11]	74	71	1	126	273
Weekday miles biked [12]	57	54	1	97	209
College Trips					
Weekday vehicle trips reduced[13]	26	20	0	85	130
Weekday miles biked [14]	39	29	0	125	193
Utilitarian Trips					
Daily vehicle trips reduced[15]	216	159	0	539	914
Daily miles biked [16]	410	301	0	1,020	1,731
Yearly Results					
Yearly bicycling trips	265,913	202,307	947	659,063	1,128,230
Yearly vehicle trips reduced	98,672	75,854	274	238,028	412,828
Yearly miles biked	344,164	255,181	211	835,605	1,435,160

Source: ACS 2005-2009 Five-Year Estimates

9 Trips multiplied by drive alone commute trip ratio to determine automobile trips replaced by bicycle trips.
10 Number of vehicle trips reduced multiplied by average bicycling work trip length (NHTS 2009).
11 Trips multiplied by school commute drive alone proportion to determine automobile trips replaced by bicycling trips (NHTS 2009).
12 Number of vehicle trips reduced multiplied by average trip length to/from school (SRTS 2010).
13 Trips multiplied by drive alone trips to determine automobile trips replaced by bicycle trips.
14 Number of vehicle trips reduced multiplied by average bicycle school/daycare/religious trip length (NHTS 2009).
15 Number of daily utilitarian trips multiplied by drive alone trips.
16 Number of vehicle trips reduced multiplied by average bicycling utilitarian trip length (NHTS 2009; does not include work or home trips).

medical expenditures were $1.06 billion.[1] Development of a bicycle and pedestrian network, as well as support facilities and encouragement programs such as Safe Routes to School will encourage people to become active. Health care benefits are not calculated for the current condition, because people who already walk and bicycle are people who would likely have found an alternative avenue for physical activity. Health benefits are therefore calculated in the future estimate only. Other current benefits are shown in Table 4-7.

Potential Future Walking and Bicycling Trips

Estimating future walking and bicycling trips requires additional assumptions regarding ARTS's future population and anticipated commuting patterns in 2035 (the latest year for which estimates are available). Future population predictions were determined by ARTS staff for the 2035 *Long Range Transportation Plan* (LRTP) and incorporated into the regional demand model by the Georgia Department of Transportation.

The LRTP uses Transportation Analysis Zones (TAZ's) to estimate the 2035 population and employment numbers from 2006 numbers. Because more recent Census (ACS) data were used in the current model, the LRTP estimate was used to determine the change in population and employment in the parts of the counties that make up the ARTS region.

The LRTP estimates that 2006 employment in the ARTS region was 168,121 jobs. The LRTP projects that there will be 225,119 jobs in 2035, representing a 33.9 percent increase in regional employment from 2006.

1 http://www.scdhec.gov/health/chcdp/obesity/docs/StatePlanComplete.pdf

Table 4-8 shows the projected future demographics used in the future analysis. The population of school students (K-12) and college/university students was assumed to be the same proportion of the total population for each county as in the 2004-2009 estimate.

The walking and bicycling mode shares are likely to increase in the future because the addition of new facilities and enhancements to the existing system. Areas with higher population and employment densities have significant potential to increase walking and bicycling. The model assumes that all counties can increase the walking share above the

Table 4-7: Benefits of Current Walking and Bicycling Trips

	Aiken	Columbia	Edgefield	Richmond	All Counties
Yearly vehicle miles reduced	1,069,821	705,604	6,152	4,797,533	6,579,110
Air Quality Reduction[1]					
Hydro-carbons (lbs/year)	3,208	2,116	18	14,384	19,726
Particulate Matter (lbs/year)	24	16	0	107	146
Nitrous Oxides (lbs/year)	2,241	1,478	13	10,048	13,779
Carbon Monoxide (lbs/year)	29,246	19,289	168	131,152	179,855
Carbon Dioxide (lbs/year)	870,306	574,013	5,005	3,902,821	5,352,144
Economic Benefits of Air Quality					
Particulate Matter	$2,001	$1,320	$12	$8,973	$12,306
Nitrous Oxides	$4,481	$2,956	$26	$20,096	$27,558
Carbon Dioxide	$14,922	$9,842	$86	$66,915	$91,764
Reduced External Costs of Vehicle Travel (Thousands)					
Traffic Congestion2	$202,196	$133,359	$1,163	$906,734	$1,243,452
Vehicle Crashes	$1,453,887	$958,915	$8,361	$6,519,848	$8,941,011
Roadway Maintenance Costs[3]	$150	$99	$1	$672	$921
Household Transportation Savings[4] (Thousands)					
Reduction in Household Transportation Spending	$535	$353	$3	$2,399	$3,290
Total Current Benefits for Walking and Bicycling (Thousands)					
	$1,656,789	$1,092,740	$9,528	$7,429,748	$10,188,805

Source: ACS 2005-2009 Five-Year Estimates

1 EPA report 420-F-05-022 "*Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks.*" 2005 and NHTSA Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks, Table VIII-5 (http://www.nhtsa.dot.gov/ portal/site/nhtsa/ menuitem.d0b5a45b55bfbe582f57529 cdba046a0/).

2 Crashes vs. Congestion – What's the Cost to Society?" http://www.aaanewsroom.net/Assets/Files/20083591910. CrashesVsCongestionFullRe

3 Kitamura, R., Zhao, H., and Gubby, A. R. (1989). *Development of a Pavement Maintenance Cost Allocation Model.* Institute of Transportation Studies – University of California, Davis (http://pubs.its.ucdavis.edu/publication_detail.php?id=19). $0.08/mile (1989), adjusted to 2010 dollars using the Bureau of Labor Statistics Inflation Calculator

4 IRS operational standard mileage rates for 2010 http://www.irs.gov/newsroom/article/0,,id=216048,00.html

Table 4-8: Projected Future Demographics

	Aiken	Columbia	Edgefield	Richmond	All Counties
Population change	48.7%	58.2%	37.1%	13.7%	35.7%
2035 Population	177,498	147,441	2,968	225,275	560,129
Employment change	38.5%	55.6%	21.1%	27.7%	33.9%
2035 Employed Population	71,633	69,229	1,192	104,836	240,052

Source: ARTS 2035 Long Range Transportation Plan

1.7 percent state average in Georgia and the 1.9 percent average in South Carolina to four percent, while Richmond County, which already exceeds that target, can increase to 10 percent walking. For bicycling, the average bicycling mode share for Bronze-level Bicycle Friendly Communities (BFC's) is 1.1 percent. The analysis assumes that every county in ARTS can achieve these levels by 2020.

The results of the model for future walking trips are shown in Table 4-9, while Table 4-10 shows the results of the model for future bicycling trips.

Future Benefits

The trip replacement factors remain the same as in the model of current trips. Since bicycling is among the most popular forms of recreational activity in the U.S.[2], when bicycling is available as a daily mode of transportation, substantial health benefits result. The health benefit of bicycling for exercise can reduce the employer cost of spending on health care by as much as $514 a year, which provides a financial incentive to businesses that provide health coverage to their employees.[3] Table 4-11 shows the air quality benefits of the future projected walking and bicycling trips in the ARTS region.

Additional Benefits of Bicycling and Walking

Bicycling and walking are low-cost and effective means of transportation that are non-polluting, energy-efficient, versatile, healthy, and fun. Everyone is a pedestrian at some point, whether walking to a parked car, taking a lunch break, or accessing transit. In addition, bicycles offer low-cost mobility to the non-driving public. Bicycling and walking as a means of transportation has been growing in popularity as many communities work to create more balanced transportation systems. In addition, more people are willing to cycle more frequently if better bicycle facilities are provided.[4]

In addition to the tangible economic benefits estimated in previous sections of this memorandum, bicycling and walking have many other benefits that are challenging to quantify, but some communities or organizations have studied.

- Walking and bicycling support job creation and create economic benefits for a region:
  - The League of American Bicyclists reports that bicycling makes up $133 billion of the US economy, funding 1.1 million jobs.[5] The League also estimates bicycle-related trips generate another $47 billion in tourism activity.
  - Many communities have enjoyed a high return on their investment in bicycling: the Outer Banks of North Carolina spent $6.7 million to improve local bicycle facilities, and reaped the benefit of $60 million of annual economic activity associated with bicycling.[6]
  - Multiple studies show that walkable, bikeable neighborhoods are more liveable and attractive, increasing home values,[7] resulting in increased wealth for individuals and additional property tax revenue.
  - Walkable, bikeable communities attract the young creative class,[8] which can help cities gain a competitive edge and diversify economic base.
  - Patrons who walk and bicycle to local stores have been found to spend more money to visit local businesses than patrons who drive.[9]

2 Almost 80 million people walking and 36 million people bicycling for recreation or exercise nationally, and 27.3 percent of the population over 16 bicycling at least once over the summer. (National Sporting Goods Association survey, 2003)

3 Feifei, W., McDonald, T., Champagne, L.J., and Edington, D.W. (2004). Relationship of Body Mass Index and Physical Activity to Health Care Costs Among Employees. Journal of Occupational and Environmental Medicine. 46(5):428-436

4 Pucher, J., Dill, J. and Handy, S. (2010). Infrastructure, programs, and policies to increase bicycling: An international review. Preventative Medicine 50:S106-S125.

5 Flusche, Darren for the League of American Bicyclists. (2009). The Economic Benefits of Bicycle Infrastructure Investments.

6 N.C. Department of Transportation, Division of Bicycle and Pedestrian Transportation. (No Date). The Economic Impact of Investments in Bicycle Facilities. atfiles.org/files/pdf/NCbikeinvest.pdf

7 Cortright, Joe for CEOs for Cities. (2009). Walking the Walk: How Walkability Raises Home Values in U.S. Cities.

8 Cortright, Joe for CEOs for Cities. (2007). Portland's Green Dividend.

9 The Clean Air Partnership. (2009). Bike Lanes, On-Street Parking and Business: A Study of Bloor Street in Toronto's Annex Neighborhood.

Table 4-9: Model Estimate of Future 2035 Walking Trips

	Aiken	Columbia	Edgefield	Richmond	All Counties
Commute Trips					
Walking commuters[21]	2,865	2,769	48	10,484	16,166
Weekday walking trips	5,731	5,538	95	20,967	32,332
School Trips					
K-12 walking commuters[22]	2,994	3,043	52	3,898	9,987
Weekday K-12 walking trips	5,988	6,085	104	7,797	19,974
College Trips					
College walking commuters[23]	422	399	5	1,736	2,562
Weekday walking college trips	844	797	9	3,473	5,124
Daily adult walking commute trips[24]	6,575	6,336	104	24,440	37,455
Utilitarian Trips					
Daily walking utilitarian trips[25]	23,112	22,272	367	85,914	131,665
Social/Recreational Trips					
Daily walking social/ recreational trips[26]	27,721	26,713	440	103,044	157,918
Total Future Daily Walking Trips	63,396	61,406	1,016	221,195	347,012
Total Current Daily Walking Trips	18,179	10,935	181	108,319	137,613
Percent Change	248.7%	461.6%	462.5%	104.2%	152.2%

21 Population and employment estimates for 2035 based on ARTS 2035 Long Range Transportation Plan and multiplied by assumed future mode split.
22 School children population multiplied by NHTS 2009 mode split for school/daycare/religious trips.
23 Assumes same mode split as employed population.
24 Number of walking commute trips plus number of walking college trips.
25 Utilitarian walking trips multiplied by ratio of utilitarian to work trips (NHTS). Weekly trips distributed over entire week (vs. commute trips over 5 days).
26 Social/recreational walking trips multiplied by ratio of social/recreational to work trips (NHTS). Weekly trips distributed over entire week (vs. commute trips over 5 days).

- By replacing short car trips, bicycling and walking (especially when combined with transit) can help middle-class families defray rising transportation costs. Families that drive less spend 10 percent of their income on transportation, compared to 19 percent for households with heavy car use,[10] freeing additional income for local goods and services.

- Increased bicycling leads to a reduction in crashes. Concerns about safety have historically been the single greatest reason people do not commute by bicycle; a Safe Routes to School survey in 2004 found that 30 percent of parents consider traffic-related danger to be a barrier to allowing their children to walk or bike to school. In a community where twice as many people walk, an individual walking has a 66 percent reduced risk of being injured by a motorist.[11]

10 Center for Neighborhood Technology. (2005). Driven to Spend: Pumping Dollars out of Our Households and Communities.

11 Jacobsen, P.L. (2003). Safety in numbers: more walkers and bicyclists, safer walking and bicycling. Injury Prevention 9:205-209.

Table 4-10: Model Estimate of Future 2035 Bicycling Trips

	Aiken	Columbia	Edgefield	Richmond	All Counties
Commute Trips					
Bicycling commuters[27]	788	762	13	1,153	2,716
Weekday bicycling trips	1,576	1,523	26	2,306	5,432
School Trips					
K-12 bicycling commuters[28]	311	317	5	406	1,039
Weekday K-12 bicycling trips	623	633	11	811	2,078
College Trips					
College bicycling commuters[29]	116	110	1	191	418
Weekday bicycling college trips	232	219	2	382	836
Daily adult bicycling commute trips[30]	1,808	1,742	29	2,688	6,268
Utilitarian Trips					
Daily bicycling utilitarian trips[31]	2,832	2,729	45	4,211	9,817
Social/Recreational Trips					
Daily bicycling social/ recreational trips[32]	8,326	8,023	132	12,379	28,860
Total Future Daily Bicycling Trips	13,589	13,127	217	20,090	47,022
Total Current Daily Bicycling Trips	2,132	1,587	5	5,437	9,161
Percent Change	537.5%	727.1%	4378.5%	269.5%	413.3%

27 Population and employment estimates for 2035 based on ARTS 2035 Long Range Transportation Plan and multiplied by assumed future mode split.

28 School children population multiplied by NHTS 2009 mode split for school/daycare/religious trips.

29 Assumes same mode split as employed population.

30 Number of walking commute trips plus number of walking college trips.

31 Utilitarian bicycle trips multiplied by ratio of utilitarian to work trips (NHTS). Weekly trips distributed over entire week (vs. commute trips over 5 days).

32 Social/recreational bicycling trips multiplied by ratio of social/recreational to work trips (NHTS). Weekly trips distributed over entire week (vs. commute trips over 5 days).

Table 4-11: Benefits of Future Walking and Bicycling Trips

	Aiken	Columbia	Edgefield	Richmond	All Counties
Yearly vehicle miles reduced	8,730,893	8,498,795	86,779	23,290,546	40,607,013
Air Quality Reduction[33]					
Hydrocarbons (lbs/year)	26,178	25,482	260	69,832	121,751
Particulate Matter (lbs /year)	194	189	2	519	904
Nitrous Oxides (lbs /year)	18,286	17,800	182	48,780	85,047
Carbon Monoxide (lbs /year)	238,679	232,334	2,372	636,701	1,110,087
Carbon Dioxide (lbs /year)	7,102,632	6,913,818	70,595	18,946,993	33,034,038
Economic Benefits of Air Quality (Thousands)					
Particulate Matter	$2.0	$1.3	$0.0	$9.0	$12.3
Nitrous Oxides	$11,865,283	$11,549,862	$117,932	$31,651,853	$55,184,930
Carbon Dioxide	$122	$119	$1	$325	$566
Reduced External Costs of Vehicle Travel (Thousands)					
Traffic Congestion[34]	$1,650,139	$1,606,272	$16,401	$4,401,913	$7,674,725
Vehicle Crashes	$11,865,283	$11,549,862	$117,932	$31,651,853	$55,184,930
Roadway Maintenance Costs[35]	$1,222	$1,190	$12	$3,261	$5,685
Household Transportation Savings (Thousands)[36]					
Reduction in HH trans. spending	$4,365	$4,249	$43	$11,645	$20,304
Reduced Healthcare Costs (Thousands)					
New adult walkers/bikers [37]	3,250	3,540	61	7,405	14,256
New student walkers/bikers	1,164	1,314	17	658	3,153
Healthcare savings of active adults[38]	$467	$601	$9	$1,258	$2,335
Healthcare savings of active children	$80	$131	$1	$66	$278
Total (Thousands)	$25,386,964	$24,712,287	$252,333	$67,722,182	$118,073,766

33 EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks." 2005 and NHTSA Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks, Table VIII-5 (http://www.nhtsa.dot.gov/ portal/site/nhtsa/ menuitem.d0b5a45b55bfbe582f57529 cdba046a0/).

34 Crashes vs. Congestion – What's the Cost to Society?" http://www.aaanewsroom.net/Assets/Files/20083591910. CrashesVsCongestionFullRe

35 Kitamura, R., Zhao, H., and Gubby, A. R. (1989). Development of a Pavement Maintenance Cost Allocation Model. Institute of Transportation Studies – University of California, Davis (http://pubs.its.ucdavis.edu/publication_detail.php?id=19). $0.08/mile (1989), adjusted to 2010 dollars using the Bureau of Labor Statistics Inflation Calculator

36 IRS operational standard mileage rates for 2010 http://www.irs.gov/newsroom/article/0,,id=216048,00.html

37 Difference between 2020 and 2010 walking/bicycling commuters and college students.

38 Applies Georgia adult obesity rate of 29.0 percent of the population and 17 percent of overweight children (2008Georgia Data Summary: Obesity in Children and Youth), and South Carolina adult obesity rate of 24.5 percent of the population (from Moving South Carolina Towards a Healthy Weight: Promoting Healthy Lifestyles and Healthy Communities) to the population, and multiplied by health care cost savings per person of $585.97 (from Relationship of Body Mass Index and Physical Activity to Health Care Costs Among Employees. Wang, Feifei; McDonald, Tim; Champagne, Laura J.; Edington, Dee W. Journal of Occupational and Environmental Medicine. Represents a recent, midrange estimate of health benefits of replacing driving with bicycling; estimates range up to $1,175 per person per year according to Krizek et al, "Guidelines for Analysis of investments in Bicycle Facilities," NCHRP Report 552, Transportation Research Board, 2006.

Bicyclist and Pedestrian Counts

Overview

To fully comprehend existing conditions in the ARTS planning area, it is important to understand the number of non-motorized users and the patterns in which they interact with the existing roadway network. To do so, the Bicycle and Pedestrian Plan Project Steering Committee and volunteers performed a comprehensive count of bicyclists and pedestrians at 23[1] regional locations during September 2011. The effort included:

- Careful identification of count locations
- A bicycle and pedestrian count form
- One training session
- One weekday and one weekend count at each location
- Data synthesis and analysis

Bicycle and pedestrian counting is important for several reasons. The U.S. Census reports that in the ARTS region bicycle mode share is less than 1 percent and pedestrian mode share is less than 2 percent, as shown in Table 4-12. While this information can be useful for comparative analysis, the data is very limited. The Census measures commute to work trips only, which account for less than 15 percent of all trips taken in the U.S. By conducting its own bicycle and pedestrian counts, ARTS can account for trips taken by bicycling and walking that are not commute to work trips, as well as better understand where bicycling and walking is occurring. Counts are also helpful to analyze existing bikeway/walkway facility use and where future facilities may be justified.

ARTS's bicycle and pedestrian counts provide a valuable snapshot for the level of bicycling and walking that occurs. This serves as baseline data for future comparison and evaluation of trends. Analysis of the counts and count location characteristics additionally provides useful information regarding the relationship between bicycle ridership levels and the bicycling environment.

Process

Weekday and weekend tallies at the 23 locations were conducted during a two week period between September 10, 2011 and September 24, 2011. The weekday morning count was conducted from 7:00 a.m. to 9:00 a.m. and the weekend count from 10:00 a.m. to noon. The morning rather than the evening peak period was chosen as the focus because of the variety of trips, such as school-commutes and morning exercise, as well as work-related commutes.

The count times and overall guidelines were developed in conjunction with the National Bicycle and Pedestrian Documentation Project (NBPDP), a joint collaboration between Alta Planning + Design and the Institute of Transportation Engineers. The NBPDP guidelines will be used for all subsequent counts within the ARTS planning area. All data from the counts will be forwarded to the NBPDP for further analysis and to add to the growing collection of consistent information about people who are bicycling and walking in different parts of the country. Screenline counting is the methodology that is recommended by NBPDP and was determined to be most appropriate for the ARTS Bicycle and Pedestrian Plan Update. Screenline counts are primarily used to identify general trends in volumes, and to see how demographics, land use, and other factors influence walking

Table 4-12: Commute Mode Share in ARTS Counties

	Aiken	Columbia	Edgefield	Richmond	All Counties	Georgia	South Carolina
Drive Alone	82.8%	85.0%	79.8%	77.3%	80.6%	89.7%	92.2%
Walk	1.4%	0.8%	0.6%	6.0%	3.33%	1.7%	1.9%
Bicycle	0.2%	0.2%	0.0%	0.4%	0.3%	0.2%	0.3%

Source: ACS 2005-2009 Five-Year Estimates

Note: analysis excludes areas of counties outside the ARTS boundary.

1 Counts were taken at 29 locations, but due to errors, six count locations are excluded from this analysis. See results section for details.

and bicycling. During screenline counts, one volunteer identifies the number of bicyclists and pedestrians that pass through a single, imaginary line running across the street, thereby capturing all cyclists and pedestrians traveling in either direction along a single corridor. A person who passes by a point more than once is counted each time they pass by the point.

Count Locations

The National Bicycle and Pedestrian Documentation project recommends one count per 15,000 of population. This is considered a reasonable balance between obtaining representative counts and budget limitations. For ARTS, NBPD methodology results in a recommendation of 33 count locations. Based on available budget and staffing, the ARTS count includes a total of 29 locations (or screenlines), 23 of which resulted in complete count data. Table 4-13 displays the number of count locations per county in the ARTS region. Criteria used to select count locations includes:

- Pedestrian and bicycle activity areas or corridors (downtowns, near schools, parks, etc.)
- Representative locations in urban, suburban, and rural locations
- Key corridors that can be used to gauge the impacts of future improvements
- Locations where counts have been conducted historically
- Locations where there are on-going counts being conducted by other agencies through a variety of means, including video taping
- Gaps and pinch points for bicyclists and pedestrians (potential improvement areas)
- Locations where bicycle and pedestrian collision numbers are high
- Select locations that meet as many of the criteria as possible.

For both bicyclists and pedestrians, counters noted if the person was male or female. Additionally, the ARTS/Aiken County Bicycle and Pedestrian Plan Update Count Form recorded the following information:

- Name of Counter
- Corridor
- Date
- Start and end time
- Weather conditions
- Existing facilities

SCREENLINE COUNT FORM

ARTS/Aiken County Bicycle and Pedestrian Plan Update

Name: _____ Corridor: _____ @ _____

Date: _____ Start Time: _____ End Time: _____

Weather: _____ Existing Facilities: _____

Please fill in your name, count location, date, time period, and weather conditions (fair, rainy, very cold). For existing facilities, list any bicycle or pedestrian specific features such as sidewalks, bike lanes, multi-use trail, or paved shoulder. Count all bicyclists and pedestrians crossing your screen line under the appropriate categories.

- Count for two hours in 15 minute increments.
- Count bicyclists who ride on the sidewalk.
- Count the number of people on the bicycle, not the number of bicycles.
- Pedestrians include people in wheelchairs or others using assistive devices, children in strollers, etc.
- People using equipment such as skateboards or rollerblades should be included as "Others."

	Bicyclists		Pedestrians		Others
Time Increments	Female	Male	Female	Male	
00-:15					
15-:30					
30-:45					
45-1:00					
1:00-1:15					
1:15-1:30					
1:30-1:45					
1:45-2:00					
Total					

Promptly return form to: Marya Moultrie, Augusta-Richmond County Planning Commission
535 Telfair St.
Augusta, GA 30901
Phone: 706-821-1807
Scan and send by e-mail to: mmoultrie@augustaga.gov

ARTS/Aiken County's Bicycle and Pedestrian Plan Update Count Form captured bicycle and pedestrian gender

Table 4-13: Number of Count Locations per County

	County			Total Count Locations
	Aiken	*Columbia*	*Richmond*	
Number of Count Locations	17	3	9	29
Number of Completed Counts	15	3	5	23

Results

The combined total count of bicyclists for both count days was 351 (Table 4-14) and the combined total count of pedestrians for both count days was 1,089 (Table 4-15). While this number provides an important snapshot of non-motorized transportation in ARTS/Aiken, it does not provide a comprehensive count of all bicyclists and pedestrians. Instead, the data offers clues as to where and when the community is bicycling and walking. See Table 4-17 and Table 4-18 at the end of this section for detailed count results by location.

On both the weekday and the weekend, five locations counted zero bicyclists. No locations on the weekday or weekend counts had zero pedestrians. The highest numbers of bicycle and pedestrian counts and the count averages are described below.

- On the weekday count, the highest number of bicyclists recorded at a location was 18 and the highest number of pedestrians recorded was 99.

Table 4-14: Bicycle Count Results

Characteristic	Total Count
Total Bicyclists Combined	351
Total Bicyclists Weekday	97
Total Bicyclists Weekend Day	254
Total Female Bicyclists (combined)	93
Total Male Bicyclists (combined)	258

Table 4-15: Pedestrian Count Results

Characteristic	Total Count
Total Pedestrians Combined	1,089
Total Pedestrians Weekday	508
Total Pedestrians Weekend Day	581
Total Female Pedestrians (combined)	532
Total Male Pedestrians (combined)	557

- On a weekend, the highest number of bicyclists counted at a location was 116 and the highest number of pedestrians counted was 117.
- The average weekday count was 4 bicyclists and 22 pedestrians, and the median weekday count was 2 bicyclists and 17 pedestrians.
- The average weekend count was 11 bicyclists and 25 pedestrians, and the median weekend count was 5 bicyclists and 2 pedestrians.

Figure 4-12 and Figure 4-13 show each of the bicycle and pedestrian count locations and include icons that vertically represent the total number of bicyclists counted at each location on the weekend (yellow) and the weekday (purple). A geographic analysis of count data is discussed in the following section.

Count Errors

Human error is a common issue in all studies. Five count locations of the ARTS Bicycle and Pedestrian count are excluded from the analysis due to errors. This report excludes both the Two Notch at Marie Drive and the Marie Drive at Two Notch locations because volunteers only attended the weekend count. The Fleming Avenue at Walton Way location is also excluded because volunteers reversed the screenline during the weekday counts meaning volunteers counted on Walton Way rather than on Fleming Avenue. Both the 8th Street at Reynolds Street and Reynolds Street and 8th Street counts received only one count at the location and did not receive a weekend count. Those locations are excluded also. The count totals for the excluded count locations are shown in Table 4-6.

Table 4-16: Excluded Count Location Results

Location	Period	Total Bicyclists	Total Pedestrians
Two Notch at Marie Drive	Weekend	7	11
Marie Drive at Two Notch	Weekend	8	12
Fleming Avenue at Walton Way	Weekend	6	45
Walton Way at Fleming Avenue	Weekday	3	76
8th Street at Reynolds Street	Weekday	1	20
Reynolds Street at 8th Street	Weekday	1	22

Figure 4-12: ARTS Regional Bicycle Counts

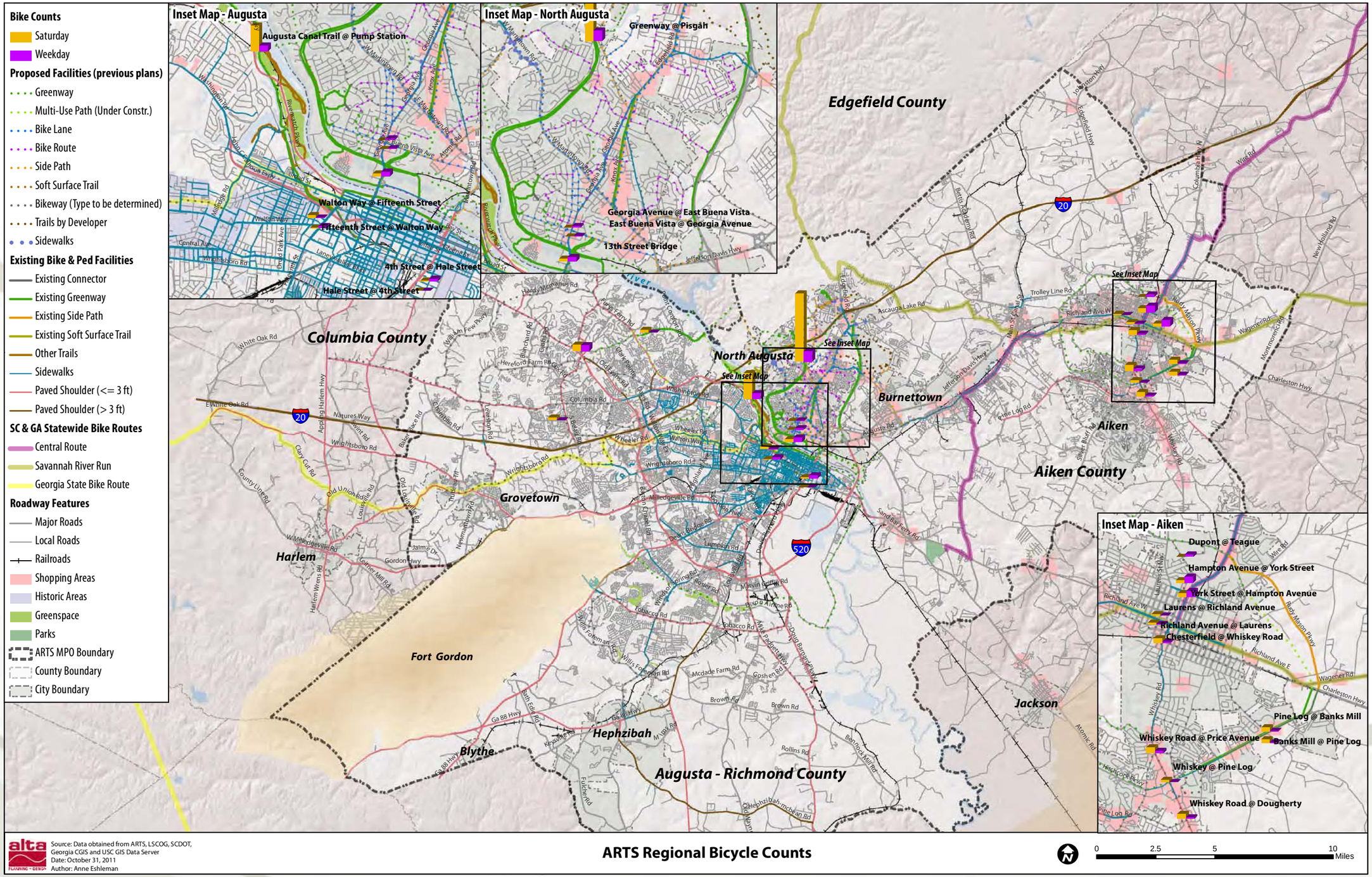
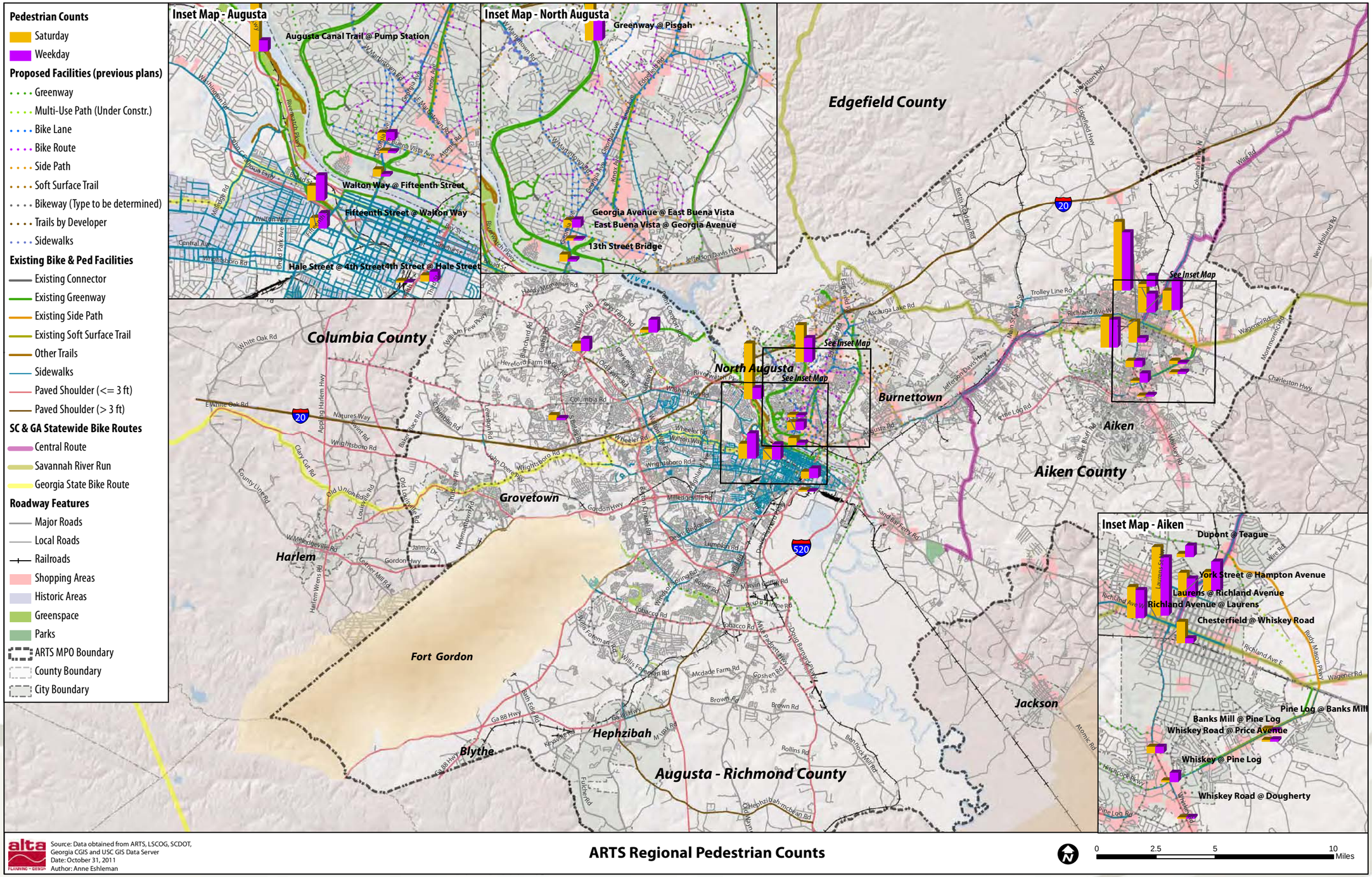


Figure 4-13: ARTS Regional Pedestrian Counts



Count Recommendations

This Plan recommends that bicycle pedestrian counts occur annually throughout the ARTS region. The data collected during the 2011 count serves as baseline data for understanding trends overtime and allows for comparative analysis in future years.

Aiken County should continue to conduct counts at 15 or more locations each year. Augusta-Richmond County should increase the number of count locations to 14 or more. Columbia County should increase the number of count locations to 8 or more. Additionally, the number of counts on downtown Main Streets should be increased. Cities can use count data in downtown commercial districts to quantify "foot traffic" and attract retailers.

Though human error is always possible, the potential for errors during counts can be mitigated by:

- Requiring all volunteers to attend a brief training session prior to the counts
- Providing a map to all volunteers that clearly identifies each count location
- Distributing a list of all count locations, the screenline of each location, and volunteer counter assigned to each location
- Communicating with volunteers prior to the counts to ensure all questions are answered

Key Findings

The results of the ARTS bicycle and pedestrian count show that:

- The majority of the bicyclists counted were male (74%).
- Bicycling is more common on the weekend than weekdays.
- Of the observed locations, the most popular areas for bicycling were the Augusta Trail Canal at the pump station, Greenway at Pisgah (North Augusta), and the intersection of Hampton Avenue and York Street (City of Aiken).
- There was a relatively equal amount of female pedestrians (49%) and male pedestrians (51%)
- There was a relatively equal amount of pedestrians walking during the week and on the weekend.
- The most popular areas for walking are Laurens at Richland Avenue, the Augusta Canal Trail at the pump station, and Hampton Avenue at York Street.

Based on the count, ARTS's ratio of male cyclists to female is just under 3:1. This ratio is consistent with count data and anecdotal evidence from cities throughout the country. While bike-friendly cities in Northern Europe have an even split between men and women (in some cases more women cyclists than men), in North American cities with limited bicycling infrastructure, the number of men is higher in all cases. In cities that strive to create a fully-integrated network of bike facilities such as Portland, Oregon or Montreal, the number of female cyclists has inched closer to male cyclists but continues to be approximately half of the gross number of men. The expectation in ARTS is that the ratio of men to women will, in time, begin to balance out as the number of less traffic-tolerant female cyclists increase as improvements to bicycle infrastructure along important corridors continues.

ARTS's ratio of male pedestrians to female pedestrians is approximately 1:1, which means about the same number of males as females are walking. This suggests that there is less of a barrier to walking for females than with bicycling.

The count data also indicates an association between increased levels of bicycle ridership and walking in close proximity to greenways. Both current and potential bicyclists prefer separated bikeways, and studies have also shown that proximity to a rail-trail spurs bicycling activity. Higher volumes of pedestrians use greenways on weekends than during the week, which suggests that people walking on the greenways are using them for recreation. As counts for the Augusta Canal Trail and other greenways are completed in the near future, more can be learned about the relationship between bicyclists and pedestrians on ARTS's roadways and off-road trail users.

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Detailed Count Results

Table 4-17: Weekday Count Results

	Bicyclists			Pedestrians		
Count Location	**Female**	**Male**	**Total**	**Female**	**Male**	**Total**
Chesterfield @ Whiskey Road (Aiken)	0	2	2	3	5	8
Whiskey Road @ Price Avenue (Aiken)	0	4	4	7	4	11
Pine Log @ Banks Mill (Aiken)	0	1	1	0	2	2
Banks Mill @ Pine Log (Aiken)	0	1	1	2	2	4
Dupont @ Teague (Aiken)	0	4	4	7	12	19
Whiskey Road @ Dougherty (Aiken)	0	2	2	0	3	3
Richland Avenue @ Laurens (Aiken)	0	1	1	24	24	48
Laurens @ Richland Avenue (Aiken)	0	0	0	63	36	99
Whiskey @ Pine Log (Aiken)	0	0	0	9	7	16
Georgia Avenue @ East Buena Vista (North Augusta)	0	3	3	9	5	14
East Buena Vista @ Georgia Avenue (North Augusta)	0	1	1	0	3	3
Greenway @ Pisgah (North Augusta)	7	11	18	25	16	41
Oakley Pirkle Road @ Cavalier Drive (Columbia County)	0	0	0	1	3	4
Stevens Creek @ Stevens Creek Elementary (Columbia County)	0	0	0	12	10	22
Evans to Locks @ Savannah Rapids Pavilion (Columbia County)	2	8	10	15	6	21
13th Street Bridge (North Augusta Side)	3	5	8	4	0	4
4th Street @ Hale Street (Richmond County)	1	4	5	12	5	17
Hale Street @ 4th Street (Richmond County)	0	0	0	0	1	1
Walton Way @ Fifteenth Street (Richmond County)	0	1	1	13	30	43
Fifteenth Street @ Walton Way (Richmond County)	0	4	4	11	15	26
Augusta Canal Trail @ Pump Station	1	9	10	7	12	19
Hampton Avenue @ York Street (Aiken)	0	11	11	12	39	51
York Street @ Hampton Avenue (Aiken)	0	11	11	7	25	32
Totals	**14**	**83**	**97**	**243**	**265**	**508**

Table 4-18: Weekend Count Results

	Bicyclists			Pedestrians		
Count Location	**Female**	**Male**	**Total**	**Female**	**Male**	**Total**
Chesterfield @ Whiskey Road (Aiken)	1	7	8	25	11	36
Whiskey Road @ Price Avenue (Aiken)	0	10	10	3	8	11
Pine Log @ Banks Mill (Aiken)	2	5	7	2	3	5
Banks Mill @ Pine Log (Aiken)	1	5	6	0	3	3
Dupont @ Teague (Aiken)	0	0	0	0	5	5
Whiskey Road @ Dougherty (Aiken)	0	8	8	1	1	2
Richland Avenue @ Laurens (Aiken)	0	3	3	24	29	53
Laurens @ Richland Avenue (Aiken)	0	2	2	64	53	117
Whiskey @ Pine Log (Aiken)	0	4	4	0	3	3
Georgia Avenue @ East Buena Vista (North Augusta)	0	0	0	9	4	13
East Buena Vista @ Georgia Avenue (North Augusta)	0	0	0	0	4	4
Greenway @ Pisgah (North Augusta)	52	64	116	39	24	63
Oakley Pirkle Road @ Cavalier Drive (Columbia County)	0	5	5	2	7	9
Stevens Creek @ Stevens Creek Elementary (Columbia County)	2	3	5	3	2	5
Evans to Locks @ Savannah Rapids Pavilion (Columbia County)	1	10	11	9	4	13
13th Street Bridge (North Augusta Side)	1	4	5	8	4	12
4th Street @ Hale Street (Richmond County)	0	2	2	6	5	11
Hale Street @ 4th Street (Richmond County)	0	0	0	2	1	3
Walton Way @ Fifteenth Street (Richmond County)	0	5	5	7	18	25
Fifteenth Street @ Walton Way (Richmond County)	0	1	1	8	10	18
Augusta Canal Trail @ Pump Station	19	25	44	53	42	95
Hampton Avenue @ York Street (Aiken)	0	5	5	12	21	33
York Street @ Hampton Avenue (Aiken)	0	7	7	12	30	42
Totals	**79**	**175**	**254**	**289**	**292**	**581**

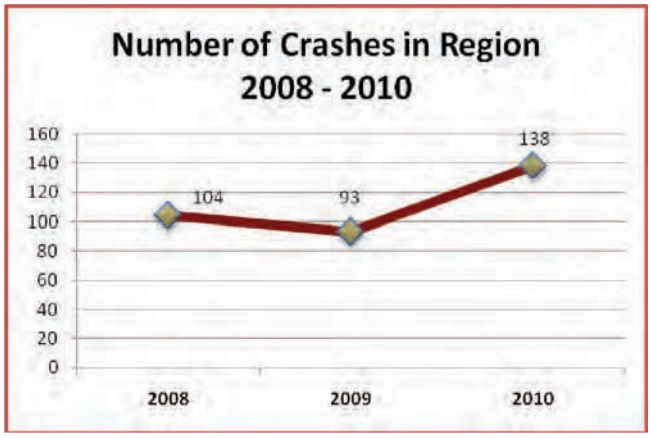
Bicycle and Pedestrian Safety Analysis

Overview

Safety for pedestrians and bicyclists is a major concern for citizens of the ARTS region and a main priority in developing a successful Bicycle and Pedestrian Master Plan. Just over the last year, the region has witnessed a number of alarming fatalities – two doctors were killed while cycling on Belair Road and Tobacco Road, a 68 year old man was killed while bicycling with his wife on Banks Mill Road, and another cyclist was hospitalized in critical condition after being hit from behind by a truck. These recent events indicate a clear safety problem for the region to address, and a Safety Analysis was undertaken to identify trends for the region and within counties so that clear and decisive action can be taken to make the region safer for bicyclists and pedestrians alike.

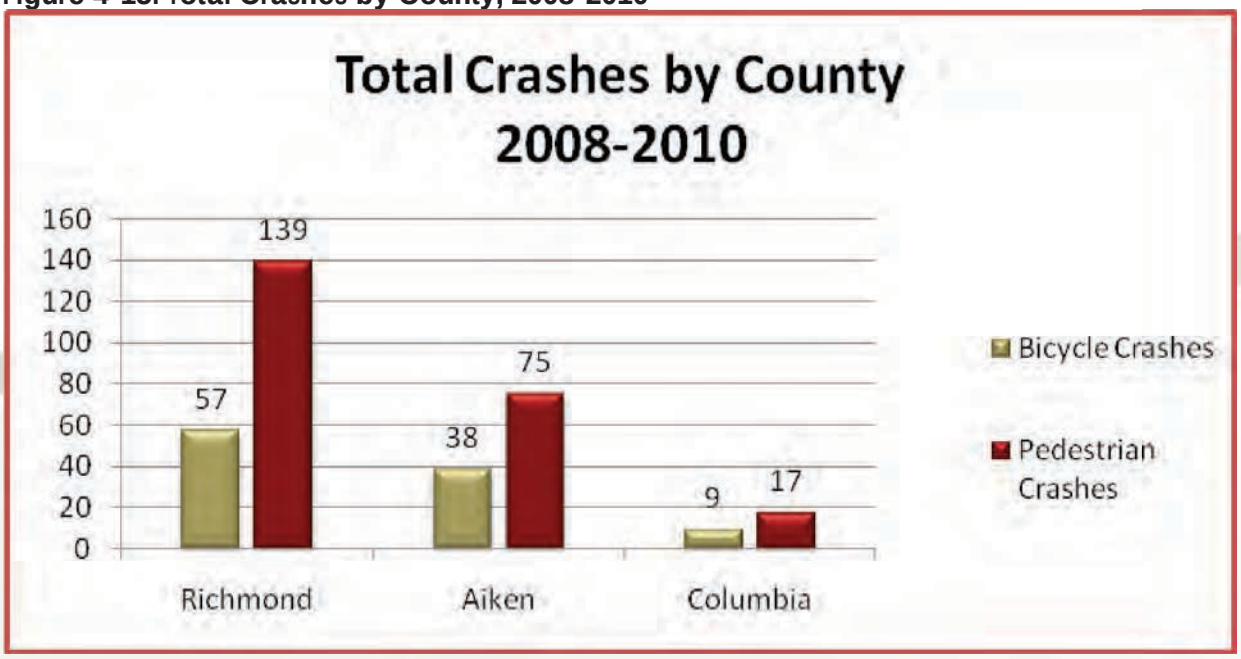
Crash data was collected from the Georgia Department of Transportation (GDOT) and the South Carolina Department of Public Safety for 2008, 2009, and 2010 to provide the needed insight into crashes involving cyclists and pedestrians in the region. As shown in Figure 4-14, crashes involving non-motorists within the region are on the rise after a minor decrease in 2009, with 138 total crashes reported in 2010 alone.

Figure 4-14: Number of Bike/Ped Crashes in the ARTS Region, 2008-2010



Over this three-year period, there have been 104 bicycle crashes and 231 pedestrian crashes. A county by county tabulation of crashes, shown in Figure 4-15, indicates that the Augusta-Richmond County area is experiencing the largest number of identified bicycle and pedestrian crashes, with 57 bicycle crashes and 139 pedestrian crashes over the three-year period. Additional Crashes in Aiken County and Columbia County indicate unsafe conditions are a regional issue in need of attention.

Figure 4-15: Total Crashes by County, 2008-2010

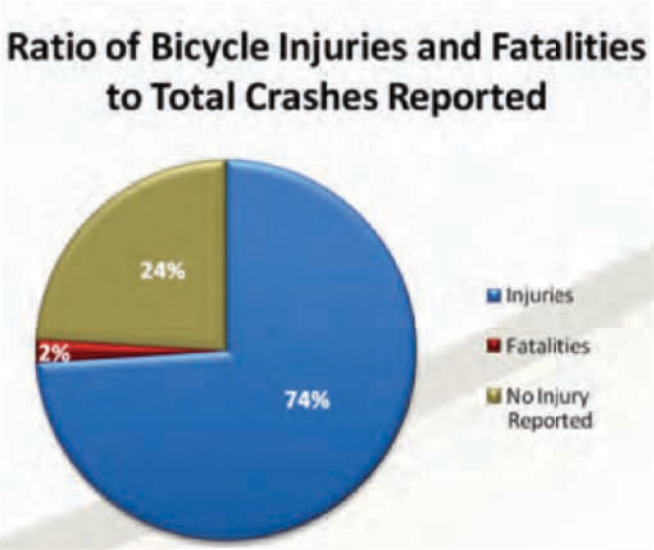


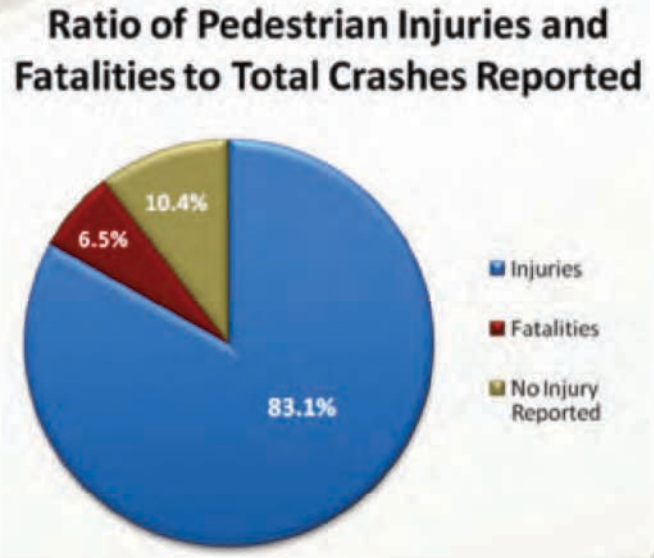
Bicycle and Pedestrian Crash Analysis

A ratio of bicycle and pedestrian crashes within the region, shown in Figure 4-16, indicates that these crashes are resulting in a number of injuries and fatalities. Over 83 percent of the pedestrian crashes reported in the region have resulted in one or more injuries, and approximately 6.5 percent of the total crashes reported have ended in pedestrian fatalities. The outlook for bicyclists is similar, with 74 percent of bicycle crashes resulting in injury and approximately 2 percent of bicycle crashes resulting in fatalities.

Local crash data for Columbia, Richmond, and Aiken Counties for the years 2008, 2009, and 2010 are included in this analysis. The Aiken County crash data provides greater details on crash types and locations than the collision data available for other areas of the ARTS region. A summary of the crash analysis is broken out by county below. This county by county analysis provides the background needed to determine regional trends.

Figure 4-16: Ratio of Pedestrian and Bicycle Injuries and Fatalities





The Aiken County crash data provides details on crash types and locations. A few considerations should be noted when reviewing the provided crash data. First, crash data often under-reports the actual occurrence of crashes, especially those crashes that do not result in a serious injury. As such, specific locations identified in the crash analysis may not present all potentially unsafe areas for bicyclists and pedestrians. Local knowledge from bicycle and pedestrian advocacy groups such as running and cycling clubs should be sought when possible to obtain additional information on unsafe environments.

Secondly, local crash data does not provide details on geographic concentrations of pedestrian or bicycle use and because of this, does not help to comparatively look at safe environments for pedestrians and bicyclists. For instance, although two streets may exhibit the same number of crashes, the level of safety at these two streets may be different depending upon the level of bicycle and pedestrian activity. This can be tested when there is sufficient bicycle and pedestrian count data available. Ironically, areas with greater bike and pedestrian activity are often considered safer than ones without much foot or bike traffic, and crash data does not provide this level of insight. Again, local knowledge should also be sought to supplement crash analyses in order to get a complete picture of the bicycle and pedestrian environment.

Finally, it should be noted that the data provided for this analysis does not contain certain data that can be helpful in identifying recommendations for awareness programs and engineering improvements. Demographic data such as the age of crash victims can be useful in determining how education plays into potential causes of crashes. Younger bicyclists and pedestrians, in particular, are often less observant of safety practices such as looking left, right, left before crossing a roadway, to check for the presence of cars. Detailed information on causes of crashes is also useful determining common types of collisions in

a given area that may indicate a need for engineering improvements. As further reporting and analysis is done on bicycle and pedestrian crash data, data needs should be monitored to ensure that measures important within communities in the region are represented in crash data.

Columbia County

ARTS bicycle and pedestrian crash data from 2008, 2009, and 2010 was obtained to identify crash statistics in the county. In Columbia County, 17 pedestrian crashes and 9 bicycle crashes were reported over the three-year period. Crashes were concentrated in the areas of Grovetown, Evans, and Martinez. These crashes resulted in 3 pedestrian fatalities, 13 pedestrian injuries, and 6 bicycle injuries. No bicycle fatalities were reported. Most crashes for pedestrians and bicyclists occurred during dry conditions (88 and 89 percent, respectively). All bicycle crashes occurred during daylight hours and 76 percent of pedestrian crashes occurred during the day. Of the 3 pedestrian fatalities, two of these occurred at night in lighted areas. A summary of crash statistics for Columbia County is provided in Table 4-19.

As shown in Figure 4-17, the majority of bicycle crashes reported are related to collisions with motor vehicles, most specifically related

Figure 4-17: Columbia County Crash Typology

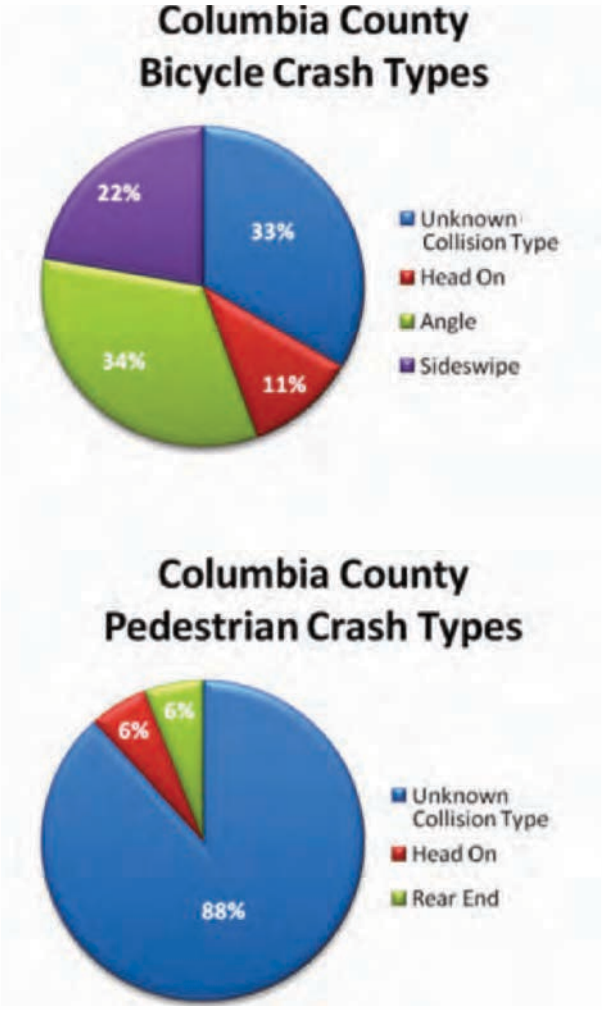


Table 4-19: Columbia County Crash Characteristics

Crash Characteristics	Bicycle Crashes	Pedestrian Crashes	% of Total Crashes*	
			Bike %	Ped %
Total Crashes Reported	9	17	100%	100%
Fatalities	0	3	0%	18%
Injuries	6	13	67%	71%
On Roadway Incidents	8	15	89%	88%
Off Roadway Incidents	1	2	11%	12%
Dry Roadway Conditions	8	15	89%	88%
Wet Roadway Conditions	1	2	11%	12%
Daytime Crashes	9	13	100%	76%
Nighttime Crashes – Lighted	0	2	0%	12%
Nighttime Crashes – Not Lighted	0	2	0%	12%

**Please note that percentages of total injuries and fatalities were calculated based on the total number of crash reports identified. In some cases, one crash report may have identified multiple injuries.*

to angle or sideswipe crashes resulting from conflicts with vehicles turning left or right. Pedestrian conflict details for the county do not provide enough information to determine the most common types of collisions. More detailed study of police reports for pedestrian crashes is recommended at the local level to identify more precisely the actions by pedestrians or motorists prior to the crash. This analysis will be useful in developing countermeasures.

Two of the three pedestrian fatalities occurred near the intersection of Belair Road (SR 383) and Owens Road and the other fatality occurred at Old Evans Road and Dent Street. Crashes near Grovetown are concentrated in the residential area northeast of Robinson Avenues (SR 223) and Old Wrightsboro Road. A number of the crashes identified near Evans and Martinez were concentrated near state roads, including Columbia Road (SR 232), Belair Road (SR 383), Washington Road (SR 104), and Carl Sanders Highway (SR 402). The total number of crashes indicates that the following locations contain concentrations of crashes in the county:

1. Washington Road/SR 104 (6 Crashes)
2. Columbia Road/SR 232 (3 Crashes)
3. Belair Road/SR 383 (3 Crashes)
4. 2nd Avenue (2 Crashes)
5. South Old Belair Road (2 Crashes)

Figure 4-18 and Figure 4-19 provide maps of bicycle and pedestrian crashes within Columbia County.

Figure 4-18: Bicyclist Safety Analysis - Columbia County

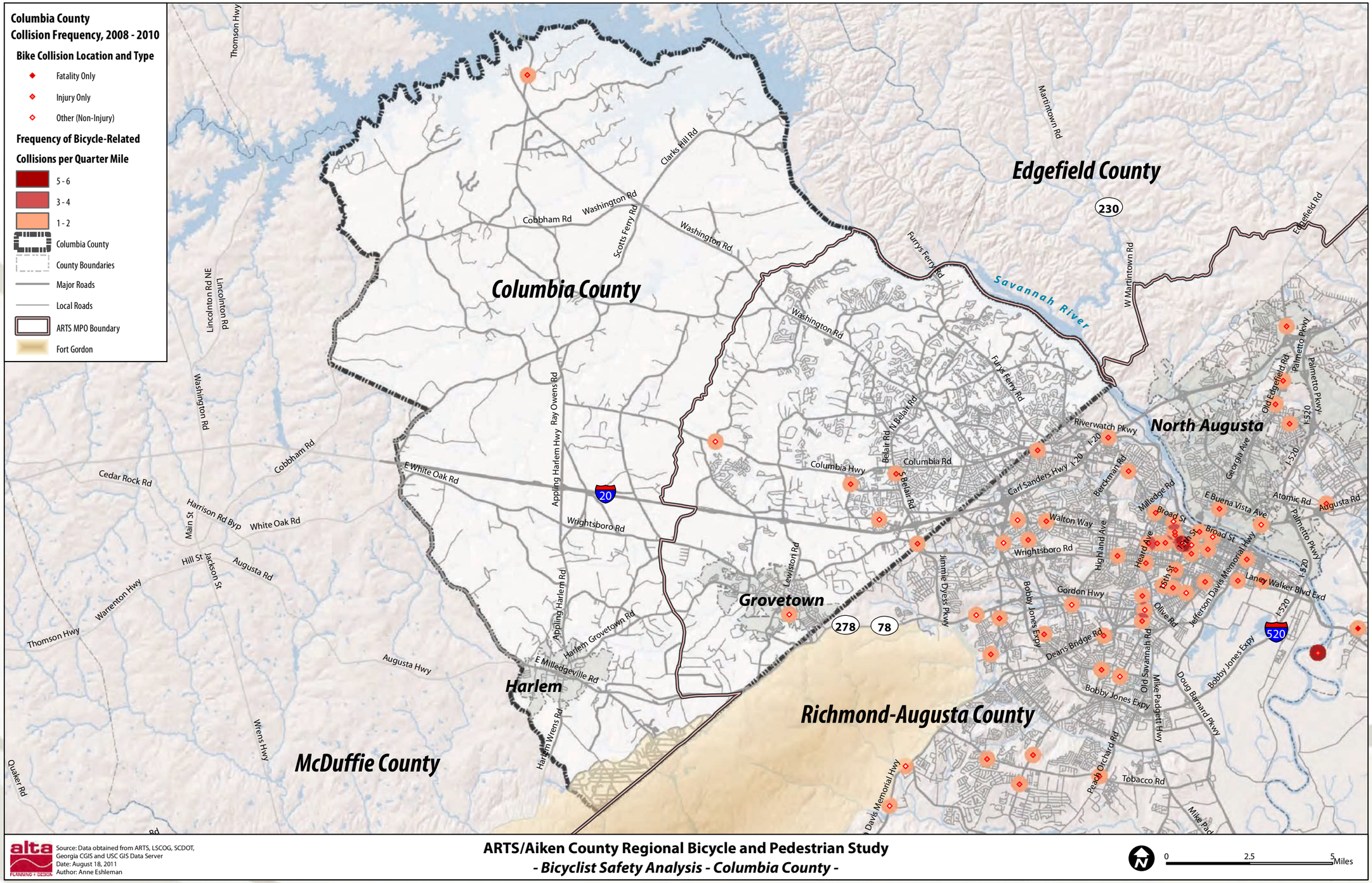
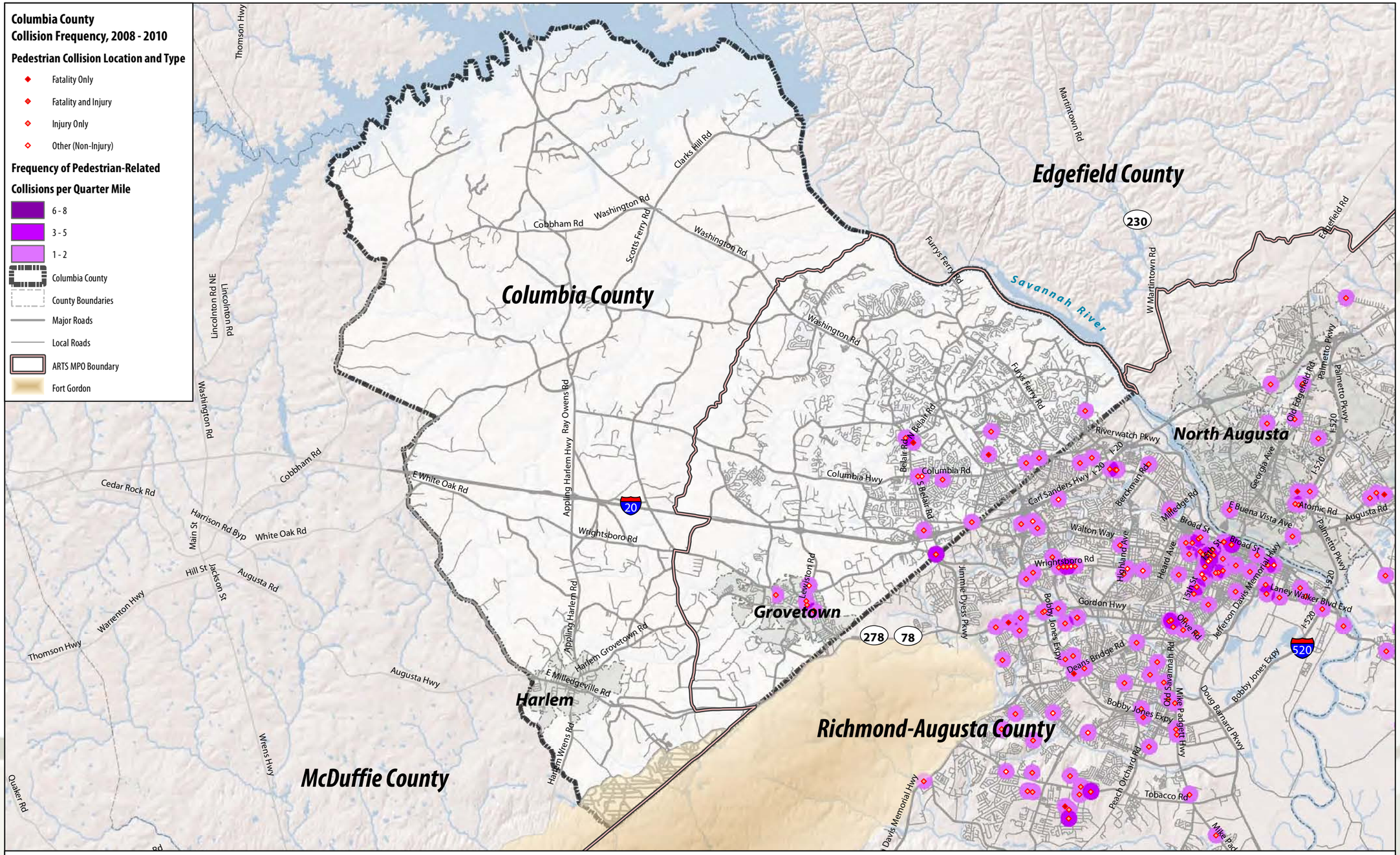


Figure 4-19: Pedestrian Safety Analysis - Columbia County



Source: Data obtained from ARTS, LSCOG, SCDOT, Georgia CGIS and USC GIS Data Server
Date: August 18, 2011
Author: Anne Eshleman

ARTS/Aiken County Regional Bicycle and Pedestrian Study
- Pedestrian Safety Analysis - Columbia County -

0 2.5 5 Miles

Richmond County

ARTS bicycle and pedestrian crash data for the three years of 2008, 2009, and 2010 provides crash statistics for Richmond County. In Richmond County, there were a reported 57 bicycle crashes and 139 pedestrian crashes over the three-year period. Crashes were concentrated in the northern portions of the county near the urbanized area of Augusta, north and south of the I-520 loop. These crashes resulted in 1 bicycle fatality, 6 pedestrian fatalities, 42 bicycle injuries, and 121 pedestrian injuries. The majority of crashes for both bicyclists and pedestrians were located on roadways (91 and 85 percent, respectively). Most crashes for bicyclists and pedestrians occurred during dry conditions (96 and 88 percent, respectively). 81 percent of all bicycle crashes occurred during daylight hours and 60 percent of pedestrian crashes occurred during the day. The one bicycle fatality occurred during daylight hours at the intersection of Walton Way and Hickman Road. All of the pedestrian fatalities occurred during night or at dusk, and in most cases were in unlighted areas. Locations for these pedestrian fatalities were distributed in various areas of the county, at I-520 (2 fatalities), Gordon Highway (SR 10), Travis Road, Story Mill Road, and Boykin Road. It should be noted that nearly 40 percent of pedestrian crashes occurred in dark conditions. Typically there is far less walking occurring then during the daytime. This signifies an overrepresentation of crashes in dark conditions. With all 6 pedestrian fatalities also occurring in dark conditions, there is a compelling case for addressing this problem in more detail. A summary of crash statistics for Richmond County is provided in Table 4-20.

As shown in Figure 4-20, the majority of bicycle crashes are related to angled collisions where both bicyclists and motorists were traveling along the same path. The most common types of pedestrian crashes could not be provided from the available crash information. More detailed study of police reports for pedestrian crashes is recommended at the local level to identify more precisely the actions by pedestrians and motorists prior to the crash. This analysis will be useful in developing countermeasures.

As might be expected, there is a concentration of reported bicycle and pedestrian crashes in the urbanized downtown Augusta area. In particular, the following roadways were noted and should be reviewed in greater detail to determine needed safety measures: Walton

Table 4-20: Richmond County Crash Characteristics

Crash Characteristics	Bicycle Crashes	Pedestrian Crashes	% of Total Crashes	
			Bike %	Ped %
Total Crashes Reported	57	139	100%	100%
Fatalities	1	6	2%	4%
Injuries	42	121	68%	81%
On Roadway Incidents	52	118	91%	85%
Off Roadway Incidents	4	12	7%	9%
On Shoulder Incidents	1	9	2%	6%
Dry Roadway Conditions	55	122	96%	88%
Wet Roadway Conditions	2	15	4%	11%
Icy/Snowy Roadway Conditions	0	2	0%	1%
Daytime Crashes	46	84	81%	60%
Nighttime Crashes – Lighted	6	29	10%	21%
Nighttime Crashes – Not Lighted	4	22	7%	16%
Dawn/Dusk Crashes	1	4	2%	3%

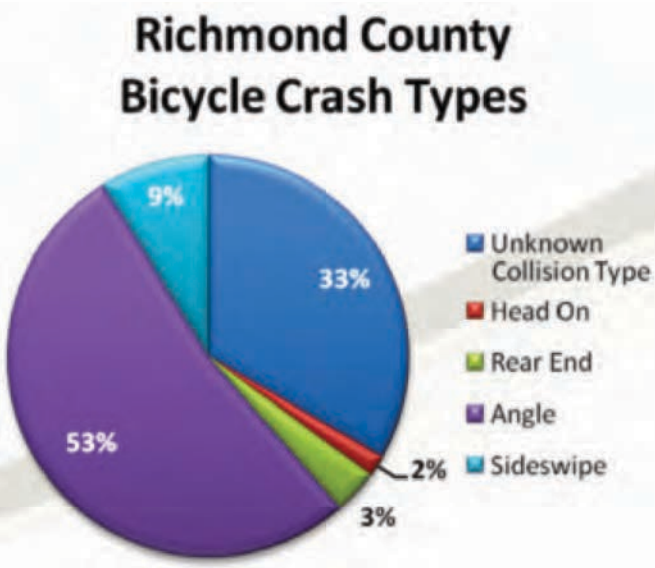
**Please note that percentages of total injuries and fatalities were calculated based on the total number of crash reports identified. In some cases, one crash report may have identified multiple injuries.*

Way, 15th Street, Wrightsboro Road, Ra Dent Boulevard, and Martin Luther King Boulevard (SR 4). The total number of crashes indicates that the following locations contain concentrations of crashes in the county:

- Wrightsboro Road (16 Crashes)
- Walton Way (14 Crashes)
- Martin Luther King Boulevard/SR 4 (13 Crashes)
- Broad Street (8 Crashes)
- SR 28 (7 crashes)

Figures 4-21 and Figure 4-22 provide maps of bicycle and pedestrian crash locations within Richmond County.

Figure 4-20: Richmond County Crash Typology



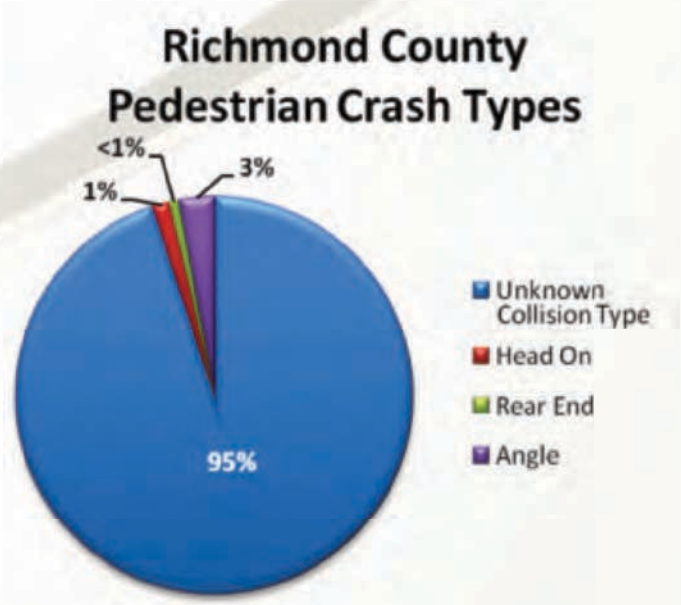


Figure 4-21: Bicyclist Safety Analysis - Richmond-Augusta County

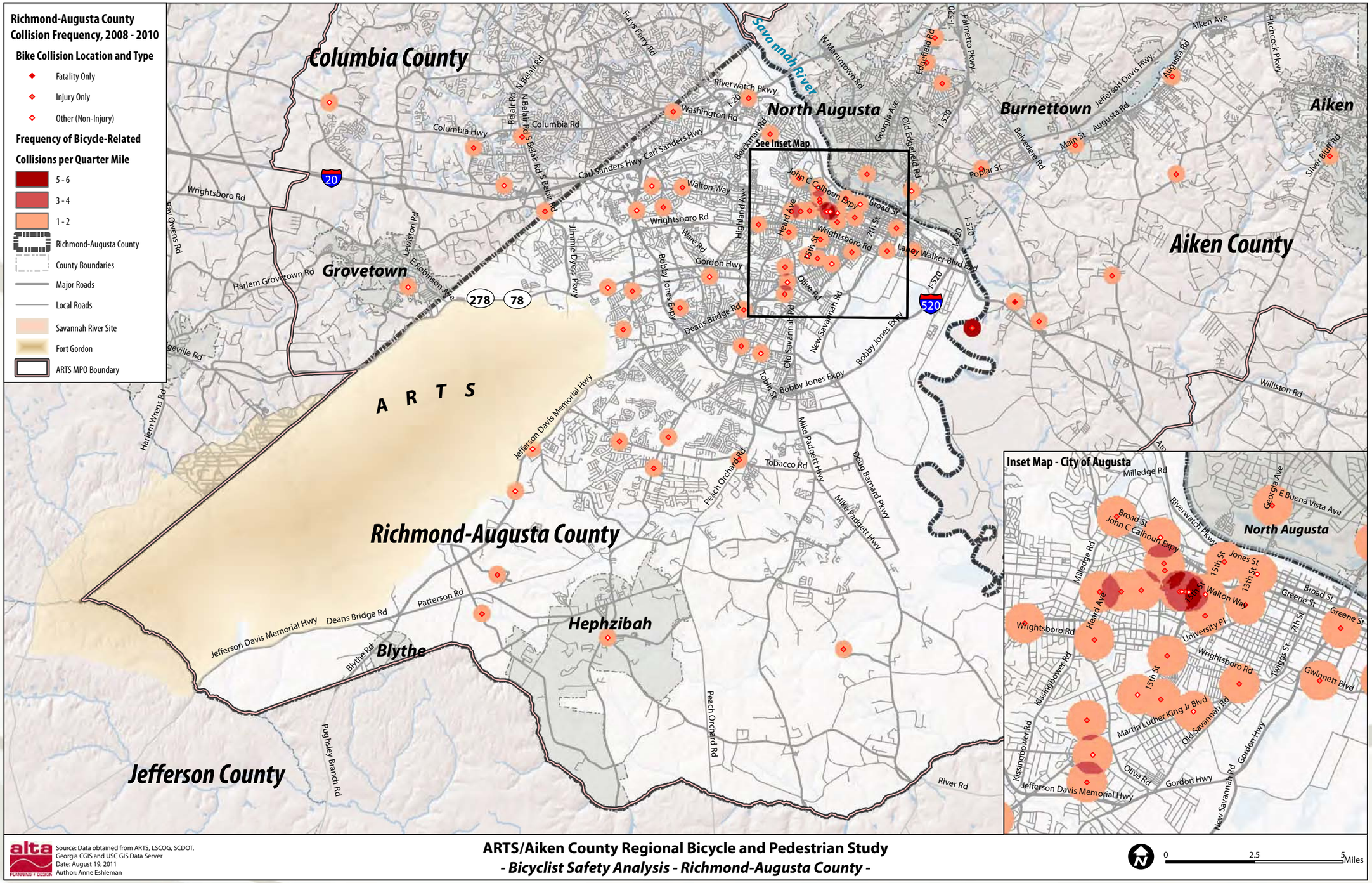
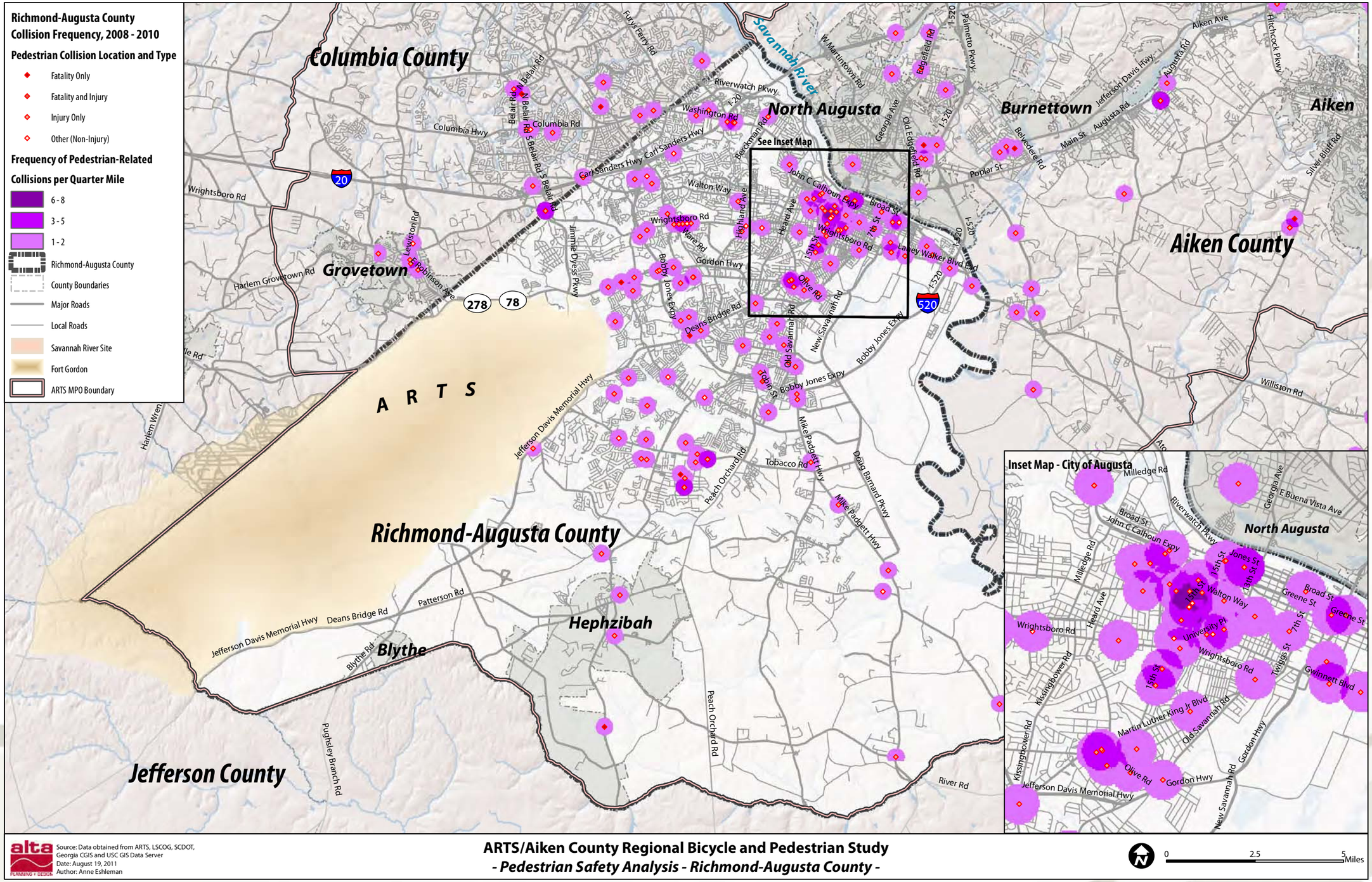


Figure 4-22: Pedestrian Safety Analysis - Richmond-Augusta County



ARTS/Aiken County Regional Bicycle and Pedestrian Study
- Pedestrian Safety Analysis - Richmond-Augusta County -

Aiken County

To provide a comparable analysis between data received on Columbia and Richmond counties, Aiken County bicycle and pedestrian crash data from 2008 to 2010 was used for this regional analysis. A summary of crash statistics for Aiken County is provided in Table 4-21. There were a reported 38 bicycle crashes and 75 pedestrian crashes over the three-year period. Crashes were concentrated in the southern portions of the county near the urbanized area of Augusta. These crashes resulted in 1 bicycle fatality and 6 pedestrian fatalities. Most crashes for bicyclists and pedestrians occurred during dry conditions (92 and 90 percent, respectively). 71 percent of all bicycle crashes occurred during daylight hours and 45 percent of pedestrian crashes occurred during the day. Approximately 40 percent of the pedestrian crashes occurred at night in areas without adequate lighting, resulting in 3 of the total pedestrian fatalities. There is an overrepresentation of crashes in dark conditions. Though there is typically less walking occurring then, over 50 percent of all pedestrian crashes occurred during non-daylight hours, which suggests a compelling case for addressing this problem in more detail. The primary factor reported in these night pedestrian crashes is pedestrians illegally in the roadway. The one bicycle fatality was reported in 2008; it occurred at night along Urquhart Drive due to a motorist under the influence. Out of the 6 pedestrian fatalities, 4 occurred during night or at dusk, mostly in unlighted areas. Locations for these pedestrian fatalities included Fairview Avenue, Pine Log Road, Edgefield Road, Seymour Drive, Laurens Street, and Belvedere Clearwater Road. The total number of crashes indicates that the following locations contain concentrations of crashes in the county:

1. East Pine Log Road (9 Crashes)
2. Atomic Road (5 Crashes)
3. Richland Avenue (4 Crashes)
4. Whiskey Road (4 Crashes)
5. Belvedere-Clearwater Road (3 Crashes)
6. Hampton Avenue (3 Crashes)
7. Rutland Drive (3 Crashes)

Other locations where more than one crash was identified include Columbia Highway, Dougherty Road, Edgefield Road, Jefferson Davis Highway, Marion Street, Seymour Drive, and South Aiken Boulevard. Figures 4-23 and

Table 4-21: Aiken County Crash Characteristics

Crash Characteristics	Bicycle Crashes	Pedestrian Crashes	Bike %	Ped %
Total Crashes Reported	38	75	100%	100%
Fatalities	1	6	3%	8%
Injuries (Possible/Identified)*	35	77	--	--
Not Injured/Unknown Injury	42	90	--	--
Dry Roadway Conditions	35	68	92%	90%
Wet Roadway Conditions	2	7	5%	9%
Unknown Roadway Conditions	1	2	3%	3%
Daytime Crashes	27	34	71%	45%
Nighttime Crashes – Lighted	5	10	13%	13%
Nighttime Crashes – Not Lighted/Unspecified	3	30	8%	40%
Unspecified Lighting Conditions	3	1	8%	1%

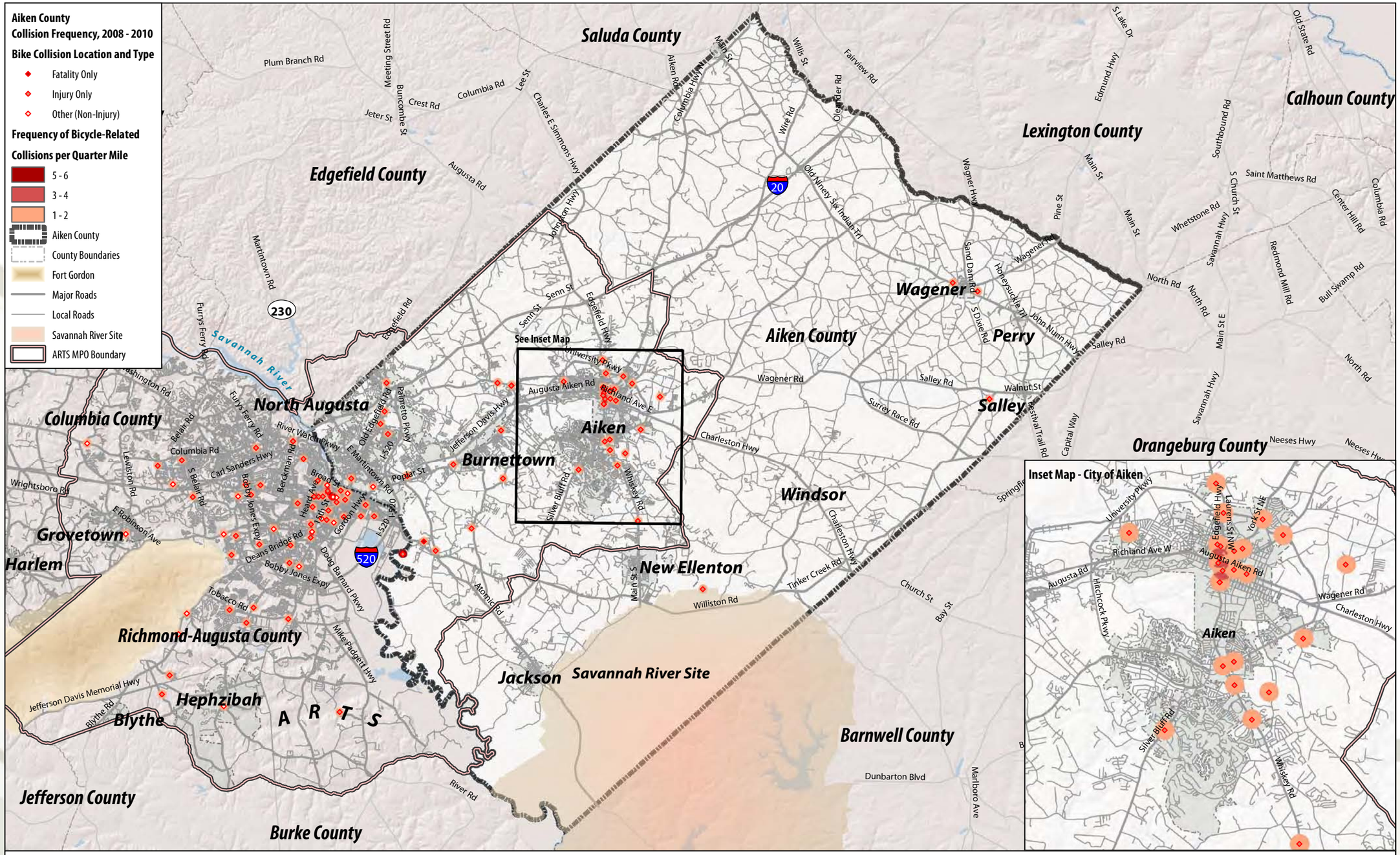
**Please note that Aiken County data provides greater detail for injury types, and have been categorized in this table to provide comparable analysis between counties in the region. Injury types include incapacitated, non-incapacitated or possible injury types. Other categories included not injured or where injury was not reported, and these are included in the category "Not Injured/Unknown Injury for the purposes of this analysis.*

Figure 4-24 provide maps of bicycle and pedestrian crash locations Aiken County.

Figure 4-25 and Figure 4-26 provide details on the primary factors in bicycle and pedestrian crashes. In bicycle crashes, over 80 percent of the automobile contributing factors included improper action or movement by driver (31 percent), driving too fast (13 percent), distracted driving (13 percent), failing to yield to right of way (13 percent), or disregarding a sign or signal (13 percent). Approximately 45 percent of bicyclist contributing factors were from failing to yield right of way and 13 percent resulted from bicyclists disregarding a sign or signal.

For pedestrian collisions, the most prominent automobile contributing factors included improper actions by drivers (30 percent), distracted driving (19 percent), failing to yield right of way to bicyclists (15 percent), and motorists under the influence (11 percent). The most prominent factors in pedestrian collisions where pedestrians contributed to the collision included pedestrians illegally in the roadway (38 percent), improper crossings (12 percent), or distracted/inattentive actions by pedestrians (12 percent). It should be noted that in many cases, the "pedestrians illegally in roadway" code can be misleading. It technically could apply to a pedestrian crossing midblock to get to a bus stop when the "block" is a half mile long. In such cases, it is misleading to code this as a primary collision factor. Reviewing police reports for these pedestrian crashes may provide further insight into countermeasures that may be provided to enhance safety.

Figure 4-23: Bicyclist Safety Analysis - Aiken County



Source: Data obtained from ARTS, LSCOG, SCDOT, Georgia CGIS and USC GIS Data Server
Date: July 28, 2011
Author: Tony Salomone

ARTS/Aiken County Regional Bicycle and Pedestrian Study
- Bicyclist Safety Analysis - Aiken County -

0 2.5 5 Miles

Figure 4-24: Pedestrian Safety Analysis - Aiken County

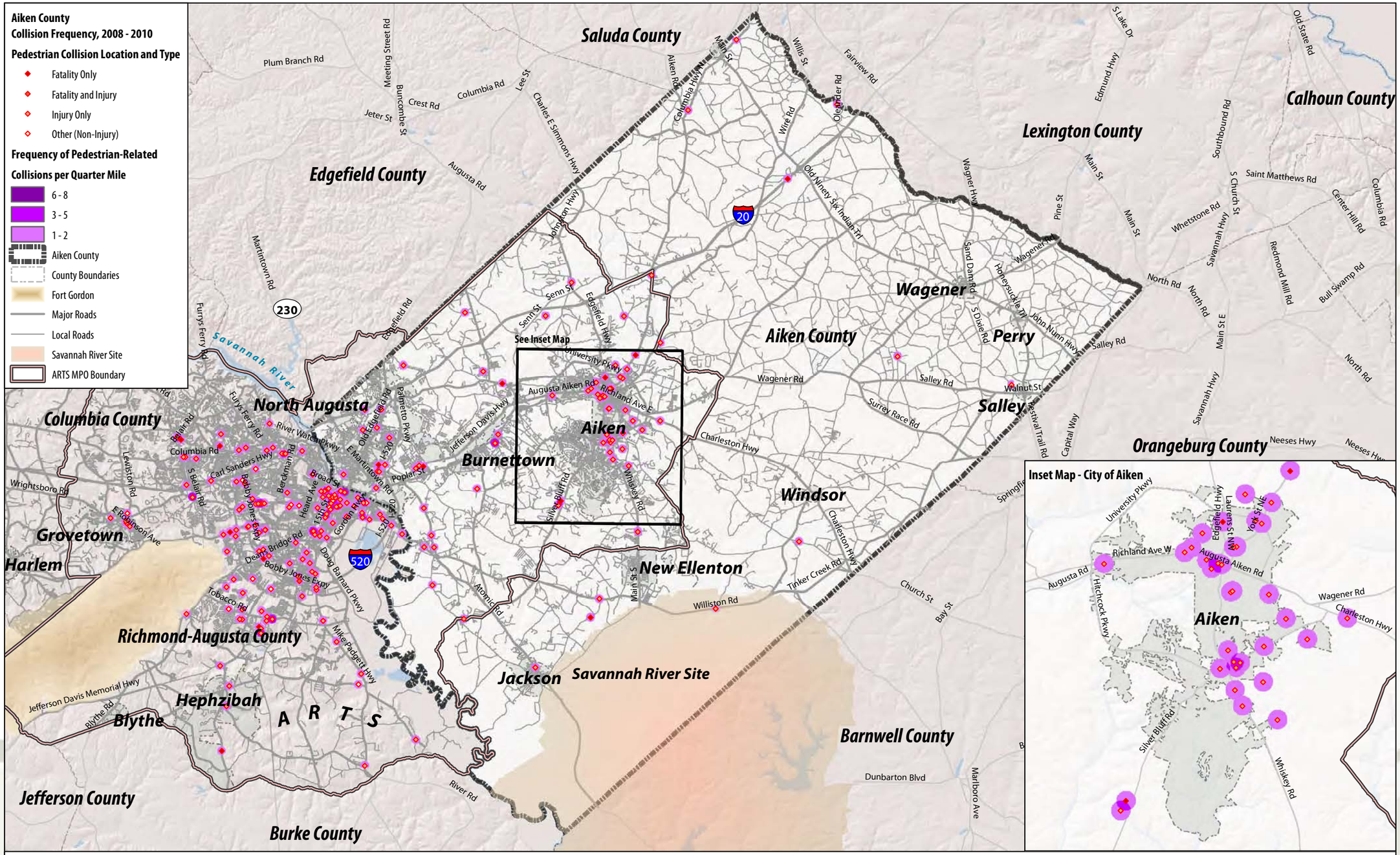
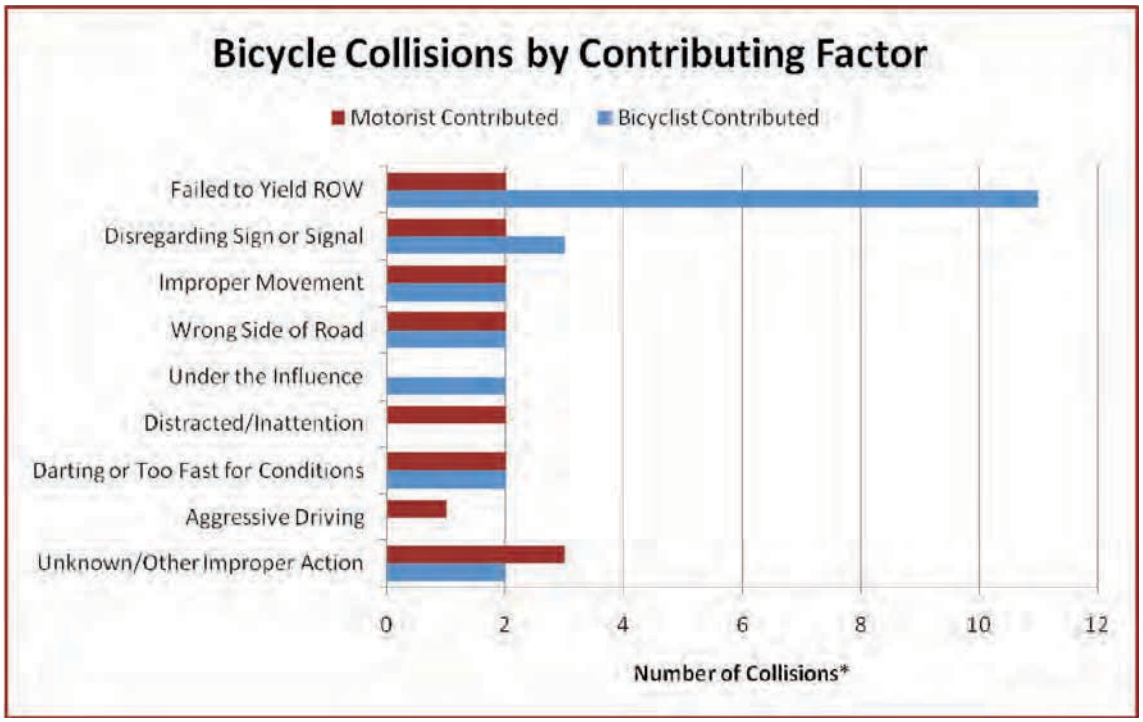
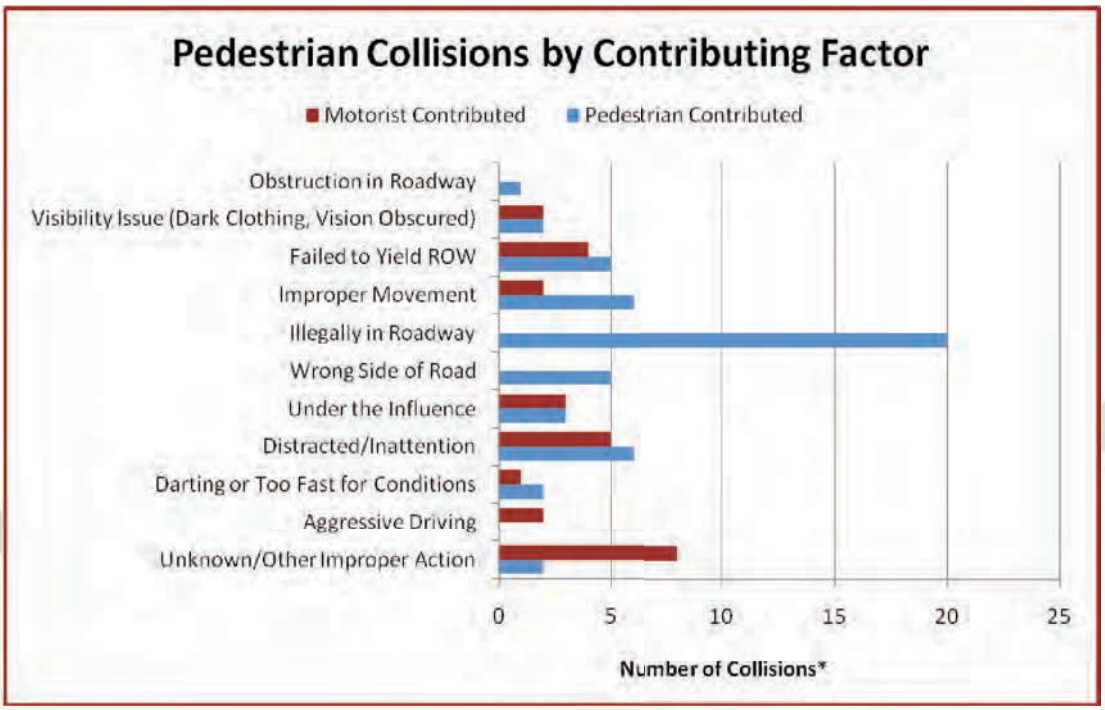


Figure 4-25: Aiken County Bicycle Collisions by Contributing Factor



**Please note that totals are in excess of the total number of bicycle crashes reported. This is due to cases where both motorists and bicyclists were determined to have contributed to the crash.*

Figure 4-26 Aiken County Pedestrian Collisions by Contributing Factor



**Please note that totals are in excess of the total number of crashes reported. This is due to cases where multiple motorists and/or pedestrians were involved in a single crash.*

Crash Analysis Findings

The crash analysis in this technical memorandum focused first on county by county information to provide available details at a localized level on bicycle and pedestrian crashes that could help determine regional trends for the findings in this report.

In identifying key locations where crashes are reported within the region, counts of all crashes for all counties were tabulated. The results of the crash analysis indicate that locations of crashes are concentrated in northern Richmond County near the Aiken County Line. The following streets are locations where at least 5 crashes have been reported during the three-year period in the region:

1. Wrightsboro Road, Richmond County (16 Crashes)
2. Walton Way, Richmond County (14 Crashes)
3. State Road 4, Richmond County (13 Crashes)
4. East Pine Log Road, Aiken County (9 Crashes)
5. Broad Street, Richmond County (8 Crashes)
6. State Road 28, Richmond County (7 Crashes)
7. Milledgeville Road, Richmond County (6 Crashes)
8. SR 104 (Washington Road), Columbia County (6 Crashes)
9. 15th Street, Richmond County (5 Crashes)
10. Atomic Road, Aiken County (5 Crashes)

These locations, in particular, will deserve attention to improve safety for pedestrians and bicyclists in the region.

Pedestrian conflict details for Columbia and Richmond counties do not provide enough information to determine the most common types of collisions. More detailed study of police reports for pedestrian crashes is recommended at the local level to identify more precisely the actions by pedestrians or motorists prior to the crash. This analysis will be useful in developing countermeasures.

There is an overrepresentation of crashes in dark conditions in Aiken and Richmond Counties, with 50 and 40 percent of all pedestrian crashes occurring during non-daylight hours yet there is typically less walking occurring then. With 100 percent and 50 percent respectively of the pedestrian fatalities also occurring in dark conditions, there is a compelling case for addressing this problem in more detail.

"ARTS conducted a proactive stakeholder and public involvement program for the development of the ARTS Bicycle and Pedestrian Plan focused on soliciting local government and community interaction throughout the study process. This process was responsive to citizen participants and utilized the knowledge and understanding of citizens to address important issues."

Chapter Five

Qualitative User Needs Analysis

Summary of Strategic Public Involvement Plan

The Augusta Regional Transportation Study (ARTS) recognizes that the success of any community improvement plan is dependent upon a meaningful community involvement effort. ARTS conducted a proactive stakeholder and public involvement program for the development of the ARTS Bicycle and Pedestrian Plan focused on soliciting local government and community interaction throughout the study process. The process was designed to be responsive to citizen participants and was committed to utilizing the knowledge and understanding of citizens to address important issues. The ARTS Bicycle and Pedestrian Plan: Strategic Public Involvement Plan (SPIP) was developed at the onset of the study to define how stakeholders, the public, and study team staff involvement roles and opportunities throughout the planning effort. Outreach activities were developed to offer multiple opportunities for engagement at varying levels of involvement. The full SPIP document is included in Appendix D.

The public participation framework included four primary groups to guide the development of the ARTS Bicycle and Pedestrian Plan. The four groups were: (1) Project Steering Committee; (2) Stakeholder Interview Group (3) Targeted Focus Groups; and (4) Community Organizations and General Public. The roles and membership for each of these groups are defined in detail in the SPIP.

The SPIP included an outline for activities including two rounds (each round consisting of two locations) of public workshops; education and information booths at public events; a study website; on on-line survey; a study fact sheet; press releases; study database development and maintenance; media education and advertisement; and advisory, stakeholder, and public meetings. The following sections include results of several of these outreach activities.

Key Findings of the Needs Assessment Phase

Key Survey Findings

The most common reasons for both not walking/biking or walking/biking infrequently were reported as: roads do not feel safe and distance from home to work or shopping. The bicycle facilities reported as most likely to have a positive impact on biking in the region in order of preference were:

- Off-street greenways,
- Bicycle lanes,
- Bicycle boulevards; and
- Signed bicycle routes.

The programs selected as most likely to be effective in promoting walking and biking in the region in order of frequency were:

- Media campaign to educate motorists, bicyclists, and pedestrians
- Safe Routes to School Program to engage schools, parents, and local officials
- Media campaign encouraging residents to bike, walk, and live an active lifestyle
- Local police enforcement programs

The Top Destinations in ARTS area Respondents Would Like to Walk or Cycle Safely To in Georgia are:

- Augusta Downtown
- Augusta State University
- Georgia Health Sciences University

- Augusta Canal
- Augusta Mall
- Lake Olmstead

The Top Destinations in ARTS area Respondents Would Like to Walk or Cycle Safely To in South Carolina are:

- Aiken Downtown
- Aiken Mall
- Aiken Regional Hospital
- Richland Ave. Wal-Mart, Aiken
- Hitchcock Woods
- O'Dell Weeks Activity Center
- University of South Carolina-Aiken
- Citizens Park
- North Augusta Greeneway
- Whiskey Road

Key Survey Conclusions

In Georgia, seven of the nine most cited biking corridors were also noted as desirable for walking:

- Walton Way
- Washington Road
- 13th Street
- Belair Road
- Broad Street
- Lake Olmstead area
- Wrightsboro Road.

Each of these corridors provides connectivity to the top six previously noted destinations desirable for bicycle and pedestrian connectivity including:

- Augusta downtown
- Augusta State University
- Georgia Health Sciences University
- Augusta Canal
- Augusta Mall
- Lake Olmstead

In South Carolina, 11 of the 13 most cited biking corridors were also noted as desirable for walking:

- Aiken downtown
- Banks Mill Road
- Georgia Avenue
- Hitchcock Parkway
- Pine Log Road
- Richland Avenue
- Silver Bluff Road
- University Parkway
- Whiskey Road
- Martintown Road
- Powderhouse Road.

Each of these corridors provides connectivity to the top ten previously noted destinations desirable for bicycle and pedestrian connectivity including:

- Aiken downtown
- Aiken Mall
- Aiken Regional Hospital
- Richland Ave. Wal-Mart, Aiken
- Hitchcock Woods
- O'Dell Weeks Activity Center
- University of South Carolina – Aiken
- Citizens Park
- North Augusta Greeneway
- Whiskey Road.

Key Focus Group and Public Workshop Findings

The following themes were noted throughout the Focus Group and Public Workshop outreach activities:

Engineering

- Connect Augusta Canal to North Augusta Greeneway
- Improve connectivity from Columbia County to Augusta Canal path
- Improve bicycle and pedestrian connectivity between downtown Augusta and the medical district.
- More bicycle parking is needed
- Shoulders needed on rural roads
- Identify "easy opportunities" and implement: fill in short gaps, erect signage, utilize opportunities like alleys and creeksides, add pavement markings
- Connect the North Augusta Greeneway to the Augusta Canal
- Recreational trails are preferred over onroad facilities

Encouragement, Education, and Enforcement

- Capitalize on areas that are already suitable for cycling and walking to promote image of user-friendliness and economic benefits
- Increased education for cyclists and motorists is needed
- Law enforcement awareness and support of cycling community is needed
- Need for positive promotion of bicycling through activities and media

Evaluation & Equity

- Plan for those who walk and bike out of necessity as opposed to simply for recreation
- Partner with the private sector to match funding for facilities, finance wayfinding signage, designate a bicycle park and ride area

Focus group meetings and other forms of stakeholder input contributed significantly to the development of the Plan.

Summary of Survey Results

To engage local residents, a Citizen Survey was widely available and promoted from September 8 to November 15, 2011. The survey included 20 questions related to biking and walking conditions in the ARTS Area. See Appendix D to view the complete survey. To guide the study team, the survey questions were designed to gather citizen input regarding:

- Frequency of walking and biking to particular types of destinations
- Reasons for not walking or biking more frequently
- Types of facilities that would likely influence more frequent biking
- Specific destinations desirable for walking or biking connection
- Roadway corridors desirable for improved accommodation of walking and biking
- Facility types that may influence increased biking in the region
- Program concepts to consider to promote safe walking and biking

The following activities were utilized to promote participation in the study survey:

Survey available on City of Augusta, City of Aiken, and Aiken County websites with user-friendly links to the sites: www.BikeWalkARTS.com and www.WalkBikeARTS.com
ARTS and Aiken County Steering Committee Member outreach
Press Releases to Local Media
Targeted Recreation, Transit and Alternative Transportation, and Aiken County Focus Group Meetings
Targeted outreach to Georgia Health Sciences University
Targeted outreach to Wheel Movement
Targeted outreach to University of South Carolina, Aiken
Targeted outreach to Eat Smart Move More of Aiken County
Targeted outreach to City of Aiken Recreation Committee
Targeted outreach to Silver Sneakers
Targeted outreach to Ashley Cooper Bridge Race Aiken County Participants
Targeted outreach to Aiken City Bike Patrol
Targeted outreach to City of Aiken Seniors Commission
Targeted outreach to City of Aiken Parks, Recreation and Tourism Staff
Targeted outreach to Aiken Bicycle Club
Targeted outreach through City of Aiken Utility Newsletter
September 9 &10 – Booth at Aiken's Makin in Aiken
September 17 – Booth at ARTS in the Heart in Augusta
September 24 – Booth at Aiken Bluegrass Festival in Aiken
September 30 – Booth at 5th Friday by Aiken Chamber of Commerce
October 3 - Public Workshop in Aiken, South Carolina
October 4 – Public Workshop in Augusta, Georgia
October 29 – Booth at Jack O' Lantern Jubilee in North Augusta
A total of 524 responses were recorded

during the two month survey period. Of the respondents, 69 percent of the responses were from South Carolina ARTS area residents and 28 percent were from Georgia ARTS area residents. Three percent of the respondents did not live in the ARTS area. Females comprised 51 percent of the respondents and 49 percent were male. The ages of the respondents ranged from age 10 to over 70 years of age. The top six groupings of respondents reported their daily work commute destinations as:

- 36 percent commute to the City of Aiken;
- 21 percent commute to Augusta-Richmond County;
- 7 percent commute to Aiken County;
- 6 percent commute to Savannah River Site;
- 3 percent commute to Columbia County; and
- 3 percent commute to Fort Gordon.

Approximately 15 percent of the respondents reported that they do not commute to work on a daily basis.

The survey was designed to gather information regarding the frequency of biking and walking in the ARTS area and further engaged the respondents to identify the reasons they do not currently walk or bike more frequently. Seventy-two percent of the respondents reported that they do own a bicycle. When asked specifically about biking activities, the most frequent destinations or trip purposes respondents reported for biking on a seldom to daily basis are: for fitness and leisure (66%); to parks and trails (46%); for shopping or errands (24%); and to a gym, YMCA or Recreation center (21%). Twenty-five percent of the respondents reported never riding a bike at all.

The most common reasons for not biking or biking infrequently were reported as follows: roads do not feel safe, distance from home to work or shopping, lack of bicycle parking at destinations, and lack of knowledge of best bicycling routes. Twenty-four percent of the respondents reported that they do ride frequently while 14 percent of the respondents reported that they do not have an interest in bicycling. Of the survey respondents that do bike to specific destinations in the region, Figure

5-1 illustrates the frequency with which they do so. Figure 5-2 defines the obstacles respondents cited that prevent more frequent biking.

When asked specifically about walking activities that occur on a seldom to daily basis, the most frequent destinations or trip purposes that respondents reported are: for fitness and leisure (82%); to parks and trails (50%); for shopping or errands (28%); to a gym, YMCA or Recreation center (26%); and to civic events or civic buildings (24%). Ten percent of the respondents reported a lack of interest in walking in the ARTS Region.

The most common reasons for not walking or walking infrequently were reported as follows: roads do not feel safe and distance from home to work or shopping. Thirty-two percent of the respondents reported that they do walk frequently while 10 percent of the respondents reported that they do not have an interest in walking. Of the survey respondents that do walk to specific destinations, Figure 5-3 illustrates the frequency with which they do so. Figure 5-4 defines the obstacles respondents cited that prevent more frequent walking.

The survey further explored types of bicycle facilities that could have a positive impact on the biking environment in the ARTS area. Participants were asked to consider several types of bicycle facilities ranging from off-road paths, on-road infrastructure, pavement markings, and signage. The participants ranked each type of facility as "very likely" to "very unlikely" to influence them personally to bike more frequently. The facilities reported as most likely to have a positive impact on biking in the region in order of preference were: off street greenways, striped bicycle lanes, bicycle boulevards, and signed bicycle routes. It should also be noted that all seven facilities listed in the survey received more positive feedback than negative feedback related to the likelihood that the facility would influence more frequent biking. Figure 5-5 illustrates the responses regarding feelings about particular types of biking facilities. The orange and blue portions of the bars indicate the levels a respondent feels that a facility would have a positive influence on them to bike more often.

Respondents were also asked to select the top three potential program concepts they believed would be effective in promoting safer walking and biking in the ARTS area. The programs selected as most likely to be effective in order of frequency were:

- Media campaign to educate motorists, bicyclists, and pedestrians
- Safe Routes to School Program to engage schools, parents, and local officials
- Media campaign encouraging residents to bike, walk, and live an active lifestyle
- Local police enforcement programs
- Figure 5-6 illustrates the support of the various program concepts presented in the survey.

The survey also sought to gather information regarding specific destinations, corridors, and intersections respondents feel are important for improved access, connectivity, and facility improvements. The questions used in this portion of the survey allowed the respondent to provide input in their own language and the study team sorted, grouped, and applied uniform language to like responses to the level of accuracy allowable given different levels of detail and specificity. The results generated by these questions served as a guide to ensure that frequently cited responses were considered as priority investment areas during the technical planning evaluation and ultimately in ranking recommended transportation system improvements.

The survey responses were divided into separate priority lists for the Georgia and South Carolina portions of the ARTS study area. The top most commonly cited destinations respondents would like to be able to walk or bike safely to were downtown areas, schools, recreation areas, shopping areas, medical districts, and existing walking or biking facilities. The most frequently cited specific destinations in Georgia are listed in Table 5-1. South Carolina top priority destinations for safe walking and biking connectivity are listed in Table 5-2.

Figure 5-1 Frequency of Biking by Destination in the ARTS Area

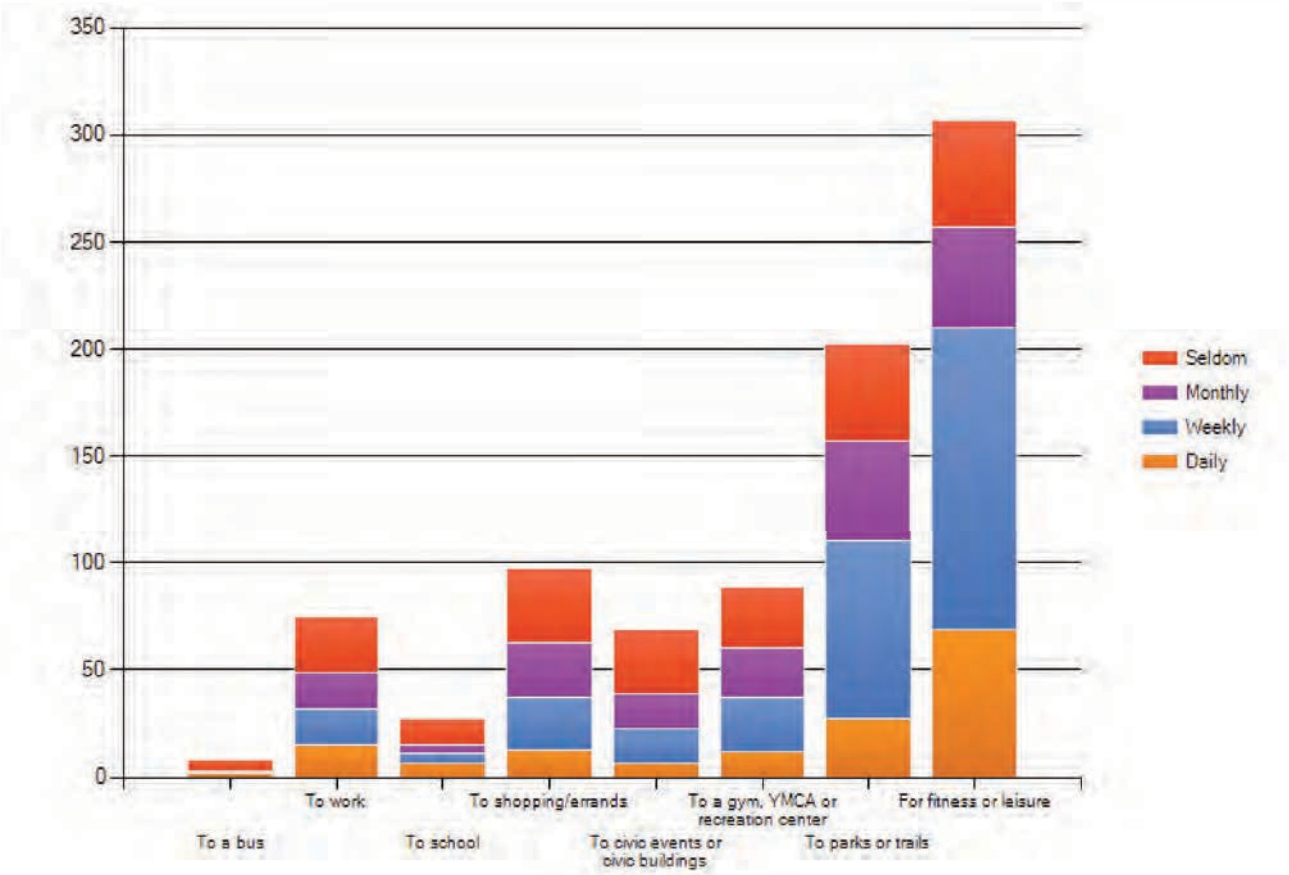


Figure 5-2 Reasons for Not Biking or for Biking Infrequently in the ARTS Area

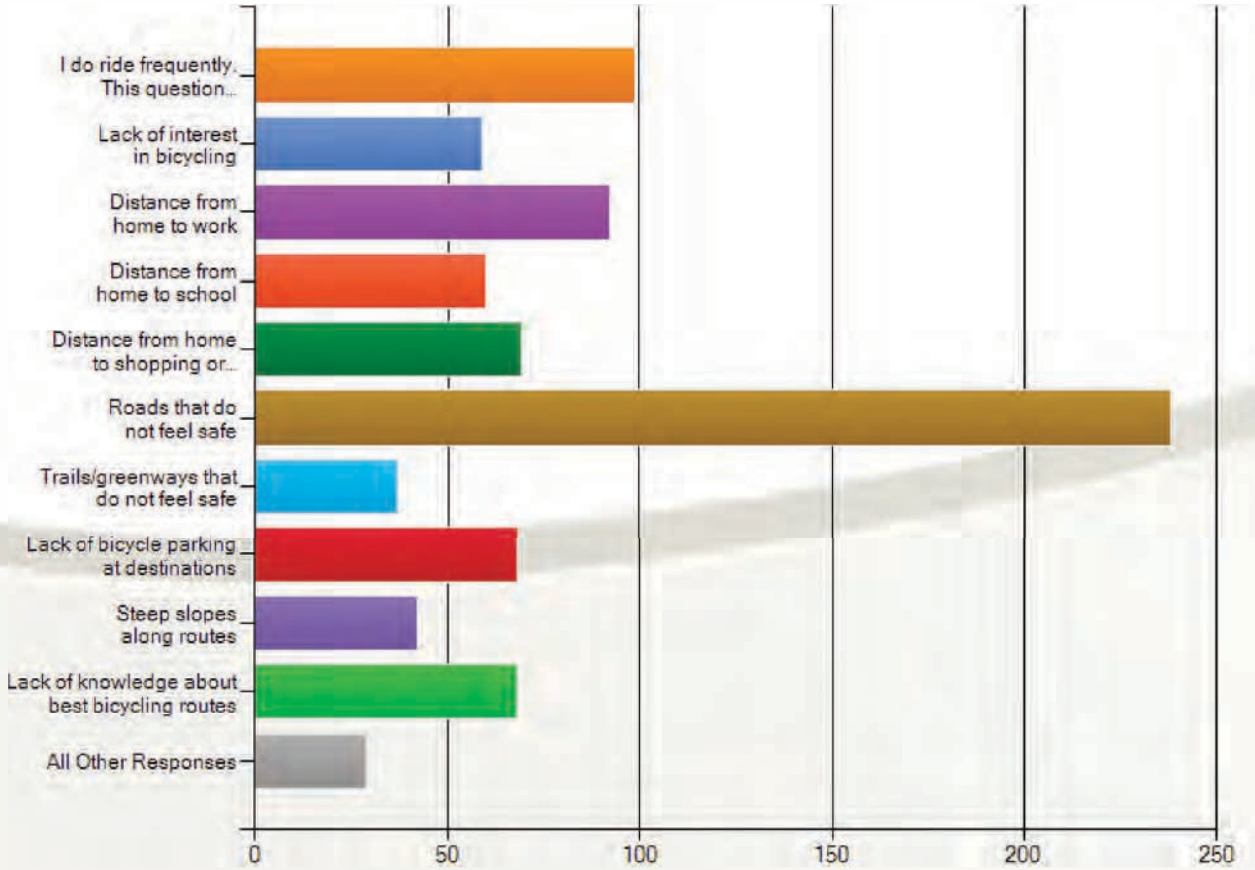


Figure 5-3 Frequency of Walking by Destination in the ARTS Area

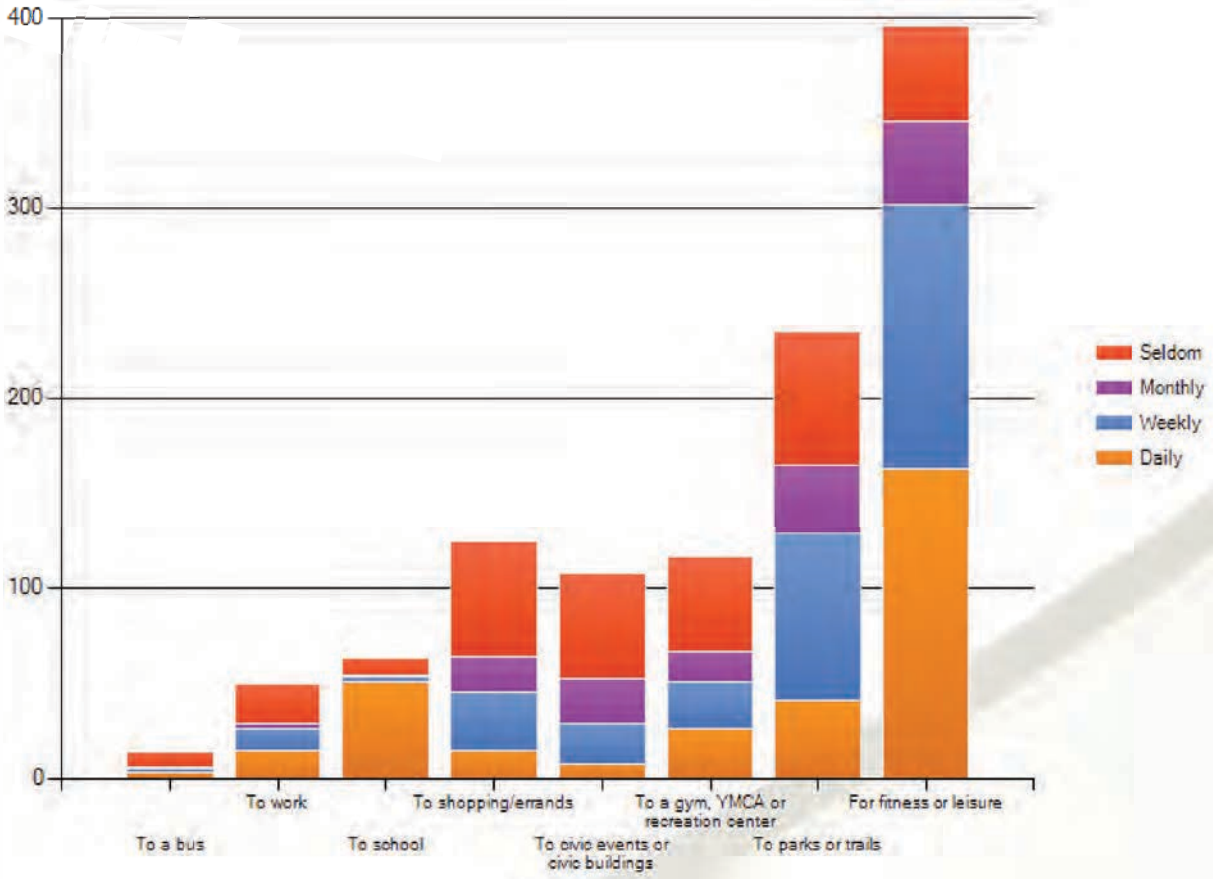


Figure 5-4 Reasons for Not Walking or for Walking Infrequently in the ARTS Area

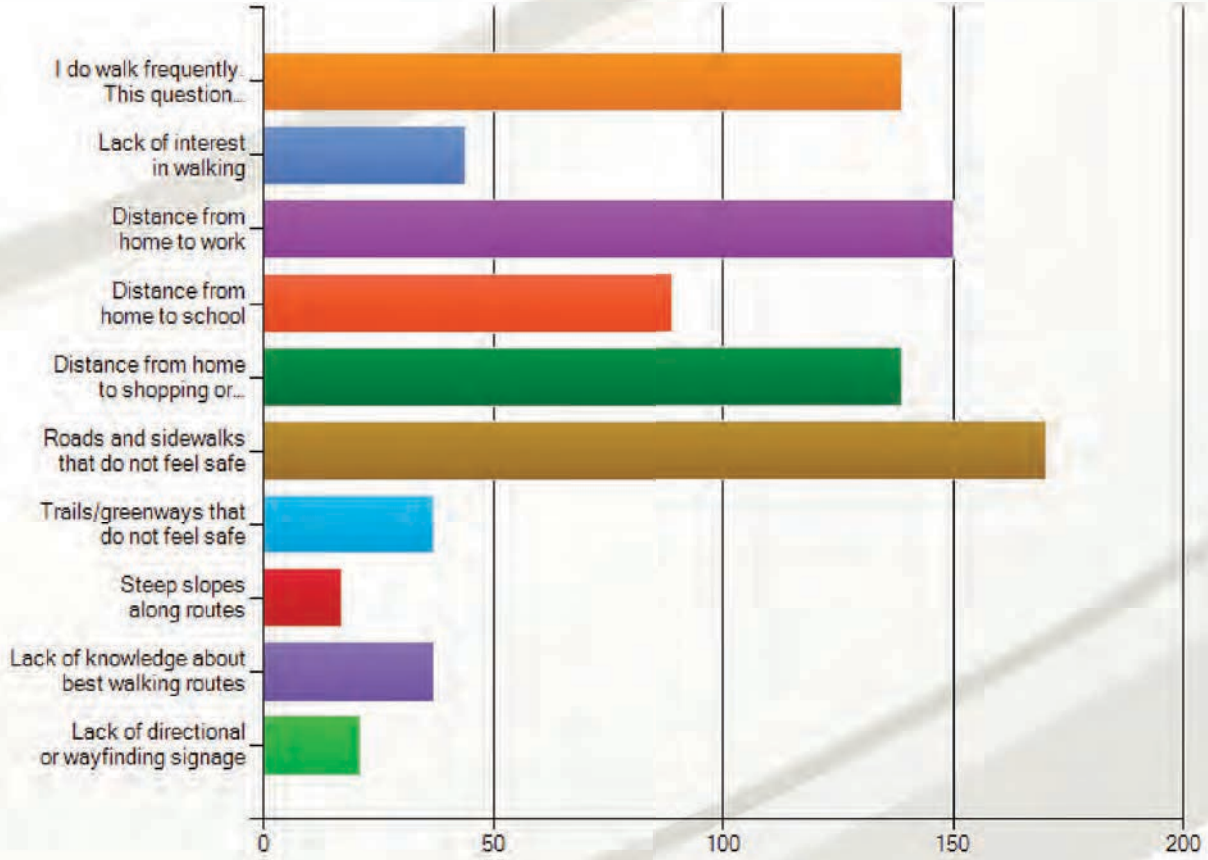


Figure 5-5 Influence of Bicycle Facilities on Biking Frequency

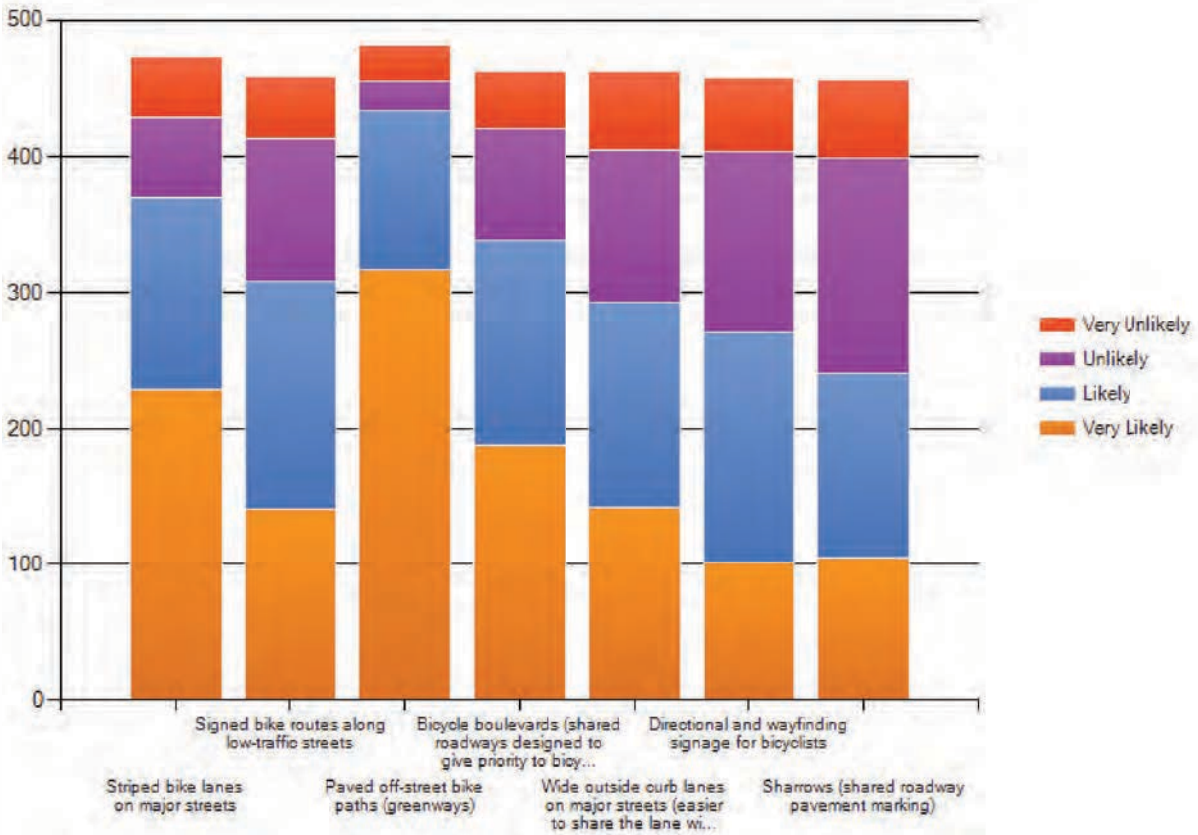


Figure 5-6 Potential Program Concepts to Promote Safer Walking and Biking in the ARTS Region

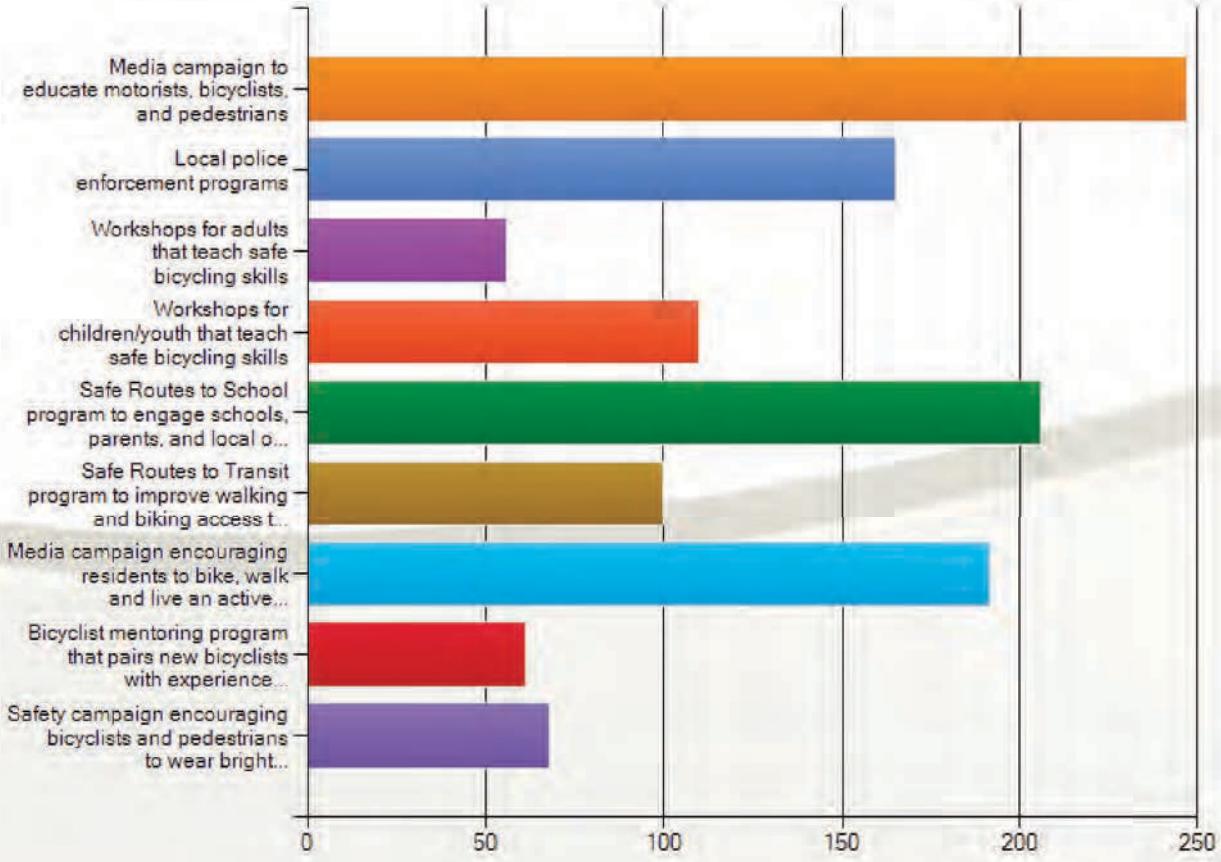


Table 5-1 Destinations in ARTS area Respondents Would Like to Walk or Cycle Safely To

Georgia

Number of Responses	Destinations
15 or more	Augusta Downtown Augusta State University Georgia Health Sciences University
11-14	Augusta Canal Augusta Mall Lake Olmstead
7-10	Augusta Exchange Shopping Center Evans Town Center Fort Gordon General shopping/grocery/gyms Savannah Rapids Pavilion
4-6	Augusta Riverwalk Columbia County Library Diamond Lakes Recreation Area Fury's Ferry Road Kroc Center Patriots Park Washington Road

Table 5-2 Destinations in ARTS Area Respondents Would Like to Walk or Cycle Safely To

South Carolina

Number of Responses	Destinations
15 or more	Aiken Downtown Aiken Mall Aiken Regional Hospital Richland Ave. Wal-Mart, Aiken Hitchcock Woods O'Dell Weeks Activity Center University of South Carolina-Aiken
11-14	Citizens Park North Augusta Greeneway Whiskey Road
7-10	Aiken High School General shopping/grocery/gyms North Augusta Downtown South Aiken High School Southside of the City of Aiken
4-6	Aiken Bypass Aiken Elementary School Hopeland Gardens Pine Log Road Richland Avenue Riverview Park Savannah Rover Site University Parkway

In comparing the most commonly cited Georgia corridors desirable for accommodation of biking with those desired for a better walking environment, there was notable overlap in the two priority lists. In Georgia, seven of the nine most cited biking

corridors were also noted as desirable for walking: Walton Way, Washington Road, 13th Street, Belair Road, Broad Street, Lake Olmstead area, and Wrightsboro Road. Each of these corridors provides connectivity to the top six previously noted destinations desirable for bicycle and pedestrian connectivity including: Augusta downtown, Augusta State University, Georgia Health Sciences University, Augusta Canal, Augusta Mall, and Lake Olmstead. Table 5-3 lists Georgia roadway corridors that respondents would like to see improved to accommodate bicycling. Georgia corridors indicated as desirable for improvement to accommodate walking are listed in Table 5-4.

Table 5-3 Roadway Corridors Respondent Would Like to See Improved to Accommodate Bicycling

Georgia

Number of Responses	Biking Corridors
15 or more	Fury's Ferry Road Walton Way Washington Road
11-14	13th Street Belair Road Broad Street Columbia Road Lake Olmstead Wrightsboro Road
7-10	Augusta Canal Hardy McManus Road
4-6	Augusta Downtown Central Avenue Evans to Locks Road Milledge Road North Belair Road Riverwatch Parkway Stevens Creek Road Wheeler Road William Few Parkway

Table 5-4 Roadway Corridors Respondent Would Like to See Improved to Accommodate Walking

Georgia

Number of Responses	Walking Corridors
15 or more	Washington Road
11-14	None
7-10	Belair Road Broad Street Lake Olmstead Walton Way Wrightsboro Road
4-6	13th Street Augusta Canal North Belair Road Wheeler Road

In comparing the most commonly cited South Carolina corridors desirable for accommodation of biking with those desired for a better walking environment, there was notable overlap in the two priority lists. In South Carolina, 11 of the 13 most cited biking corridors were also noted as desirable for walking: Aiken downtown, Banks Mill Road, Georgia Avenue, Hitchcock Parkway, Pine Log Road, Richland Avenue, Silver Bluff Road, University Parkway, Whiskey Road, Martintown Road, and Powderhouse Road. Each of these corridors provides connectivity to the top ten previously noted destinations desirable for bicycle and pedestrian connectivity including: Aiken downtown, Aiken Mall, Aiken Regional Hospital, Richland Ave. Wal-Mart in Aiken, Hitchcock Woods, O'Dell Weeks Activity Center, University of South Carolina – Aiken, Citizens Park, North Augusta Greeneway, and Whiskey Road. Table 5-5 lists South Carolina roadway corridors that respondents would like to see improved to accommodate bicycling. South Carolina corridors indicated as desirable for improvement to accommodate walking are listed in Table 5-6.

Table 5-5 Roadway Corridors Respondent Would Like to See Improved to Accommodate Bicycling

South Carolina

Number of Responses	Biking Corridors
15 or more	Aiken Bypass Aiken Downtown Banks Mill Road Georgia Avenue Hitchcock Parkway Pine Log Road Richland Avenue Silver Bluff Road University Parkway Whiskey Road
11-14	Highway 1 Martintown Road Powderhouse Road
7-10	Five Notch Road Highway 118 Laurens Street North Augusta Greeneway South Boundary Avenue
4-6	Dibble Road Hayne Avenue Highway 19 Highway 25 Highway 302 Highway 421 Park Avenue Trolley Line Road Vacluse Road

Table 5-6 Roadway Corridors Respondent Would Like to See Improved to Accommodate Walking

South Carolina

Number of Responses	Walking Corridors
15 or more	Pine Log Road Richland Avenue Silver Bluff Road Whiskey Road
11-14	Banks Mill Road University Parkway
7-10	Aiken Downtown Hitchcock Parkway Highway 118 Bypass Powderhouse Road
4-6	Dibble Road Georgia Avenue Martintown Road Trolley Line Road York Street

Finally, intersections respondents would like to see improved to accommodate safe pedestrian crossing in Georgia are listed in Table 5-7 and South Carolina top priority intersections are listed in Table 5-8. The majority of the intersections in each table overlap with previously identified corridors desirable for walking. The following intersections may indicate key locations desirable for crossing each corridor and will be considered in the improvement prioritization.

Table 5-7 Roadway Intersections Respondent Would Like to See Improved to Accommodate Safe Pedestrian Crossing

Georgia

Number of Responses	Pedestrian Intersections
11-14	None
7-10	Walton Way and 15th Street
4-6	15th Street and Laney Walker Boulevard
3	Belair Road and Columbia Road Broad Street and 13th Street Washington Road and Bobby Jones

Table 5-8 Roadway Intersections Respondent Would Like to See Improved to Accommodate Safe Pedestrian Crossing

South Carolina

Number of Responses	Pedestrian Intersections
11-14	Pine Log Road and Silver Bluff Road Whiskey Road and Pine Log Road Whiskey Road and South Boundary
7-10	Whiskey Road and Dougherty Road Whiskey Road and Silver Bluff Road
4-6	Laurens Street and Richland Avenue Pine Log Road and Banks Mill Road University Parkway and Richland Avenue
3	Aiken Mall and Target/Lowes Georgia Avenue and Martintown Road Knox Avenue and Martintown Road Whiskey Road and East Gate Drive Whiskey Road and O'Dell Weeks Activity Center Whiskey Road and Price Avenue

Summary of Focus Group Comments

During the Needs Assessment Phase of the ARTS Bicycle and Pedestrian Plan, three strategic focus group panels met for a facilitated discussion of bicycle and pedestrian needs throughout the ARTS area. The three focus groups were designed to bring together citizens with common interest in the following areas: recreation; transit and alternative transportation; and Aiken County.[1] The complete notes from the three focus group meetings are in Appendix D. The key findings emerging from each focus group meeting are summarized in Table 5-9.

The three focus groups were designed to bring together citizens with common interest in the following areas: recreation; transit and alternative transportation; and Aiken County.

1 As described in Appendix D, the SPIP included a fourth focus group focused on housing and economic development. The group did not generate any attendees.

Table 5-9 Summary of Focus Group Bicycle and Pedestrian Priorities

Focus Group	Summary of Bicycle and Pedestrian Priorities
Recreation	• Bicycle education through drivers education and drivers license testing • Law enforcement awareness and support of cycling community • Need for positive promotion of bicycling through activities and media • Connect Augusta Canal to North Augusta Greeneway • Connect end of North Augusta Greeneway to existing bicycle facility along I-520 in Aiken County • Add paved shoulders on rural roads • Mark best cycling routes with identification markers and wayfinding signage • Improve connectivity from Columbia County to Augusta Canal path • Add midpoint Augusta Canal path connectivity • Identify "easy opportunities" and implement: fill in short gaps, erect signage, utilize opportunities like alleys and creeksides, add pavement markings
Transit and Alternative Transportation	• The sidewalk system is inadequate and hazardous in places (uneven pavement, hanging limbs, cars parked on sidewalks) • Low Speed electric vehicles and bicycle paths/lanes on roads posted at 25 mph could provide short trip alternatives • Improve bicycle and pedestrian connectivity between downtown Augusta and the medical district. • Implement a bike share initiative • Education for cyclists and motorists • Target solutions for seniors and children who often rely on alternative transportation • Develop incentive programs to encourage biking and walking • Improve downtown Augusta and North Augusta connection • Connect the Augusta Canal to the Evans Town Center • Install tactile ramps at roadway intersections for visually impaired • Audible bus stop announcements would be beneficial to the visually impaired

Aiken County	• Conduct activities to promote courtesy between motorists, cyclists, and pedestrians • Focus on involving private sector investment • Capitalize on areas that are already suitable for cycling and walking to promote image of user-friendliness and economic benefits • All planning for new facilities should address walking and biking • Inter-governmental planning and funding of improvements is key • Provide a safe connection between Aiken, North Augusta, and Edgefield • Connect the North Augusta Greeneway to the Augusta Canal • Plan for those who walk and bike out of necessity as opposed to simply for recreation • Address sidewalk gaps and opportunities to connect to key destinations • Examine bus routes, sidewalk connectivity to stops, and shelters • Install bicycle racks at public buildings

Summary of Public Workshop Activities

Two rounds of Public Workshops were held during the Needs Assessment Phase of the study as follows:

- October 3, 2011: City of Aiken Municipal Building, Aiken, SC
- October 4, 2011: Julian Smith Casino, Augusta, GA

A presentation was delivered at each meeting covering the following material:

- National Bike-friendly, Walk-friendly Trends
- Engineering, Education, Encouragement, Enforcement, Evaluation, and Equity
- Existing Conditions
- Goals and Objectives
- Public Outreach Efforts and Opportunities

Following the presentation, workshop participants engaged with study team staff at four break-out stations focused on: walking programs, walking infrastructure, bicycling programs, and bicycling infrastructure. At the break-out stations, participants marked locations of opportunity and concern on large maps, completed questionnaires related to walking and biking programs, and engaged in discussions of walking and biking needs. All discussions were documented on flip charts to create a list of needs and opportunities to be incorporated into the planning process. In addition, general comment forms were also distributed to all participants for submittal of additional information relevant to the study process. A summary of the key findings from the public workshops is shown in Table 5-10.

Two rounds of Public Workshops were held during the Recommendations Phase of the study.

The workshops consisted of an informative presentation followed by public break-out sessions. Key findings from these sessions can be seen on the following pages.

Table 5-10 Needs Assessment Public Workshop Summary of Key Findings

Workshop Location	Summary of Key Findings
October 3, 2011: City of Aiken Municipal Building Aiken, SC	Bicycling Infrastructure: • Bicycle parking is needed • Shoulders needed on rural roads • Recreational trails are preferred over on-road facilities • Connect equestrian trails and expand access Bicycling Programs: • Targeted law enforcement needed for motorists and cyclists • Chamber of Commerce support to encourage biking and walking and to secure private sector sponsors • Safety education regarding laws, lights, clothing • Incorporate bicycle safety training in schools and through employers • Online tool for planning safe walking and biking routes Walking Infrastructure: • Ramps and handrails are needed throughout Aiken for wheelchairs and mobility carts • Ensure roadside landscaping does not hinder walking infrastructure or hinder driver visibility Walking Programs: • Increased public transportation would promote walking as a viable option • Partner with Aiken Downtown Merchants Association to emphasize economic benefits of pedestrian accommodation • Lower or better enforce speed limits in downtown Aiken • Improve pedestrian crossing conditions at key intersections in town and outside of town • Partner with retiree population to encourage senior citizens to walk for health

Workshop Location	Summary of Key Findings
October 4, 2011: Julian Smith Casino Augusta, GA	Bicycling Infrastructure: • Connect Augusta to North Augusta via Fifth Street Bridge, Thirteenth Street Bridge cantilever or new bridge • Pave shoulders, clean current paved shoulders, and examine potential for new facilities along creeks or other right-of-way • Connect Augusta State University to downtown Augusta • Connect Evans to downtown Augusta • Separate cyclists and motorists when possible • Provide secure bicycle parking Bicycling Programs: • Expand bicycle groups to include all types of riders • Build bicycle park and ride lots • Bicycle share or recycle program • Motorist education • Host the Georgia Bike Summit Walking Infrastructure: • Harrisburg area needs better pedestrian infrastructure • Washington Road near I-20 needs safe pedestrian infrastructure • Augusta State University area from Wrightsboro Road housing and athletic complex to main campus should be more pedestrian friendly • Connect Wheeler Road to Augusta Exchange Shopping Center • Evans needs more sidewalks • Build sidewalks near parks, libraries, and schools Walking Programs: • Tie walking facilities to historical markers in area • Add signage in downtown areas (similar to the signs in Aiken) • Print walking maps • Utilize social media to educate and bring walkers together • Focus on walking programs for children and Seniors Overall comment: Partner with the private sector to match funding for facilities, finance wayfinding signage, designate a bicycle park and ride area

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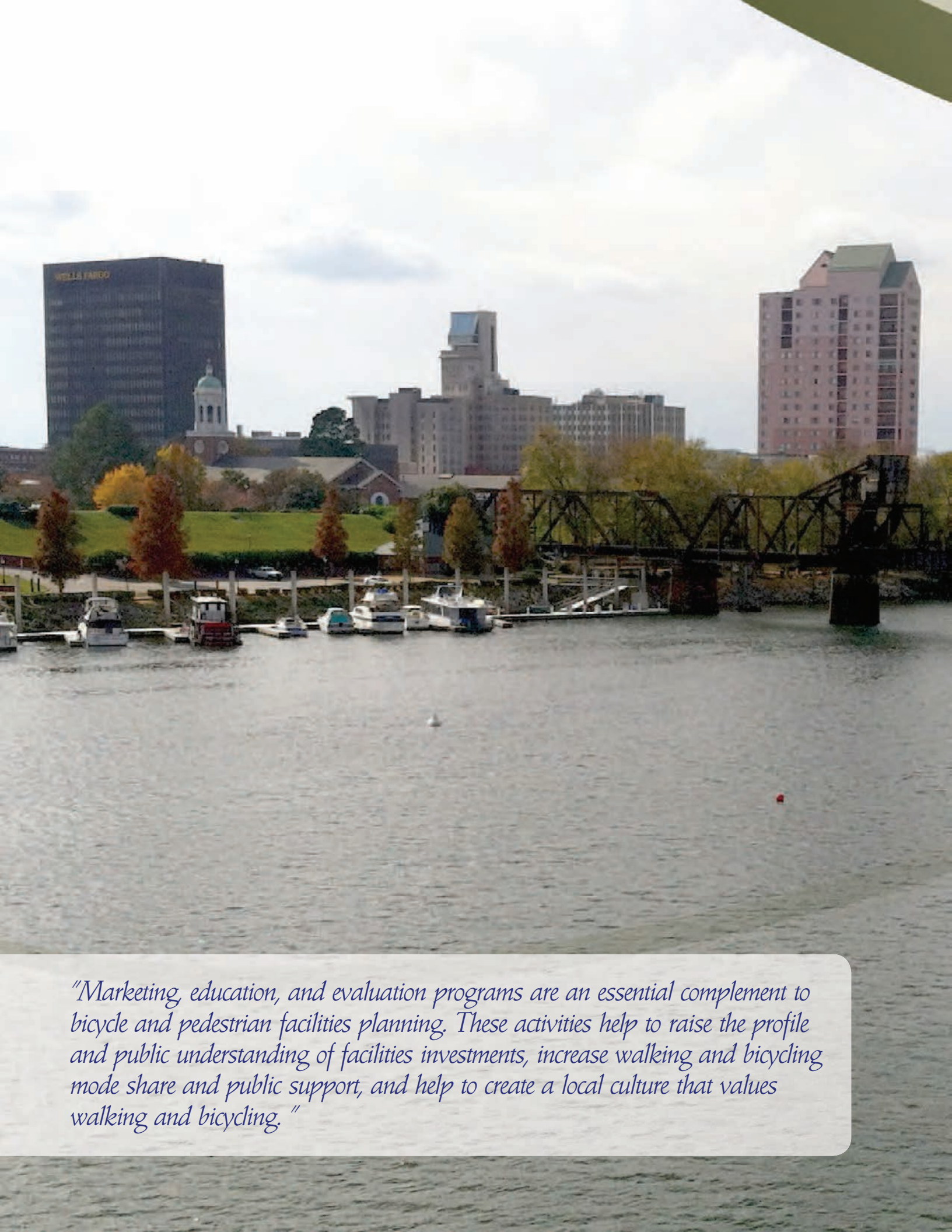


"Marketing, education, and evaluation programs are an essential complement to bicycle and pedestrian facilities planning. These activities help to raise the profile and public understanding of facilities investments, increase walking and bicycling mode share and public support, and help to create a local culture that values walking and bicycling."

Chapter Six

Bicycle and Pedestrian Program Recommendations

Introduction

Marketing, education, and evaluation programs are an essential complement to bicycle and pedestrian facilities planning. These activities help to raise the profile and public understanding of facilities investments, increase walking and bicycling mode share and public support, and help to create a local culture that values walking and bicycling.

The purpose of this chapter is to provide a set of programmatic recommendations for the four non-infrastructure "E's" of bicycle and pedestrian planning: Encouragement, Education, Enforcement, and Evaluation. These initiatives can be undertaken by local agencies and community organizations.

Program concepts were developed by the technical team and were based on:

- knowledge about existing programs in the region and states;
- the Vision, Goals and Objectives developed for this planning effort;
- stated community needs and concerns (as communicated through stakeholder interviews, public meetings and surveys, and discussions with the client team and Project Steering Committee);
- and the consultant team's knowledge about national model programs and best practices.

Additionally, this chapter is intended to assist municipalities in the ARTS region in their efforts to reach the status of a nationally designated Walk-Friendly and Bicycle-Friendly Community. For each program, we have provided information about the program purpose, a description of the basic approach and, wherever possible, links to model programs and useful resources.

Role of the Augusta Regional Transportation Study

ARTS, as a regional agency already engaged in transportation demand management, inter-jurisdictional coordination, and regional cooperation, should play the following roles:

- **Convener**: Bring the right people and organizations together.
- **Coordinator**: Assist interested parties in working in concert.
- **Adviser**: Develop expertise around education, promotion and marketing, and become the repository of institutional memory.
- **Unifier**: Create a regional identity and brand that serves as a rallying point for public involvement in walking and bicycling issues.
- **Monitor**: Develop an evaluation strategy, ensure that evaluation metrics are collected and report back to funders, stakeholders, decision-makers and the general public about the results of education, promotion and marketing efforts.
- **Funder**: Fund education, promotion and marketing efforts directly, when possible, and indirectly, by leading and participating in efforts to secure additional funding.
- **Implementer**: Where there is no clear existing implementing agency or where ARTS is the uniquely qualified agency to act (such as in the area of train-the-trainer programs), consider directly creating and implementing programs to fill the void.

The counties and municipalities within ARTS can and should also play these roles in the geographies over which they have jurisdiction. The Lower Savannah Council of Governments (LSCOG) may also fulfill some of these roles

in the South Carolina portion of the region, especially in unincorporated Aiken County.

Existing Statewide Programs

GEORGIA DEPARTMENT OF TRANSPORTATION

The Georgia Department of Transportation (GDOT) provides a guidebook, Georgia Bike Sense, to teach both bicyclists and motorists about safe behaviors in sharing the roadway. This guidebook instructs people on roadway rules, etiquette, and safety issues, and a listing of local, state and national bicycle resources are also provided. The guidebook is available online for download and may be printed by local communities for use.

The Georgia Department of Transportation (GDOT) provides a guidebook, Georgia Bike Sense, to teach both bicyclists and motorists about safe behaviors in sharing the roadway. (http://www.dot.ga.gov/travelingingeorgia/bikepedestrian)

GDOT also provides information and applications for Safe Routes to School Programs that help to educate young people on safety. Localities may take advantage of these programs to increase awareness and provide recommendations on needed improvements. A state advisory committee with representatives throughout Georgia oversees this program in the state and helps to develop and recommend program improvements. Within Georgia, the ARTS region is geographically located within the Coastal Region. A Safe Routes to School Outreach Coordinator for this region is available to help staff obtain regular information on the outcomes of these committee meetings and to offer insight into how to improve safety programs within the region to keep pace with statewide efforts.

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

The South Carolina Department of Transportation (SCDOT) Bicycle and Pedestrian Program provides a guide of safety tips for bicyclists and pedestrians as well as state route maps on their website. Links to a number of programs within the state related to bicycle and pedestrian awareness are also provided, including statewide public safety crash data and health related education awareness programs. SCDOT additionally houses the state's Safe Routes to School program. Regional Safe Routes to School offices serve the role of "resource center" and collaborator for communities advancing Safe Routes to School initiatives.

The Bikes Belong Coalition and the League of American Bicyclists advocacy organizations have also awarded a "Complete Streets" grant to SCDOT to implement bicycle and pedestrian policies and to improve conditions for bicycling and walking. The grant supports research, training and evaluation programs for the state. SCDOT, the League of American Bicyclists, the Palmetto Cycling Coalition, and other local advocacy groups work to support implementation of this grant program.

GEORGIA BIKES!

Georgia Bikes is a non-profit organization that works to improve bicycling conditions and promote bicycling throughout the state of Georgia. The organization provides safety tips for bicyclists and motorists and works closely with local bicycling advocacy groups around the state. Georgia Bikes hosts bike rides and events, including a ride to the Georgia Capitol. Resources for school teachers, non-English speaking adults, law officers, legislators, Safe Routes to School advocates, and others are available on the Georgia Bikes website.

PALMETTO CYCLING COALITION (PCC)

The Palmetto Cycling Coalition (PCC) is a non-profit organization dedicated to making South Carolina more bicycle friendly for everyone. PCC offers a number of education and training workshops, including adult bicycle driving classes, league certified bicycle instructor courses and law officer training education. Previously, PCC also initiated a bike lights program, whereby they are able to partner with organizations and local governments to

provide bicycle lights and safety informational brochures to cyclists in need. A Safe Streets Save Lives Campaign has also recently been initiated by PCC as a public private partnership program to promote bicycle safety and reduce the number of bicycle crashes across the state. Recently, a DVD was developed for the campaign, which has been shown within the state at local community facilities to enhance safety awareness. In May 2011, this DVD was shown in Aiken at the River of Life Church and was advertised through local bicycle advocacy groups.

Existing Regional and Local Programs

SAFE ROUTES TO SCHOOL PROGRAMS

Safe Routes to School Programs (SRTS) provide funding for school based programs which encourage bicycling and walking to school. This typically involves examining conditions around public schools and providing programs to improve bicycle/pedestrian safety, accessibility and use. Lewiston Elementary School in Columbia County was recently awarded a Safe Routes to School grant. Schools in Richmond County that have participated in this program include C.T. Walker Traditional Magnet School, Freedom Park Elementary School, Goshen Elementary School, Tutt Middle School, and A. Brian Merry Elementary School. Schools in Aiken County that have participated in the program include Aiken Middle School and North Aiken Elementary School. Both GDOT and SCDOT offer Safe Routes to School Resource Centers to specific regions throughout the two states.

An excerpt from the Georgia Safe Routes to School (SRTS) Planning Guide and Workbook. This graphic outlines the different levels of partnership in the SRTS program. (http://www.saferoutesga.org)

Columbia and Richmond County are within the Georgia Coastal Region and Aiken is within the South Carolina Midlands Region.

SAFE KIDS PROGRAMS

The Safe Kids East Central program serves Richmond and Columbia counties for the purpose of preventing childhood accidents. Safe Kids Aiken serves the Aiken County community. The program also promotes legislation geared at child safety, and provides varying information and classes on safety, including the distribution of safety equipment such as bike helmets at little or no cost.

AUGUSTA'S GEORGIA BIKES! PROGRAM

A Georgia Bikes! Grant Program was recently initiated by the Governor's Office of Highway Safety (GOHS) to help reduce bicycle crashes in the state. Georgia Bikes! is a support group to help improve bicycling conditions and promote safe bicycling throughout the state. The program provides a mechanism for local advocacy groups to provide community driven safety education and advocacy programs. The Wheel Movement in Augusta (Richmond County) was one of five areas in the state to receive the first round of these grants. Members of Wheel Movement plan to use their grant award to produce safe riding clinics, develop a safe road initiative media campaign, host law enforcement education seminars, and set up bicycle safety classes for kids.

EAT SMART MOVE MORE AIKEN

Eat Smart Move More South Carolina (ESMM SC) is a statewide coalition that offers resources about healthy lifestyles and advocacy for active living to local groups. In particular, the "Options for Action" toolkit offered by the organization is a best practices guide for community campaigns that promote bicycling, walking, and access to healthy foods. Aiken County is currently developing a local chapter ESMM SC.

Other Existing and Potential Partners

Local non-profit organizations, coalitions, and major institutions should play a leading role in developing, implementing and sponsoring bicycling and walking programs. The ARTS region already has a network of entities that could partner with local governments

to generate community awareness and broad participation in bicycling and walking programs.

Aiken Bicycle Club
Aiken Medical Center
Aiken Running Club
Aiken Sidewalk Appreciation Society
Augusta BMX
Augusta Cross Coalition
Augusta Freewheelers
Augusta Road Cyclists
Augusta Sports Council
Augusta Striders
Augusta Wheel Movement
Augusta Greenway Alliance
Augusta Striders
Central Savannah River Area (CSRA)
Fort Gordon
Healthy Augusta
Local bicycle shops
Local active-wear and outfitter retailers
North Atalnta Riding Club
SORBA CSRA (Local Chapter of the Southern Off-Road Bicycle Association)
Tri Augusta
University Health Care System
Universities and colleges within the ARTS region
YMCAs

Program Recommendations

Encouragement

SAFE ROUTES TO SCHOOL

As referenced earlier, a number of schools within the region have already participated in a Safe Routes to School Program. A major next step in developing a regional approach to this program is to develop a regional Safe Routes to School Plan and set a benchmark that all elementary schools within the region take part in the program over a specified period of time. Communities should contact their regional Safe Routes to School Coordinators to leverage resources as they develop plans for implementation of this program. This coordination would assist the Regional Bicycle and Pedestrian Committee in forming a list of all elementary schools in the region and in determining priorities and funding partnerships for the regional program.

Program Resources:

National Safe Routes to School Partnership: http://www.saferoutespartnership.org/

National Center for Safe Routes to School: http://www.saferoutesinfo.org/

SC Safe Routes to School Resource Center: http://scsaferoutes.org/

GA Safe Routes to School Resource Center: http://www.saferoutesga.org/

Sample Safe Routes to School Encouragement Program (SC): http://active-living.org/Walking--Wheeling-Wednesday.html

Sample Safe Routes to School Travel Plans (GA): http://www.saferoutesga.org/content/completed-travel-plans

CAR-FREE STREET EVENTS

Car-free street events have many names: Sunday Parkways, Ciclovias, Summer Streets, and Sunday Streets. The events are periodic street "openings" (i.e., "open" to users besides just cars; usually on Sundays) that create a temporary park that is open to the public for walking, bicycling, dancing, hula hooping, roller-skating, etc. They have been very successful internationally and are rapidly becoming popular in the United States. Car-free street events promote health by creating a safe and attractive space for physical activity and social contact, and are cost-effective compared to the cost of building new parks for the same purpose. Events can be weekly events or one-time occasions, and are generally very popular and well attended.

This Plan recommends that the municipalities of ARTS consider hosting car-free street events annually. Smaller communities may choose a two-block section of street, while larger population centers may choose a longer corridor.

Program Resources:

Atlanta Streets Alive: http://www.atlantabike.org/atlantastreetsalive

Vancouver LiveStreets: http://www.livestreets.ca/

San Francisco Sunday Streets: http://sundaystreetssf.com/

Oakland's Oaklavia http://oaklavia.org/media

Portland Sunday Parkways: http://portlandsundayparkways.org/

WEEKEND WALKABOUTS

Weekend Walkabouts are regularly occurring events that promote walking while also bringing attention to pedestrian infrastructure. Weekend Walkabouts can be held either monthly from May to October or quarterly to include one walk per season, depending on staff availability and marketing opportunities. The events' walking routes should highlight safe and inviting places to walk in the public realm (rather than private or enclosed facilities such as cemeteries or walking tracks) and should be 3 miles or less in length. These events are ideal for families and seniors.

Weekend Walkabouts may be organized based on themes for each walk, such as an architectural tour, a "Steeple Chase" tour (visiting historic churches), a tour of parks, neighborhood strolls, etc. To generate added marketing potential, community leaders or local celebrities could be chosen to lead each walk. For each event, at least one volunteer or staff member should be positioned at both the front and the rear of the walking group. The pace should remain at 2-2.5 miles per hour or less. A refreshment break with water should be offered at the halfway point for any walk of 2 or more miles.

In the spring, a Weekend Walkabout may be planned in conjunction with the annual event known as "Jane's Walk." Inspired by the "people's planner" Jane Jacobs, Jane's Walk occurs on May 1st and involves free neighborhood walking tours, developed and delivered by citizens, as a way to help put people in touch with their environment and with each other.

Program Resources:

Spartanburg, SC Weekend Walkabouts: http://active-living.org/Walkabouts-and-Rideabouts-3.html

Jane's Walk: www.janeswalk.net

BIKE MONTH ACTIVITIES

Cities and towns across the country participate in National Bike Month annually, during May. The League of American Bicyclists (LAB) hosts a website for event organizers. The website

Inspired by the "people's planner" Jane Jacobs, Jane's Walk occurs on May 1st and involves free neighborhood walking tours, developed and delivered by citizens, as a way to help put people in touch with their environment and with each other. (www.janeswalk,net)

contains information on nationwide and local events, an organizing handbook, and promotional materials.

It is recommended that ARTS counties and municipalities host National Bike Month events and activities annually, with the support of local bicycling groups and shops. Bike Month activities may include:

- Bike to Work Day events: morning-commute energizer stations with food, encouragement, information, and sponsored goodies for participants; rally or celebration with raffles, food, and vendors.
- Group rides to the business center with the mayor and/or local celebrities.
- Discounts at local businesses for bicycle commuters.
- Bike vs. Bus vs. Car challenge. This is a fun competition to determine which transportation mode arrives at the city center in the least amount of time.
- Short, themed community bicycle rides, such as an art tour or restaurant tour.
- Participation in the national Ride of Silence bike ride to bring awareness to cyclist safety
- Mountain biking skills clinic and tour of mountain biking trails
- Bicycle parking valet, hosted by volunteers, to offer free bicycle parking at special events
- Bicycle Commuter Course taught by nationally certified League Cycling Instructors
- A contest for artists to create public art pieces using bicycle materials

Program Resources:
National Bike Month: http://www.bikeleague.org/programs/bikemonth/

Greenville, SC Bike Month events: http://www.greenvillesc.gov/ParksRec/trails/bikemonth.aspx

Atlanta, GA Bike Month events: http://www.atlantabike.org/May

Education and Enforcement

As noted in the review of existing safety programs, there are a number of opportunities to enhance programs already enacted in the region utilizing available statewide resources. The following recommendations are proposed for the region:

SAFE STREETS SAVE LIVES REGIONAL PROGRAM

The Safe Streets Save Lives Campaign of the Palmetto Cycling Coalition in South Carolina is intended to advance safe practices of both bicyclists and motorists within the state. Using this resource, Aiken County has already conducted some community outreach at a local community center. It is recommended that a regional campaign be developed with assistance from representatives at the Palmetto Cycling Coalition to advance this effort throughout the South Carolina portion of the region.

Program Resource:
Safe Streets Save Lives Program: http://www.safestreetssavelives.org/

safe streets save lives.org
let's get there together

ISSUE FOCUSED SAFETY CAMPAIGN: NIGHTTIME CRASHES

The crash analysis conducted as part of Chapter 3 of this Plan revealed that approximately 50 percent of pedestrian crashes in Aiken County are occurring in dark conditions and 40 percent of all pedestrian crashes in Richmond are occurring during non-daylight hours. These night-time crashes are

also a major factor in the reported pedestrian fatalities. A focused safety campaign, with active media outreach to providing bike lights and educate citizens on clothing and other safety issues during these times of day is recommended to address this crash analysis finding. A benchmark to reduce night-time crash rates could be set to provide an evaluation measure for how well this safety program works in reducing these crashes. Coordination with local advocacy groups and retailers is recommended in the implementation of this safety program and others that may become relevant over time.

Program Resource:
Greenville, SC Lights for Life: http://bikegreenville.blogspot.com/2011/10/lights-for-life.html

POLICE TRAINING PROGRAMS

Police training courses provide police officers with safety education related to the rights and responsibilities of bicyclists, pedestrians, and motorists. These educational courses may be provided in coordination with Palmetto Cycling Coalition, Georgia Bikes!, and other regional programs. The training will explain such matters as: common errors in reporting a bicycle or pedestrian collision; laws related to pedestrian crossings in and out of crosswalks; laws related to a motorist passing a bicyclist; etc. A regional benchmark could be set to provide bicycle and pedestrian training programs for all police officers within the region by 2014.

Program Resource:
Bike Law: http://www.bikelaw.com/

PROFESSIONAL DRIVER TRAINING

Driver training programs are currently offered for employees of Augusta-Richmond County, Columbia County, and the City of Aiken. ARTS should coordinate with each agency offering the driver training courses to ensure that the courses offer up-to-date and practical information about sharing the road with bicyclists. Additionally, ARTS should provide incentives for the agencies to expand their driver training programs to include other commercial drivers in the region, such transit drivers, school bus drivers, and taxi drivers.

The Cities of Aiken and Augusta currently have a number of police officers serving the downtown area on bicycles.

Program Resource:
San Francisco Bicycle Coalition Driver Education: http://www.sfbike.org/?drivertraining

Evaluation

REGIONAL BICYCLE AND PEDESTRIAN COMMITTEE

An advisory committee has already been successfully used to develop an updated bicycle and pedestrian plan for the region and it is recommended that a permanent committee comprised of government staff and local advocacy groups be instituted to oversee bicycle safety programs at a regional level. This will allow a forum for regional interests to coordinate and share successes and lessons learned. Information on actions of this committee and educational materials should be made available through a regional website to make the program visible and transparent to the public. This website may also provide

a centralized location for tracking safety awareness and other bicycling and walking events in the area and overall progress towards plan implementation and achievement of goals for bicycling and walking.

Program Resources:

Roanoke Valley Alleghany Regional Commission: http://www.rvarc.org/bike/home.htm

Capitol Region Council of Governments: http://www.crcog.org/Meetings_minutes/mm_bicycle_committee.html

Southwestern Pennsylvania Commission: http://www.spcregion.org/trans_pedbike.shtml

REGIONAL PLAN FOR BICYCLE AND PEDESTRIAN COLLISION REDUCTION

Based on the findings of the safety analysis provided in Chapter 4 of this Plan, ARTS should develop a regional plan to reduce bicycle and pedestrian crashes and fatalities. The Regional Bicycle and Pedestrian Committee (recommended earlier in this chapter) should facilitate the process of developing the plan. The plan should complement the existing Strategic Highway Safety Plans for GA and SC and should be developed in partnership with SCDOT, GDOT, the SC Department of Public Safety Office of Highway Safety, the Georgia Governor's Office of Highway Safety, and local public safety or police departments. Every other year, these partners should complete an analysis of bicycle and pedestrian collision data and reconvene to update the plan.

Program Resources:

GA Strategic Highway Safety Plan: http://www.gahighwaysafety.org/shsp/

SC Strategic Highway Safety Plan: http://www.scdot.org/inside/multimodal/pdfs/road_map.pdf

DEDICATED FUNDING SOURCE

Nationally, bicycle and pedestrian travel account for 13 percent of all traffic fatalities. In Georgia, it is 10.1 percent and in South Carolina it is 12 percent. Yet, these travel modes account for only 0.6 percent of Federal Safety funds nationally, and only 0.5 percent and 0.0 percent of Georgia and South Carolina's Federal Safety funds, respectively.

Public funding for biking and walking facilities is a crucial component of local policy. ARTS should consider a funding program to increase the portion of funds available for bicycle and pedestrian infrastructure. As an example, Nashville, Tennessee (population 605,473) recently established a model program for determining local funding allotments. By virtue of a policy established by the MPO Executive Board, 15 percent of Surface Transportation Program (STP) funds are set aside annually for active transportation projects. For the current funding cycle (2011 to 2015), that amounts to roughly $2.5 million that will be used exclusively for bicycle and pedestrian infrastructure and education costs. That figure does not reflect additional funds allotted for bicycle and pedestrian facilities that are incorporated into other, larger projects (such as a road widening project that may include a sidewalk and bike lane).

Program Resource:

Nashville Area Metropolitan Planning Organization, 2035 Regional Transportation Plan: Urban Surface Transportation Program Investment Strategy: http://www.nashvillempo.org/plans_programs/rtp/2035_rtp.aspx

Evaluation programs allow communities to effectively measure the impact that their facility, policy, and program improvements are having on the community and gauge where additional measures may be needed.

ANNUAL COUNT PROGRAM

Evaluation programs measure and evaluate the impact of projects, policies and programs. Typical evaluation programs range from a simple year over year comparison of US Census Journey to Work data to bicycle and pedestrian counts and community surveys. Counts and community surveys act as methods to evaluate not only the impacts of specific bicycle and pedestrian improvement projects but can also function as way to measure progress towards reaching local goals such as increased bicycle and pedestrian travel for trips one mile or less. Through development of the Regional Bicycle and Pedestrian Plan Update, ARTS has already established baseline data and a tested methodology for collecting annual counts.

This Plan recommends, at minimum:

- Before and after bicycle, pedestrian and motor vehicle counts on all major roadway, bikeway, or pedestrian infrastructure projects.
- Annual bicycle and pedestrian counts conducted at minimum at the 23 locations counted as part of this regional planning effort. (More count locations, especially in Richmond County, would be worthwhile.)
- Annual analysis of the collected bicycle and pedestrian data.

Program Resource:
National Bicycle and Pedestrian Documentation Project: http://bikepeddocumentation.org/

Facilities Inventory

The existing conditions report in Chapter 3 of this Plan identified a lack of comprehensive inventories of sidewalk facilities and bicycle support facilities. A lack of comprehensive sidewalk data impairs a community's ability to effectively assess pedestrian facility needs and prioritize funding for sidewalk construction and repair. Columbia County has begun the process of addressing this issue by developing a County-wide sidewalk inventory.

The process of completing the Bicycle Friendly Community application for three ARTS communities (see Chapter 3, Section 3) revealed a lack of data related to existing bicycle parking. An inventory of bicycle parking and other bicycle support facilities is not only important for achieving Bicycle Friendly Community status, by also for providing information to the public about the location of bicycling parking amenities and for identifying locations in need of parking amenities.

This Plan recommends that, at a minimum, in coordination with ARTS:

- Augusta-Richmond and Aiken counties develop sidewalk and bicycle parking inventory programs
- Columbia County continue to develop its existing sidewalk inventory program and establish a bicycle parking inventory program
- All counties establish internal processes to update the inventories on an ongoing basis

Policy Recommendations

Policy recommendations of the ARTS Bicycle and Pedestrian Plan are based on a review and assessment of development requirements related to bicycle and pedestrian facilities for five jurisdictions within the ARTS study area. The full policy review is provided in Appendix B. The list of jurisdictions evaluated includes Augusta/Richmond County (GA), Columbia County (GA), City of North Augusta (SC), City of Aiken (SC), and Aiken County (SC). Each of these communities is a member of the ARTS community and representative of the "state of the practice" within the ARTS jurisdiction. As shown in Appendix B, the review is not limited to the land development ordinances of each jurisdiction; some of these jurisdictions also have design guidelines associated with streets and the recently completed North Augusta Greeneway, Pedestrian, and Bicycle Master Plan was reviewed, as well.

In evaluating the existing policies, it is evident that ARTS could provide guidance and direction to its member municipalities to significantly strengthen many areas regarding complete streets, bicycle, and pedestrian facility requirements and enhancements within the context of their development ordinances. Additional guidance geared toward retrofit of existing facilities is also recommended. The

following provides recommended "next steps" for improving the bicycle- and walk-friendliness of local policies.

Complete Streets Policy

A Complete Street is a roadway that, in addition to general purpose vehicular travel lanes, includes items such as sidewalks, bike lanes or shoulders, bus lanes, transit stops, crosswalks, median refuges, curb bulbouts, appropriate landscaping, and other features that add to the usability and livability of the street as determined by context. As of October, 2011, legislation on the subject has been passed in 25 states and almost 300 other jurisdictions throughout the country, and the Safe and Complete Streets Act of 2011 is currently pending in Congress.

This Plan recommends that ARTS and each jurisdiction within ARTS adopt a Complete Street Policy.

It is anticipated that at a national level when the surface transportation bill is reauthorized, projects receiving federal funding will need to demonstrate some level of Complete Streets compliance. SCDOT was one of the first states to adopt a Complete Streets Policy in 2002, but has been lacking in taking the next step in revising state roadway design guidelines to accommodate and implement Complete Streets on a statewide level. For this reason, it is imperative that each municipality not only develop and adopt a Policy, but also review and revise current design guidelines to effectively implement Compete Streets in each community. In addition to ARTS adopting its own overarching Complete Streets Policy, each community should adopt a similarly-worded Policy, then also adopt street design guidelines as provided in Appendix E of this Plan. ARTS can facilitate the tailoring and adoption of those guidelines for each member jurisdiction, and in this way can maintain consistency across the region consistent with the goals and tenets of this planning effort.

To aid in policy development and provide consistency across the region, ARTS should provide sample language for a Complete Streets Policy to its member jurisdictions. According to the National Complete Streets Coalition (www.completestreets.org), an ideal Policy should include the following elements:

- Includes a vision for how and why the community wants to complete its streets
- Specifies that 'all users' includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, buses and automobiles.
- Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way.
- Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions.
- Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes.
- Is adoptable by all agencies to cover all roads.
- Directs the use of the latest and best design criteria and guidelines while recognizing the need for flexibility in balancing user needs.
- Directs that complete streets solutions will complement the context of the community.

ARTS can use the resources associated with the National Complete Streets Coalition (they have sample policies from around the country to draw upon) to develop and tailor a Policy consistent with the area's context and goals. The Policy itself need not be cumbersome in its language; however, the real "teeth" associated with the Policy is the subsequent development of Design Guidelines such as typical cross sections that can be applied in varied contexts throughout each of the member jurisdictions, as articulated in the next recommendation.

As a complement to a Complete Streets Policy, ARTS should work with its member communities in expanding their respective palettes of street sections to incorporate a more context-based approach similar to other progressive communities. These cross-sections should be represented graphically as well as in table form, to clearly depict ideal street sections while giving flexibility in retrofit situations. North Augusta implies inclusion of Complete Streets principles in roadway design, but falls short in actual availability of design guidelines incorporating those principles. The new ARTS Bicycle Plan includes a number of street cross-sections that accommodate multimodal users in rural to urban contexts occurring throughout

member communities. It is recommended that each municipality adopt the design guidelines provided by ARTS to encourage regional consistency and predictability in application. ARTS should also facilitate discussions with SCDOT and GDOT to help reconcile the historical disconnect between state and local roads.

Development Ordinances

ARTS should also direct member jurisdictions to consider revisions to their development ordinances to include more pedestrian-friendly automobile parking ratios and layout guidance, bicycle parking, and amenities geared toward increasing non-motorized utilization for commuters. In order to promote a vibrant pedestrian-oriented environment, it is important that strict policies and guidelines are put into place to limit the physical and visual impact of automobiles in a place. Limiting automobile parking quantity and requiring that parking lots and garages are somewhat hidden and do not form part of the "street wall" immediately adjacent to sidewalks are items that should be explicitly addressed within design regulations.

Block Size and Street Connectivity

ARTS should direct member jurisdictions to consider revisions to their development ordinances to include requirements for block size and street connectivity (both motorized and non-motorized) which facilitates multimodal travel choice. Block size regulations should include a provision stipulating that pedestrian facilities including sidewalks, paths, and accessways are spaced no more than 400 feet apart. Ideally, streets and intersections supporting vehicular movement would have the same resolution, but a maximum block length of 600-800 feet (with bisecting pedestrian facilities) would still provide a high level of accessibility for all travel modes. Dead-end streets should be discouraged to the greatest extent possible (North Augusta has good code language with regards to this), with allowable lengths specified as no more than 300 feet. Maximum connectivity indexes for areas of any size can be specified and calculated using a link-node ratio such that given in the most recent LEED-ND guidelines; indexes can be used in addition to or in lieu of the block length specifications proposed above to provide a desired level of walkability.

Member communities could use a combination of incentives and disincentives to encourage compliance.

Sidewalk Ordinance

The existing conditions report in Chapter 3 of this Plan identified not only a need for closing existing gaps within the sidewalk network, but also for establishing policies that prevent the creation of sidewalk gaps through the development process. This Plan recommends that Aiken, Augusta-Richmond, and Columbia Counties each develop policy language recommending that new developments be conditioned to include sidewalks.

Policy Development

Columbia County is already in the process of developing language that recommends complete streets elements (such as traffic calming), which improve the pedestrian environment, and is additionally, developing a comprehensive sidewalk inventory. Building from those efforts, the following provides a framework for policy language related to sidewalk requirements:

Whereas,

- the Public Works Department is routinely incorporating sidewalks into roadway expansion projects;
- new development within the County routinely does not include sidewalks;
- the Public Works Department routinely receives public requests for sidewalks that cannot be supported through existing County resources;
- sidewalks are positively correlated to improved walkability and increased real estate values;[1]

Therefore, resolve to adopt a policy recommending code revision to require sidewalks on particular street types, land uses, or densities.

Recognizing the unique characteristics of the ARTS region, this Plan recommends aligning sidewalk requirements with a combination of street type and land use, rather than densities.

1 Refer to Chapter 1 of this Plan for research related to the correlation between economic vitality and walkability, as well as the following reports:

- Active Living Research: http://www.activelivingresearch.org/files/Synthesis_Shoup-Ewing_March2010.pdf;

- CEOs for Cities: http://www.ceosforcities.org/pagefiles/WalkingtheWalk_Summary.pdf;

- Commission for Architecture and the Built Environment (CABE): http://webarchive.nationalarchives.gov.uk/20110118095356/http:/www.cabe.org.uk/files/paved-with-gold-summary.pdf

Table 6-1: Mt. Pleasant Pedestrian Minumum Access Standards

Land Use/Road Classification	Minimum Requirement
Commercial and industrial (new streets)	Sidewalk both sides
Commercial and industrial (new development on existing street)	Sidewalk one side if specified on Road Improvement/Transportation Plan
Major arterial	Sidewalk both sides
Residential collector (including boulevards, parkways, and spine roads)	Sidewalk one side on streets having direct access to lots
	Pedestrian path/bikeway on one side may be direct access to lots with Planning Commission approval
Local residential streets	
-Greater than 3.5 units per acre	Sidewalk both sides
-Between 3.5 and 1.1 units per acre	Sidewalk one side
-Less than or equal to 1.0 units per acre	Pedestrian path/bikeway
-Between neighborhoods, commercial developments, schools, parks, community areas and the like	Whenever possible, a pedestrian access path, bike trail, or crosswalk shall be provided between existing and proposed new subdivisions and other pedestrian- oriented destinations

Examples can be found in nearby Dekalb County, GA, and the City of Mount Pleasant, SC., as cited below:

Dekalb County Code of Ordinances sec. 14-383 (Streets)

(a) Sidewalks shall be required on all sides of street frontage on all new and improved local residential streets in all subdivisions and along the street frontage of all new and improved non-residential developments and as set forth in section 14-190 of this article, unless determined by the planning commission to be infeasible only due to severe cross-slopes, shallow rock, soil or topographic conditions. At a minimum, however, continuous sidewalks shall be required on at least one (1) side of all new and improved local residential streets in all new and improved. No other variances or exceptions are allowed.

(b) The development director or planning commission may require that sidewalks required pursuant to 14-383(a) be continued to the nearest major or minor arterial or collector street.

Mt. Pleasant, South Carolina Code of Ordinances sec. 156-108 (Curb Cuts and Pedestrian Access)

(1) New developments, subdivisions, and remodeling. Appropriate pedestrian access shall be provided for all new developments, subdivisions, and renovation or remodeling equaling 50% of the existing building's value, either through the construction of concrete sidewalks or pedestrian path/ bikeway systems, or a combination of both.

(2) Table of pedestrian access requirements. Requirements for pedestrian access shall be in accordance with the provisions as shown in Table 6-1

Policy Enforcement

In implementation of sidewalk requirements, it is important to note that Columbia County currently experiences discrepancies between approved plat designs and the construction that follows. Plats adopted with sidewalks are, at times, not constructed per the approved plan. The issue is not unique to Columbia County and is relatively common among local municipalities, particularly those experiencing rapid growth and development. This Plan recommends that the counties of ARTS:

- Use land development tracking software to flag parcels that are planned to include a sidewalk, bike lane or other traffic calming improvements;
- Consider rejecting or not approving construction plan sets that omit said improvements to assist in successful inspection of these requirements.

Table 6-2: Criteria for short-term and long-term bicycle parking[2]

Criteria	Short-term	Long-term
Parking Duration	Less than two hours	More than two hours
Fixture Type	Simple bicycle racks	Lockers, racks in secured area
Weather Protection	Unsheltered	Sheltered or enclosed
		Secured, active surveillance
Security	Unsecured, passive surveillance	Unsupervised
		"Individual-secure" such as bicycle lockers
		"Shared-secure" such as bicycle room or cage
		Supervised
		Valet bicycle parking
		Paid area of transit station
Typical land uses	Commercial or retail, medical/ healthcare, parks and recreation areas, community centers	Residential, workplace, transit

2 Association of Pedestrian and Bicycle Professionals (APBP) Bicycle Parking Guide, 2010. Page 10.

Bicycle Parking Ordinance

At present, bicycle parking within the ARTS region is extremely limited and member jurisdictions of ARTS do not have codified bicycle parking requirements. To expand bike parking in the region, each city should adopt general bicycle requirements that extend to all land uses. The expansion of bicycle parking will enable more trips to be made by bicycle.

Just as car trips vary in purpose and duration, so too do bicycle trips. Because of the varied nature of bicycle trips, different types of bicycle parking should be provided to accommodate these needs. These needs can be met by providing both short-term and long-term parking. The Association of Pedestrian and Bicycle Professionals addresses the distinction between Short/Long-Term parking in the Bicycle Parking Guide, 2nd Edition, 2010) (Table 6-2).

Providing the options for short-term and long-term bicycle parking is important to bicyclists. Table 4 lists typical bicycle parking recommendations based on land use categories. The figures are derived from the APBP Bicycle Parking Guide, 2nd Edition and other best practices from around the country.

Refer to the Design Guidelines of this Plan, found in Appendix E, for additional guidance related to bicycle parking design, installation, and location.

Unit of Measurement

Communities use different metrics for assigning appropriate levels of bicycle parking, including:

- Unit count
- Percentage of building square footage
- Building occupancy
- Percentage car parking

The new APBP Guidelines recommend decoupling bike parking supply from car parking supply. The reason for this is that a percentage of car parking supply is not necessarily a good measure of the number of cyclists who would be expected to travel to a particular destination, especially in densely urbanized areas or where multiple travel options exist. We recommend a land use-based approach with location-specific measures of supply such as parking spaces per square footage of retail or percentage of transit boardings. The APBP Bicycle Parking Guide provides two groups of recommendations, one standard set and a higher level for "Urbanized or High Mode Share Areas." Because of the characteristics of the ARTS region, Table 6-3 does not reflect the higher bicycle parking rates from the Bicycle Parking Guide.

In-Lieu of Parking

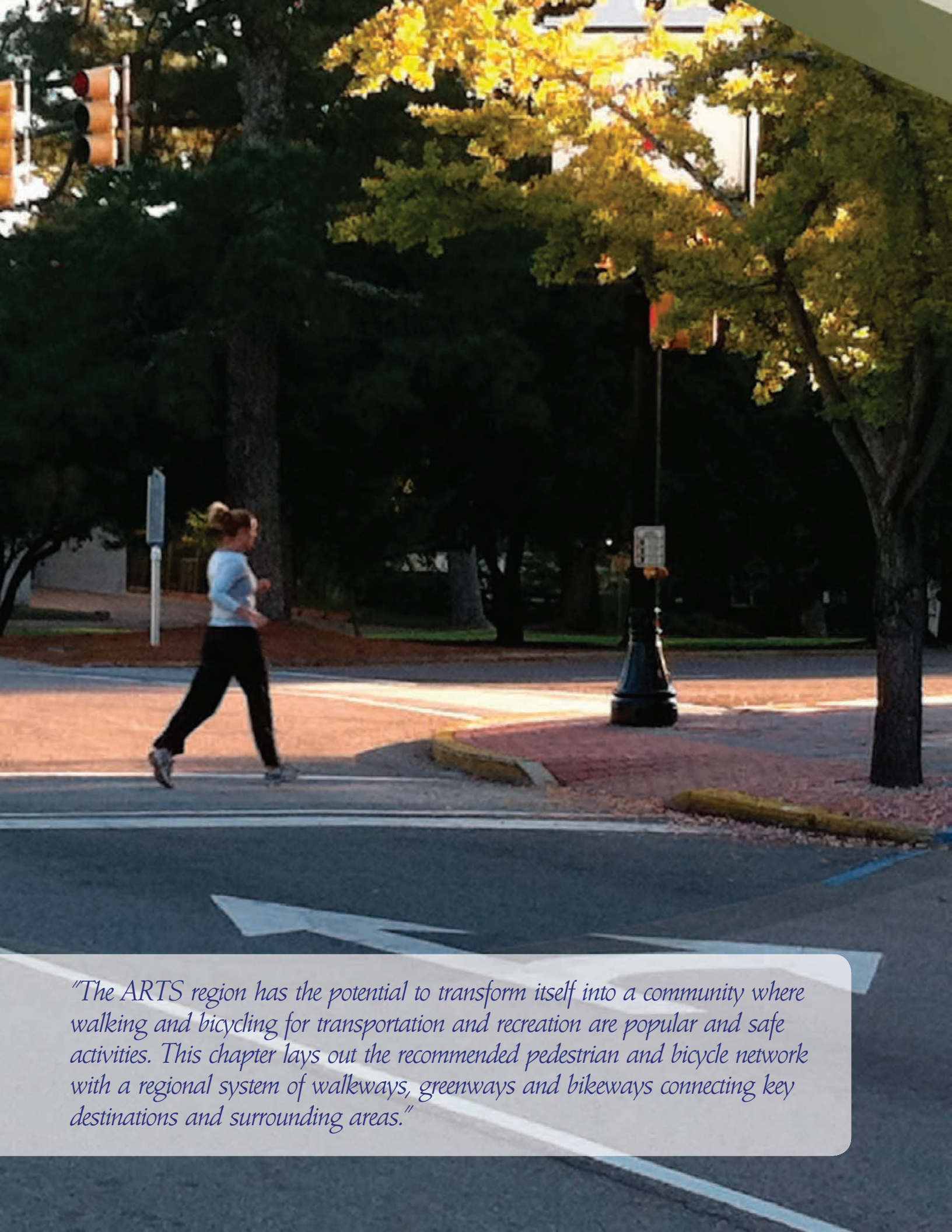
Cities or Counties within ARTS that enforce short and long-term bicycle parking requirements as outlined in Table 4: Bike Parking Recommendations by Use may also choose to offer an "In-lieu of Parking" program. These programs allow property owners to pay fees to a general City or County Fund established for the development of bicycle support facilities, instead of installing bike parking on their facility. The money collected in this fund can then be used for the development of bicycle facilities elsewhere in the community.

Funding Assistance

ARTS can provide guidance to its member communities as to funding avenues on both the Federal and State level to facilitate retrofits of existing facilities to realize Complete Streets throughout the ARTS area. Appendix F is a comprehensive listing of Federal funding opportunities currently available for Complete Streets implementation.

Table 6-3: Typical Bike Parking Recommendations by Use

Use	Short-Term Bicycle Parking	Long-Term Bicycle Parking
Recreational/Civic		
Non-assembly cultural (library, government buildings, etc.)	1 sp./10K sq. ft. (2 min)	1 sp./10 employees (2 min)
Assembly cultural (church, theater, park, etc.)	Spaces for 2% maximum daily attendance	1 sp./20 employees (2 min)
Hospital	1 sp./20K sq. ft., (2 min.)	1 sp./20 employees or 1 sp./70K sq. ft., whichever is greater (2 min.)
Schools		
Kindergarten/Elementary Schools	1 sp./20 students (2 min)	1 sp./10 employees (2 min)
Jr. High/High School	1 sp./20 students (2 min)	1 sp./10 employees + 1 sp./20 students (2 min)
Colleges/Universities	1 sp./10 students (2 min)	1 sp./10 employees + 1 sp./10 students; or 1 sp./20K sq. ft., whichever is greater
Residential		
Single Family	No spaces required	No spaces required
Multifamily Residential		
With private garage for each unit	.05 sp./bedroom (2 min)	No spaces required
Without private garage for each unit	.05 sp./bedroom (2 min.)	.5 sp./bedroom (2 min)
Senior Housing	.05 sp./bedroom (2 min.)	.5 sp./bedroom (2 min)
Commercial/Other	1 sp./5K sq. ft.	1 sp./12K sq. ft.
Offices	1 sp./20K sq. ft. (2 min)	1 sp./10K sq. ft. (2 min)
Retail (furniture, appliances, hardware, etc.)	1 sp./5K sq. ft. (2 min)	1 sp./12K sq. ft. (2 min)
Retail (grocery, convenience, personal)	1 sp./2K sq. ft. (2 min)	1 sp./12K sq. ft. (2 min.)
Industrial/Manufacturing	Determined at discretion of Planning Director (Suggested 2 min)	1 sp./15K sq. ft. (2 min)
Bus terminals/stations	Spaces for 1.5% of a.m. peak period ridership	Spaces for 5% projected a.m. peak period daily ridership



"The ARTS region has the potential to transform itself into a community where walking and bicycling for transportation and recreation are popular and safe activities. This chapter lays out the recommended pedestrian and bicycle network with a regional system of walkways, greenways and bikeways connecting key destinations and surrounding areas."

Chapter Seven

Engineering: Bikeway, Walkway, and Trail System Recommendations

Introduction

The ARTS region has the potential to transform itself into a community where walking and bicycling for transportation and recreation are popular and safe activities. This chapter lays out the recommended pedestrian and bicycle network with a regional system of walkways, greenways and bikeways connecting key destinations and surrounding areas. The network recommendations build upon current and past planning efforts. The recommendations included in this chapter are based on the types of bikeways, walkways, and off-street shared facilities described in the Design Guidelines, found in Appendix E.

This chapter presents proposed bikeways, walkways, and greenways facilities identified through input from the community, the Project Steering Committee, and the needs analysis. The proposed improvements are intended to make bicycling more comfortable and accessible for bicyclist of all skill levels and trip purposes and to create walkable communities through the region. This chapter presents the recommendations to expand the bikeway and walkway network so that the community has a seamless and comprehensive network for active transportation and recreation.

Recommended Walkway Network

Walkway Network Development

Refining the Pedestrian Suitability Analysis

Pedestrian suitability analysis (PSA), as described in Chapter 4, is an important tool for identifying priority pedestrian corridors. The results of the analysis created a picture of where people live, work, play and key roadway connections between these locations as a way to depict both 'demand' for and 'supply' of pedestrian infrastructure in the region. Beyond identifying regional priority corridors, PSA results can be enhanced based on local priorities and characteristics to reveal crucial areas for investment in sidewalk infrastructure and other pedestrian facilities. The resulting process ranks pedestrian corridors as high-, medium-, or low-priority corridors within the ARTS region.

Composite Priority Scores

To refine the analysis of priority pedestrian corridors, PSA weighted criteria were adjusted and combined with new feasibility considerations to reflect the weights identified by ARTS in the project evaluation criteria, shown in Table 7-1. Thus, the criteria for 'Proximity to Attractors/Destinations' were weighted based on the 16 point scale identified by ARTS to establish an adjusted score for pedestrian 'demand'. The 'roadway quality' criteria of the PSA, which includes both 'Connectivity' and 'Safety'[1], were weighted based on the 28 point scale identified by ARTS to create a 'supply' score.

The 'Connectivity' category includes an analysis of sidewalk gaps. However, without an existing sidewalk inventory of the region, it was not possible to exhaustively identify sidewalk gaps/presence for the region or for every municipality. This analysis assumes that there are no sidewalks except for those corridors that were verified via field work or existing data. The corridors where a sidewalk is known to exist on one side or both sides of the roadway are identified on Figures 7-1 through 7-5. Corridors with two known sidewalks were excluded from prioritization, though roadways with only one known sidewalk were not.

1 Improved health and quality of life are important benefits associated with all pedestrian infrastructure projects.

Table 7-1: Prioritization Scoring Criteria

Criteria	Scoring Weights	Available Points
Proximity to Attractors/Destinations		
Access to public or private school (K-12)	Yes = 2; No = 0	16 pts.
Direct access to existing/planned transit route or stop	Yes = 2; No = 0	
Direct access to major employment centers	Yes = 2; No = 0	
Direct access to mixed-use areas or shopping centers	Yes = 2; No = 0	
Direct access to University/College	Yes = 2; No = 0	
Direct access to Central Business District	Yes = 2; No = 0	
Access to public places *(parks, libraries, civic uses)*	Yes = 2; No = 0	
Transit Stop within 1/2 mile radius	Yes = 1; No = 0	
Direct access to higher density residential areas	Yes = 1; No = 0	
Connectivity		
Completes gap in existing bicycle or pedestrian facility	Yes = 4; No = 0	14 pts.
Removes barrier in route	Yes = 3; No = 0	
Regional connection and/or major roadway/river Xing	Yes = 3; No = 0	
Connects 2 or more communities	Yes = 2; No = 0	
Connects residential area to business/commercial area	Yes = 1; No = 0	
Project supports economic development/tourism	Yes = 1; No = 0	
Safety / Health / Quality of Life		
Improves locations where bicycle or pedestrian crashes/fatalities have occurred	Yes = 4; No = 0	14 pts.
Is the improvement on a high volume road	Yes = 2; No = 0	
Is the improvement separated from vehicular traffic	Yes = 2; No = 0	
Provides speed reduction or traffic calming benefits	Yes = 2; No = 0	
Improves physical activity	Yes = 2; No = 0	
Improves air quality/offers environmental benefits	Yes = 2; No = 0	
Feasibility		
Improvement is on or adjacent to roadway project contained in the ARTS 2035 LRTP.	Yes = 5; No = 0	10 pts.
Improvement has full or partial funding, or is likely to be funded	Yes = 3; No = 0	
Improvement was recommended during the public outreach process/or is contained and supported in a local plan	Yes = 2; No = 0	

The adjusted PSA results were then combined with local feasibility data, which provided weighted scoring for projects included within the ARTS Long Range Transportation Plan, recommended by the public process, and allotted partial or full funding. 'Feasibility' criteria allow a maximum score of 10. This process results in a composite 'Priority Score' based on the 'Demand Score,' 'Supply Score,' and 'Feasibility Score'. The composite score has a maximum potential value of 54. In all cases, a higher number means that the corridor should be prioritized for pedestrian infrastructure.

The composite score reveals where ARTS should consider short, medium and long term pedestrian improvement projects. Since these score ranges are based on the distribution of scores across the

entire region, where population density and the density of attractors and destinations vary greatly, adjusted score ranges were used in several areas outside of the major urban centers of Augusta, North Augusta, and Aiken. These adjusted ranges account for the fact that the scores are lower across the board in certain areas, such as Burnettown or Columbia County, but recommendations are desired in these areas along with the urban centers, and should be prioritized independently of higher scoring areas. Adjusted ranges and their geographic application are provided in Table 7-2.

Table 7-2: Prioritization Composite Scores

Geographic Area	Score Range		
	Low	Medium	High
Augusta Metro Area	22-29	30-39	40-52
Aiken Metro Area	18-22	23-32	33-52
North Augusta Metro Area	22-29	30-39	40-52
Columbia County	21-24	25-27	28-40
Blythe	11-13	14-15	16-18
Hephizabah	14-15	16-21	22-32
Grovetown	15-20	21-25	26-32
Burnettown	15-18	19-26	27-41

Results

The results of the refined pedestrian network analysis provide a closer look as to where new sidewalks or enhanced pedestrian infrastructure are most needed. Figures 7-1 through 7-5 depict color-coded corridor segments that identify the three-tiered priority network.

A majority of the region's destinations are along arterial roads with high traffic volumes and speeds. It is important to provide safe, comfortable access to these destinations from the surrounding residential areas. Additionally, creating walkable neighborhoods that are accessible to pedestrians ensures that residents can safely access sidewalks along major arterials and collectors.

Across the region, thoroughfares and collectors are the highest priority corridors, along with connections to schools. Communities will need to do additional study to identify gaps in the existing network and quality of existing sidewalks to determine actual projects in these corridors. Chapter 8 identifies recommended areas for near-term investment in pedestrian infrastructure based on the results of this pedestrian network refinement analysis. It is important to note, however, that well-maintained sidewalks meeting ADA requirements are recommended on all collectors and arterials in the ARTS region, as well as local roads that provide important pedestrian connections. This Plan recommends that ARTS and its member jurisdictions adopt a sidewalk ordinance (as described in Chapter 6), invest in high priority pedestrian areas (as described in Chapter 8), and incorporate sidewalks into all new collector and arterial road construction projects to meet the needs of current and future pedestrian activity.

Figure 7-1 Central Augusta

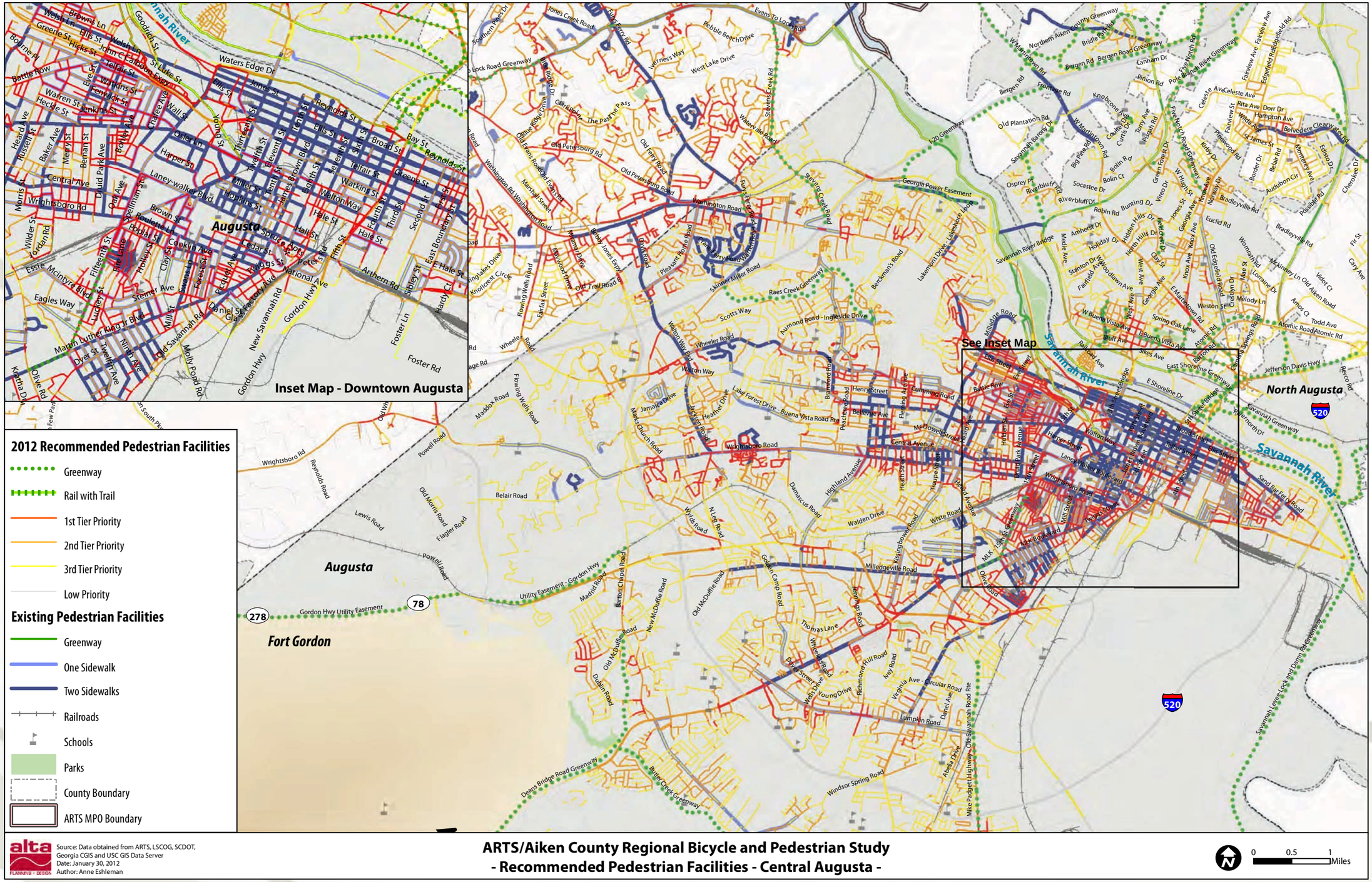
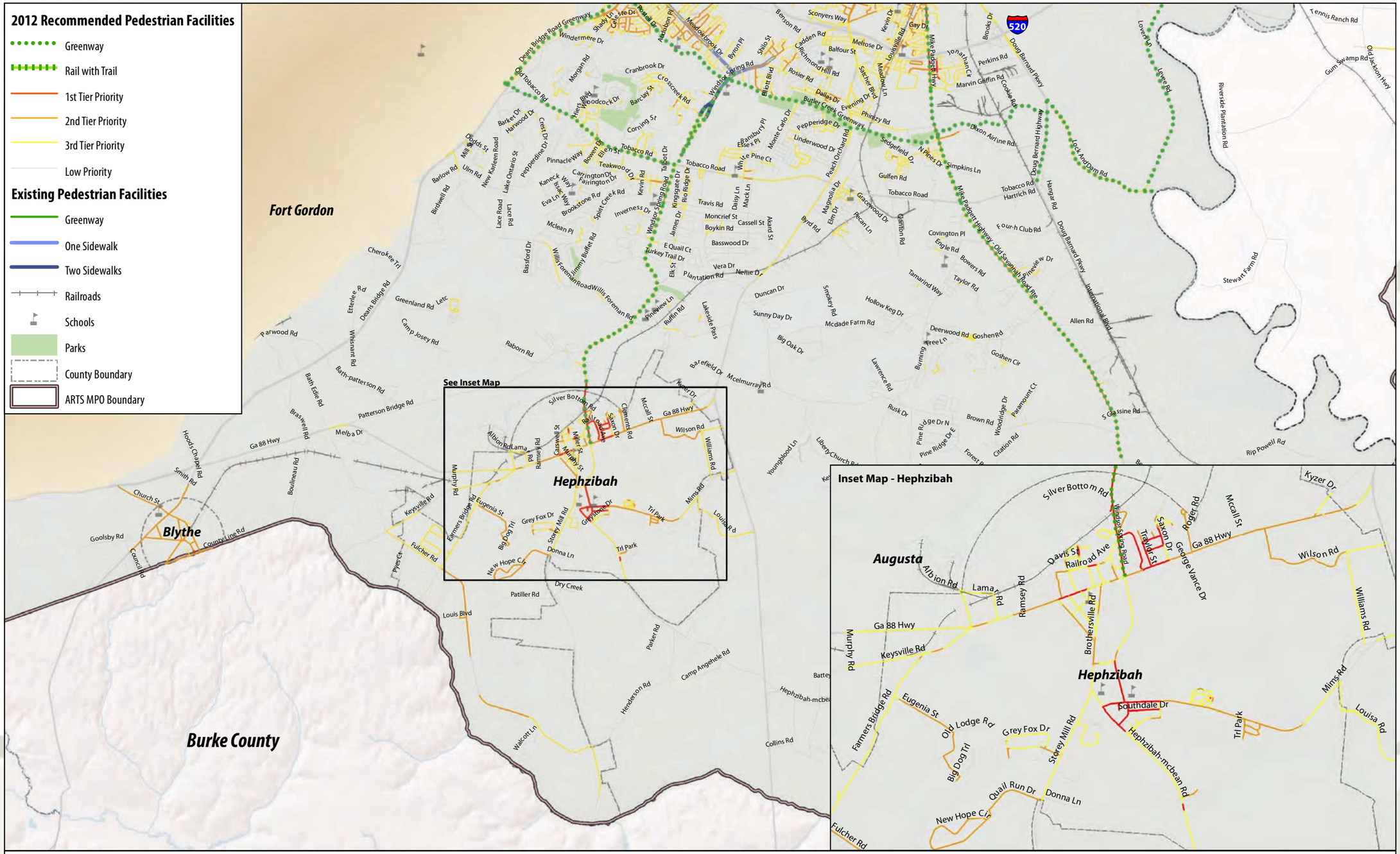


Figure 7-2 South Augusta



Source: Data obtained from ARTS, LSCOG, SCDOT, Georgia CGIS and USC GIS Data Server
Date: January 30, 2012
Author: Anne Eshleman

ARTS/Aiken County Regional Bicycle and Pedestrian Study
- Recommended Pedestrian Facilities - South Augusta -

0 0.5 1 Miles

Figure 7-3 Columbia County

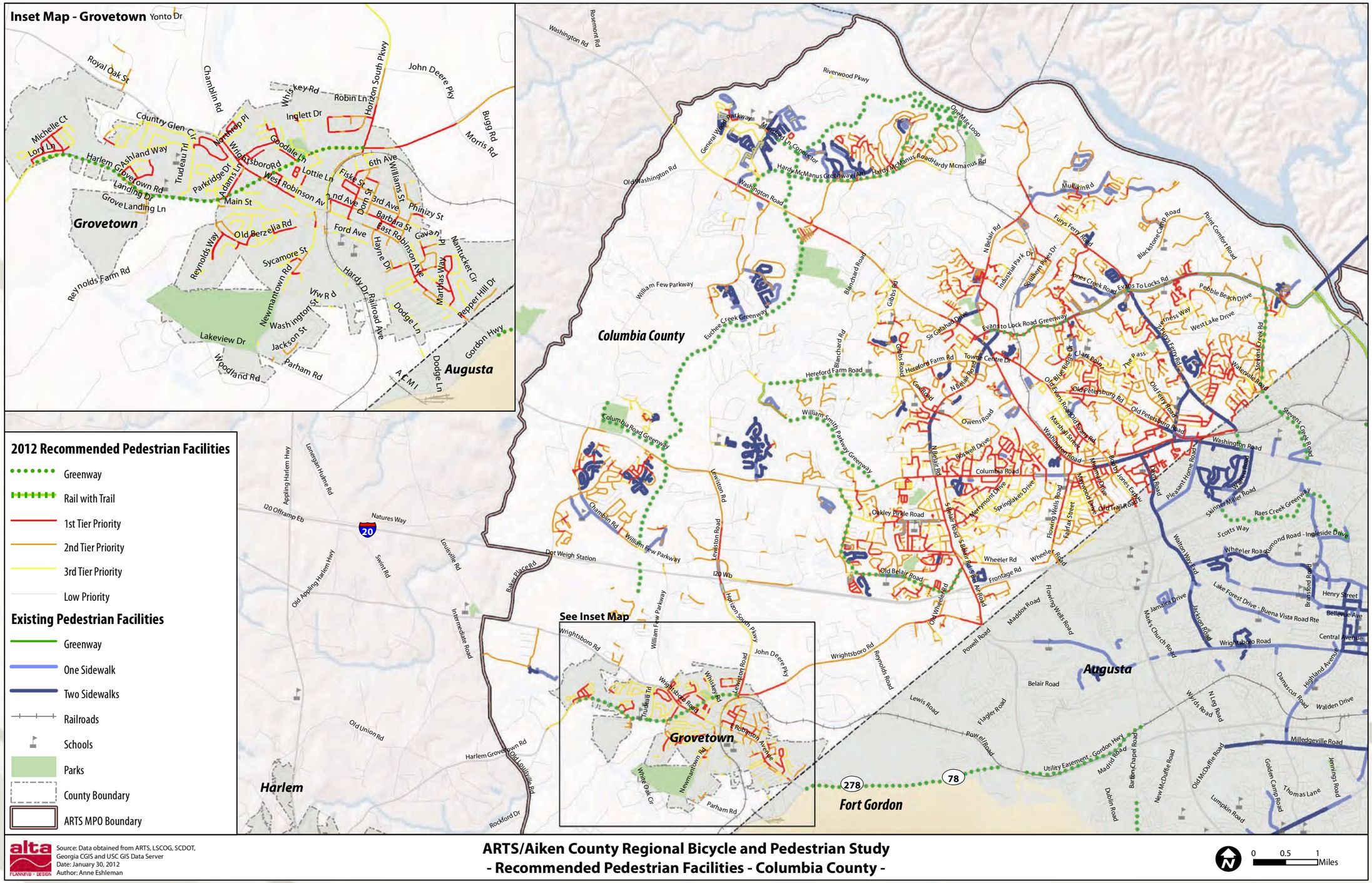


Figure 7-4 North Augusta and Burnettown

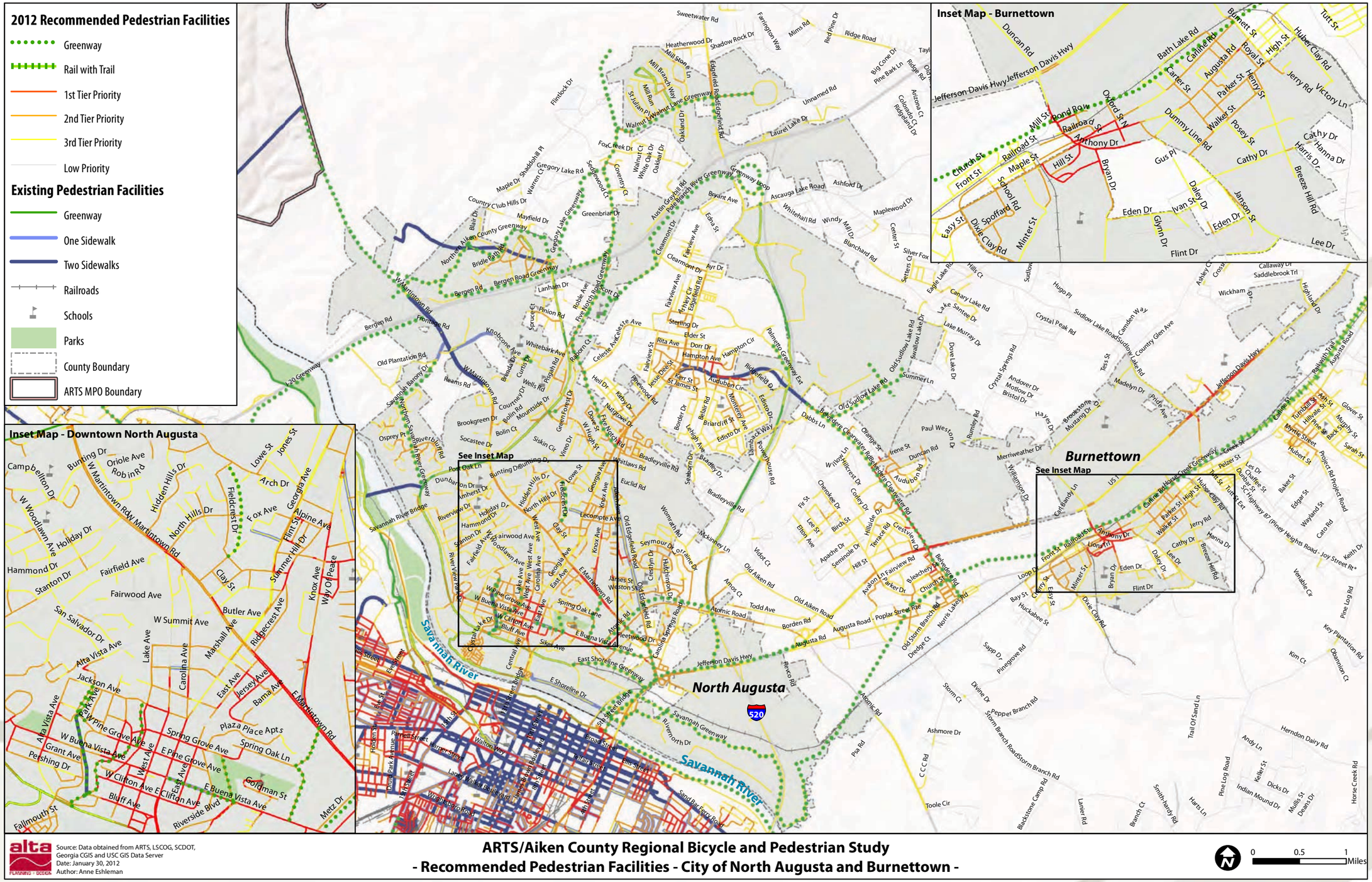
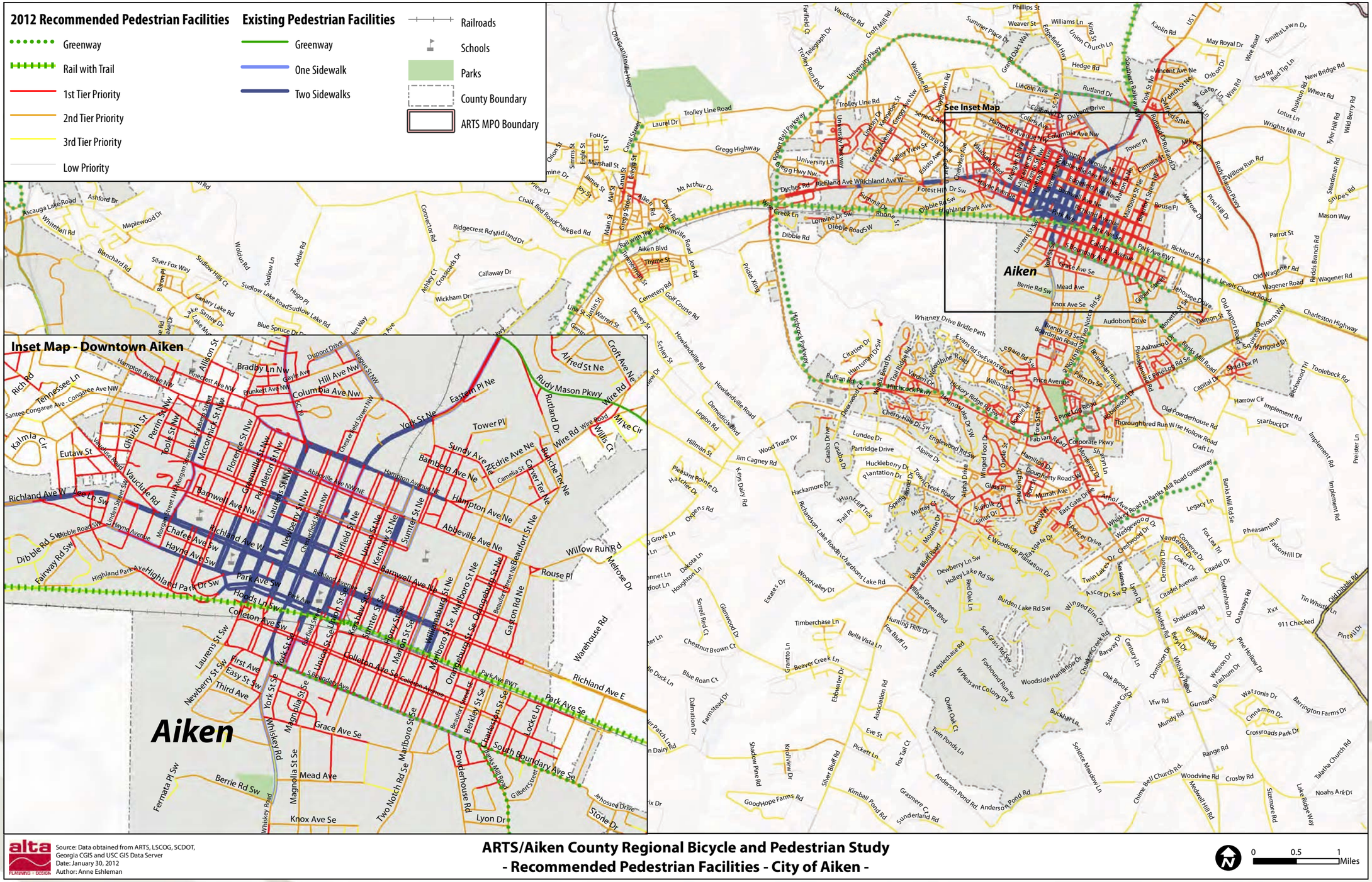


Figure 7-5 City of Aiken



ARTS/Aiken County Regional Bicycle and Pedestrian Study
- Recommended Pedestrian Facilities - City of Aiken -

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Recommended Bikeway Network

The ARTS recommended bikeway network represents a comprehensive set of existing and proposed bicycle transportation facilities. In total, there are approximately 740.63 miles of recommended facilities that range from signed bicycle routes to seperated greenways as shown in Table 7-3. The proposed improvements are intended to make bicycling more comfortable and accessible for bicyclist of all skill levels and trip purposes.

The following sections of this chapter include 1) how the network was designed; 2) the ARTS regional network maps; and 3) projects recommended for further review. Priority projects are identified in Chapter 8, as part of the regional implementation plan.

Bikeway Network Development

The bicycle facility network was designed by first assembling all existing bicycle-related recommendations and information from current plans and studies. Secondly, a thorough analysis with geographic information systems (GIS) and fieldwork was conducted to examine roadways for recommendations. The assembled information was then presented to the public, local government staff, the Steering Committee, and various project stakeholders. Together, the input from these groups helped to inform the overall network design; through writing and drawing on input maps, filling-out comment forms, direct dialogue, and e-mailed comments.

A variety of bicycle facilities are recommended due to 1) the range of skill and comfort levels involved in bicycling; 2) the range of conditions for bicycling on different roadway environments; and 3) local preferences identified through the public input process. These recommendations are at a planning level only and will require further analysis before implementation.

The recommended bicycle network is made up of five core types of bicycle facilities: paved shoulders, shared lane markings, bicycle lanes (including buffered bicycle lanes), bicycle routes, and greenways (including multi-use paths). The recommended strategies for implementing the proposed facilities include road widening, lane narrowing, lane reconfiguration, parking reduction, adding markings/signage, and new construction. Descriptions and standards for each facility type and implementation strategy are described in detail in the Design Guidelines provided in Appendix E.

Figures 7-6 through 7-9 shows the existing and proposed bikeway network and Tables 7-4 through Table 7-9 list the bikeways by type and mileage. The proposed bikeways were developed with consideration for roadway widths, traffic volumes and speeds, and connections to destinations.

Table 7-3: Recommended Facilities Summary

Facility Type	Total Mileage of Recommended Projects
Bicycle Lanes & Buffered Bicycle Lanes	154.80
Roadways with Shared-Lane Markings	39.10
Bicycle Routes	131.72
Paved Shoulders	252.95
Greenways, Multi-use Paths, & Rails with Trails	161.16
Total Recommended Greenway and Bikeway Network	**739.73**

Bikeway Network Facility Types

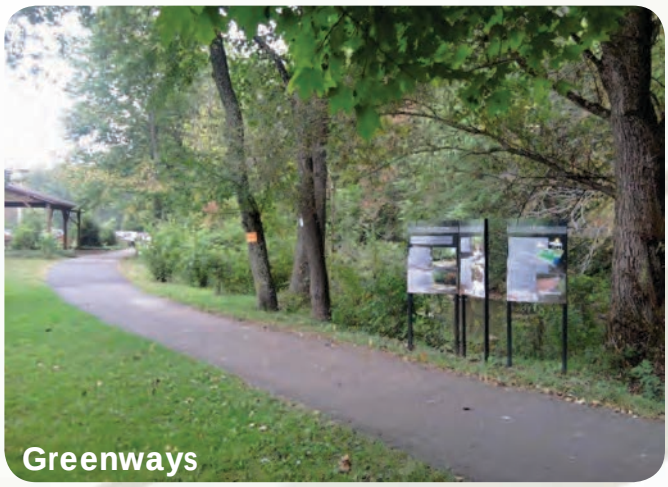
*Roadways with **Paved Shoulders** (4' or greater) are wide enough for safe and comfortable bicycle travel.*

***Bicycle Lanes** are separate lanes within the right of way and travel way of a road designated exclusively for bicycles.*

***Shared Lane Markings** indicate to motorists that bicycles have an equal right to the roadway and can designate where bicyclists should ride in the roadway.*

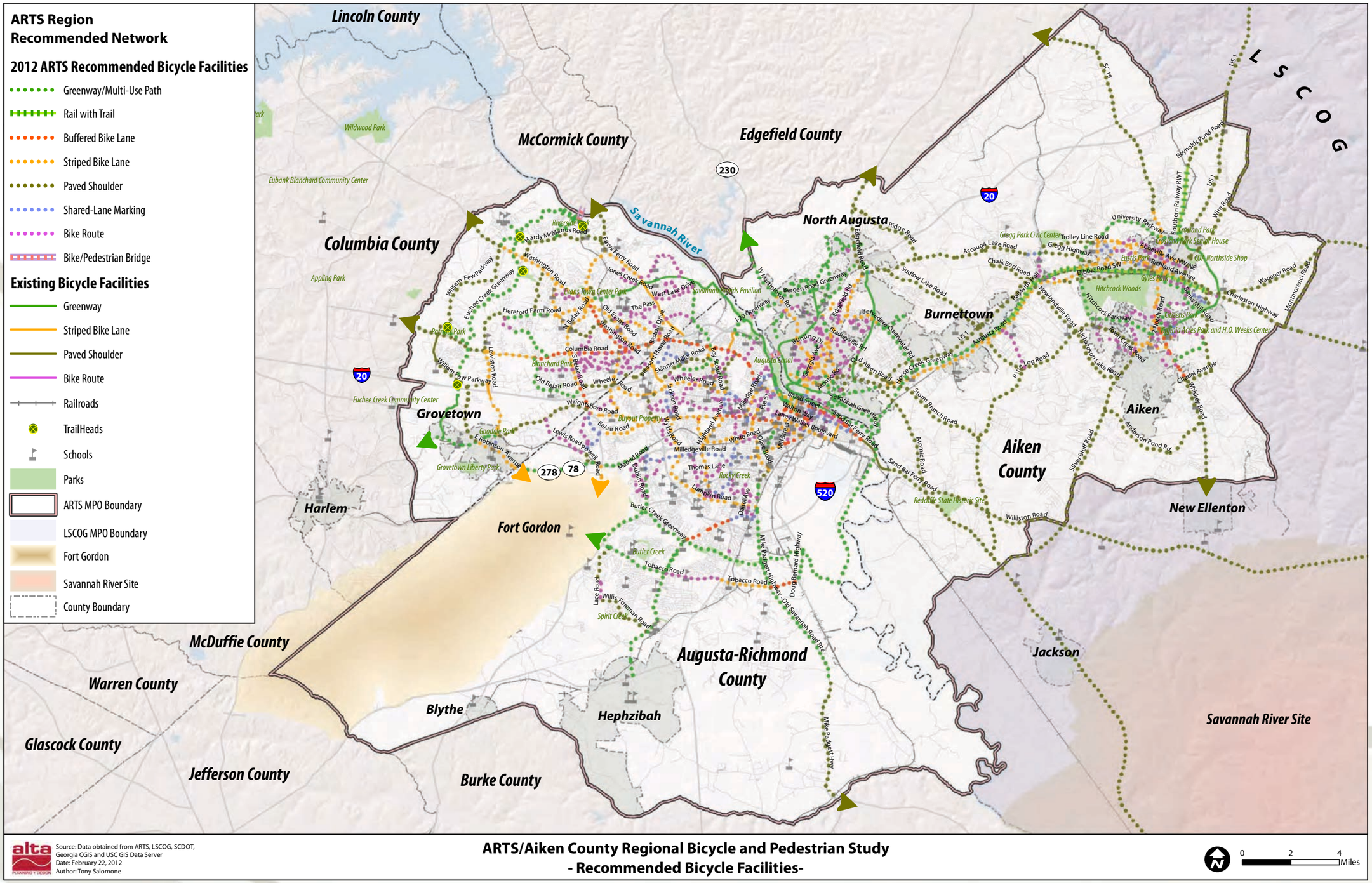
***Bicycle Routes** are usually designated by strategic signage and can include traffic calming measures and other treatments on low-speed and residential streets.*

***Bicycle Lanes** are separate lanes within the right of way and travel way of a road designated exclusively for bicycles.*



***Greenways** (including multi-use paths) are paths designated for pedestrian and bicycle travel with an exclusive right of way.*

Figure 7-6: ARTS Composite Existing and Proposed Bicycle Network



ARTS/Aiken County Regional Bicycle and Pedestrian Study
- Recommended Bicycle Facilities-

Figure 7-7: Augusta and Richmond Co. Existing and Proposed Bicycle Network

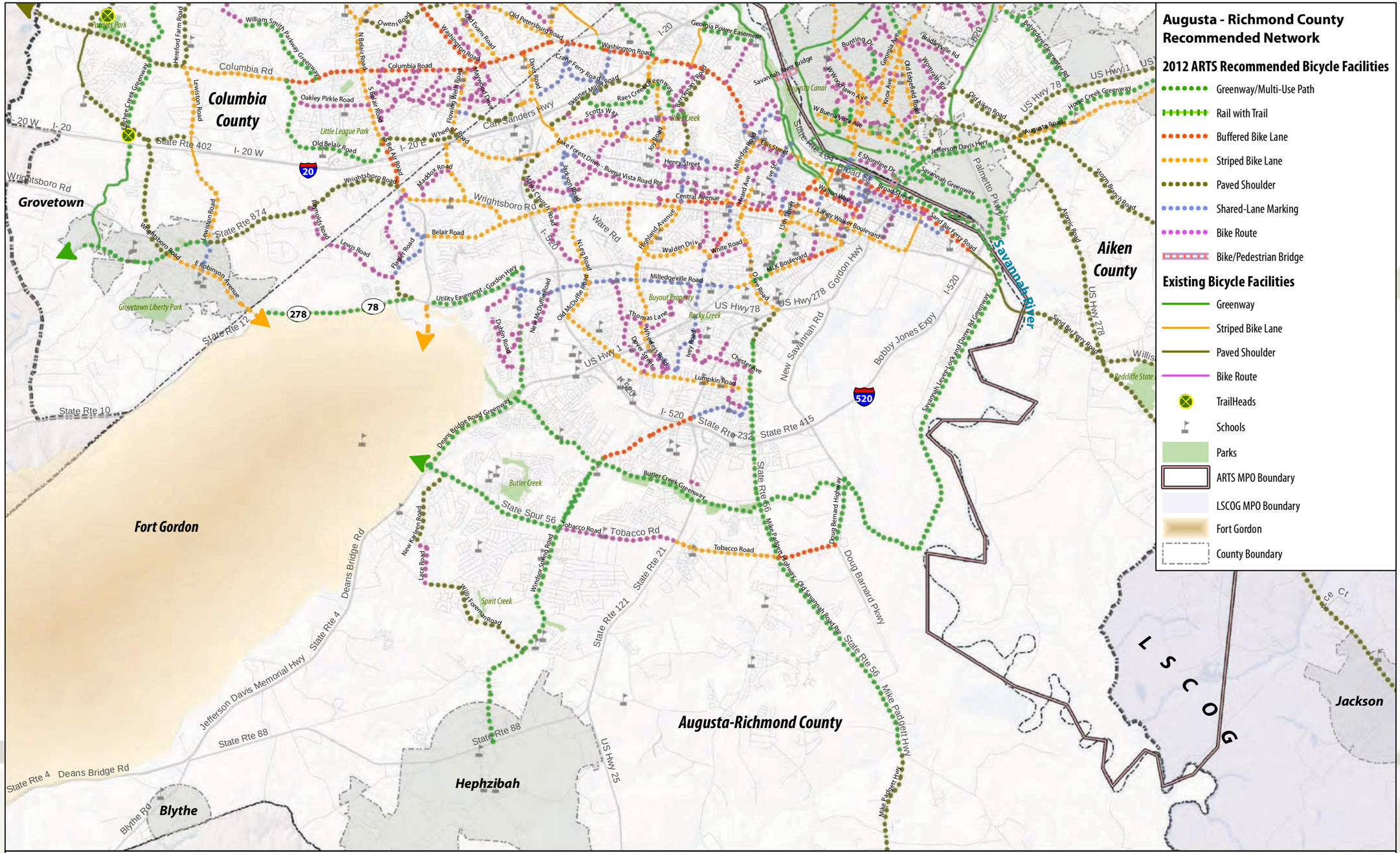
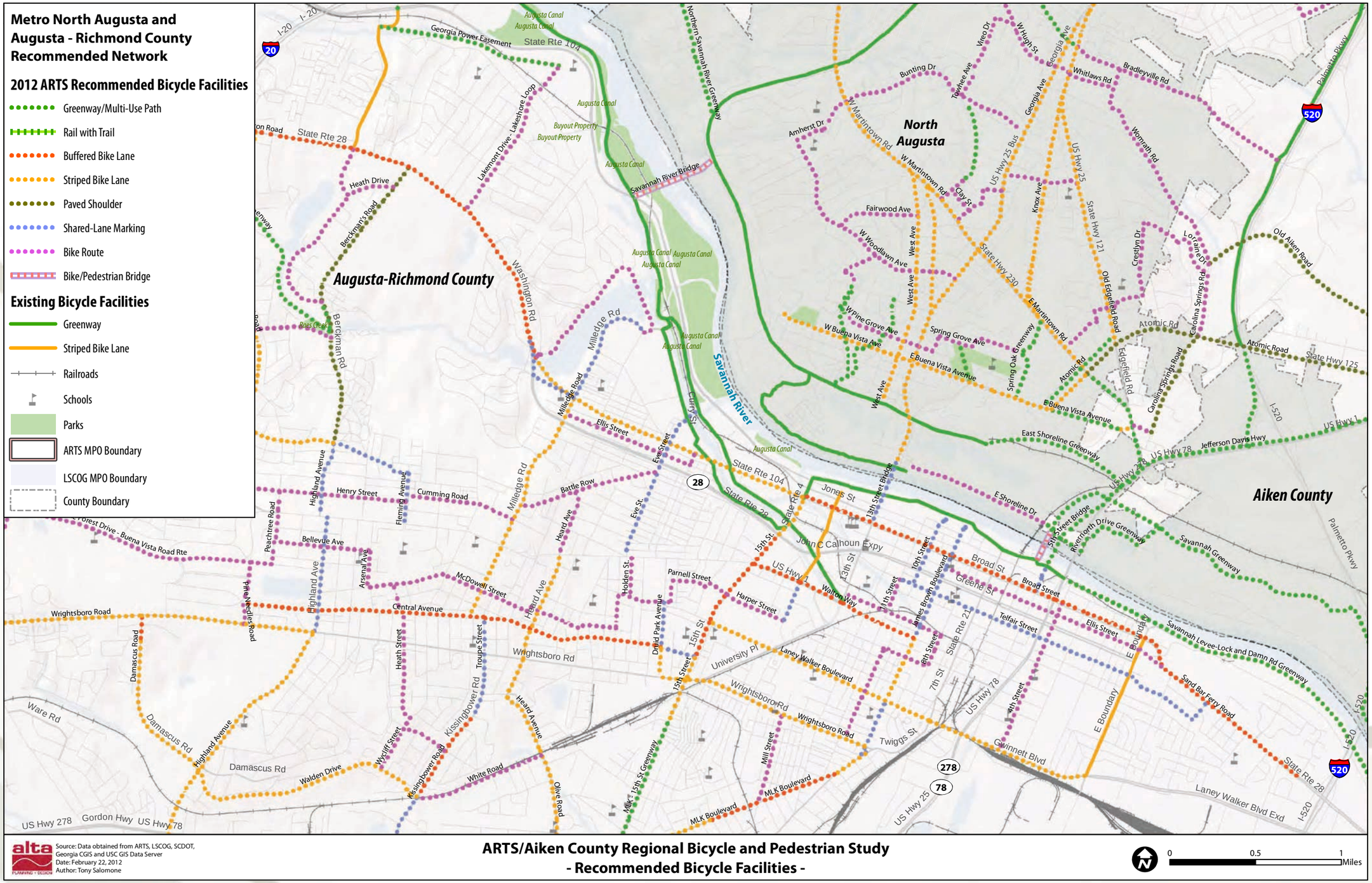
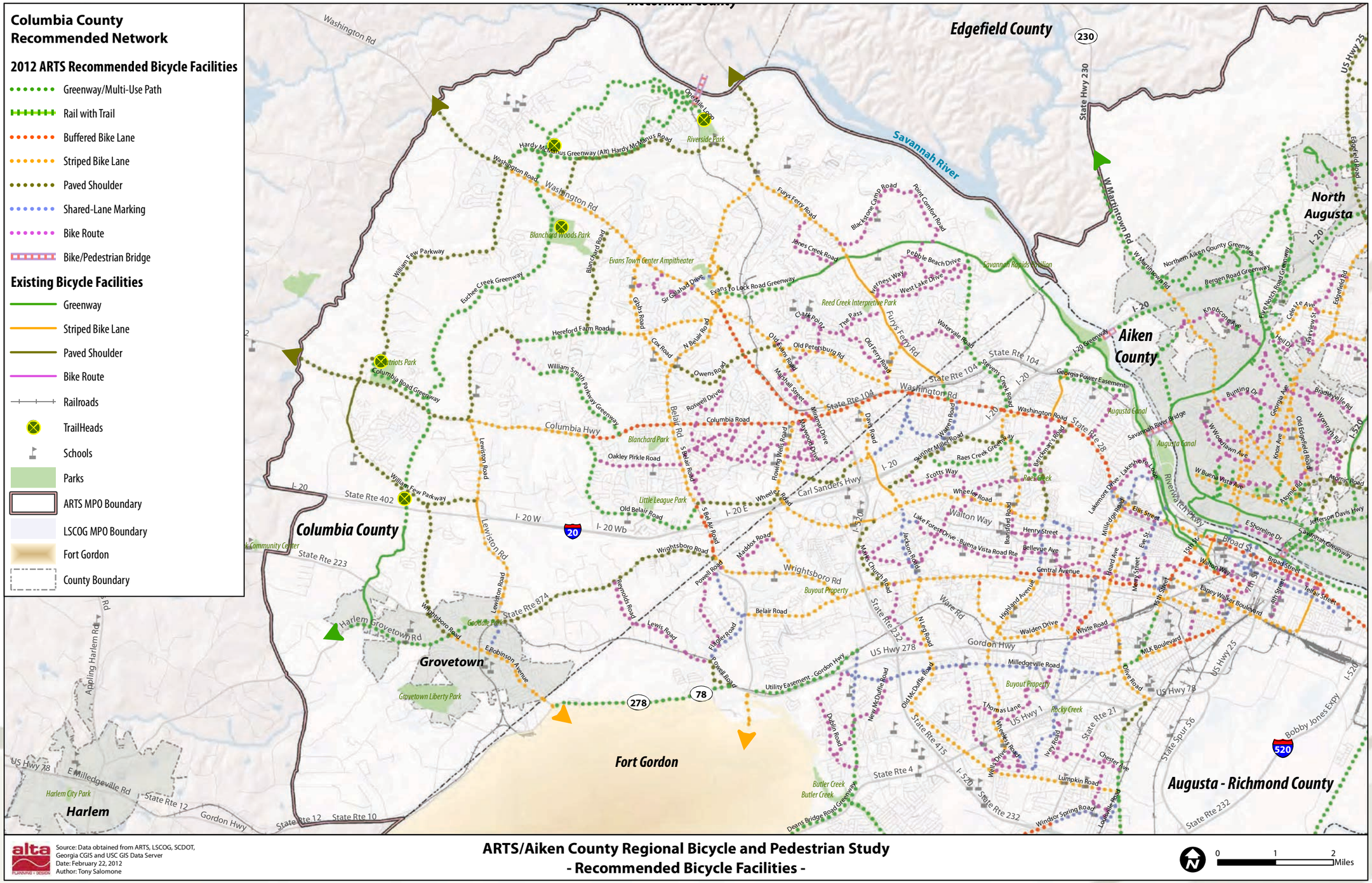


Figure 7-8: Augusta and North Augusta Metro Region Existing and Proposed Bicycle Network



ARTS/Aiken County Regional Bicycle and Pedestrian Study
- Recommended Bicycle Facilities -

Figure 7-9: Columbia Co. Existing and Proposed Bicycle Network



Source: Data obtained from ARTS, LSCOG, SCDOT, Georgia CGIS and USC GIS Data Server
Date: February 22, 2012
Author: Tony Salomone

ARTS/Aiken County Regional Bicycle and Pedestrian Study
- Recommended Bicycle Facilities -

0 1 2 Miles

Figure 7-10: Aiken Co. Existing and Proposed Bicycle Network

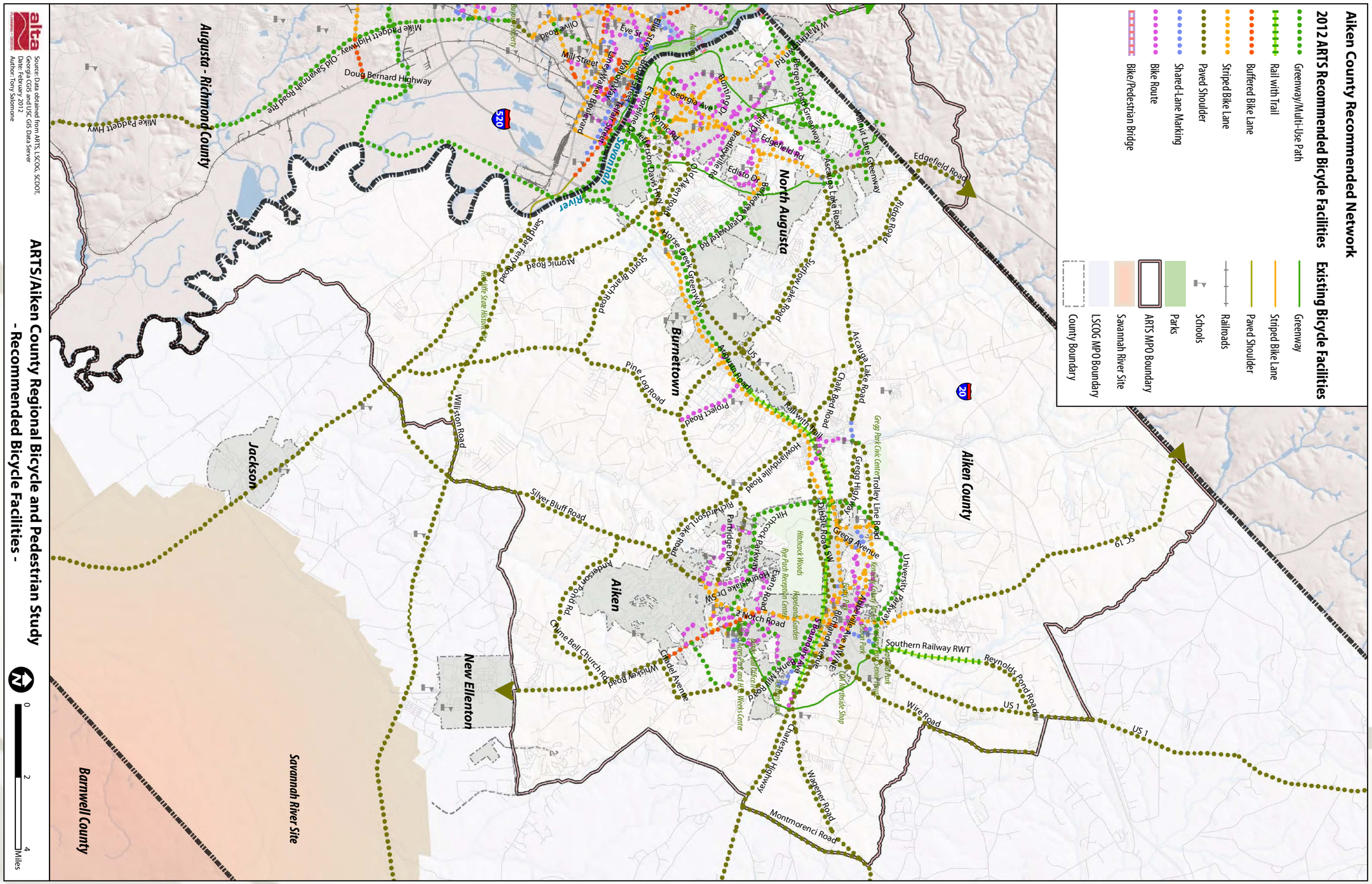
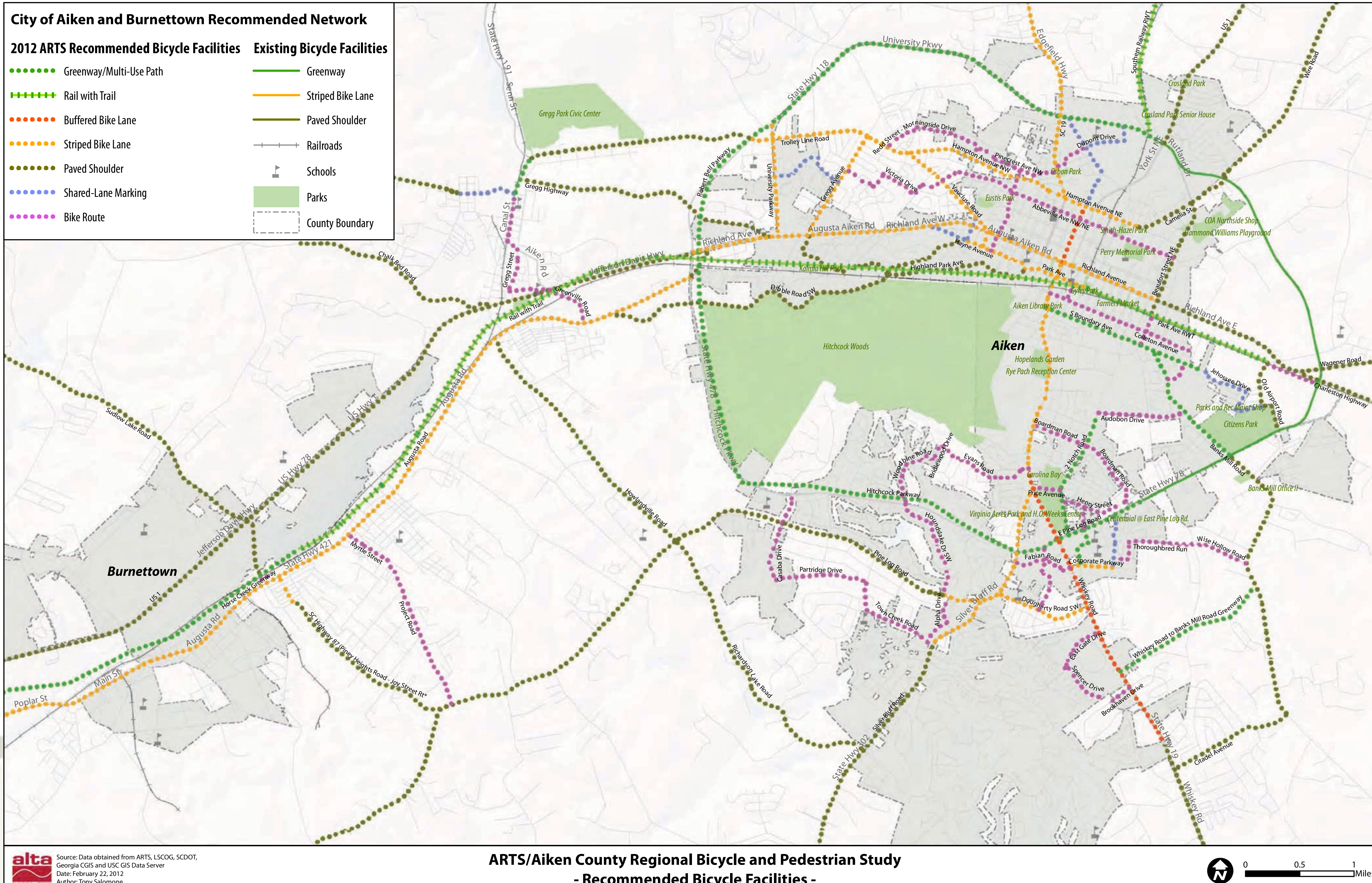


Figure 7-11: Aiken and Burnettown Existing and Proposed Bicycle Network



Recommended Bicycle Lanes

Bicycle lanes provide a signed, striped, and stenciled lane for one-way travel on both sides of a roadway. Bicycle lanes are often used by commuters, bicycle enthusiasts, and casual riders (if on lower volume and lower speed roadways). Bicycle lanes are often recommended on roadways with moderate traffic volumes and speeds and where separation of users facilitates safer operation.

On higher volume roadways that serve as important connections in the bikeway network, this Plan recommends Buffered Bicycle Lanes, as shown in Table 7-4. Buffered Bicycle Lanes provide additional separation between the bicyclist and motor vehicle traffic.

A total of 154.80 miles of Bicycle Lanes and Buffered Bicycle Lanes are recommended for the ARTS region. Further detail regarding the application of Bicycle Lanes and Buffered Bicycle Lanes is provided in the Design Guidelines of this Plan, found in Appendix E.

Table 7-4: ARTS Recommended Bicycle Lanes

Corridor	From	To	Facility Type	Implementation Strategy	Length (mi)	County
Chesterfield Street NW	Hampton Avenue NW	Richland Avenue	Buffered Bike Lane	Lane Narrowing	0.58	Aiken
Whiskey Road	Kings Grant Drive	Powderhouse Road	Buffered Bike Lane	Road Widening	2.82	Aiken
Piney Heights Road - Joy Street (SC Highway 87)	Nettie Lane	Highway 421	Bike Lane	Lane Narrowing	0.27	Aiken
Augusta Road	Stadium Circle	Storm Branch Road	Bike Lane	Lane Narrowing	7.28	Aiken
Carolina Ave	Georgia Avenue	W Marintown Road	Bike Lane	Lane Narrowing	0.79	Aiken
Chesterfield Street NW	Richland Avenue	Whiskey Road	Bike Lane	Lane Narrowing	0.55	Aiken
Corporate Parkway	Whiskey Road	Centennial Avenue	Bike Lane	Lane Narrowing	0.40	Aiken
Hampton Avenue NE	Camille Street	Greenville Street NW	Bike Lane	Lane Narrowing	0.42	Aiken
Hayne Avenue	Park Avenue	Linden Street SW	Bike Lane	Lane Narrowing	0.62	Aiken
Pine Log Road	Houndslake Drive	Silver Bluff Road	Bike Lane	Lane Narrowing	0.41	Aiken
Richland Avenue	Vaucluse Drive	Beaufort Street NE	Bike Lane	Lane Narrowing	1.65	Aiken
Silver Bluff Road	Pine Log Road	Indian Creek Trail	Bike Lane	Lane Narrowing	1.19	Aiken
Vaucluse Road	Trolley Line Road	Richland Ave	Bike Lane	Lane Narrowing	1.06	Aiken
W Buena Vista Ave	Georgia Avenue	Georgetwon Drive	Bike Lane	Lane Narrowing	0.81	Aiken

Corridor	From	To	Facility Type	Implementation Strategy	Length (mi)	County
W Martintown Rd	I-20 On Ramps (South)	I-20 On Ramps (North)	Bike Lane	Lane Narrowing	0.52	Aiken
Waterloo Street	Hayne Avenue	Richland Avenue	Bike Lane	Lane Narrowing	0.14	Aiken
West Ave	W Marintown Road	End of West Ave	Bike Lane	Lane Narrowing	1.38	Aiken
Whiskey Road	Boardman Road	Kings Grant Drive	Bike Lane	Lane Narrowing	1.52	Aiken
Park Ave	Union Street	Highland Park Avenue	Bike Lane	Parking Reduction	0.58	Aiken
Augusta Road	Hitchcock Parkway	Stadium Circle	Bike Lane	Road Diet	1.38	Aiken
Atomic Rd	E Buena Vista Avenue	Martintown Road	Bike Lane	Road Widening	0.30	Aiken
Belvedere Clearwater Rd	Edgefield Road	Palmetto Parkway	Bike Lane	Road Widening	1.70	Aiken
Celeste Ave	Five Notch Road	Edgefield Road	Bike Lane	Road Widening	1.36	Aiken
Dougherty Road SW	Whiskey Road	Silver Bluff Road	Bike Lane	Road Widening	0.90	Aiken
E Buena Vista Ave.	Atomic Road	Riverside Blvd	Bike Lane	Road Widening	0.50	Aiken
E Buena Vista Ave.	Riverside Blvd	Georgia Ave	Bike Lane	Lane Narrowing	0.35	Aiken
E Martintown Rd	Georgia Avenue	Atomic Road	Bike Lane	Road Widening	0.96	Aiken
Edgefield Rd	Knox Ave	Ascauga Ave	Bike Lane	Road Widening	2.72	Aiken
Floyd Ave	E Buena Vista Avenue	E Marintown Road	Bike Lane	Road Widening	0.08	Aiken
Georgia Ave	13th Street Bridge	Knox Ave	Bike Lane	Road Widening	2.86	Aiken
Gregg Avenue	Richland Avenue W	Trolley Line Road	Bike Lane	Road Widening	1.08	Aiken
Hampton Avenue NW	Greenville Street NW	Trolley Line Road	Bike Lane	Road Widening	1.38	Aiken
Knox Ave	E Marintown Road	Edgefield Road	Bike Lane	Road Widening	2.21	Aiken
Old Edgefield Road	Knox Avenue	Atomic Road	Bike Lane	Road Widening	1.51	Aiken
Richland Avenue	Augusta Road	Hitchcock Pkwy	Bike Lane	Road Widening	2.79	Aiken
SC 19	Hampton Avenue	Shiloh Heights Road	Bike Lane	Road Widening	2.00	Aiken
Silver Bluff Road	Whiskey Road	Pine Log Road	Bike Lane	Road Widening	0.62	Aiken

Corridor	From	To	Facility Type	Implementation Strategy	Length (mi)	County
Trolley Line Road	University Parkway	Vaucluse Drive	Bike Lane	Road Widening	1.51	Aiken
University Parkway	Richland Avenue W	Robert M Bell Parkway	Bike Lane	Road Widening	1.05	Aiken
W Martintown Rd	Georgia Avenue	I-20 On Ramps (South)	Bike Lane	Road Widening	2.96	Aiken
15th Street	Government Road	Harper Street	Buffered Bike Lane	Lane Narrowing	0.41	Augusta-Richmond
15th Street	Pope Avenue	Walton Way	Buffered Bike Lane	Lane Narrowing	0.24	Augusta-Richmond
15th Street	Walton Way	John C Calhoun Overpass	Buffered Bike Lane	Lane Narrowing	0.50	Augusta-Richmond
Central Avenue	Pine Needle Road	Monte Sano Avenue	Buffered Bike Lane	Lane Narrowing	0.63	Augusta-Richmond
Damascus Road	W Hancock Road	Wrightsboro Road	Buffered Bike Lane	Lane Narrowing	0.14	Augusta-Richmond
Kissingbower Road	White Road	Woodland Avenue	Buffered Bike Lane	Lane Narrowing	0.56	Augusta-Richmond
MLK Boulevard	15th Avenue	Twiggs Street	Buffered Bike Lane	Lane Narrowing	0.69	Augusta-Richmond
Twiggs Street	MLK Boulevard	9th Street	Buffered Bike Lane	Lane Narrowing	0.08	Augusta-Richmond
Walton Way	15th Street	10th Street	Buffered Bike Lane	Lane Narrowing	0.92	Augusta-Richmond
Windsor Spring Road	Peach Orchard Road	Meadowbrook Drive	Buffered Bike Lane	Lane Narrowing	1.92	Augusta-Richmond
Broad Street - Sand Bar Ferry Road	US 1	Fair Hope Street	Buffered Bike Lane	Parking Reduction	1.42	Augusta-Richmond
Broad Street	10th Street	US 1	Buffered Bike Lane	Parking Reduction	1.21	Augusta-Richmond
Broad Street	15th Street	10th Street	Buffered Bike Lane	Road Diet	0.75	Augusta-Richmond
Central Avenue	Monte Sano Avenue	Druid Park Avenue	Buffered Bike Lane	Road Diet	1.85	Augusta-Richmond

Corridor	From	To	Facility Type	Implementation Strategy	Length (mi)	County
Tobacco Road	Doug Bernard Highway	Gracewood Elementary School	Buffered Bike Lane	Road Diet	1.20	Augusta-Richmond
Walton Way	10th Street	James Brown Boulevard (9th Street)	Buffered Bike Lane	Road Diet	0.12	Augusta-Richmond
Washington Road	Old Petersburg Road	Broad Street	Buffered Bike Lane	Road Widening	4.22	Augusta-Richmond
15th Street	John C Calhoun Overpass	Broad Street	Bike Lane	Lane Narrowing	0.24	Augusta-Richmond
7th Avenue @ Fort Gordon	Gordon Highway	Fort Gordon Boundary	Bike Lane	Lane Narrowing	0.76	Augusta-Richmond
Boy Scout Road	Joy Road	Washington Road	Bike Lane	Lane Narrowing	1.91	Augusta-Richmond
Druid Park Avenue	Central Avenue	Wrightsboro Road	Bike Lane	Lane Narrowing	0.17	Augusta-Richmond
Heard Avenue	Olive Road	Walton Way	Bike Lane	Lane Narrowing	1.26	Augusta-Richmond
James Brown Boulevard	Laney Walker Boulevard	Walton Way	Bike Lane	Lane Narrowing	0.40	Augusta-Richmond
Joy Road	Wheeler Road	Boy Scout Road	Bike Lane	Lane Narrowing	0.23	Augusta-Richmond
Lumpkin Road	Deans Bridge Road	Old McDuffie Road	Bike Lane	Lane Narrowing	1.26	Augusta-Richmond
Milledge Road	Central Avenue	Broad Street	Bike Lane	Lane Narrowing	1.43	Augusta-Richmond
MLK Boulevard	15th Avenue	Twiggs Street	Bike Lane	Lane Narrowing	0.63	Augusta-Richmond
Old McDuffie Road	Lumpkin Road	Milledgeville Road	Bike Lane	Lane Narrowing	0.82	Augusta-Richmond
Olive Road	Heard Avenue	Gordon Highway	Bike Lane	Lane Narrowing	1.69	Augusta-Richmond
Pleasant Home Road - Scott Nixon Memorial Drive	Walton Way Exd	NW Frontage Road	Bike Lane	Lane Narrowing	0.36	Augusta-Richmond
Twiggs Street	MLK Boulevard	9th Street	Bike Lane	Lane Narrowing	0.22	Augusta-Richmond
Walden Drive	Highland Ave	Kissingbower Road	Bike Lane	Lane Narrowing	1.49	Augusta-Richmond
Walton Way Exd	Jackson Road	Skinner Miller Road	Bike Lane	Lane Narrowing	0.37	Augusta-Richmond
Wheeler Road	Highland Avenue	Marks Church Road	Bike Lane	Lane Narrowing	3.19	Augusta-Richmond
Wheeler Road	Perimeter Parkway	Wellsbo Court	Bike Lane	Lane Narrowing	1.34	Augusta-Richmond

Corridor	From	To	Facility Type	Implementation Strategy	Length (mi)	County
Wheeless Road	Wells Drive	Gordon Highway	Bike Lane	Lane Narrowing	1.37	Augusta-Richmond
Wrightsboro Road	Druid Park Avenue	James Brown Blvd	Bike Lane	Lane Narrowing	1.29	Augusta-Richmond
Highland Avenue	Gordon Highway	Wrightsboro Road	Bike Lane	Road Diet	1.47	Augusta-Richmond
Laney Walker Boulevard	E Boundary Street	15th Street	Bike Lane	Road Diet	2.38	Augusta-Richmond
Tobacco Road	Gracewood Elementary School	Peach Orchard Road	Bike Lane	Road Diet	2.06	Augusta-Richmond
15th Street	Government Road	Central Avenue	Bike Lane	Road Widening	0.41	Augusta-Richmond
Belair Road	Jimmy Dyes Parkway	Wrightsboro Road	Bike Lane	Road Widening	1.68	Augusta-Richmond
Damascus Road	Highland Avenue	W Hancock Road	Bike Lane	Road Widening	0.92	Augusta-Richmond
Flowing Wells Road	Wheeler Road	Columbia Road	Bike Lane	Road Widening	1.17	Augusta-Richmond
Lumpkin Road	Mike Padgett Highway	Deans Bridge Road	Bike Lane	Road Widening	2.77	Augusta-Richmond
Milledgeville Road	15th Street	Deans Bridge Road	Bike Lane	Road Widening	0.42	Augusta-Richmond
N Leg Road	Wylds Road	Wrightsboro Road	Bike Lane	Road Widening	1.60	Augusta-Richmond
Wheeless Road	Wells Drive	Gordon Highway	Bike Lane	Road Widening	0.51	Augusta-Richmond
Wrightsboro Road	Belair Road	Jimmy Dyes Parkway	Bike Lane	Road Widening	2.41	Augusta-Richmond
Wrightsboro Road	North Leg Road	Belair Road	Bike Lane	Road Widening	1.46	Augusta-Richmond
Wrightsboro Road	Pine Needle Road	Highland Avenue	Bike Lane	Road Widening	0.41	Augusta-Richmond
Wrightsboro Road	Pine Needle Road	N Leg Road	Bike Lane	Road Widening	1.62	Augusta-Richmond
S Bel Air Road	Wrightsboro Road	Wheeler Road	Buffered Bike Lane	Lane Narrowing	1.10	Columbia
Columbia Road	Old Belair Road	Washington Road	Buffered Bike Lane	Road Widening	4.04	Columbia
Washington Road	Columbia Road	Broad Street	Buffered Bike Lane	Road Widening	1.70	Columbia
Washington Road	Pleasant Home Road	N Belair Road	Buffered Bike Lane	Road Widening	2.62	Columbia

Corridor	From	To	Facility Type	Implementation Strategy	Length (mi)	County
Baston Drive	Furys Ferry Road	Old Petersburg Road	Bike Lane	Lane Narrowing	0.75	Columbia
E Robinson Avenue	Harlem Grovetown Road	Woodward Drive	Bike Lane	Lane Narrowing	1.35	Columbia
N Belair Road	Columbia Road	Town Park Lane	Bike Lane	Lane Narrowing	1.68	Columbia
Old Petersburg Rd	Old Evans Road	Murray Drive	Bike Lane	Lane Narrowing	0.48	Columbia
S Belair Road	Wheeler Road	Columbia Road	Bike Lane	Lane Narrowing	1.48	Columbia
Columbia Road	Old Belair Road	Lewiston Road	Bike Lane	Road Widening	2.06	Columbia
Cox Road	Hereford Farm Road	N Belair Road	Bike Lane	Road Widening	0.82	Columbia
E Robinson Avenue	Woodward Drive	Gordon Highway	Bike Lane	Road Widening	0.90	Columbia
Evans Town Center	Washington Road	N Belair Road	Bike Lane	Road Widening	0.83	Columbia
Furys Ferry Road	N Belair Road	Evans to Locks Road	Bike Lane	Road Widening	2.09	Columbia
Gibbs Road	Hereford Farm Road	Washington Road	Bike Lane	Road Widening	1.43	Columbia
Hereford Farm Road	Evans Middle School	N Belair Road	Bike Lane	Road Widening	1.61	Columbia
Lewiston Road	William Few Parkway	Columbia Road	Bike Lane	Road Widening	1.42	Columbia
Lewiston Road	Wrightsboro Road	Steiner Way	Bike Lane	Road Widening	1.76	Columbia
N Belair Road	Town Park Lane	Evans to Locks Road	Bike Lane	Road Widening	1.04	Columbia
N Belair Road	Ronald Reagan Drive	Furys Ferry Road	Bike Lane	Road Widening	1.90	Columbia
Old Evans Road	Washington Road N	Washington Road S	Bike Lane	Road Widening	2.59	Columbia
Old Petersburg Road	Old Evans Road	Baston Drive	Bike Lane	Road Widening	1.57	Columbia
Washington Road	Hardy McManus Road	William Few Parkway	Bike Lane	Road Widening	1.06	Columbia
Washington Road	Old Evans Road	Hardy McManus Road	Bike Lane	Road Widening	3.35	Columbia
Davis Road	Pleasant Home Road	Washington Road	Bike Lane	Lane Narrowing	0.95	Columbia /Augusta-Richmond
Flowing Wells Road	Wheeler Road	Columbia Road	Bike Lane	Road Widening	2.43	Columbia /Augusta-Richmond

Recommended Roadways with Shared-Lane Markings

Roadways with Shared Lane Markings (SLMs), or Sharrows, are bicycle routes with stencils in the travel lane for bicycle accommodation. This plan recommends Sharrows be used on bikeway corridors where there are narrow travel lanes, high parking turn over, when bicyclists may need assistance with lane positioning, and where drivers may need additional notice to expect bicyclists regardless of the auto parking configuration. Sharrows will improve bicyclist mobility and access while increasing driver and bicyclist awareness. For all Roadways with Shared-Lane Markings, the implementation strategy is to add pavement markings.

As shown in Table 7-5, a total of 39.10 miles of roadways with Shared-Lane Markings are recommended for the ARTS region. Further detail regarding the purpose and application of Sharrows is provided in the Design Guidelines of this Plan, found in Appendix E.

Table 7-5: ARTS Recommended Shared Lane Markings

Corridor	From	To	Length (mi)	County
13th Street Bridge	Georgia Ave. on SC side of Savannah River	Broad Street on GA side of Savannah River	0.38	Aiken County
Aiken Street - 2nd Street	Canal Street	Ergle Street	0.53	Aiken County
Ascauga Lake Road	100 yards east of Whitehall Road	Edgefield Road	0.13	Aiken County
Ascauga Lake Road	100 yards east of Whitehall Road	Edgefield Road	0.25	Aiken County
Centennial Avenue	Corporate Parkway	E Pine Log Road	0.50	Aiken County
Chesterfield Street NW	Columbia Avenue	Hampton Avenue NW	0.32	Aiken County
Damon Street	Jehossee Dr.	Old Airport Rd.	0.66	Aiken County
Dupont Drive	Rutland Drive	Teague St NW	0.49	Aiken County
Hayne Avenue	Linden Street SW	Richland Avenue	0.35	Aiken County
Hudson Road	Medical Park Drive	Gregg Avenue	0.32	Aiken County
Jehossee Drive	Cherokee St SE	Damon St.	0.26	Aiken County
Linden Street SW	Hayne Ave SW	Vaucluse Road	0.23	Aiken County
Medical Park Drive	Hudson Road	University Parkway	0.47	Aiken County
S Boundary Ave	Cherokee St SE	Old Airport Road	0.46	Aiken County
Teague St NW	Rutland Drive	Columbia Avenue NW	0.62	Aiken County
10th Street	Telfair Street	End of Telfair Street (Cul-de-Sac)	0.48	Augusta-Richmond County
5th Street	Broad Street	5th Street Bridge	0.18	Augusta-Richmond County
Barton Chapel Road	London Boulevard	Proposed Gordon Hwy Greenway	1.07	Augusta-Richmond County
Belair Road	Powell Road	Jimmy Dyes Parkway	0.97	Augusta-Richmond County
Broad Street	15th Street	Washington Road	5.92	Augusta-Richmond County
Central Avenue	Druid Park Avenue	15th Street	0.20	Augusta-Richmond County

Corridor	From	To	Length (mi)	County
Crane Ferry Road	Pleasant Home Road	Warren Road	0.85	Augusta-Richmond County
Druid Park Avenue	Central Avenue	McNally Street	0.27	Augusta-Richmond County
Eve Street	Battle Row	Goodrich St/ Greenway	0.44	Augusta-Richmond County
Eve Street	Battle Row	Walton Way	0.51	Augusta-Richmond County
Flagler Road	Belair Road	Powell Road	1.05	Augusta-Richmond County
Fleming Avenue	Walton Way	Wheeler Road	0.30	Augusta-Richmond County
Highland Avenue	Wrightsboro Road	Wheeler Road	1.12	Augusta-Richmond County
Jackson Road	Wrightsboro Road	Wheeler Road	1.36	Augusta-Richmond County
James Brown Boulevard	Twiggs Street	Laney Walker Boulevard	0.40	Augusta-Richmond County
James Brown Boulevard	Walton Way	End of James Brown Blvd	0.76	Augusta-Richmond County
Kissingbower Road	Gordon Highway	White Road	1.10	Augusta-Richmond County
Lake Course Drive (Broad Street SB)	Milledge Road	Washington Road	0.51	Augusta-Richmond County
Louisville Road	Mike Padgett Highway	Windsor Spring Road	0.42	Augusta-Richmond County
Milledge Road	Broad Street	Lakeshore Loop	0.70	Augusta-Richmond County
Milledgeville Road	Deans Bridge Road	Gordon Highway (westernmost intersection)	4.45	Augusta-Richmond County
Oak Street	Telfair Street	Sand Bar Ferry Road	0.13	Augusta-Richmond County
Pleasant Home Road	Washington Road	Walton Way Exd	1.38	Augusta-Richmond County
Richmond Hill Road	Deans Bridge Road	Ruby Drive	1.27	Augusta-Richmond County
Ruby Drive	Richmond Hill Road	Wells Drive	0.60	Augusta-Richmond County
St Sebastian Way	Walton Way	Harper Street	0.25	Augusta-Richmond County
Telfair Street	Oak Street	11th Street	1.91	Augusta-Richmond County
Troupe Street	Woodland Avenue	Central Avenue	0.59	Augusta-Richmond County

Corridor	From	To	Length (mi)	County
Walton Way	W Lake Forest Drive	Jackson Road	0.23	Augusta-Richmond County
Warren Road	Skinner Miller Road	Washington Road	0.94	Augusta-Richmond County
Wheeler Road	Fleming Avenue	Highland Avenue	0.48	Augusta-Richmond County
Windsor Spring Road	Louisville Road	Peach Orchard Road	1.06	Augusta-Richmond County
Katherine Street	Wrightsboro Road	E Robinson Avenue	0.60	Columbia County
Pleasant Home Road - Scott Nixon Memorial Drive	Old Anderson Road	Flowing Wells Road	0.22	Columbia County
Ronald Reagan Drive	Washington Road	N Belair Road	0.40	Columbia County

Recommended Bicycle Routes

Bicycle Routes provide for shared roadway use and are generally only identified with signing. Bicycle Routes may have a wide travel lane or shoulder that allow for parallel travel with automobiles, or they may be a typical residential street with very low traffic volumes and speeds.

The recommended Bicycle Routes provide connections through residential areas connecting residents to schools, retail districts, and other community destinations, typically without having to travel on main arterial roadways. Table 7-6 lists the recommended Bicycle Routes of this Plan. For all routes, the implementation strategy is adding signage.

The Bicycle Route network recommended for the ARTS region totals 131.72 miles. Further detail regarding the purpose and application of a Bicycle Route network is provided in the Design Guidelines of this Plan, found in Appendix E.

Table 7-6: ARTS Recommended Bicycle Routes

Corridor	From	To	Length (mi)	County
Abbeville Ave NW/NE	Congaree Ave NW	Beaufort Street NE	2.15	Aiken
Aiken Road - Canal Street	Gregg Street	2nd Street	0.57	Aiken
Alpha Drive	Pine Log Road	Seven Oaks Drive	0.25	Aiken
Alta Vista Ave	Mokateen Avenue	W Woodlawn Avenue	0.21	Aiken
Amherst Drive	W Woodlawn Avenue	Bunting Drive	0.18	Aiken
AP Nivens St	Aiken Road	Gregg Street	0.35	Aiken
Assembly Street	Washington Circle	Congress Drive	0.06	Aiken
Audobon Drive	Banks Mill Road	Two Notch Road	0.81	Aiken
Austin St	Weston Street	Crestlyn Drive	0.19	Aiken
Baker Street	Project Road	Myrtle Street	0.05	Aiken
Beaufort Street SE	Park Ave SE	S Boundary Street	0.28	Aiken
Boardman Road	Henry Street	Whiskey Road	1.19	Aiken
Bradleyville Rd	Knox Avenue	Palmetto Parkway	1.42	Aiken

Corridor	From	To	Length (mi)	County
Bridlewood Drive	Evans Road	Woodbine Road	0.16	Aiken
Brookhaven Drive	Whiskey Road	Spencer Drive	0.24	Aiken
Bunting Dr	Amherst Drive	End of Bunting Drive	1.37	Aiken
Carolina Springs Rd	Atomic Road	Lorraine Drive	0.39	Aiken
Casaba Drive	Partridge Drive	Pine Log Road	0.56	Aiken
Cascade Dr	Cadada Court	Green Forest Drive	0.08	Aiken
Cherry Laurel Dr	Walnut Drive	Oakland Drive	0.17	Aiken
Clay St	Hampton Avenue	Observatory Avenue	0.15	Aiken
Clearmont Dr	Wooden Ave	Edgefield Road	0.53	Aiken
Colleton Avenue	Timberlane Road	Chesterfield Street NW	1.44	Aiken
Collier Street	Henry Street	E Pine Log Road	0.21	Aiken
Concord Ave	Observatory Ave	Sidereal Ave	0.09	Aiken
Congress Drive	Assembly Street	Tennessee Ave NW	0.22	Aiken
Crestlyn Dr	Austin Street	Seymour Drive	0.43	Aiken
Depot Road - Carline Road	Hwy 421	Langley Dam Road	0.12	Aiken
Dove Ave	Vireo Drive	W Hugh Street	0.11	Aiken
Dupont Drive	Teague Street	Gayle Ave	0.26	Aiken
E Hugh St	Georgia Avenue	Knox Drive	0.09	Aiken
E Pine Grove Ave	Georgia Avenue	East Avenue	0.09	Aiken
E Shoreline Drive	Landing Drive	End of Shoreline Drive	0.88	Aiken
E Town Drive	Spring Grove Avenue	Spring Oak Lane	0.05	Aiken
East Ave	E Pine Grove Ave	Spring Grove Lane	0.10	Aiken
East Gate Drive	Spencer Drive	Whiskey Road	0.55	Aiken
Edisto Ave	Victoria Drive	Santee Congaree Ave	0.11	Aiken
Edisto Drive	Monterey Avenue	Ridgefield Drive	0.55	Aiken
Evans Road	Hitchcock Drive SW	Bridlewood Drive	0.91	Aiken
Evelyn Lane	Edgefield Road	Fairview Street	0.15	Aiken
Fabian Road	Ola Hitt Lane	Silver Bluff Road	0.49	Aiken
Fairfield Street	Colleton Avenue	Park Avenue	0.16	Aiken
Fairlane Drive	Pinewood Road	Proposed Pressley Avenue Extension	0.05	Aiken
Fairview Ave	Johnson Road	Clearmont Drive	0.44	Aiken
Fairview St	Evelyn Lane	Celeste Avenue	0.57	Aiken
Fairwood Ave	W Woodlawn Avenue	West Ave	0.49	Aiken
Future Roadway	Old Plantation Road	W Marintown Road	0.13	Aiken
Gayle Ave	Dupont Drive	Laurens Street NW	0.11	Aiken

Corridor	From	To	Length (mi)	County
Gilbert Street	Banks Mill Road	S Boundary Avenue	0.25	Aiken
Green Forest Drive	Cascade Drive	Knotty Pine Drive	0.29	Aiken
Greenville Road	Jefferson Davis Hwy	Augusta Road	0.50	Aiken
Gregg Street	AP Nivens Street	Aiken Road	0.40	Aiken
Hampton Ave	W Marintown Road	Clay Street	0.08	Aiken
Haskell Rd	Lehigh Avenue	Palmetto Avenue	0.09	Aiken
Heil Dr	Five Notch Road	Pressley Avenue	0.29	Aiken
Henry Street	Collier Street	Boardman Road	0.63	Aiken
Hitchcock Drive SW	Whiskey Road	Evans Road	0.08	Aiken
Holly Lane	Floyd Ave	Carolina Springs Road	0.11	Aiken
Houndslake Dr SW	Varden Dr	Pine Log Road	1.03	Aiken
Huntsman Drive SW	Hitchcock Parkway	Pine Log Road	0.28	Aiken
Johnson Rd	Celeste Avenue	Fairview Avenue	0.38	Aiken
Knobcone Ave	W Marintown Road	Pisgah Road	1.29	Aiken
Knollwood Blvd	Pisgah Road	White Pine Drive	0.17	Aiken
Knotty Pine Drive	Green Forest Drive	White Pine Drive	0.17	Aiken
Lamar Lane - Kalmia Forest Drive	Wildwood Drive	Valley Road	0.11	Aiken
Laurens St	E Marintown Road	Yardley Drive	0.25	Aiken
Lecompte Ave	Georgia Avenue	Old Edgefield Road	0.43	Aiken
Lehigh Ave	Haskell Road	Kerr Street	0.15	Aiken
Levels Church Road	Old Airport Road	120' NW of Pine Log Road	0.48	Aiken
Lorraine Drive	Seymour Drive	Womrath Road	0.31	Aiken
Mokateen Ave	Jackson Avenue	Alta Vista Avenue	0.13	Aiken
Monterey Ave	Edisto Drive	Rhomboid Place	0.45	Aiken
Morgan Street NW-Morgan Street SW - Fauberg Street	Pinecrest Avenue	Hayne Avenue	0.80	Aiken
Myrtle Street	Baker Street	Hwy 421	0.47	Aiken
Neilson Street	Pawnee Connector	Dougherty Road	0.27	Aiken
Oak Street	Valley Road	Victoria Drive	0.16	Aiken
Oakland Dr	Redbud Drive	Cherry Laurel Drive	0.24	Aiken
Observatory Ave	W Marintown Road	Concord Avenue	0.18	Aiken
Ola Hitt Lane	Whiskey Road	Fabian Road	0.09	Aiken
Old Plantation Road	Plantation Drive	W Marintown Road	0.21	Aiken
Palmetto Ave	Haskell Road	Rhomboid Place	0.14	Aiken
Partridge Drive	Town Creek Road	Casaba Drive	0.86	Aiken
Pawnee Connector	Pawnee Road	Neilson Street	0.20	Aiken

Corridor	From	To	Length (mi)	County
Pawnee Road	E Pine Log Road	Pawnee Connector	0.22	Aiken
Photinia Drive	Thoroughbred Run	Centennial Avenue	0.30	Aiken
Pinecrest Ave NW	Plunkett Ave NW	Washington Circle	0.41	Aiken
Pinewood Rd	Edgefield Road	Fairlane Drive	0.25	Aiken
Pisgah Rd	Knollwood Blvd	Knobcone Avenue	0.05	Aiken
Plunkett Ave NW	Laurens Street NW	Pinecrest Ave NW	0.21	Aiken
Possible Road	Clay Street	555 Feet North of Clay Street	0.11	Aiken
Pressley Avenue - Pressley Avenue Ext	Heil Drive	Fairlane Drive	0.46	Aiken
Price Avenue	Two Notch Road	Whiskey Road	0.25	Aiken
Project Road	E Pine Log Road	Baker Street	1.41	Aiken
Redd Street - Morningside Drive	Tennessee Ave NW	Trolley Line Road	0.73	Aiken
Rhomboid Place	Monterey Avenue	Palmetto Avenue	0.22	Aiken
Ridgefield Dr	Belvedere Clearwater Road	Edisto Drive	0.48	Aiken
Santee Congaree Ave - Congaree Ave NW	Edisto Ave	Abbeville Ave NW	0.38	Aiken
Seven Oaks Drive	Alpha Drive	Town Creek Road	0.26	Aiken
Seymour Drive	Crestlyn Drive	Lorraine Drive	0.23	Aiken
Sidereal Ave	Concord Avenue	Georgia Avenue	0.11	Aiken
Spencer Drive	Brookhaven Drive	East Gate Drive	0.48	Aiken
Spring Grove Ave	E Town Drive	East Avenue	0.21	Aiken
Spring Oak Lane	End of Spring Oak Lane	E Town Drive	0.27	Aiken
St James St	Edgefield Road	Lehigh Avenue	0.35	Aiken
Thoroughbred Run	Powderhouse Road	Photinia Drive	0.59	Aiken
Towhee Ave	Bunting Drive	Vireo Drive	0.17	Aiken
Town Creek Road	Seven Oaks Drive	Partridge Drive	0.95	Aiken
Valley Road	Kalmia Forest Drive	Oak Street	0.05	Aiken
Varden Road	Woodbine Road	Houndslake Drive	0.10	Aiken
Victoria Drive	Oak Street	Edisto Ave	0.34	Aiken
Vireo Drive	Towhee Avenue	Dove Avenue	0.34	Aiken
W Hugh St	Green Forest Dr	Georgia Avenue	0.68	Aiken
W Pine Grove Ave	Park Avenue	Carolina Avenue	0.47	Aiken
W Woodlawn Ave	Amherst Drive	Georgia Avenue	1.37	Aiken
Washington Circle	Pincrest Ave NW	Assembly Street (northside of W. Circle)	0.22	Aiken

Corridor	From	To	Length (mi)	County
Weston St	Yardley Drive	Austin Street	0.13	Aiken
White Pine Dr	Knollwood Blvd	Knotty Pine Drive	0.12	Aiken
Whitlaws Rd	Knox Ave	Womrath Road	0.27	Aiken
Wildwood Drive	Gregg Ave	Lamar Lane	0.20	Aiken
Wise Hollow Road	Banks Mill Road	Powderhouse Road	0.54	Aiken
Womrath Rd	Bradleyville Road	Lorraine Drive	1.38	Aiken
Woodbine Road	Bridlewood Drive	Varden Road	0.59	Aiken
Yardley Dr	Laurens Street	Weston Street	0.07	Aiken
Holden Street	Walton Way	Bransford Ave	0.24	Augusta-Richmond
10th Street	Wrightsboro Road	Dantignac Street	0.58	Augusta-Richmond
11th Street	Fenwick Street	Telfair Street	0.21	Augusta-Richmond
4th Street	Laney Walker Boulevard	Broad Street	0.94	Augusta-Richmond
8th Street	Dantignac	Fenwick Street	0.20	Augusta-Richmond
Abelia Drive	Windsor Spring Road	Kings Grant Drive	0.17	Augusta-Richmond
Allen Ave	Lumpkin Road	Ruby Drive	0.23	Augusta-Richmond
Amsterdam Road	Madrid Road	Old McDuffie Road	0.15	Augusta-Richmond
Arsenal Ave	Bellevue Ave	McDowell Street	0.22	Augusta-Richmond
Aumond Road - Ingleside Drive	Huxley Drive	Berckmans Road	1.65	Augusta-Richmond
Battle Row	Milledge Road	Eve Street	0.82	Augusta-Richmond
Bellevue Ave	Peachtree Road	Arsenal Ave	0.56	Augusta-Richmond
Bransford Ave - McAnally St	Merry Street	Emmett Ave	0.31	Augusta-Richmond
Bransford Road	Wheeler Road	Walton Way	0.41	Augusta-Richmond
Bungalow Road	Richmond Hill Road	Ivey Road	0.10	Augusta-Richmond
Camelia Road - Huxley Drive	Heather Drive	Aumond Road	0.75	Augusta-Richmond
Chafee Ave	Parnell Street	Pope Ave	0.03	Augusta-Richmond
Chester Ave	Mike Padgett Hwy	Danel Ave	0.31	Augusta-Richmond

Corridor	From	To	Length (mi)	County
Crawford Avenue	Ellis Street	Broad Street	0.07	Augusta-Richmond
Cumming Road	Fleming Avenue	Milledge Road	0.64	Augusta-Richmond
Danel Ave	Chester Ave	Kings Grant Drive	0.75	Augusta-Richmond
Dantignac Street	10th Street	8th Street	0.28	Augusta-Richmond
Dover Street	Sheraton Drive	Deans Bridge Road	0.42	Augusta-Richmond
Dublin Road	Madrid Road (@ north end of Dublin)	Massoit drive	1.28	Augusta-Richmond
Ellis Street	James Brown Bld	E Boundary Street	1.23	Augusta-Richmond
Ellis Street	Milledge Road	Crawford Avenue	0.78	Augusta-Richmond
Emmett Ave	McAnally Street	Parnell Street	0.13	Augusta-Richmond
Fenwick Street	13th Street	8th Street	0.61	Augusta-Richmond
Franklin Street	Wells Drive	Allen Ave	0.37	Augusta-Richmond
Golden Camp Road	Milledgeville Road	Deans Bridge Road	1.53	Augusta-Richmond
Harper Street	15th Street	St. Sebastian Way	0.37	Augusta-Richmond
Heard Ave	Walton Way	Battle Row	0.39	Augusta-Richmond
Heath Drive	Stanley Drive	Berckman's Drive	0.28	Augusta-Richmond
Heath Street	McDowell Street	Kimberly Drive	0.86	Augusta-Richmond
Heather Drive	Kamel Drive	Camelia Road	0.48	Augusta-Richmond
Henry Street	Fleming Avenue	Bransford Road	0.99	Augusta-Richmond
Ivey Road	Bungalow Road	Martin Road	0.60	Augusta-Richmond
Jamaica Drive	Jackson Road	Marks Church Road	0.82	Augusta-Richmond
Jennings Road	Thomas Lane	Regency Boulevard	0.31	Augusta-Richmond
Kamel Drive	Alpine Drive	Heather Drive	0.11	Augusta-Richmond
Kimberly Drive	Heath Street	Kissingbower Road	0.28	Augusta-Richmond

Corridor	From	To	Length (mi)	County
Kings Grant Drive	Abelia Drive	Daniel Ave	0.29	Augusta-Richmond
Lace Road	Willis Foremand Road	Lake Erie Drive	0.73	Augusta-Richmond
Lake Forest Drive - Buena Vista Road Rte	Walton Way	Pine Needle Road	2.18	Augusta-Richmond
Lakemont Drive - Lakeshore Loop	Washington Road	Milledge Road	2.30	Augusta-Richmond
Lewis Road	Reynolds Road	Powell Road	1.07	Augusta-Richmond
Lombardy Court	Peachtreet Road	Buena Vista Road	0.13	Augusta-Richmond
Maddox Road	Flowing Wells Road	Wrightsboro Road	0.95	Augusta-Richmond
Madrid Road	Milledgeville Road	Dublin Road	0.80	Augusta-Richmond
Martin Road	Virginia Ave - Circular Road	Ivey Road	0.25	Augusta-Richmond
Massoit Drive	Old McDuffie	Utility Easement Greenway (paralleling Barton Chap	0.31	Augusta-Richmond
McDowell Street	Arsenal Ave	Merry Street	1.56	Augusta-Richmond
Merry Street	McDowell Street	Bransford Ave	0.21	Augusta-Richmond
Mill Street	Wrightsboro Road	Martin Luther King, Jr Blvd	0.53	Augusta-Richmond
New McDuffie Road	Milledgeville Road	Old McDuffie Road	0.58	Augusta-Richmond
Old McDuffie Road	New McDuffie Road	Dublin Road	1.17	Augusta-Richmond
Old Morris Road	Powell Road	Woodside Road	1.29	Augusta-Richmond
Parnell Street	Emmett Ave	Chafee Ave	0.21	Augusta-Richmond
Peach Orchard Road	Circular Drive	Bungalow Road	0.36	Augusta-Richmond
Peachtree Road	Henry Street	Lombardy Court	0.45	Augusta-Richmond
Pine Needle Road	Buena Vista Road	Wrightsboro Road	0.14	Augusta-Richmond
Pope Ave	Chafee Ave	15th St.	0.12	Augusta-Richmond
Powell Road	Flagler Road	Lewis Road	0.45	Augusta-Richmond

Corridor	From	To	Length (mi)	County
Powell Road	Old Morris Road	Wrightsboro Road	0.47	Augusta-Richmond
Regency Boulevard	Jennings Road	Milledgeville Road	0.66	Augusta-Richmond
Ruth Street	Woodside Ave	Flagler Road	0.11	Augusta-Richmond
Sand Bar Ferry Road	E Boundary Street	Broad Street	0.19	Augusta-Richmond
Scotts Way	Skinner Miller Road	Wheeler Road	1.39	Augusta-Richmond
Sheraton Drive	Wells Drive	Dover Street	0.12	Augusta-Richmond
Stanley Drive-Heath Drive-Wicklow Drive Rte	Washington Road	Berckman's Road	1.20	Augusta-Richmond
Tanglewood Drive - Alpine Drive	Marks Church Road	Kamel Drive	1.09	Augusta-Richmond
Thomas Lane	Golden Camp Road	Jennings Road	1.16	Augusta-Richmond
Tobacco Road	Peach Orchard Road	Windsor Spring Road	2.37	Augusta-Richmond
Ulm Road - Lake Erie Drive Rte	Lace Road	New Karleen Road	0.26	Augusta-Richmond
Virginia Ave - Circular Road	Danel Ave	Martin Road	0.82	Augusta-Richmond
Wells Drive	Ruby Drive	Lumpkin Road	0.43	Augusta-Richmond
White Road	Kissingbower Road	Olive Road	0.78	Augusta-Richmond
Woodside Avenue	Bolton Street	Ruth Street	0.13	Augusta-Richmond
Wycliff Street	Kimberly Drive	Walden Drive	0.28	Augusta-Richmond
Wylds Road	Wrightsboro Road	North Leg Road	1.47	Augusta-Richmond
Young Drive	Wells Drive	Franklin Street	0.38	Augusta-Richmond
Allison Road	Hillbrook Drive	Springlakes Drive	0.53	Columbia
Almon Drive	Fairfax Street	Miramar Drive	0.28	Columbia
Bedford Drive	Gibbs Road	Brandermill Road	0.08	Columbia
Bettys Branch Way	Brandermill Road	Country Place Lane	0.10	Columbia
Blackstone Camp Road	Furys Ferry Road	Point Comfort Road	1.87	Columbia
Blue Ridge Drive	Evans to Locke Road	Clark Point	0.61	Columbia
Brandermill Road	Bedford Drive	Bettys Branch Way	0.19	Columbia

Corridor	From	To	Length (mi)	County
Clark Point	Blue Ridge Drive	Old Petersburg Road	0.89	Columbia
Clinton Way W	Matheny Cut	Melrose Drive	0.45	Columbia
Country Place Lane	Washington Road	Graystone Way	0.71	Columbia
Dent Street	Marshall Street	Desoto Drive	0.11	Columbia
Desoto Drive	Dent Street	Hightower Drive	0.19	Columbia
Dresden Drive	Roswell Drive	Columbia Road	0.31	Columbia
Fairfax Street	Pleasant Home Road	Almon Drive	0.63	Columbia
Forest Court	Wheeler Road	Matheny Cut	0.43	Columbia
Graystone Way	Country Place Lane	Sir Galahad Drive	0.16	Columbia
Hammonds Ferry Crossing	Jones Creek Road	Furys Ferry Road	0.63	Columbia
Highlands Lane - Gloucester Ct - Watervale Way	Parliament Road	Watervale Road	0.46	Columbia
Hightower Drive	Desoto Drive	Washington Road (Rail with Trail)	0.23	Columbia
Hillbrook Drive	Columbia Road	Allison Road	0.62	Columbia
Holly Road	S Belair Road	Thomas Drive	0.34	Columbia
Iverness Way	Pebble Beach Drive	Furys Ferry Road	0.73	Columbia
Jones Creek Road	Evans to Locke Road	Hammonds Ferry Crossing	0.73	Columbia
Knollcrest Circle	Sandalwood Drive	Quail Springs Circle	0.58	Columbia
Marshall Street	Vernon Street	Dent Street	0.45	Columbia
Matheny Cut	Forest Court	Clinton Way W	0.20	Columbia
Maywood Drive	Columbia Road	Old Trail Rd E	0.73	Columbia
McCormick Road	Old Petersburg Road	Old Evans Road	0.46	Columbia
Melrose Drive	Merrymont Drive	Thomas Drive	0.33	Columbia
Merrymont Drive	Melrose Drive	Columbia Road	0.78	Columbia
Miramar Drive	Almon Drive	Columbia Road	0.32	Columbia
Oakley Pirkle Road	S Belair Road	Old Belair Road	1.50	Columbia
Od Stevens Creek Road	Evans to Locks Road	Point Comfort Road	0.23	Columbia
Old Ferry Road	Baston Drive	Stagecoach Way	0.90	Columbia
Old Trail Road W - Old Trail Road E	Flowing Wells Road	Bobby Jones Expressway	1.23	Columbia
Pebble Beach Drive	Iverness Way	St Andrews Way	1.79	Columbia
Point Comfort Road	Blackstone Camp Road	Old Stevens Creek Road	0.85	Columbia
Quail Springs Circle	Knollcrest Circle N	Flowing Wells Road	1.01	Columbia
Reynolds Road	Wrightsboro Road	Lewis Road	0.87	Columbia
Roswell Drive	Owens Road	Dresden Drive	0.93	Columbia
Sandalwood Drive	Springlakes Drive	Knollcrest Circle	0.07	Columbia
Shallow Creek Crossing	Stagecoah Way	The Pass	0.24	Columbia

Corridor	From	To	Length (mi)	County
Sir Galahad Drive	Graystone Way	Washington Road	0.33	Columbia
Springlakes Drive	Allison Road	Columbia Road	0.98	Columbia
St Andrews Way	Stevens Creek Road	West Lake Drive	0.10	Columbia
Stagecoach Way	Old Ferry Road	Shallow Creek Crossing	0.16	Columbia
Syglass Road	Evans to Locke Road	Pebble Beach Drive	0.39	Columbia
The Pass	Fury's Ferry Road	Clark Pointe	1.31	Columbia
Thomas Drive	Holly Road	Columbia Road	0.83	Columbia
Vaughn - Parliament Road	Furys Ferry Road	Highlands Lane	0.42	Columbia
Vernon Street	Old Evans Road	Marshall Street	0.26	Columbia
Watervale Road	Watervale Way	Stevens Creek Road	0.66	Columbia
West Lake Drive	St Andrews Way	Iverness Way	1.78	Columbia
William Smith Parkway	Oconee Circle	Hereford Farm Road	0.80	Columbia

Recommended Paved Shoulders

Paved shoulders are a type of separated bikeway, which uses signage and striping to delineate the right-of-way assigned to bicyclists and motorists. Typically found in less dense areas, paved shoulders are paved roadways with striped shoulders wide enough for bicycle travel (generally four to six feet wide). The implementation strategies applicable to the paved shoulder facilities recommended in this Plan are roadway widening, lane narrowing, and parking reduction.

This Plan recommends 252.95 miles of paved shoulders for the ARTS region, as shown in Table 7-7. Further detail regarding the development of a greenway network is provided in the Design Guidelines of this Plan, found in Appendix E.

Table 7-7: ARTS Recommended Paved Shoulders

Corridor	From	To	Length (mi)	County
Storm Branch Road	Pine Log Road	Augusta Road	4.73	Aiken
Anderson Pond Road	Silver Bluff Road	Chime Bell Church Road	3.50	Aiken
Ascauga Lake Road	Ergle Street	100 yards east of Whitehall Road	6.93	Aiken
Atomic Road	Martintown Road	ARTS Boundary	11.47	Aiken
Augusta Road	Hitchcock Parkway	Richland Avenue	1.32	Aiken
Augusta Road - Poplar Street	Stadium Circle	Atomic Road	1.20	Aiken
Banks Mill Road	E Pine Log Road	Citadel Drive	2.67	Aiken
Beaufort Street NE	Camillia Street	Park Ave SE	1.12	Aiken
Breezy Hill Road	Ascauga Lake Road	Chalk Bed Road	0.73	Aiken
Camelia St	Beaufort Street NE	Hampton Avenue NE	0.57	Aiken
Carolina Springs Road	Atomic Road	E Buena Vista Avenue	0.63	Aiken
Chalk Bed Road	Breezy Hill Road	Main Street	1.95	Aiken

Corridor	From	To	Length (mi)	County
Charleston Highway	Old Wagener Road	Montmerenci Road	3.19	Aiken
Chime Bell Church Road	Anderson Pond Road	Whiskey Road	2.59	Aiken
Citadel Avenue	Banks Mill Road	Whiskey Road	1.18	Aiken
Dibble Road SW	Hayne Ave SW	Augusta Road	3.62	Aiken
Gregg Highway	Richland Avenue W	Canal Street	2.46	Aiken
Highland Park Ave	Park Avenue SW	Laurel Drive	3.87	Aiken
Howlandville Road	Pine Log Road	Augusta Road	2.52	Aiken
Jefferson Davis Hwy	Hitchcock Pkwy	GA/SC Line	12.26	Aiken
Langley Dam Road	Carline Road	Sudlow Lake Road	0.58	Aiken
Laurel Drive - Summit Drive - Spring Drive – Meadow Drive	Highland Park Avenue	Richland Ave	0.70	Aiken
Montmorenci Road	Wagener Road	Charleston Highway	3.59	Aiken
Old Aiken Road	Augusta Road	Carolina Springs Road	2.01	Aiken
Old Airport Road	Park Ave SE	E Pine Log Road	0.74	Aiken
Pine Log Road	Atomic Road	Houndslake Drive	14.22	Aiken
Piney Heights Road - Joy Street (SC Highway 87)	Pine Log Road	Nettie Lane	1.74	Aiken
Reynolds Pond Road	Southern Railway RWT (Proposed)	US 1	2.10	Aiken
Richardson Lake Road	Silver Bluff Road	Pine Log Road	2.85	Aiken
Richland Avenue	Beaufort Street NE	Old Wagener Road	1.27	Aiken
Ridge Road	Ascauga Lake Road	Edgefield Road	3.61	Aiken
Sand Bar Ferry Road	SC/GA border	Easternmost ARTS boundary	1.82	Aiken
SC 19	Shilo Heights Road	Aiken/Edgefield County Line	9.17	Aiken
Silver Bluff Road	Indian Creek Trail	Atomic Road	12.13	Aiken
Sudlow Lake Road	Langley Dam Road	Ascauga Lake Road	4.60	Aiken
Trolley Line Road	University Parkway	Canal Street	2.07	Aiken
US 1	Abbeville Avenue	Aiken County Line	24.35	Aiken
US 1	Old Aiken Rd	Augusta Road	9.68	Aiken
US 1	Rutland Drive	ARTS Boundary	6.80	Aiken
Wagener Road	Richland Avenue E	Montmorenci Road	5.07	Aiken
Whiskey Road	Powderhouse Road	ARTS Boundary (South)	4.33	Aiken
Williston Road	Sand Bar Ferry Road	ARTS Bondary	5.97	Aiken
Wire Road	Beaufort Street NE	ARTS boundary	6.09	Aiken
Edgefield Road	Ascauga Lake Road	ARTS Boundary (Edgefield County)	4.17	Aiken / Edgefield
Berckman's Road	Wheeler Road	Washington Road	1.80	Augusta-Richmond

Corridor	From	To	Length (mi)	County
Marks Church Road	Wrightsboro Road	Wheeler Road	1.37	Augusta-Richmond
Mike Padgett Highway - Old Savannah Road Rte	Gordon Highway	Nixon Road	0.75	Augusta-Richmond
Mike Padgett Hwy	Benock Mill Road	ARTS Boundary (S)	5.19	Augusta-Richmond
New Karleen Road	Ulm Road	Tobacco Road	1.61	Augusta-Richmond
Pleasant Home Road - Scott Nixon Memorial Drive	NW Frontage Road	Old Anderson Road	1.18	Augusta-Richmond
Powell Road	Gordon Highway	Flagler Road	0.72	Augusta-Richmond
Skinner Miller Road	Walton Way	Boy Scout Road	2.38	Augusta-Richmond
Willis Foreman Road	Lace Road	Windsor Spring Road	2.61	Augusta-Richmond
Windsor Spring Road	Meadowbrook Drive	Tobacco Road	2.14	Augusta-Richmond
William Few Parkway	Baker Place Road	Lewiston Road	2.62	Columbia
Blanchard Road	Washington Road	Hereford Farm Road	1.96	Columbia
Columbia Road	Lewiston Road	ARTS boundary (West)	3.18	Columbia
Furys Ferry Road	Arts Boundary (North)	N Belair Road	1.82	Columbia
Hardy McManus Road - Hardy McManus Extension	Washington Road	Furys Ferry Road	5.32	Columbia
Hereford Farm Road	Columbia Road	William Smith Parkway	2.24	Columbia
N Belair Road	Evans to Locks Road	Ronald Reagan Drive	0.50	Columbia
Owens Road	N Belair Road	Washington Road	1.54	Columbia
Riverwatch Parkway Extension	Old Petersburg Road	Washington Road	0.56	Columbia
Washington Road	William Few Parkway	ARTS boundary (West)	1.65	Columbia
Wheeler Road	Wellsbo Court	S Belair Road	1.65	Columbia
William Few Parkway	Columbia Road	Washington Road	5.39	Columbia
William Few Parkway	International Parkway	Wrightsboro Road	1.96	Columbia
Wrightsboro Road	Chamblin Road	Harlen Grovetown Road (@ E Robinson Ave)	0.53	Columbia
Wrightsboro Road	Jimmy Dyes Parkway	Lewiston Road	4.13	Columbia

Recommended Greenways

Greenways are facilities separated from roadways for use by bicyclists and pedestrians. These corridors offer excellent transportation and recreation opportunities for bicyclists of all ages and skills. As identified in Table 7-8, the greenways recommended in this Plan may be constructed outside of a roadway right-of-way, such as along greenbelts, rivers, utility corridors, or in parks. Other types of greenways may be constructed within a roadway corridor (listed as "Multi Use Path), along a new or existing bridge (listed as "Greenway Bridge"), or within the right-of-way of an active rail line (listed as "Rail with Trail").

A total of 162.93 miles of greenways are recommended for the ARTS region. Further detail regarding the development of a greenway network is provided in the Design Guidelines of this Plan, found in Appendix E.

Table 7-8: ARTS Recommended Greenways

Corridor	From	To	Greenway Type	Length (mi)	County
Amy Circle Greenway	Amy Circle	376' North of Amy Circle	Greenway	0.07	Aiken
East Shoreline Greenway	River Club Lane	Jefferson Davis Hwy	Greenway	0.98	Aiken
Fox Creek Greenway	Fox Creek	Northern Aiken County Greenway	Greenway	0.33	Aiken
Greenway Loop	Edgefield Road	Ascauga Lake Road	Greenway	1.15	Aiken
Gregory Lake Greenway	Gregory Lake Road	Approx 1 Mile S of Gregory Lake Road	Greenway	1.06	Aiken
Horse Creek Greenway	Langley Dam Road	Savannah River	Greenway	3.29	Aiken
Knobcone Greenway Loop	Curtis Drive	Lodgepole Avenue	Greenway	0.22	Aiken
Northern Savannah River Greenway	Existing Greenway (River Oak Drive)	Savanah Barony Drive	Greenway	0.96	Aiken
Palmetto Greenway	Atomic Road	Jefferson Davis Hwy	Greenway	0.60	Aiken
Palmetto Greenway Ext	Existing Palmetto Greenway	1659' N of Palmetto Greenway	Greenway	0.31	Aiken
Savannah Greenway	Goodrich Street	Horse Creek	Greenway	2.89	Aiken
Savannah River Greenway	Gordon Highway	East Shoreline Drive	Greenway	0.25	Aiken
Whiskey Road to Banks Mill Road Greenway	Whiskey Road	Banks Mill Road	Greenway	1.52	Aiken
E Martintown Road	Atomic Road	E Buena Vista Avenue	Multi Use Path	0.42	Aiken
S Aiken Lane	E Pine Log Road	Corporate Parkway	Multi Use Path	0.41	Aiken
Atomic Rd	Buena Vista Ave	Old Edgefield Rd.	Multi Use Path	0.53	Aiken
Belvedere Clearwater Road	Palmetto Parkway	US 1	Multi Use Path	2.11	Aiken

Corridor	From	To	Greenway Type	Length (mi)	County
Bergen Road Greenway	1000 Feet West of I-20 on ramp	Five Notch Road	Multi Use Path	2.11	Aiken
Brookside Avenue Greenway	E Buena Vista Avenue	Spring Grove Avenue	Multi Use Path	0.23	Aiken
Cascade Drive Greenway	Cascade Drive	Springwood Drive	Multi Use Path	0.10	Aiken
Crystal Lake Drive/ Mokateen Avenue Greenway	Bluff Avenue	Jackson Avenue	Multi Use Path	0.76	Aiken
E Buena Vista Avenue	Floyd Ave	Atomic Road	Multi Use Path	0.42	Aiken
Belvedere Rd	US 1	Augusta Rd.	Multi Use Path	0.63	Aiken
E Pine Log Road	Silver Bluff Road	Trailwood Avenue	Multi Use Path	1.27	Aiken
Edgefield Road Greenway	Walnut Lane	Austin Graybill Road	Multi Use Path	0.31	Aiken
Five Notch Road Greenway	Knox Road	End of Five Notch Road	Multi Use Path	4.60	Aiken
Gregory Lake Road Greenway	Sedgewood Court	Five Notch Road	Multi Use Path	0.16	Aiken
Hitchcock Parkway	US 1	Whiskey Road	Multi Use Path	4.85	Aiken
I-20 Greenway	Riverwatch Parkway	W. Marintown Road	Multi Use Path	2.05	Aiken
Jefferson Davis Hwy	E. Marintown Road	Revco Road	Multi Use Path	1.86	Aiken
Lake Avenue Greenway	Terrace Avenue	Jackson Avenue	Multi Use Path	0.73	Aiken
Martintown Rd	E Buena Vista Avenue	US 1	Multi Use Path	0.26	Aiken
Nims Branch River Greenway	1500' N of Old Sudlow Lake Rd	790' S of Old Sudlow Lake Rd	Multi Use Path	0.46	Aiken
Northern Aiken County Greenway	Bergen Road	Edgefield County	Multi Use Path	2.75	Aiken
Old Sudlow Lake Rd	Belvedere Clearwater Road	750 Feet North of Summer Lane	Multi Use Path	1.08	Aiken
Plantation Dr	Savannah Barcony Drive	Old Plantation Road	Multi Use Path	0.14	Aiken
Pole Branch River Greenway	Ponderosa Drive	Edgefield Road	Multi Use Path	2.46	Aiken
Possible Road Greenway	Hampton Avenue	Fieldcrest Drive	Multi Use Path	0.48	Aiken
Rivernorth Drive Greenway	Proposed Bobby Jones Greenway	End of Rivernorth Drive	Multi Use Path	0.64	Aiken

Corridor	From	To	Greenway Type	Length (mi)	County
Robert Bell Parkway	University Parkway	US 1	Multi Use Path	1.46	Aiken
S Boundary Ave	Chesterfield St NW	Cherokee St SE	Multi Use Path	1.59	Aiken
Savannah Barony Dr	Wildmeade Court	Plantation Drive	Multi Use Path	0.58	Aiken
Scott Drive Greenway	Madison Road	Five Notch Road	Multi Use Path	0.21	Aiken
Spring Oak Greenway	Buena Vista Avenue	Marintown Road	Multi Use Path	0.55	Aiken
University Parkway	Robert M Bell Parkway	SC 19	Multi Use Path	4.11	Aiken
Walnut Lane Greenway	Five Notch Road	Edgefield Road	Multi Use Path	1.56	Aiken
Canal Street	Trolley Line Road	2nd Street	Multi Use Path	0.35	Aiken
Two Notch Road	Audobon Road	E Pine Log Road	Multi Use Path	1.21	Aiken
Banks Mill Road	S Boundary Ave	E Pine Log Road	Multi Use Path	1.24	Aiken
Active Rail Line	Greenville Road	Park Avenue	Rail with Trail	4.97	Aiken
Levels Church Road RWT	120' NW of E Pine Log Road	Levels Church Road	Rail with Trail	0.05	Aiken
Park Ave RWT	Old Airport Road	Union Street	Rail with Trail	1.87	Aiken
Langley Pond RWT	State Highway 70	Langley Dam Road	Rail with Trail	3.42	Aiken
Southern Railway RWT	Rutland Drive	Reynolds Pond Road	Rail with Trail	3.08	Aiken
Greenway Bridge			Greenway Bridge	0.19	Aiken
I-20 Greenway	Riverwatch Parkway	W. Marintown Road	Multi Use Path Bridge	0.26	Aiken
Savannah River Bridge Near Riverwatch	Riverwatch Parkway	Riveroak Drive	Greenway Bridge	0.51	Aiken
Georgia Power Easement	Alexander Drive	Eisenhower Drive	Greenway	1.09	Augusta-Richmond
Raes Creek Greenway	Skinner Mill Road	Boy Scout Road	Greenway	2.96	Augusta-Richmond
Savannah Levee-Lock and Damn Rd Greenway	Doug Barnard Parkway	Jefferson Davis Highway	Greenway	11.14	Augusta-Richmond
Gordon Hwy Utility Easement	Milledgeville Road	E Robinson Avenue	Multi Use Path	5.22	Augusta-Richmond

Corridor	From	To	Greenway Type	Length (mi)	County
Tobacco Road - 10th Army Division Road	Windsor Spring Road	Fort Gordon Boundary	Multi Use Path	3.06	Augusta-Richmond
Windsor Spring Road	Tobacco Road	GA Highway 88	Multi Use Path	4.89	Augusta-Richmond
Butler Creek Greenway	Deans Bridge Road	Lock And Dam Road	Multi Use Path	7.66	Augusta-Richmond
Deans Bridge Road Greenway	Tobacco Road	London Boulevard	Multi Use Path	3.77	Augusta-Richmond
MLK - 15th St Greenway	Olive Road	Government Road	Multi Use Path	1.21	Augusta-Richmond
Doug Bernard Highway	Tobacco Road	Lock and Dam Road	Multi Use Path	1.32	Augusta-Richmond
Furys Ferry Road	Riverwatch Parkway	Washington Road	Multi Use Path	0.30	Augusta-Richmond
Mike Padgett Highway - Old Savannah Road Rte	Kellos Drive/Nixon Road	Bennock Mill Road	Multi Use Path	9.14	Augusta-Richmond
Euchee Creek Greenway	Savannah River	Chamblin Road	Greenway	11.05	Columbia
Mansford Lane Connector	Greenway near Spotswood Lane	Mansford Lane	Greenway	0.40	Columbia
One Mile Loop			Greenway	1.92	Columbia
William Smith Parkway Greenway	William Smith Parkway	Columbia Road	Greenway	2.09	Columbia
Wrightsboro Road Greenway	Euchee Trail terminus	I-20	Greenway	0.54	Columbia
Old Belair Road	S Belair Road	Columbia Road	Multi Use Path	3.38	Columbia
Wrightsboro Road	Lewiston Road	Lory Lane	Multi Use Path	2.75	Columbia
Columbia Road Greenway	William Few Parkway	Euchee Creek Greenway	Multi Use Path	1.37	Columbia
Evans to Lock Road Greenway	Evans Town Center	Riverbend Drive	Multi Use Path	1.36	Columbia
Hardy McManus Greenway	Hardy McManus Road	Near Savannah River	Multi Use Path	1.60	Columbia
Hardy McManus Greenway (Alt)	Washington Road	Furys Ferry Road	Multi Use Path	2.58	Columbia
Hereford Farm Road	William Smith Parkway	Gibbs Road	Multi Use Path	1.78	Columbia
Savannah River Bridge Near 5th Street	SC	GA	Greenway Bridge	0.56	Columbia
Stevens Creek Road	Evans to Lock Road	Washington Road	Multi Use Path	2.99	Columbia /Augusta-Richmond
W Martintown Rd	ARTS Boundary (Edgefield County)	Bergen Road	Multi Use Path	2.37	Edgefield

Bikeway Projects Recommended for Further Study

The ARTS region is delineated by a number of high-volume, relatively high-speed commercial arterials, which provide challenging conditions for cyclists attempting to move along or across these corridors. The corridors are characterized by 5- to 7-lane cross-sections and traffic volumes on these roadways tend to be high. These corridors also are the location of many primary local and regional destinations and provide critical north-south and east-west connectivity. These corridors were also named as priority locations for bicycling improvements by participants in the public input process of this plan (see Chapter 5 for further information). Table 7-9 lists corridors recommended for further study.

Table 7-9: ARTS Corridors Recommended for Further Study

Corridor	From	To	Recommended Facility Type	Length (mi)	ADT
Augusta-Richmond County					
15th Street	Pope Avenue	Walton Way	Buffered Bike Lane	0.24	22400
15th Street	Government Road	Harper Street	Buffered Bike Lane	0.41	22400
Washington Road[1]	Old Petersburg Road	Broad Street	Buffered Bike Lane	4.32	21210-35350
Wrightsboro Road	Pine Needle Road	Highland Avenue	Striped Bike Lane	0.41	21390
Columbia County					
Columbia Road	Old Belair Road	Washington Road	Buffered Bike Lane	3.53	19080
Washington Road	Old Evans Road	Hardy McManus Road	Striped Bike Lane	3.35	27330
Washington Road	Pleasant Home Road	N Belair Road	Buffered Bike Lane	2.62	32550
Washington Road	Columbia Road	Old Petersburg Road	Buffered Bike Lane	1.6	26570-34460
Aiken County					
Richland Avenue	Vaucluse Drive	Hitchcock Parkway	Striped Bike Lane	3.79	12400-19600
Whiskey Road	Kings Grant Drive	Boardman Road	Striped Bike Lane	1.51	15400-19300
Whiskey Road	Kings Grant Drive	Powderhouse Road	Buffered Bike Lane	2.82	15400-36000

1 Includes 0.10 mile of roadway in Columbia County.

At a minimum, this plan recommends that bicycle lanes be implemented on these roadways. However, bike lanes alone will provide very little comfort for most cyclists on roadways of this nature. Higher order bicycle facilities that provide greater separation between bicyclists and motor vehicles would be more appropriate (such as buffered bike lanes). Planning and design for these corridors could include access management approaches to limit the number and spacing of driveways and turning locations; land use policies to facilitate more bicycle- and pedestrian-friendly development patterns; connectivity improvements to provide additional parallel route options; travelway designs that are more appropriate to an urban context; and speed reduction measures for motor vehicle travel.

Additionally, a number of corridors identified for bikeway facilities in this Plan present an opportunity for implementation through lane reconfiguration, which is also commonly known as a "road diet" (see page 67 of Appendix E: Design Guidelines). Road diets typically involve reducing the number of travel lanes (from a four-lane road to a two-lane road with center turn lane, for example) allowing adequate space for bicycle lanes. Road diets also have traffic calming and safety benefits. A report by the Federal Highway Administration documents lower pedestrian crash risk when crossing two- or three-lane roads, as compared to roads with four or more lanes.[3] Additionally, a reduction in travel lanes does not necessarily result in a reduction in motor vehicle traffic volumes and in some cases leads to an increase in ADT (East Boulevard in Charlotte, NC, as one example). Research shows that roadways with an ADT under 18,000 are prime candidates for road diets. A recent FHWA study of road diet streets in California, Iowa, and Washington found that increased congestion might occur for streets over 20,000 ADT.

This Plan recommends that ARTS coordinate with GDOT, SCDOT, and local municipalities to consider a lane reconfiguration along the roadway segments identified in Table 7-10.

Before and after images of a road reconfiguration show the benefits of slowing traffic speeds in this residential, school zone, while also providing space for bicyclists on the roadway, providing a buffer for pedestrians on the sidewalk, and accommodating similar traffic volumes.

3 Federal Highway Administration: Safety Effects of Marked vs Unmarked Crosswalks at Uncontroleld Locations.

Table 7-10 – Roadways Recommended for Lane Reconfiguration

Corridor	From	To	Facility Type	ADT	Existing Lane Config.	Lane Reconfig. For Consideration
Augusta-Richmond County						
5th Street Bridge	Riverwalk Marina	Jefferson Davis Hwy	Greenway	5100	2 Lanes	1-Way Lane
Broad Street	15th Street	10th Street	Buffered Bike Lane	10200-10460	6 Lanes Divided	4 Lanes Divided
Central Avenue	Monte Sano Avenue	Troup Street	Buffered Bike Lane	1160	4 Lanes Divided	2 Lanes Divided
Central Avenue	Troup Street	Druid Park Avenue	Buffered Bike Lane	9030	4 Lanes	2 Lanes with Turn Lane
Highland Avenue	Gordon Highway	Wrightsboro Road	Striped Bike Lane	13470-14720	4 Lanes	2 Lanes with Turn Lane
Laney Walker Boulevard	E Boundary Street	15th Street	Striped Bike Lane	6150-8710	4 Lanes	2 Lanes with Turn Lane
Tobacco Road	Doug Bernard Highway	Gracewood Elementary School	Buffered Bike Lane	4800	4 Lanes with Turn Lane	2 Lanes with Turn Lane
Tobacco Road	Gracewood Elementary School	Peach Orchard Road	Striped Bike Lane	6820	4 Lanes with Turn Lane	2 Lanes with Turn Lane
Walton Way	10th Street	James Brown Boulevard (9th Street)	Buffered Bike Lane	16780	6 Lanes Divided	4 Lanes Divided
Aiken County						
Augusta Road	Hitchcock Parkway	Stadium Circle	Striped Bike Lane	5300	3 Lanes	2 Lanes

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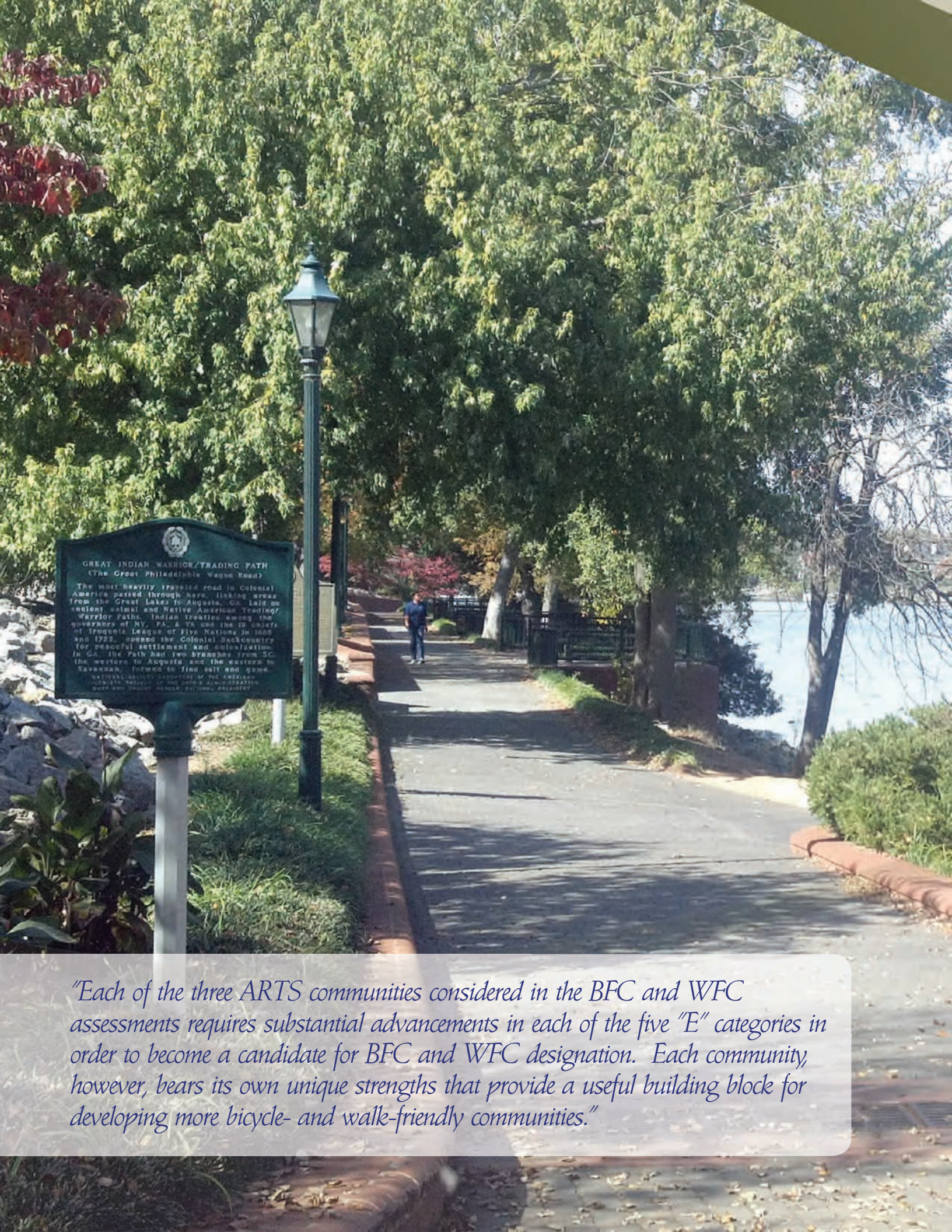


"Each of the three ARTS communities considered in the BFC and WFC assessments requires substantial advancements in each of the five "E" categories in order to become a candidate for BFC and WFC designation. Each community, however, bears its own unique strengths that provide a useful building block for developing more bicycle- and walk-friendly communities."

Chapter Eight

Prioritization and Implementation

Introduction

This chapter presents implementation strategies for achieving Bicycle- and Walk-Friendly Community (BFC and WFC) designations within the ARTS region, as well as the recommended projects of the Plan. Proposed projects are also prioritized based on criteria identified by the Project Steering Committee and Project Team. Regional plans of this size are typically implemented over decades using a combination of private, local, state, and federal funding and participation. A deliberate phasing and prioritization strategy is required to effectively focus available funding, maximize funding and implementation, and meet the needs of the region, while also allowing flexibility to maximize completed projects.

BFC and WFC Action Plans

As discussed in Chapter 3, each of the three ARTS communities considered in the BFC and WFC assessments requires substantial advancements in each of the five "E" categories in order to become a candidate for BFC and WFC designation. Each community, however, bears its own unique strengths that provide a useful building block for developing more bicycle- and walk-friendly communities. The community assessments were conducted using the full applications for designation of the BFC and WFC programs, which are provided in Appendix C of this Plan. Based on the answers provided for the application questions, the following is a list of near-term steps that each community can take to begin the process of improving its BFC and WFC applications:

- Adopt the regional Bicycle & Pedestrian Plan Update as the County's/City's Plan
- Appoint a bicycle coordinator and pedestrian coordinator within the County's/City's existing staff
- Establish the Regional Bicycle and Pedestrian Committee (recommended in Chapter 5 of this Plan) as a collaborative body supporting regional progress as bike-friendly and walk-friendly communities.
- Adopt a bicycle parking ordinance
- Adopt a "complete streets" policy
- Inventory bike parking spaces in the community, including those at civic buildings and public places
- Inventory ADA curb ramps on sidewalks
- Track investment in bicycling and walking facilities
- Identify sources of funding for bicycle and pedestrian projects and programs
- Include community groups and private sector partners in the BFC and WFC discussions

The non-infrastructure recommendations of this Plan provide relatively inexpensive means of improving and raising public awareness and adding to the safety and enjoyment of bicycling and walking in the ARTS region. Because of their minimal expense and importance to supporting bicycle and pedestrian travel and thereby increasing activity, all of the recommended programs and policies should be considered short- or medium-term priorities. The non-infrastructure recommendations of this Plan are designed for implementation within two years of adoption of the Plan.

While the vast majority of infrastructure and policy recommendations fall within the exclusive jurisdiction of ARTS and its member jurisdictions, many program recommendations can, and should, fall under the banner of outside agencies, private sector partners, and nonprofit organizations.

Nonprofit organizations that may want a role in implementing community programs in the ARTS region are identified in Chapter 6 as existing and potential partners. A collaborative approach to implementing and sustaining bicycling and walking programs contributes to the broader vision of fostering a strong advocacy community and culture. Additionally, the minimal expense associated with most programs offers the unique opportunity for multiple, varied sectors of the community to contribute to the larger bicycle friendly and walk friendly community campaigns.

While every community will need to follow its own distinct path toward improving the local bicycling and walking environment, the following timeline provides a framework for ARTS communities to achieve BFC and WFC status:

August 2012: Adopt Regional Bicycle & Pedestrian Plan Update.

Summer 2012: Assemble and organize the regional bicycle and pedestrian committee.

August 2012: In coordination with start of school year and fall weather, launch at least one new program based on the recommendations of the Bicycle & Pedestrian Plan Update.

September 2012: Coordinate and host annual bicycle and pedestrian counts.

October 2012: Map and analyze count data to determine key findings.

January 2013: Review priority network and policy recommendations of the Bicycle & Pedestrian Plan Update and develop a strategy for implementing new facilities and improved policies during the 2013 calendar year.

Early Spring 2013: Develop, plan and promote Bike Month activities for May.

April 2013: Use springtime weather as a launching point to introduce at least one new program based on the recommendations of the Bicycle & Pedestrian Plan Update.

May 2013: Promote Bike Month regionally with events in each ARTS community.

Summer 2013: Develop a Safe Routes to School Plan that involves regional collaboration and local support.

August 2013: In coordination with start of school year and fall weather, launch new programs based on Bicycle & Pedestrian Plan Update recommendations and the goals of the Safe Routes to School regional Plan.

September 2013: Coordinate and host annual bicycle count

January 2014: Review priority network and policy recommendations of the Bicycle & Pedestrian Plan Update and develop a strategy for implementing new facilities and improved policies during the 2014 calendar year.

Early Spring 2014: Develop, plan and promote Bike Month activities for May.

March 2014: Assess progress by reviewing Bicycle Friendly and Walk Friendly Community application and citing changes to the answers for each application question. Create a strategy for making further BFC and WFC improvements that will bolster the applications.

May 2014: Promote Bike Month regionally with events in each ARTS community.

June/July 2014: Apply for a Walk Friendly and Bicycle Friendly Community designations

Infrastructure Improvement Prioritization

The infrastructure recommendations of this Plan include 741 miles of new greenways and bikeways to increase the network connectivity of the ARTS region and to create a comprehensive, safe, and logical network for bicyclists and pedestrians. It is important to note, however, that all recommended projects of the Plan are important for the comprehensive bikeway and walkway network and should be implemented when funding and political conditions warrant. To gauge the relative importance of recommended improvement projects, the Project Steering Committee developed evaluation criteria to identify and prioritize each proposed project. The criteria highlight the features of a bicycle and pedestrian network most important to ARTS residents and rank projects against each other as an indication of their relative importance. Through this approach, the best possible future bicycling and walking network is determined.

Project Evaluation Criteria

Table 8-1 shows the evaluation criteria used to prioritize potential projects, as well as the possible scores (0 – 5) and the total potential values. While all of the projects are important to the development of ARTS regional bicycling and walking network, focusing on the most viable and publicly supported projects can build momentum and set the groundwork for future investments. The ratings within each category were considered together to prioritize projects. Projects fulfilling the greatest number of evaluation criteria received higher scores, correspondingly leading to higher rankings within the overall list. Any of these projects can proceed when funding and political conditions warrant.

Table 8-1: Project Evaluation Criteria

Criteria	Scoring Weights	Available Points
Proximity to Attractors/Destinations		
Access to public or private school (K-12)	Yes = 2; No = 0	16 pts.
Direct access to existing/planned transit route or stop	Yes = 2; No = 0	
Direct access to major employment centers	Yes = 2; No = 0	
Direct access to mixed-use areas or shopping centers	Yes = 2; No = 0	
Direct access to University/College	Yes = 2; No = 0	
Direct access to Central Business District	Yes = 2; No = 0	
Access to public places *(parks, libraries, civic uses)*	Yes = 2; No = 0	
Transit Stop within 1/2 mile radius	Yes = 1; No = 0	
Direct access to higher density residential areas	Yes = 1; No = 0	
Connectivity		
Completes gap in existing bicycle or pedestrian facility	Yes = 4; No = 0	14 pts.
Removes barrier in route	Yes = 3; No = 0	
Regional connection and/or major roadway/river Xing	Yes = 3; No = 0	
Connects 2 or more communities	Yes = 2; No = 0	
Connects residential area to business/commercial area	Yes = 1; No = 0	
Project supports economic development/tourism	Yes = 1; No = 0	
Safety / Health / Quality of Life		
Improves locations where bicycle or pedestrian crashes/fatalities have occurred	Yes = 4; No = 0	14 pts.
Is the improvement on a high volume road	Yes = 2; No = 0	
Is the improvement separated from vehicular traffic	Yes = 2; No = 0	
Provides speed reduction or traffic calming benefits	Yes = 2; No = 0	
Improves physical activity	Yes = 2; No = 0	
Improves air quality/offers environmental benefits	Yes = 2; No = 0	
Feasibility		
Improvement is on or adjacent to roadway project contained in the ARTS 2035 LRTP.	Yes = 5; No = 0	10 pts.
Improvement has full or partial funding, or is likely to be funded	Yes = 3; No = 0	
Improvement was recommended during the public outreach process/or is contained and supported in a local plan	Yes = 2; No = 0	

Priority Projects and Cost Opinions

This section identifies the highest priority areas for pedestrian improvements, the top 50 ranked bikeway and greenway projects throughout the ARTS region, and priority bicycle parking locations. First- and second-tier projects are described in Tables 8-2 through 8-6. The top 50 ranked bikeway and greenway projects were determined based on the evaluation criteria and prioritization matrix described in the previous section. All remaining proposed projects not listed in Table 8-6 are within the third-tier. Based on extensive research, analysis, and public input in the preparation of this plan, the entire list of projects proposed within this Plan have evidenced merit. Third-tier projects play an important role in completing the vision of the bicycling and pedestrian network, but should be considered long-term projects based on their limited ranking within the prioritization matrix.

GDOT, SCDOT, and member jurisdictions of ARTS will be the implementing agencies for on-street facilities. Cities and Counties within ARTS should coordinate with GDOT and SCDOT on the design and implementation of these facilities. In most cases, implementation of bike lanes on GDOT and SCDOT roadways will be completed through scheduled resurfacing projects. GDOT and SCDOT will incur most of the street resurfacing costs. The added incremental costs for bike lane symbols and signage will be borne locally.

Walkway Network Priority Zones

Chapter 7 describes the pedestrian network prioritization method used to identify a hierarchy of pedestrian infrastructure needs throughout the ARTS region. The results of the refined pedestrian suitability analysis provide regional priorities for pedestrian infrastructure. Table 8-2 provides local pedestrian priority zones within each primary member county of ARTS, based on the regional analysis.

This Plan recommends that ARTS and its member jurisdictions prioritize improvements to the pedestrian infrastructure in the zones listed in Table 8-2. The results of the refined pedestrian suitability analysis reflects a composite ranking score of both supply (existing infrastructure) and demand (pedestrian activity), thus priority investments in these areas could range from intersection safety upgrades to new sidewalk construction, and from improved sidewalk maintenance to enhanced pedestrian amenities (such as lighting, street furniture, etc).

Table 8-2: High Priority Walkway Network Improvement Zones

County	Priority Zone	Identifiers/Boundary Corridors
Augusta-Richmond County	W.S. Hornsby School Zone	East Cedar Street - Laney Walker Blvd - Lovers Lane - Sand Bar Ferry Road
	South Central Augusta	15th Street – Laney Walker Blvd – MLK Jr. Blvd
	Wrightsboro Road Corridor	Wrightsboro Road from Marks Church Road to Highland Avenue
	West Central Augusta	Wrightsboro Road – Broad Street – 15th Street – Heard Avenue
	Hephzibah School Zones	Hephzibah Middle School and Hephzibah High School; Hephzibah High Freshman Academy and Graham School
Columbia County	Westmont Elementary School Zone	Oakley Pirkle Corridor and connecting residential streets
	Columbia Road Corridor	Columbia Road Corridor from Washington Road to Old Belair Road and connecting residential streets
	Furys Ferry Road	Furys Ferry Road Corridor from Evans to Locks Road to Hardy McManus Road
	Southeast Grovetown	Katherine Street to Gordon Highway
	Flowing Wells Road	Flowing Wells Road from Washington Road to Wheeler Road
	Washington Road Corridor	Washington Road North of Columbia Road
Aiken County	York Street – Rutland Crossing	York Street Corridor and Rutland Drive Corridor and connecting residential streets near that intersection
	Northwest Aiken School Zone	Hampton Avenue from SC 19 to North Carolina Avenue and streets connecting to and between Aiken High School and surrounding neighborhoods
	Virginia Acres Park Zone	Residential street east and north of Virginia Acres Park
	South Aiken	Full extent of Whiskey Road, Silver Bluff Road, and East Pine Log Road south of Aiken's city center
	West Central North Augusta	Residential streets west of Georgia Avenue from Spring Grove Avenue to Bluff Avenue
	Burnettown Central	Anthony Drive and connecting streets

Bicycle Parking Priorities

Beyond priority bikeway projects, increasing bicycle parking is an area-wide priority project. Bicycle parking should be expanded as the bikeway network is expanded. This Plan recommends three priority action steps to achieve this and to ensure a wide network of bicycling parking locations that will serve the broad population of bicyclists.

- As described in the Policy Recommendations of Chapter 6, this Plan recommends that ARTS assist communities in adopting local policies to ensure long-term investment in bicycle parking throughout the region.
- Secondly, this Plan recommends that ARTS and its member jurisdictions ensure that bicycle parking is provided at all publicly owned buildings and facilities. This includes all public schools, civic buildings (such as libraries), government offices, recreation facilities, and others.
- Thirdly, ARTS and the communities within ARTS should partner with local landowners to prioritize bicycle parking at locations cited as priority destinations for bicyclists through the public outreach process of this Plan. Requests by the general public provide an appropriate gauge of bicycle parking needs and unmet demand. Priority locations for bicycle parking identified in the public outreach process are shown in Table 8-3.

Table 8-3: High Priority Bicycle Parking Locations

Rank	Citizen Priorities for Bicycle Parking Locations
Priority Locations in Georgia	
1	• Augusta Downtown • Augusta State University • Georgia Health Sciences University
2	• Augusta Canal • Augusta Mall • Lake Olmstead
3	• Augusta Exchange Shopping Center • Evans Town Center • Fort Gordon • General shopping/grocery/gyms • Savannah Rapids Pavilion
Priority Locations in South Carolina	
1	• Aiken Downtown • Aiken Mall • Aiken Regional Hospital • Richland Ave. Wal-Mart, Aiken • Hitchcock Woods • O'Dell Weeks Activity Center • University of South Carolina-Aiken

Rank	Citizen Priorities for Bicycle Parking Locations
2	• Citizens Park • North Augusta Greeneway • Whiskey Road

Planning Level Cost Opinions

This section provides general planning-level cost opinions for a variety of facility types, as well as the specific planning-level cost estimates of the top 50 ranked projects of the regional greenways and bikeways network recommended in this Plan. The following is a summary of the fully burdened costs of sidewalks and different bikeway facility types. All costs are total installed costs that include: planning and engineering, environmental, and contingency.

Table 8-4: Pedestrian Facility Type Planning Level Cost Estimates

Sidewalk, Drainage, C&G - one side of roadway					
Item Description	**Unit**	**Quantity**	**Unit Price**	**Total**	**Notes**
Standard Concrete Curb and Gutter	LF	5,280	$18.00	$95,040.00	
Sidewalk	SF	31,680	$5.00	$158,400.00	6' Wide
12 Inch Storm Sewer Pipe, 10' deep	LF	2,640	$70.00	$184,800.00	Storm System Pipe, Including Trenching/ Backfill, half total costs
Storm Manhole	EA	9	$2,800.00	$24,640.00	Every 300', half total costs
Standard Catch Basin	EA	18	$1,500.00	$26,400.00	Every 300'
Construction cost per mile				$489,280.00	
Fully burdened cost per mile (25% contingency)				$831,776.00	
Fully burdened cost per LF				**$157.53**	
Sidewalk Widening - one side of roadway					
Item Description	**Unit**	**Quantity**	**Unit Price**	**Total**	**Notes**
Sidewalk	SF	10,560	$5.00	$52,800.00	2'
Construction cost per mile				$52,800.00	
Fully burdened cost per mile (25% contingency)				$89,760.00	
Fully burdened cost per LF				**$17.00**	

Table 8-5: Bicycle, Greenway, and Traffic Calming Planning Level Cost Estimates

Bikeway/Traffic Calming Facility	Cost	Materials	Additional Costs*
Greenway/Multi-use path (per mile)	$800,000.00	Construction, signing	30%
Bike lane: restriping as retrofit (per mile)	$15,000.00	Striping and signing	20%
Bike lane: restriping w/ resurfacing project (per mile)	$ 8,000.00	Striping and signing	20%
Bike lane: widening on street with curb & gutter (per mile; minimum)	$250,000.00	Roadway widening	40%
Bike lane: add pavement; no curb (per mile with resurfacing)	$28,000.00	Asphalt, striping, signing	20%
Buffered bike lane: restriping w/resurfacing project (per mile)	$12,000.00	Striping and signing	20%
Buffered bike lane: widening on street with curb & gutter (per mile; minimum)	$254,000.00	Roadway widening	40%
Buffered bike lane: add pavement; no curb (per mile with resurfacing)	$32,000.00	Asphalt, striping, signing	20%
Bike route (per mile)	$2 ,000.00	Signing	15%
Shared lane marking (per mile)	$6,500.00	Signing, markings	15%
Inverted 'U' bicycle rack (ea)	$200.00	Rack	15%
"Share the Road" signs (ea)	$100.00	Signs, posts	15%
Shared lane marking (ea)	$200.00	Stencils (20 per mile)	15%
Wayfinding/destination sign (ea)	$150.00	Signs, posts	15%
Loop detectors (two)	$1,500.00	Detector, stencil, labor	$300 for calibration only
Colored bike lane (square foot thermoplastic)	$4.50		
Traffic circle (ea)	$40,000.00	Concrete curb, landscaping	15%
Diverter (ea)	$15,600.00 - $40,000.00	Concrete curb, landscaping	15%
Bike box (ea)	$5,000.00	Thermoplastic, signs	15%
Advanced stop line (ea)	$225.00		15%
Bicycle/pedestrian bridge (linear foot)	$150.00		15%

** Planning and engineering, environmental, and contingency*

Priority Project Cost Opinions

The cost of greenway and bikeway facilities significantly varies by facility type, as shown in Table 8-5. For example, the addition of shared lane markings (sharrows) to an existing roadway requires few changes to the existing roadway, but provides no exclusive space for bicycle use. By contrast, a separated multi-use path provides a far greater level of separation from the roadway, but at a greater fiscal burden. Table 8-6 below is a summary of the fully burdened costs of the 50 highest ranked bikeway and greenway projects recommended in this Plan. It is important to note that

all recommended projects of the Plan are important for the comprehensive bikeway network. ARTS and the counties, cities, and towns within its boundaries should be opportunistic in implementing bikeway and greenway projects as opportunities arise, rather than focusing exclusively on implementation of highly ranked projects. For example, the 18-mile Euchee Creek Greenway in Columbia County will serve a central role in creating a connected network of bikeway facilities and is a regional priority with near-term opportunities for implementation.

Table 8-6: Augusta Regional Transportation Study Bicycle Pedestrian Plan Cost Estimates

Summary of Projects		
No.	Project Name	Project Cost
1	E Pine Log Road Greenway	$1,320,800
2	MLK - 15th St Greenway	$1,258,400
3	University Parkway Greenway	$4,264,000
4	East Buena Vista Ave Bike Lanes	$12,096
5	15th Street Bikelanes	$4,320
6	US 1 Paved Shoulders	$325,248
7	5th Street Shared Lane Markings	$1,346
8	Atomic Rd. Greenway	$551,200
9	North Belair Road Bike Lanes	$30,240
10	Columbia Road Buffered Bike Lanes	$1,436,624
11	Flowing Wells Rd Bike Lanes	$441,000
12	Wrightsboro Rd. Paved Shoulders	$137,760
13	S Aiken Lane	$416,000
14	SC 19	$700,000
15	West Aiken Greenway	$5,158,400
16	15th Street Buffered Bike Lanes	$2,880
17	13th Street Bridge - Augusta-Richmond County	$1,271
18	Ellis Street	$2,440
19	Wrightsboro Road	$511,000
20	Telfair Street	$14,203
21	Jefferson Davis Hwy	$1,934,400
22	Collier Street	$400
23	13th Street Bridge – Aiken County	$1,346
24	Belvedere Clearwater Rd	$16,320
25	Belvedere Clearwater Rd	$2,194,000
26	E Buena Vista Avenue	$436,800
27	5th Street Bridge	$126,786
28	Central Avenue	$17,760
29	Georgia Ave	$27,456
30	Henry Street	$1,980
31	Knox Ave	$770,000
32	McDowell Street	$3,120
33	Bransford Ave - McAnally St	$620
34	US 1	$228,480
35	15th Street	$143,500
36	4th Street	$1,880
37	Broad Street	$14,520
38	Broad Street	$9,000
39	Central Avenue	$1,495
40	James Brown Boulevard	$2,990
41	James Brown Boulevard	$5,681
42	Laney Walker Boulevard	$22,848
43	E. Martintown Rd	$270,400
44	Olive Road	$16,224
45	University Parkway	$367,500
46	Old Evans Road	$906,500
47	Belvedere Rd.	$655,200
48	Windsor Spring Road	$5,085,600
49	10th Street	$1,160
50	Wrightsboro Road	$12,384
Total Cost for Projects		**$29,865,578**

Priority Project Description Sheets

This section provides project description sheets for the four highest priority projects within each of the three largest Counties in the ARTS region: Aiken County, Augusta-Richmond County, and Columbia County. The four highest priority projects were identified through evaluation criteria and prioritization process already described. These 1-page project description sheets provide an excellent tool for future implementation funding applications.

East Pine Log Road

Project Limits:

Silver Bluff Road to Trailwood Ave

Project Length: 1.27 miles

Improvement Type:

Greenway

Implementation Type:

Off-Street

Average Daily Traffic:

Current: 24,600 **2035 est:** 26,918

Prioritization Score: 28

Estimated Cost: $1,320,800

Project Description

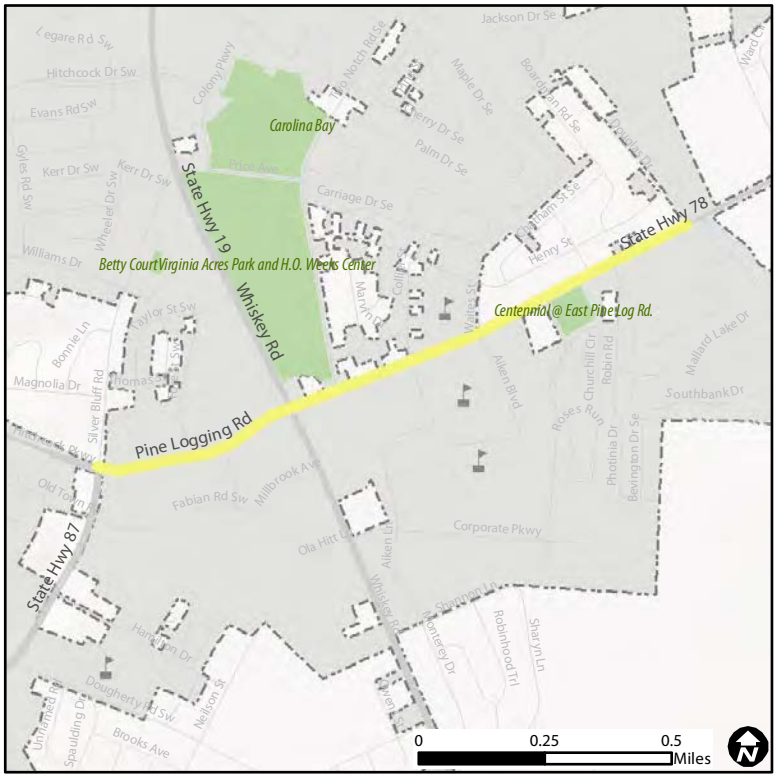
Existing Issues:

- Without physical separations, safety issues may arise between bicyclists and motorized vehicles.
- Extremely high number of crashes along this route
- Schools along corridor do not have good bicycle/ pedestrian access

Project Benefits:

- Enhances safety by providing bicyclists with separated path, allowing children to access destinations
- Provides access to multiple schools and Virginia Acres Park

Greenway



Reference Map

MLK and 15th St. Greenway

Project Limits:

Olive Road to Government Road

Project Length: 1.21 miles

Improvement Type:

Greenway

Average Daily Traffic:

Current: 14,250 **2035 est:** 24,823

Prioritization Score: 27

Estimated Cost: $1,258,400

Project Description

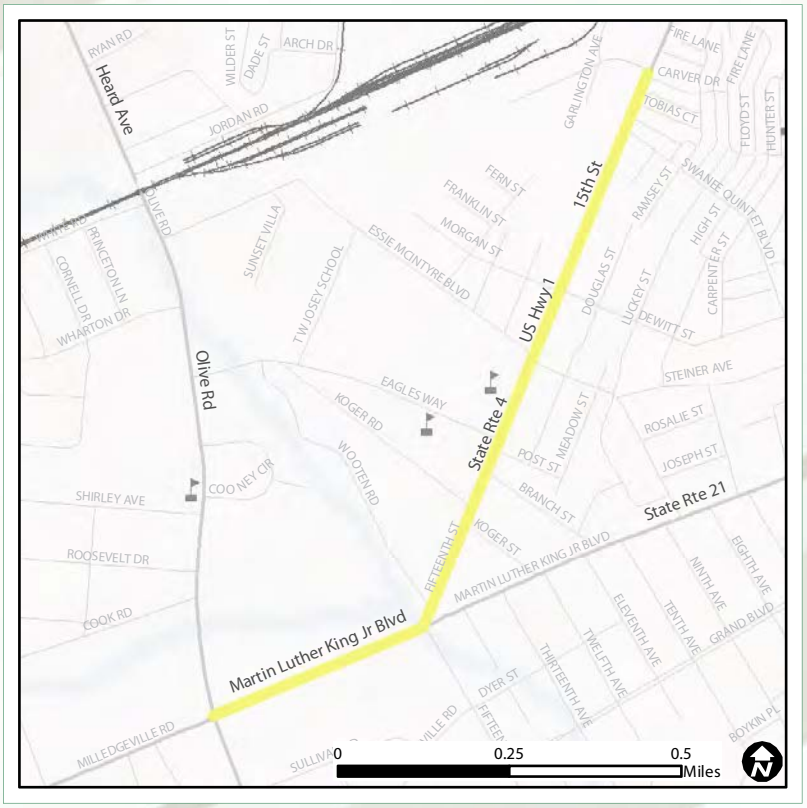
Existing Issues:

- Without physical separations, safety issues may arise between bicyclists and motorized vehicles.
- High number of crashes along this route
- Schools along corridor do not have good bicycle/ pedestrian access

Project Benefits:

- Enhances safety by providing bicyclists with separated path, allowing children to access destinations
- Provides access to multiple schools and colleges
- Will ultimately connect the Savannah River Greenways with planned greenway system on SR 56, leading south.

Greenway



Reference Map

University Parkway

Project Limits:

Robert M Bell Parkway to SC 19

Project Length: 4.1 miles

Improvement Type:

Greenway

Average Daily Traffic:

2035 est: 11,612

Prioritization Score: 26

Estimated Cost: $4,264,000

Project Description

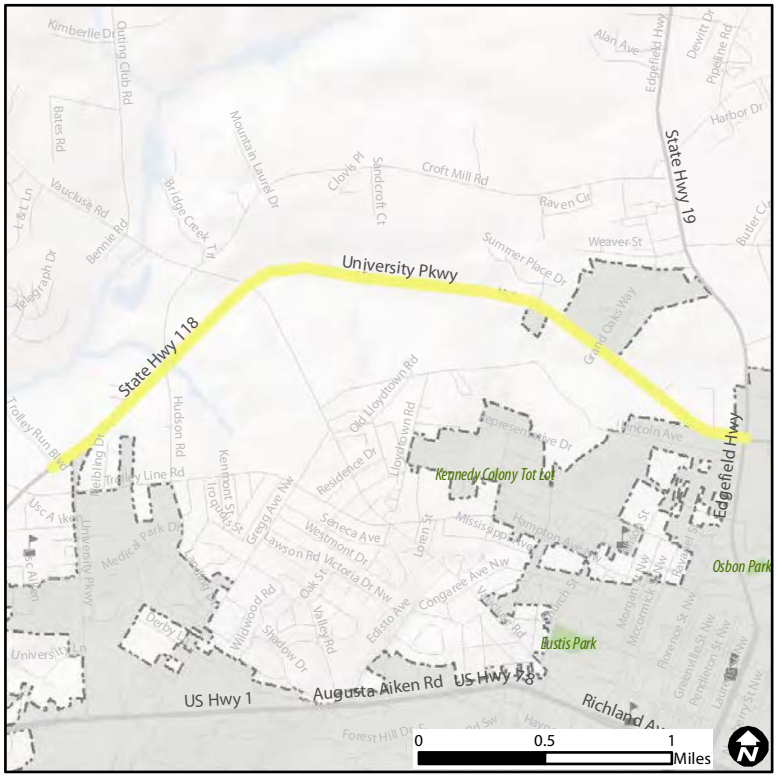
Existing Issues:

- No bicycle facilities currently exist to get from University of South Carolina Aiken to Aiken's greenway to the east.
- Without physical separations, safety issues may arise between bicyclists and motorized vehicles

Project Benefits:

- Enhances safety by providing bicyclists with separated path
- Provides access to multiple schools and South Carolina State University
- Extends the Aiken greenway System
- Creating a greenway loop around Aiken can provide an economic benefit as it would become a bicycle touring destination.

Greenway



Reference Map

East Buena Vista Avenue

Project Limits:

Riverside Boulevard to Georgia Avenue

Project Length: 0.4 miles

Improvement Type:

Striped Bike Lane

Average Daily Traffic:

2035 est: 3,702

Prioritization Score: 26

Estimated Cost: $12,096

Project Description

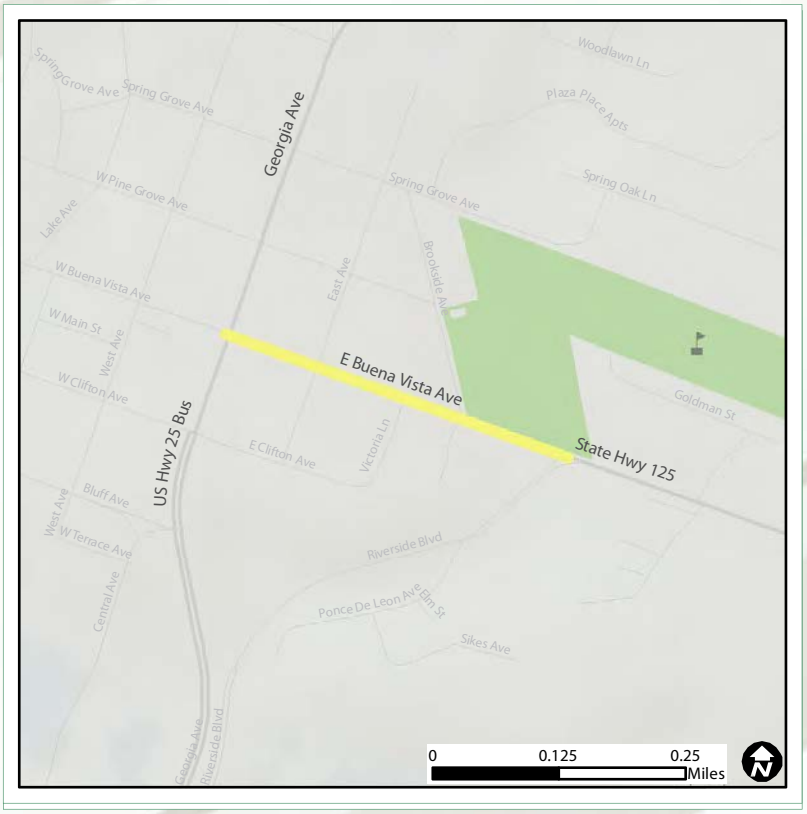
Existing Issues:

- Buena Vista Ave is a major east west route connecting desired cycling routes.
- The safety analysis conducted determined that Buena Vista Ave was a concentrated location for bicycle crashes in the region.

Project Benefits:

- Provides access to school and N. Augusta Recreation Facilities and Waterworks Park
- Enhances safety by providing bicyclists with separated path, allowing children to access destinations
- Key connector in planned greenway and bicycle network

Striped Bike Lane



Reference Map

15th Street

Project Limits:

John C. Calhoun Overpass to Broad Street

Project Length: 0.2 miles

Improvement Type:

Striped Bike Lane

Implementation Strategy:

Lane Narrowing

Average Daily Traffic:

Current: 18,910 **2035 est:** 21,796

Prioritization Score: 25

Estimated Cost: $4,320

Project Description

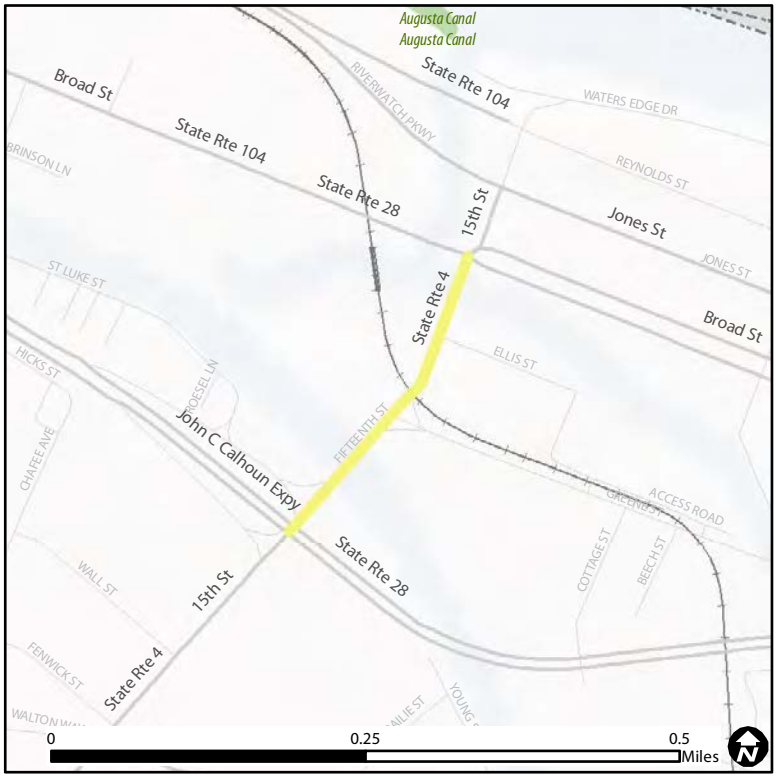
Existing Issues:

- No bicycle facilities currently exist to get from this section of the Greenways along the Savannah River to Broad St. and the Savannah Levee-Lock and Damn Rd. Greenway
- No bicycle facilities connect the John C. Calhoun Overpass and Broad St.

Project Benefits:

- This short segment of roadway is a critical link between the river greenways and Broad St.
- Connects critical gaps in current greenway system
- Enhances safety by providing bicyclists with dedicated travel lanes, and a direct route between segments of the greenway system
- Will ultimately connect the Savannah River Greenways with the 15th St/MLK Greenway.
- Ability to implement quickly and cost effectively

Striped Bike Lane



Reference Map

US Highway 1

Project Limits:

Old Aiken Road to Augusta Road

Project Length: 9.7 miles

Improvement Type:

Paved Shoulder

Implementation Type:

Road Widening

Average Daily Traffic:

2035 est: 30,578

Prioritization Score: 25

Estimated Cost: $325,248

Project Description

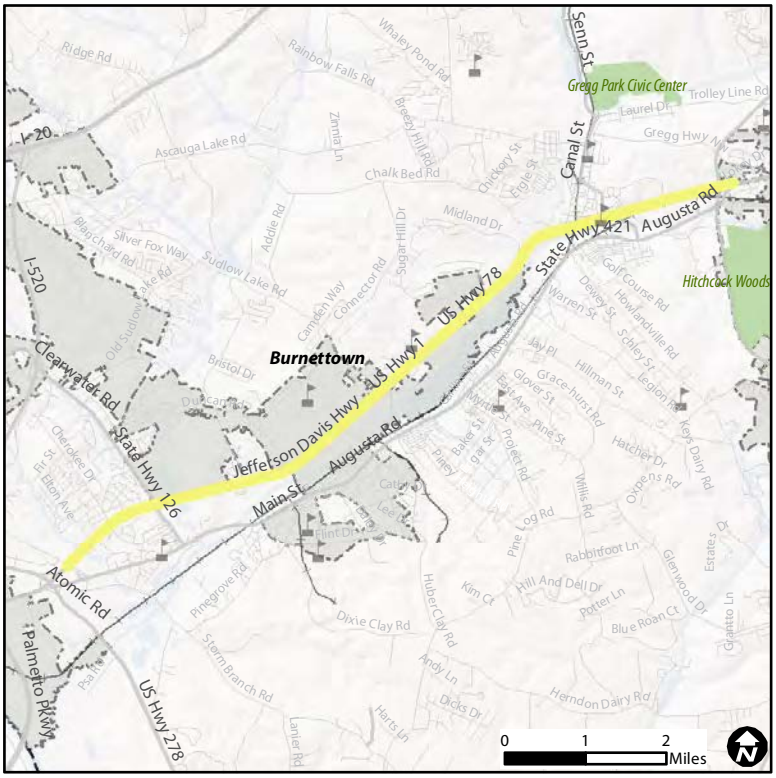
Existing Issues:

- US 1 is the main route between Aiken and North Augusta and has many destinations which bicyclists wish to access.
- Currently safety issues may arise between bicyclists and motorized vehicles without a separate space to ride.

Project Benefits:

- Provides direct access to many destinations
- Enhances safety by providing bicyclists with a space to ride separated from motorized vehicles
- Ability to implement quickly and cost effectively
- Paved shoulders improves safety for all road users, lengthens pavement life and reduces maintenance costs

Paved Shoulder



Reference Map

5th Street

Project Limits:

Broad Street to 5th Street Bridge

Project Length: 0.18 miles

Improvement Type:

Shared Lane Marking

Implementation Strategy:

Add Marking

Average Daily Traffic:

Current: 5,100 **2035 est:** 10,152

Prioritization Score: 25

Estimated Cost: $1,346

Project Description

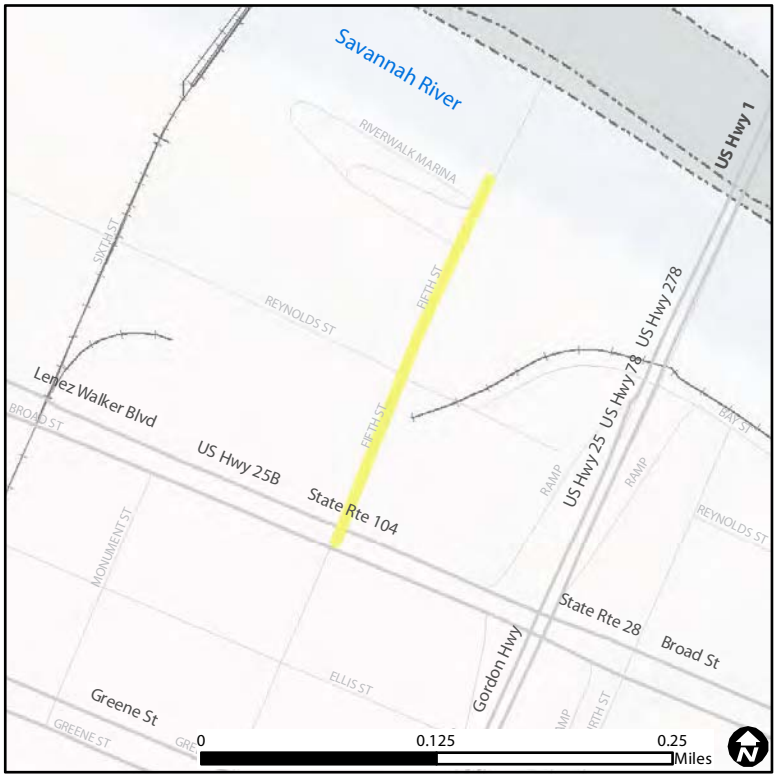
Existing Issues:

- This short segment of roadway is a critical link between Broad St. and the 5th St. Bridge crossing into N. Augusta.
- No bicycle facilities currently exist to get from this section of Broad St to the Greenways along both sides of the Savannah River.

Project Benefits:

- Provides direct access to 5th St. Bridge and Savannah River Greenways from downtown Augusta.
- Connects residential to commercial activities
- Enhances safety by providing bicyclists with a designated location on the roadway.
- Ability to implement quickly and cost effectively

Shared Lane Marking



Reference Map

Atomic Road

Project Limits:

Buena Vista Avenue to Old Edgefield Road

Project Length: 0.53 miles

Improvement Type:

Greenway

Average Daily Traffic:

Current: 4900 **2035 est:** 12,154

Prioritization Score: 25

Estimated Cost: $551,200

Project Description

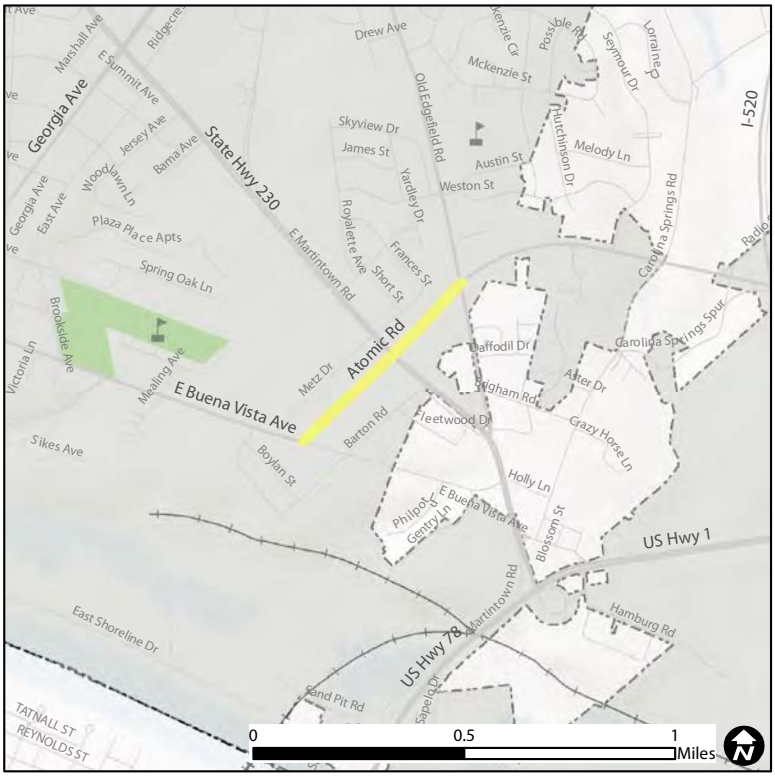
Existing Issues:

- No bicycle or pedestrian facilities currently exist along this roadway segment
- Safe and convenient bicycle and pedestrian connections to the Palmetto Parkway Greeneway are needed

Project Benefits:

- Enhances safety by providing bicyclists and pedestrians with a separated path, allowing all ages and abilities to access destinations
- Provides access to the Palmetto Parkway Greeneway
- Connects residential communities and commercial areas to one another and to the Greeneway

Greenway



Reference Map

North Belair Road

Project Limits:

Columbia Rd. to Town Park Blvd.

Project Length: 1.7 miles

Improvement Type:

Striped Bike Lane

Implementation Strategy:

Lane Narrowing

Average Daily Traffic:

Current: 24,690 **2035 est:** 22,685

Prioritization Score: 18

Estimated Cost: $30,240

Project Description

Existing Issues:

- Without physical separations, safety issues may arise between bicyclists and motorized vehicles.
- There is no north-south bicycle facility in this part of county and North Belair Rd leads to Evans to Locks Road, which is a popular destination due to the greenway beginning there.

Project Benefits:

- Connects residential to schools
- Enhances safety by providing bicyclists with dedicated travel lanes, separated from high motorized vehicle traffic
- Will ultimately connect Columbia Rd. with the Evans to Locks Rd Greenway.
- Will ultimately connect to Augusta via planned bicycle facilities crossing 1-20.
- Can be implemented quickly and inexpensively

Striped Bike Lane

Reference Map

Columbia Road

Project Limits:

Old Belair Rd. to Washington Rd.

Project Length: 4mi

Improvement Type:

Buffered Bike Lane

Implementation Strategy:

Road Widening

Average Daily Traffic:

Current: 19,080 **2035 est:** 28,189

Prioritization Score: 17

Estimated Cost: $1,436,624

Project Description

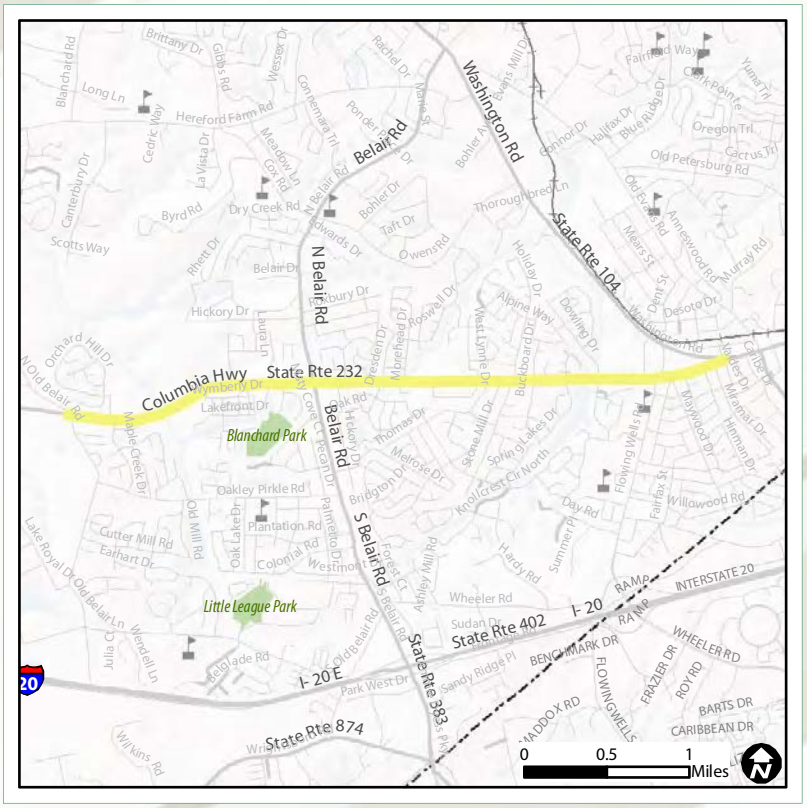
Existing Issues:

- No bicycle facilities currently exist to go west into through Columbia County.
- Without physical separations, safety issues may arise between bicyclists and motorized vehicles.

Project Benefits:

- Enhances safety by providing bicyclists with dedicated travel lanes, with extra separation from motorized vehicles
- Ultimately this will connect to the Euchee Creek Greenway creating numerous loop opportunities and encouraging riding and tourism in the area.
- Ability to implement quickly and cost effectively

Buffered Bike Lane



Reference Map

Flowing Wells Road

Project Limits:

Wheeler Rd. to Columbia Rd.

Project Length: 1.3 miles

Improvement Type:

Striped Bike Lane

Implementation Strategy:

Road Widening

Average Daily Traffic:

Current: 14,210 **2035 est:** 13,990

Prioritization Score: 16

Estimated Cost: $441,000

Project Description

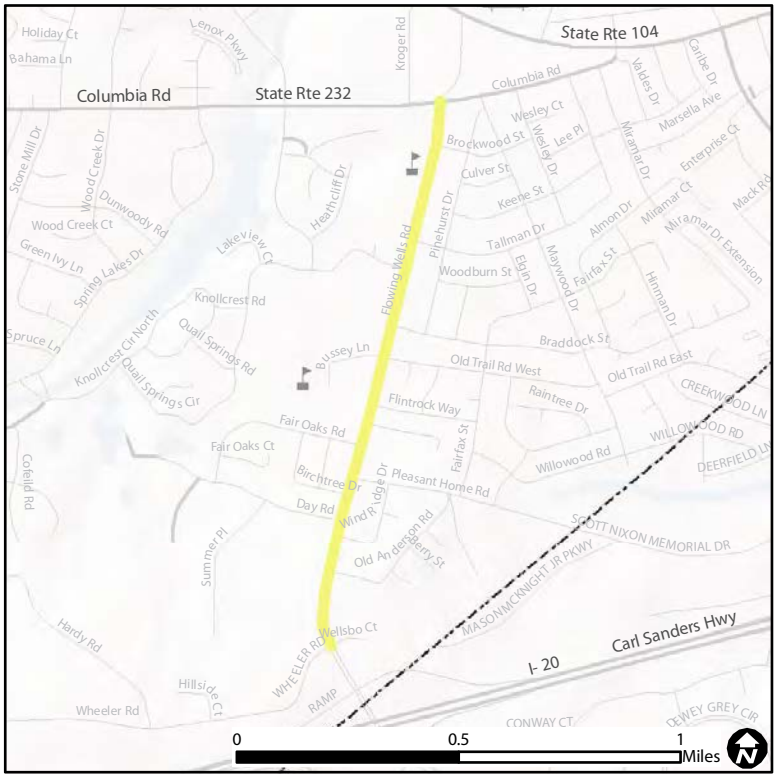
Existing Issues:

- No bicycle facilities currently exist to get from Columbia Rd to Wheeler Rd to access schools.
- Direct link to Augusta needed

Project Benefits:

- Enhances safety by providing bicyclists with dedicated travel lanes, separated from motorized vehicles
- Connects residential to schools
- Will ultimately connect to proposed bikelanes on Wheeler Rd. crossing into Augusta.

Striped Bike Lane



Reference Map

Wrightsboro Road

Project Limits:

Jimmy Dyess Pkwy to Lewiston Rd.

Project Length: 4.1 miles

Improvement Type:

Paved Shoulder

Implementation Strategy:

Road Widening

Average Daily Traffic:

Current: 9,860 **2035 est:** 13,865

Prioritization Score: 16

Estimated Cost: $137,760

Project Description

Existing Issues:

- Wrightsboro is the main route between Aiken and Grovetown
- Without physical separations, safety issues may arise between bicyclists and motorized vehicles.

Project Benefits:

- Provides direct route to Grovetown and Harlem
- Enhances safety by providing bicyclists with a space to ride separated from motorized vehicles
- Ability to implement quickly and cost effectively
- Paved shoulders improves safety for all road users, lengthens pavement life and reduces maintenance

Paved Shoulder

Reference Map

Funding Options

Federal Funding Programs

There is no dedicated federal funding source for just bicycle and pedestrian improvements. However, there are several federal funding programs that can be used to finance bicycle and pedestrian facilities. The following provides a list of federal funding programs that could be used to fund the bicycle and pedestrian improvements in the ARTS area:

- **Transportation Enhancement Funds** - This program provides funding for a range of enhancement-related activities including facilities for pedestrians and bicycles. Within the state of Georgia, the Transportation Enhancement (TE) program is a competitive grant program, with application deadlines every two years. Nationally, this program has been the largest federal source that funds bicycle and pedestrian projects.

- **Congestion Mitigation and Air Quality Improvement Program (CMAQ) Funds –** This program funds transportation projects to improve air quality and reduce traffic congestion in areas that do not meet air quality standards. The ARTS area is currently in attainment, however if new rules are implemented by the Obama Administration it is anticipated that the ARTS area would be designed a nonattainment area. As with other federal funding sources, MPOs that have made cycling and walking priorities in their planning will have an easier time using CMAQ funds on bike/ped projects. A large share of federal bike/ped funding comes from CMAQ. According to FHWA, the program accounted for nearly 10 percent of all Federal-Aid Highway Program funding obligated to bicycle and pedestrian projects between 1992 and 2008, making it the second largest federal source for bicycle and pedestrian funds after Transportation Enhancements (TE).

- **Surface Transportation Program Funds** - This program provides funding for bicycle and pedestrian facilities. STP funds can be used on any roadway classified higher than a local road or a rural minor collector. Q23 funds are specifically for urbanized areas and are allocated based on population.

- **Highway Safety Improvement Programs (HSIP)** – This Program was created under the 2006 transportation authorization law, SAFETEA-LU, as one of the core Federal-Aid funding sources. HSIP funds safety projects aimed at reducing traffic fatalities and serious injuries. Bike and pedestrian safety projects are eligible for HSIP funding. All public roads – including state, county and local roads – are eligible for HSIP funding. Examples of eligible projects include bike lanes, roadway shoulders, crosswalks, other intersection improvements and signage.

- **Section 402 State and Community Highway Safety Grants** – This federal grant program provides funds for education, enforcement and research programs designed to reduce traffic crashes, deaths, injuries, and property damage. Under Section 402, bike and pedestrian safety programs are eligible to receive funding. In many areas, Section 402 is overlooked as a funding source and is rarely used for bike and pedestrian projects.

- **Safe Routes to School Program –** This program was established by Congress in July 2005. The Federal Highway Administration administers the Safe Routes to School program funds and provides guidance and regulations about SRTS programs. Federal SRTS funds are distributed to states based on student enrollment, with no state receiving less than $1 million per year. SRTS funds can be used for both infrastructure projects and non-infrastructure activities.

- **Transit Funds (5309, 5307, 5311, and 5310)** – These funds can be used for bicycle and pedestrian transit amenities such as shelters, bicycle racks on vehicles, and bicycle storage at stations or transfer centers.

State Funding Programs

State funding programs for bicycle and pedestrian improvements are limited. Georgia and South Carolina DOTs do not provide dedicated funds for physical bicycle or pedestrian improvements. In both states, the DOTs incorporate bicycle and pedestrian friendly elements into planned or programmed improvement projects as they move through the design and construction stages. There are several of these types of projects in the ARTS area that will benefit from this policy and it is crucial that bicycle and pedestrian

facilities be reviewed during the planning and programming process to ensure these improvements are identified early in the process.

Regional Funding Programs

During the 2010 Georgia General Assembly, House Bill 277 (HB 277) was passed and it was signed into law by Governor Purdue. The enacted law, The Georgia 2020 Transportation Act, permits by statute referenda developing 12 Regional Commissions that cover all of Georgia and imposes on a 1 percent sales tax for 10 years to fund a list of transportation projects, which may include all modes of transportation. The referenda will occur on July 31, 2012. If passed by voters, Augusta-Richmond County and Columbia County will receive transportation funding from this new funding source and some of the nondiscretionary fund may be eligible to fund bicycle and pedestrian improvements.

Local Funding Sources

There are limited local funding programs that provide financing opportunities for bicycle and pedestrian enhancements. Generally, local funds are utilized to satisfy local match requirements of using federal funding sources listed earlier. However, Georgia and South Carolina law provide counties a local tax option to fund a variety of improvements, including transportation.

In Georgia, voters in Augusta-Richmond County and Columbia County have historically approved a one cent Special Purpose Local Option Sales Tax (SPLOST) referendum. This local funding source provides direct funding to construct transportation projects, including bicycle and pedestrian improvements, in both counties.

In South Carolina, the referendum on Round 3 of the Aiken County Capital Projects Sales Tax was passed in November 2010. The ballot included funding for Greeneway related projects by both the City and Aiken County.

Financial Plan

During the development of the ARTS 2035 Long Range Transportation Plan, MPO staff coordinated with GDOT, SCDOT, and other local jurisdictions to identify transportation revenue that are reasonably expected over the next 25 years, which govern how and when projects will be financed. Actual funding availability over the next 25 years will depend largely upon future actions and public policy directives initiated at the federal and state levels. Today, most roadway, bicycle, and pedestrian projects in the ARTS area are financed through federal, state, and local funds which are mostly derived from taxes on fuel, fees from vehicle registration, and local option sales taxes. To bring ARTS/Aiken County Bicycle and Pedestrian Study to reality, a thorough plan for funding a number of needed bike and pedestrian improvements is required. The purpose of this section is to address this issue by identifying funding sources to implement a five-year bicycle and pedestrian plan.

Federal planning statutes require that Long Range Transportation Plans must be financially constrained, which means that the estimated cost for all LRTP multimodal transportation improvements cannot exceed the amount of reasonably expected revenues projected from identified federal, state, and local funding sources. This requirement ensures that the LRTP is based upon realistic assumptions and can be implemented.

The ARTS 2035 LRTP was approved in September 2010 and is a financially constrained document that includes funding for bicycle and pedestrian improvements over the next 25-years. As discussed in the previous prioritization section, the ARTS/Aiken County Bicycle and Pedestrian Study has identified and prioritized numerous projects throughout the study area. In total, these projects exceed the amount of anticipated available funding to implement these projects. Similar to the ARTS 2035 LRTP, the Bicycle and Pedestrian Five-Year Financial Plan is based upon realistic assumptions. Table 8-7 (next page) provides a summary of the bicycle and pedestrian constrained funds listed in the ARTS 2035 LRTP, annual funding, and the five-year constrained plan. Since the ARTS area includes Georgia and South Carolina and funding levels and sources are different in each state, the financial plan shows the amount of funding for each state over the next five-years. The amounts are in 2012 dollars, not Year-of-Expenditure dollars. **Thus, the Short-Term Implementation Plan for Georgia (Augusta-Richmond and Columbia Counties) totals $13.5 million while South Carolina's (Aiken County) totals $1.9 million to implement top priority projects.**

Table 8-7: Bicycle and Pedestrian Funding

State	2035 LRTP Total Bicycle and Pedestrian Funding	Annual Funding	Five-Year Constrained Plan
Georgia	$67,676,740	$2,707,070	$13,535,348
South Carolina	$9,809,124	$392,365	$1,961,825
Total	**$77,485,864**	**$3,099,435**	**$15,497,173**

Source: ARTS 2035 LRTP

Five-Year Implementation Plan

Getting bicycle and pedestrian projects funded opens the door programming future multimodal projects. Thus, identifying the best project candidates that have the greatest positive impact on improving bicycle and pedestrian safety, connectivity, and mobility is crucial to the success implementing this plan. There is adequate federal funding available to support the priority projects identified in this plan. However, when trying to access federal funds it is crucial to work with local funding decision makers. During the development of this plan, local county and city planners were involved throughout the planning process. This will be helpful because ARTS cannot program federal funds unless local agencies are willing to sponsor projects and provide a 20 percent local match. To improve the chances of leveraging federal funds to construct and implement the Five-Year Program highlighted in this Plan, the following must occur:

- Secure the support of local elected officials, such as mayors, commissioners, and council members;
- Make the case to implement bicycle and pedestrian projects to agency leadership, such as labor, economic development, parks and recreation, etc.;
- Identify sources of local funds for the required 20 percent match to access federal formula funds, such as the local option sales tax;
- Research if in-kind donations are allowed to be used for local match and if so maximize it to its fullest; and
- Find allies, including transportation, health, and environmental partners in your community to lobby on enhancing the bicycle and pedestrian system in the ARTS area.

In the short term, the approach to implementing an expanded bicycle and pedestrian network must consider what is achievable and realistic given foreseeable funding. The implementation plan is based on the goals and objectives developed during the beginning of this study. The general priority of projects in Georgia and South Carolina, as shown in Table 8-8, Table 8-9, and Table 8-10, should be followed, except in cases where there are opportunities to combine bike and pedestrian improvements with other capital improvement projects, such as resurfacing, roadway widening, or new location roadway projects.

Table 8-8 provides the list of projects included in the Five-Year Implementation Plan in Augusta-Richmond County and Columbia County. The estimated cost to construct and implement this Five-Year Plan totals $10.2 million.

Table 8-8: Implementation Plan - Georgia

Priority	Project Name		Cost	Treatment
2	MLK - 15th St	From Olive Rd to Government Rd.	$1,258,400	Multi Use Path
5	15th Street	John C. Calhoun Overpass to Broad St.	$4,320	Striped Bike Lanes
7	5th Street	From Broad St. to 5th St. Bridge	$1,346	Shared Lane Marking
9	North Belair Road	Columbia Rd to Town Park Rd	$30,240	Striped Bike Lane
10	Columbia Road	Old Belair Rd to Washington Rd	$1,436,624	Striped Bike Lane
11	Flowing Wells Road	Wheeler Rd to Columbia Rd	$441,000	Striped Bike Lane
12	Wrightsboro Rd.	Jimmy Dyess Pkwy to Lewiston Rd	$137,760	Paved Shoulders
16	15th Street	Pope Avenue to Walton Way	$2,880	Buffered Bike Lane
17	13th Street Bridge	Georgia Ave (SC) to Broad Street (GA)	$1,271	Shared Lane Marking
18	Ellis Street	James Brown Blvd to E Boundary Street	$2,440	Bike Route
19	Wrightsboro Road	Belair Road to North Leg Road	$511,000	Striped Bike Lane
20	Telfair Street	Oak Street to 11th Street	$14,203	Shared Lane Marking
27	5th Street Bridge	Riverwalk Marina to Jefferson Davis Hwy	$126,786	Multi Use Path
28	Central Avenue	Monte Sano Avenue to Druid Park Avenue	$17,760	Buffered Bike Lane
30	Henry Street	Fleming Avenue to Bransford Road	$1,980	Bike Route
32	McDowell Street	Arsenal Ave to Merry Street	$3,120	Bike Route
33	Bransford Avenue - McAnally Street	Merry Street to Emmett Ave	$620	Bike Route
35	15th Street	Government Road to Central Avenue	$143,500	Striped Bike Lane
36	4th Street	Laney Walker Boulevard to Broad Street	$1,880	Bike Route
37	Broad Street	10th Street to US 1	$14,520	Buffered Bike Lane
38	Broad Street	15th Street to 10th Street	$9,000	Buffered Bike Lane
39	Central Avenue	Druid Park Avenue to 15th St.	$1,495	Shared Lane Marking
40	James Brown Boulevard	Twiggs Street to Laney Walker Boulevard	$2,990	Shared Lane Marking
41	James Brown Boulevard	Walton Way to End of James Brown Blvd	$5,681	Shared Lane Marking
42	Laney Walker Boulevard	E Boundary Street to 15th St.	$22,848	Striped Bike Lane
44	Olive Road	Heard Ave to Gordon Highway	$16,224	Striped Bike Lane
46	Old Evans Road	Washington Road S to Washington Road N	$906,500	Striped Bike Lane
48	Windsor Spring Road	Tobacco Road to GA Highway 88	$5,085,600	Multi Use Path
49	10th Street	Wrightsboro Road to Dantignac Street	$1,160	Bike Route
50	Wrightsboro Road	Druid Park Avenue to James Brown Blvd	$12,384	Striped Bike Lane
TOTAL			**$10,215,532**	

Table 8-9 provides the list of prioritized projects included in the Five-Year Implementation Plan for Aiken County. The estimated cost to construct and implement this Five-Year Plan totals $1.7 million. While this total is below the projected $1.9 in the 2035 ARTS LRTP, additional funds should be allocated to developing the bicycle route network, such as extending the Collier Street bike route to Henry Street and Boardman Road (see Table 7-6 Recommended Bicycle Routes, in Chapter 7), and/or toward the total cost of high priority projects identified in the Extended Implementation Plan, shown below, in Table 8-10. The Extended Implementation Plan lists high priority projects in order of the preferred sequencing for implementation.

As noted earlier, there are potential funding sources available, which the County can request and apply for to construct priority projects. As funding is identified, the County will construct as many projects as possible over the next five years that improve connectivity and encourage increased bicycle and pedestrian activity. Specifically, this Plan recommends that the County pursue additional funding for implementation of projects shown in Table 8-10. Where possible, the County will capitalize on cost efficiencies by implementing proposed bike and pedestrian improvements (as identified in Chapter 7) in conjunction with other capital improvement projects, such as resurfacing, roadway widening, or new location roadway projects.

Table 8-9: Five-Year Implementation Plan – South Carolina

Priority	Project Name	Project Cost	Corridor Segment	Project Type
1	E Pine Log Road Greenway	$1,320,800	Silver Bluff Road to Trailwood Ave	Multi-Use Path
4	East Buena Vista Ave	$12,096 (funded)	From Riverside Blvd to Georgia Ave	Bike Lane
8	Atomic Rd. Greenway	$551,200 (funded)	From Buena Vista Ave to Old Edgefield Road	Multi Use Path
22	Collier Street	$400	Henry Street to E Pine Log Road	Bike Route
23	13th Street Bridge	$1,346	Georgia Ave (SC) to Broad Street (GA)	Shared-lane marking
24	Belvedere Clearwater Rd	$16,320	Edgefield Road to Palmetto Parkway	Striped Bike Lane
29	Georgia Ave	$27,456	13th Street Bridge to Knox Ave	Striped Bike Lane
45	University Parkway	$367,500	Richland Avenue W to Robert M Bell Parkway	Striped Bike Lane
	Total Cost for Projects	**$1,733,822**	**(Does not included funded projects)**	

Table 8-10: Extended Implementation Plan – South Carolina

Priority	Project Name	Project Cost	Corridor Segment	Project Type
3	University Parkway Greenway	$4,264,000	From Robert M Bell Pkwy to SC 19	Multi Use Path
6	US 1	$325,248	Old Aiken Rd. to Augusta Rd.	Paved Shoulders
13	S Aiken Lane	$416,000	E Pine Log Road to Corporate Parkway	Multi Use Path
14	SC 19	$700,000	Hampton Avenue to Shiloh Heights Road	Striped Bike Lane
15	West Aiken Greenway	$5,158,400	Greenville Road to Highland Park Avenue	Rail with Trail
21	Jefferson Davis Hwy	$1,934,400	E. Martintown Road to Revco Road	Greenway
25	Belvedere Clearwater Rd	$2,194,000	Palmetto Parkway to US 1	Multi Use Path
26	E Buena Vista Avenue	$436,800	Floyd Ave to Atomic Rd	Multi Use Path
31	Knox Ave	$770,000	E Martintown Road to Edgefield Road	Striped Bike Lane
34	US 1	$228,480	Rutland Dr. to ARTS Boundary	Paved Shoulders
43	E. Martintown Rd	$270,400	E Buena Vista Avenue to US1	Multi Use Path
47	Belvedere Road	$655,200	US 1 to Augusta Road	Multi Use Path
	Total Cost for Projects	**$17,352,928**		

Non-infrastructure Improvement Prioritization

The programs recommended in this Plan are a relatively inexpensive method for improving and raising public awareness and adding to the safety and enjoyment of bicycling and walking in the ARTS region. Because of their minimal expense and importance to supporting the bicycle travel and thereby increase usage, all of the recommended programs and policies are designated for short- or medium-term implementation, shown below as first- and second-tier priorities. A comprehensive and diversified approach to programs and policies is essential to growing the community and culture of bicyclists and pedestrian in the ARTS region. Thus, both first-tier and second-tier lists include an appropriate combination of mutually reinforcing strategies that reach diverse audiences.

First-tier Programs, Policies, and Evaluation

First-tier non-infrastructure recommendations are programs and policies that have the highest impact for the lowest cost. Short-term priority projects are listed below, distinguished by those programs that offer immediate opportunities through continuation and expansion of existing programs and those that will be strategies new to the ARTS region.

Continued and expanded efforts:

- Safe Routes to School
- Safe Streets Save Lives
- Annual Count Program

New efforts:

- Issue Focused Safety Campaign
- Regional Bicycle and Pedestrian Committee
- Car Free Street Events
- Weekend Walkabouts
- Facilities Inventory Program
- Police Training Program

This Plan recommends implementing first-tier programs, policies, and evaluation within nine months of adoption of the Plan.

Second-tier Programs, Policies and Evaluation

Second-tier non-infrastructure recommendations are programs and policies that may take time to plan and implement, due to cost, political will or other factors, or particularly benefit from building upon first-tier successes. Medium-term priority projects include:

- Bike Month Activities
- Professional Driver Training
- Regional Plan for Bicycle and Pedestrian Collision Reduction
- Dedicated Funding Source

This Plan recommends implementing second-tier programs, policies, and evaluation within 18 months of adoption of the Plan.

Non-infrastructure Improvement Implementation

The non-infrastructure recommendations of this Plan are designed for implementation within three years of adoption of the Plan. While the vast majority of infrastructure and policy recommendations fall within the exclusive authority of ARTS and its member jurisdictions, many program recommendations can, and should, fall under the banner of outside agencies, private sector partners, and nonprofit organizations. In the ARTS region, nonprofit organizations that may want a role in implementing community programs include: Augusta Wheel Movement, Aiken Bicycle Club, Healthy Augusta, YMCA, Central Savannah River Area Regional Commission, Eat Smart Move More Aiken, Georgia Bikes, and Palmetto Cycling Coalition, among others.

A collaborative approach to implementing and sustaining bicycling and walking programs contributes to the broader vision of fostering a strong bicycling and walking advocacy community and culture. Additionally, the minimal expense associated with most programs offers the unique opportunity for multiple, varied sectors of the community to contribute to the larger bicycle friendly community campaign.

For each non-infrastructure recommendation of the Plan, Table 8-11 outlines the timeline

for implementation and the frequency of the program's occurrence. The fourth column provides a scaled estimation of potential cost for implementing the program. Programs such as Safe Streets Save Lives, the Regional Bicycle and Pedestrian Committee, and the Regional Plan for Bicycle and Pedestrian Collision Reduction, primarily require a commitment of staff or volunteer time and build on existing resources. Those programs are identified as low-cost programs that require minimal initial investment. Other programs require staff and/or volunteer time as well as funding for marketing materials, special events, or other components.

With adoption of this Plan, ARTS will use the timeline provided in Table 8-11 to begin implementing new programs and policies. As part of that process, ARTS will recruit partner agencies and organizations to assist in the implementation of (and future maintenance and expansion of) recommended programs.

Table 8-11: Implementation plan for non-infrastructure recommendations

Strategy	Commencement	Duration; Occurrence	Cost Range
Safe Routes to School	Immediate	Ongoing	$$
Safe Streets Save Lives	Immediate	Ongoing	$
Issue Focused Safety Campaign	August 2012	1-2 months; Every Two Years	$$
Regional Bicycle and Pedestrian Committee	August 2012	Ongoing	$
Car Free Street Events	September 2012	Monthly during Spring or Fall; Occurring Annually	$$$
Weekend Walkabouts	September 2012	Monthly during Spring or Fall; Occurring Annually	$$
Annual Count Program	September 2012	Annual	$-$$
Facilities Inventory Program	January 2013	Ongoing	$-$$
Police Training Program	January 2013	Every Three Years	$$$
Bike Month Activities	May 2013	Annual	$$-$$$
Professional Driver Training	June 2013	Every Three Years	$$$
Regional Plan for Bicycle and Pedestrian Collision Reduction	June 2013	Ongoing	$
Dedicated Funding Source	October 2013	Ongoing	$$$

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Appendix A

Planning and Legislation Review

Introduction

Existing policies, plans and ordinances that apply to bicycle and pedestrian planning were collected and reviewed as they pertain to the vision of the ARTS/Aiken County Bicycle and Pedestrian Plan.

The vision of the ARTS/Aiken County Bicycle and Pedestrian Plan is "to seek to develop a Bicycle and Pedestrian Plan that not only identifies projects, but also develops the framework for a dynamic multi-modal program that can be embraced by the public and easily re-evaluated on a regular basis. In addition, Aiken County, one of our MPO partners as described above, will be seeking an expanded analysis and supplemental study of their own bicycle and pedestrian system."

This appendix provides a review of the goals and objectives of current plans that may affect the goals and issues relevant to the ARTS/Aiken County Bicycle and Pedestrian Plan. Not all local and regional planning documents were reviewed for this chapter; the focus of this review was on existing locally adopted, plans and, as well as documents that are of regional significance to Aiken County, South Carolina. Table A-1 summarizes the plans reviewed.

National Plans/Policies

United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations Press Release Summary March 11, 2010

The following quotes and excerpts from the U.S. Department of Transportation policy statement on Bicycle and Pedestrian Accommodation summarize elements related to bicycle and pedestrian planning in the ARTS region:

"The United States Department of Transportation (DOT) is providing this Policy Statement to reflect the Department's support for the development of fully integrated active transportation networks. The establishment of well-connected walking and bicycling networks is an important component for livable communities, and their design should be a part of Federal-aid project developments."....

"The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems."....

"This policy is based on various sections in the United States Code (U.S.C) and the Code of Federal Regulations (CFR) in Title 23 – Highways, Title 49 – Transportation, and Title 42 – The Public Health and Welfare. "....

Recommended Actions:

"The DOT encourages States, local governments,...and other government agencies, to adopt similar policy statements on bicycle and pedestrian accommodation as an indication of their commitment to accommodating bicyclist and pedestrians as an integral element of the transportation system. "...Transportation agencies and local communities should go beyond minimum design standards.....Such action should include:

- Consider walking and bicycling as equals with other transportation modes...
- Ensuring that there are transportation choices for people of all ages and abilities, especially children...
- Going beyond minimum design standards...

Table A-1. Existing Plans/Policies and Adoption Dates

Jurisdiction	Document Name	Date Adopted
US DOT	Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations Press Release	March 11, 2010
US DOT FHWA	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users	August 25, 2005
GDOT	Designs and Policy Manual Chapter Nine – Bicycle and Pedestrian Accommodations	March 2011
Central Savannah River Area (CSRA)	CSRA Bicycle and Pedestrian Plan	June 2005
ARTS, SC	Regional Bicycle and Pedestrian Plan	2003
ARTS, SC	ARTS 2035 Long Range Transportation Plan	September 2010
Aiken County, SC	Comprehensive Plan	2004-2014
Aiken County, SC	Aiken County US 1/US 78 Corridor Study	2012
Augusta Richmond GA	County Comprehensive Plan Ch. 11	2008
Columbia County, GA	2025 Long Range Transportation Plan	June 2004
Columbia County , GA	Growth Management Plan: Partial Update	2011-2016
Edgefield County, SC	Edgefield County Comprehensive Plan	2009
Augusta, GA and North Augusta, SC	Master Plan for a Sustainable Future: The Westobou Vision	2009
Augusta, GA	Public Transit Development Plan	October 2009
Augusta, GA	Realizing the Garden City: The Augusta Sustainable Development Agenda	October 2010
North Augusta, SC	Riverfront Redevelopment District Master Plan	1996
North Augusta, SC	Community Needs Assessment	2003
North Augusta, SC	Parks and Recreation Facilities Master Plan	2003
North Augusta, SC	Comprehensive Plan	2005
North Augusta, SC	North Augusta Greeneway, Pedestrian and Bicycle Master Plan	May 2011
Aiken, SC	Strategic Plan	2010

- Integrating bicycle and pedestrian accommodation on new, rehabilitated, and limited-access bridges…
- Collecting data on walking and biking trips…
- Setting mode share targets for walking and bicycling and tracking them over time…
- Removing snow (and ice) from sidewalks and shared-use paths.
- Improving nonmotorized facilities during maintenance projects…
- Increased commitment to and investment in bicycle facilities and walking networks can help meet goals for cleaner, healthier air; less congested roadways; and more livable, safe, cost-efficient communities"….

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. August 25, 2005

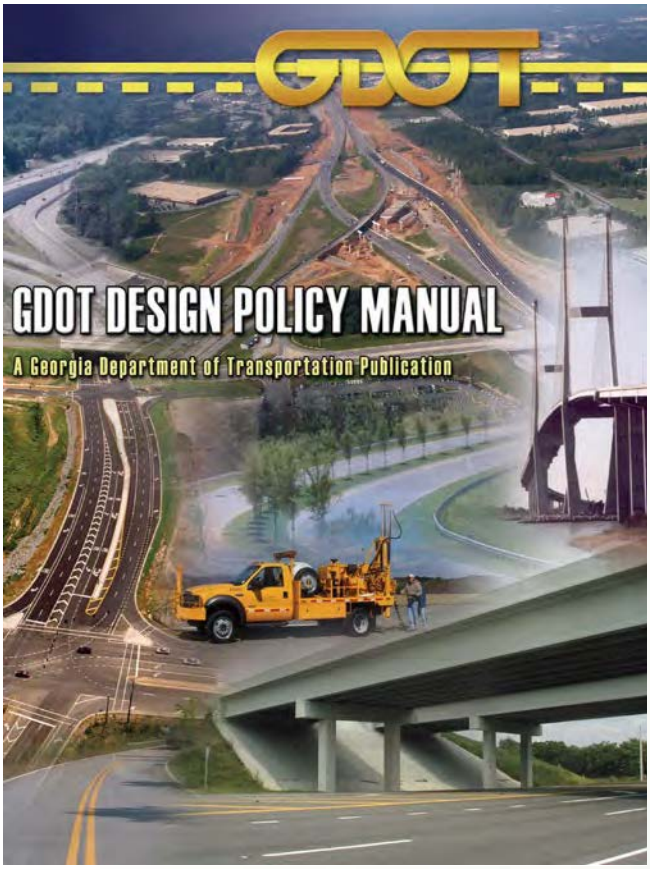
The following quotes and excerpts from the U.S. Transportation Bill known as "SAFETEA-LU" summarize elements related to bicycle and pedestrian planning in the ARTS region:

"On August 10, 2005, the President signed into law the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). With guaranteed funding for highways, highway safety, and public transportation…., SAFETEA-LU represents the largest surface transportation investment in our Nation's history." (Overview, Page 2)

"SAFETEA-LU addresses the many challenges facing our transportation system today – challenges such as improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment…" (Overview, Page 2)

SAFETEA-LU contains targeted investment features with a focus on Safety, Equity, Innovative Finance, Congestion Relief, Mobility and Productivity, Efficiency, Environmental Stewardship, and Environmental Streamlining. (Overview, Page 2) In two of these targeted investment areas, Safety and Environmental Stewardship, funding is provided for programs that emphasize bicycle and pedestrian modes of travel. Under the Safety investment focus the Safe Routes to School program is created to "enable and encourage primary and secondary school children to walk and bicycle to school. Both infrastructure- related and behavioral projects will be geared toward providing a safe, appealing environment for walking and biking that will improve the quality of our children's lives and support national health objectives by reducing traffic, fuel consumption, and air pollution in the vicinity of schools." (Safe Routes to School, Page 9) Additionally, more funding is provided under the Environmental Stewardship investment focus that is geared toward bicycle and pedestrian infrastructure development. This focus area includes funding for recreational trails (Recreation Trails, Page, 16) and funding for a Nonmotorized Transportation Pilot program "to fund pilot projects to construct a network of nonmotorized transportation infrastructure facilities in four designated communities. The purpose is to demonstrate the extent to which walking and bicycling can represent a major portion of the transportation solution in certain communities." (Nonmotorized Transportation Pilot, Page 17)

State Plans/Polices



GDOT Designs and Policy Manual Chapter Nine – Bicycle and Pedestrian Accommodations March 2011

In chapter nine, section 9.4 of the GDOT Design Manual, standards and guidelines are established to ensure that accommodations for bicycle and pedestrian users are provided "on all appropriate infrastructure projects where pedestrians and bicyclists are permitted to travel." (Page 9-6)

Additionally in section 9.4.1, Pedestrian Warrants, the GDOT standard states that "pedestrian accommodations shall be considered in all planning studies and included in all reconstruction, new construction, and capacity-adding projects that are either

located in an urban area (typically where curb and gutter is provided) or located in areas with any of the following conditions:

- on corridors with pedestrian travel generators and destinations (i.e. residences, commercial locations, schools, public parks, etc.), or areas where such generators and destinations can be expected within the projected lifespan of the project;
- where there is evidence of pedestrian traffic (e.g. worn path along roadside);
- on corridors served by fixed-route transit in urban and suburban areas;
- where there is an occurrence of "walking along the roadway" type crashes; and
- where a need is identified by a local government through a planning study and public involvement process." (Page 9-6)

GDOT also suggests a design guideline that "pedestrian accommodations should be considered in all planning studies and included in all reconstruction, new construction, and capacity-adding projects that are located in areas with any of the following conditions:

- within close proximity (i.e. 1 mile) to any school, college or university; and
- any location where engineering judgment of planning analysis determines a need." (Page 9-6)

The GDOT Design Manual also provides standards and guidelines for bicycle accommodations in section 9.4.2. Bicycle Warrants. The GDOT standard for bicycles states that "bicycle accommodations shall be considered in all planning studies and included in all reconstruction, new construction, and capacity-adding projects that are located in areas with any of the following conditions:

- where there is an existing bicycle facility in place (including bike lanes, paths, shoulders, wide curb lane, and/or signage)
- if the project is on a state, regional, local bike route; and
- where there is a demonstrated need, with bicycle travel generators and destinations (i.e. urban areas, residential neighborhoods, commercial centers, schools, colleges, public parks, etc.), or areas where such generators and destinations can be expected within the projected lifespan of the project."(Page 9-6)

GDOT also provides additional guidelines for bicycle accommodation consideration on projects "with any of the following conditions:

- within close proximity (i.e. 2 miles) to any school, college or university;
- where a project will provide connectivity between two or more existing bikeways;
- where a local bike route is identified by a local government through a planning study;
- along bicycle routes that connect metropolitan areas and regional destinations;
- on resurfacing projects in urban areas, the Department may consider restriping the roadway and narrowing ravel lanes to provide additional shoulder width or wide curb lane. Restriping will be considered where space is available and where there is no significant history of sideswipe crashes. The Office of Maintenance will coordinate with the Office of Planning and Office of Traffic Operations to define and appropriate crash threshold for determining eligibility for restriping on a project-by-project basis;
- on projects where a bridge deck is being replaced or rehabilitated with Federal financial participation, and where bicycle are permitted to operate at each end of the bridge, the bridge deck may be replaced or rehabilitated to provide safe bicycle accommodations; and
- any location where engineering judgment of planning analysis determines a need." (Page 9-7)

SC DOT Complete Streets Resolution 2003

The SC DOT Complete Streets Resolution states that "bicycling and walking accommodations are a routine part of the department's planning and design, construction and operating activities, and will be included in everyday operations" of the statewide transportation system.

SC DOT Engineering Directive Memorandum 22, Consideration for Bicycle Facilities 2003

This important document provides design guidelines for bicycle facilities within South Carolina Department of Transportation right of way. These guidelines are already referenced in plans reviewed for this background summary.

Regional Plans

CSRA Regional Bicycle and Pedestrian Plan June 2005

The Central Savannah River Area Regional Commission (CSRA RC) is a public sector, non-profit planning and development agency that serves a 13 county and 41 city region in the eastern portion of Central Georgia.

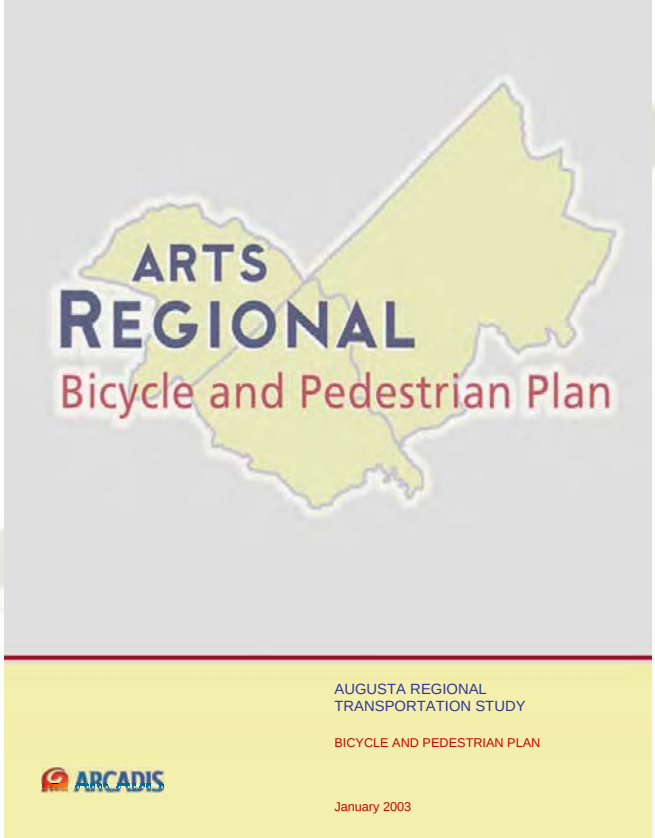
Vision Statement for the CSRA Regional Bicycle and Pedestrian Plan: *The CSRA will become a place where people choose to make bicycling and walking part of their everyday lives. Residents and visitors will be able to bicycle and walk with confidence, comfort and safety in every community.*

The goals of the regional bicycle and pedestrian plan are as follows:

- To provide an action plan to create viable and efficient bicycle and pedestrian networks
- To outline a strategy to encourage bicycle and pedestrian transportation throughout the region
- To identify and meet the diverse needs of bicyclists and pedestrians
- To actively involve residents in the planning of bicycle and pedestrian projects and programs
- To promote bicycle and pedestrian safety and reduce the number of injuries and fatalities

Key recommendation of the plan relevant to the ARTS/Aiken County Bicycle and Pedestrian Plan include:

- Bicycle support facilities in high-use areas
- Directional signage in high-use bicycle and pedestrian areas
- Lighting along pedestrian corridors within the municipalities
- Bicycle and pedestrian safety and promotion efforts through media outreach and coordination among local and state agencies
- Changes to land development codes to promote bicycle and pedestrian transportation



ARTS Regional Bicycle and Pedestrian Plan 2003

The 2003 ARTS Regional Bicycle and Pedestrian Plan was developed to provide policy guidance at the regional level. Three goals were pursued as part of the study:

- Provide for a bicycle and pedestrian transportation network to serve local, community, and regional needs
- Promote the viability of walking and biking as a safe and healthy transportation option throughout the region for all potential users
- Identify appropriate and adequate funding for the development and maintenance of regional and local bicycle and pedestrian systems

Table A-2: ARTS 2035 Long Range Transportation Plan

Goal 3: Develop a transportation system that will allow effective mobility throughout the region and provide efficient movement of persons and goods
Objective 1: Provide a plan that works to relieve congestion and prevent it in the future. Objective 4: Provide a plan which addresses consideration of non-motorized modes such as bicycles and pedestrians.
Goal 4: Develop a transportation system that will enhance the economic, social, and environmental fabric of the area, using resources wisely while minimizing adverse impacts
Objective 5: Provide a plan that reduces mobile emissions and meets air quality standards.
Goal 5: Promote efficient land use and development patterns to improve safety and economic vitality to meet existing and future multimodal transportation needs
Objective 2: Protect adequate rights-of-way in newly developing and redeveloping areas for pedestrian, bicycle, transit and roadways. **Objective 3:** Promote new developments that provide efficient, balanced movement of pedestrians, bicyclists, buses and motor vehicles within, to and through the area.
Goal 6: Increase the safety and security of the transportation system for motorized and non-motorized users
Objective 1: Identify policies, plans and transportation improvements that address unsafe designs and conditions to increase safety for users. **Objective 2:** Develop and maintain a transportation system that provides increased security of all of its users.
Goal 7: Continue to develop a multimodal transportation network that utilizes strategies for addressing congestion management and air quality issues in the ARTS region.
Objective 2: Encourage strategies that reduce mobile source emissions in an effort to improve air quality. **Objective 3:** Continue to implement and promote strategies and policies such as system preservation, access management, managed lanes, travel demand management, mass transit, complete streets, and alternative transportation to improve congestion conditions.

The first goal implies coordination and connectivity with other planning agencies, such as the Lower Savannah COG.

ARTS 2035 Long Range Transportation Plan 2010

Augusta Regional Transportation Study (ARTS) functions as bi-state MPO and is responsible for transportation planning in accordance with the federal metropolitan planning requirements for Augusta-Richmond County and portions of Columbia County in Georgia, and portions of Aiken and Edgefield Counties in South Carolina. The cities in the Augusta Regional Transportation Study (ARTS) area include Augusta, Grovetown, Hephzibah, and Blythe in Georgia, and Aiken, North Augusta, and Burnettown in South Carolina.

The ARTS Long Range Transportation Plan is the long-range, financially-constrained transportation plan for the region that covers a planning horizon of 25 years. According to federal law, all LRTPs must be updated every four or five years depending on their MPOs air quality status: maintenance, nonattainment, or attainment. The ARTS LRTP must be updated every five years because it is currently considered in attainment for federal air quality standards.

The Goals and Objectives relevant to the ARTS/ Aiken County Bicycle and Pedestrian plan are as follows;

County Plans

Aiken County SC Comprehensive Plan

The South Carolina Local Government Comprehensive Planning Enabling Act of 1994 requires all units of local government utilizing zoning or land use controls to complete and adopt a comprehensive plan. The law requires that an independent board of local

Table A-3. Relevant Aiken County Comprehensive Plan Goals and Policies

Aiken County Comprehensive Plan Goals and Policies Relevant to Bicycle and Pedestrian Planning
Part 1 Population Element Goal: Control Urban Sprawl and development of rural and natural resource areas
Part 2 Population Element Goal: Promote an "age sensitive" environment – meet and accommodate changes in age and gender composition of county residents.
Recommendation 2: Provide pedestrian and/or public transportation linkages.
Part 3 Economic Element Goal: Create new economic markets to benefit from South Carolina's emerging Recreation – Retirement image.
Recommendation: To capitalize on state initiatives, the development of a more aggressive tourism promotion program is recommended, together with educational programs for individuals involved in tourism, and the integration of infrastructure development in support of tourism.
Part 4 Community Facilities Element Goal 2: Develop a transportation system that is financially feasible, with broad public support
Recommendation: Provide a plan which addresses bicycle and pedestrian needs.

citizens called a Planning Commission act as an advisory committee to the governing body on constructing and adopting the plan. The objectives of the planning process are to develop an inventory of the community's historical and existing conditions and trends and to develop goals and objectives regarding community growth and development.

These goals and objectives communicate the suggested policy directions for the local government. The goals and policies element of the Aiken Comprehensive Plan were developed through an extensive citizen participation program intended to accurately reflect the desires of county residents. Goals related to this bicycle and pedestrian plan include safe, pedestrian friendly neighborhoods, with facilities, transportation, and activities accessible to all; high quality streets, parking and pedestrian facilities; excellent public facilities including police, fire and schools; and intergovernmental cooperation.

The 2005 Comprehensive Plan became effective in June. The Goals and Policies of the plan elements relevant to bicycle and pedestrian planning are listed in Table A-3 on the following page. The goals and policies of the Comprehensive Plan are consistent with a sustainable Bicycle and Pedestrian Plan that uses a coordinated approach to address safety, design, maintenance and coordinated planning issues.

Augusta Richmond GA County Comprehensive Plan 2008

In Chapter 11 of the Augusta Richmond County Comprehensive Plan, the Community Agenda outlines the final goals and objectives and provides the guiding policy that serves as a basis for the policy decisions of the city's elected and appointed leaders as well as staff. (Page 249)

Those goals and objectives that relate to the development of bicycle and pedestrian infrastructure are as follows:

"Transportation Goal – A transportation system that is accessible to all citizens, provides for the efficient movement of people, goods and services, is integrated with planned land use, and provides mode choice." (Page 283)

Objective number two under the Transportation Goal states:

"Make more efficient use of the existing surface transportation system and encourage more walking and biking" by "promoting interconnectivity within and between subdivisions," and by implementing "projects in the *ARTS Advanced Transportation Management System (ATMS) Mater Plan (February 2002)*" (Page 283)

Objective six under the Transportation Goal states:

"Increase the number and extent of bicycle and pedestrian facilities" by implementing

"projects in the *ARTS Regional Bicycle and Pedestrian Plan (January 2003)*" (Page 283)

Objective seven under Transportation Goal states:

"Improve access to/use of transportation facilities by the handicapped and disabled." (Page 283)

In addition to the above goals and objectives, the Land Use / Growth Management Goal states:

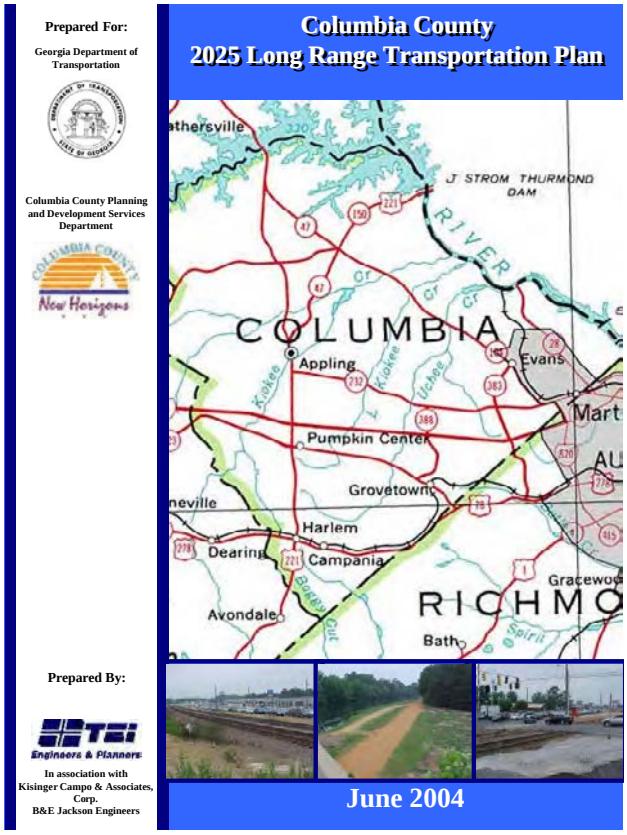
"Promote a land use pattern that accommodates growth and revitalization while protecting established residential areas and natural resources." (Page 286)

A guiding policy under this stated land use goal is to "encourage Quality Growth as a Development Option." (Page 292) Some of the key features of Quality Growth as they pertain to pedestrian and bicycle modes of travel include:

- "Sidewalks and bike trails are provided to encourage more walking and biking.
- Schools and playgrounds are located within neighborhoods to encourage more walking to school and make recreation facilities easily accessible.
- Street trees are planted to enhance community appearance and provide shade for pedestrians and bicyclists.
- New industry or other major employers are located where they are accessible by transit, walking or bicycle." (Page 292-293)

Columbia County GA 2025 Long Range Transportation Plan 2004

The following quotes and excerpts from the Columbia County GA 2025 Long Range Transportation Plan 2004 summarize elements related to bicycle and pedestrian planning in the ARTS region: "Columbia County currently has two multi-use trails for bicyclists and pedestrians recognized in the Georgia Department of Transportation Statewide Bicycle and Pedestrian Plan. The longer of these two facilities is the Augusta Link Corridor. It travels east-west across Columbia County in seven segments from McDuffie County to Richmond County covering approximately 19.6 miles. Three segments of this trail, totaling 4.7



miles, are part of the Georgia State System. The second multi- use trail in Columbia County is Phase I of the Evans-to-Locks Road facility. This first phase of the trail extends from Savannah Rapids Pavilion to Fury's Ferry Road.

Columbia County is currently developing priorities for enhancing their bicycle and pedestrian facilities. The County's goal is to provide a bicycle and pedestrian network to serve the local and regional needs of the communities. It is also the intent of the County to promote these facilities as a safe and healthy transportation option throughout the region for potential users." (Page 33)

"There are several activity centers that do not have adequate facilities for bicycles and pedestrians. These activity centers include recreation sites, schools, libraries and commercial development areas. A one mile buffer was placed around these facilities to prioritize areas for bicycle and pedestrian improvements.

Criteria were developed to identify and prioritize potential bicycle and pedestrian enhancements beyond those established as part of the ARTS Bicycle and Pedestrian Plan.

Key bicycle and pedestrian evaluation criteria include:

- Proximity to Schools and other Public Facilities;
- Infill – Connecting existing pieces of the sidewalk network;
- Connectivity – Access between major bicycle and pedestrian origins and destinations;
- Roadway Expansion – Where roads are reconstructed or constructed along new alignments, provide sidewalks as appropriate;
- As new development occurs, encourage development to provide adequate right of way for bicycle and pedestrian facilities; and,
- Consistency with the GDOT Statewide and ARTS Bicycle and Pedestrian Plan". (Page 71)

Columbia County Growth Management Plan: Partial Update 2011-2016

Intended to serve as a bridge between the 2005 Columbia County Growth Management Plan and the future, the update requirements adopted by the Georgia Department of Community Affairs in 2007 "make it easier for local governments to educate and engage the public as well as cultivate that type of development that creates communities of lasting value. As Columbia County looks towards the future, it is important to have an up-to-date policy guide that can reflect the community's vision." (Page 2)

As part of the Columbia County Growth Management Plan: Partial Update Quality Community Objectives Assessments are conducted, Issues and Opportunities are identified, and the Implementation Program is identified. (Page 2)

The Quality Community Objectives Local Assessment was created "to assist local governments in evaluating their progress towards sustainable and livable communities…A majority of "yes" answers for an objective may indicate that the community has in place many of the governmental options for managing development patterns. "No" answers may provide guidance in how to focus planning and implementation efforts for those governments seeking to achieve these Quality Community Objectives." (Page 5)

Identification of Issues and Opportunities – Columbia County developed the issues and opportunities based on eight main planning elements. These include population, economic development, housing, Natural and Cultural Resources, Community Facilities and Services, Transportation System, and Land use. (Page 16 – 19-8)

Issues and opportunities identified as they related to bicycle and pedestrian plan development include:

"**Population** – Reliable and adequate funding needs to be secured to ensure the delivery of basic services to our growing senior population. (Nutrition, Recreation, Transportation, etc.)

Economic Development – Collaborate on a multi-jurisdictional level to promote tourism throughout the region.

Houses – encourage housing development to locate in areas convenient to shopping, recreation, facilities, schools and other community activities.

Natural and Cultural Resources – Future development will impact viewsheds across the county due to topographical variability found throughout the jurisdiction.

- Nominate eligible historic resources to the National Register.
- Prioritize historic resources for preservation and enhancement.
- Continue to implement the County's existing Green Space Plan.

Community Facilities and Services – Continued support of the public library system and other cultural facilities to ensure adequate service is provided to existing and future populations.

- Continue to support the preservation and enhancement of cultural facilities throughout the county.

Transportation System – Upgrade and expand existing transportation facilities, especially the street network, to accommodate future growth in the most efficient manner.

- Improve the mobility of pedestrians and bicyclists throughout the county.
- New developments are not required to connect to existing sidewalk networks. They are encourage (not required) to provide sidewalks within the development." (Pages 16-17)

Landuse – Some of the Landuse Opportunities and Constraints are as follows:

Opportunities:

- "Elected officials have a positive attitude with regard to the need for planned development of the county that will enhance the quality of life.
- Columbia County enjoys excellent access to regional recreation amenities such as Thurmond Lake and the Savannah River.
- Columbia County is located just far enough from Augusta to provide a relaxed lifestyle, facilitating creation of a unique community identity.
- There is an abundance of undeveloped land within the county. Almost two-thirds of the land area is undeveloped or in agricultural use." (Page 29)

Constraints – Current development patterns, …contributing to increased traffic congestion…erodes quality of life in the county and effectively poses as a drag on new development.

- There is significant floodplain acreage within the county, particularly along Kiokee, Little Kiokee, and Euchee Creek all well as adjacent to Thurmond Lake and the Savannah River.
- A significant portion of the lakefront is controlled by the Corps of Engineers." (Pages 29-30)

Implementation: Long Term Goals and Supporting Policies

Some of Columbia County's long term goals and supporting policies will have direct or significant impact on the development of an adequate bicycle and pedestrian infrastructure. Some of these are as follows:

Goal 1: "Coordination with Other Government Entities- Columbia County will maintain and enhance planning processes that ensure coordination across county departments, local service providers, surrounding municipalities and the general public.

- Coordinate planning and development review with the Columbia County Board of Education.

a) The planning department should have the opportunity to review and comment of school facility location and expansion plans.

b) School placement should reinforce desirable growth patterns as outlined in the Growth Management Plan.

c) The planning department and the Board of Education should coordinate on the reuse of former school sites.

Goal 2: Diversity the housing stock and provide quality housing opportunities reflecting the variety of lifestyle and life stages of Columbia County residents.

- Protect residential areas from encroachment by incompatible uses and adverse environmental conditions.

a) Develop enhanced lighting, signage, landscaping and buffering standards for new non-residential developments in close proximity to existing residential neighborhoods.

- Promote and encourage residential densities and designs that ensure varied living areas and housing types and an integration of uses.

a) Enhance the planned development character of the Kiokee Creek Character Area with the provision of open space and public squares, landscaped medians, protection of trees and an emphasis on Traditional Neighborhood Development in appropriate locations within master planned developments

b) Promote interconnectivity within and between subdivisions to allow the diffusion of traffic patterns

c) Require multiple entrances and exits to increase neighborhood connectivity.

d) Develop sidewalk requirements based on residential densities and proximity to nodes.

- Address the housing needs of an active aging population.

e) Explore regional and national trends and tools for providing appropriate housing choices for an active aging population.

- Require a reasonable portion of all residential development to be set aside for neighborhood level recreation areas.
- Enable people to work near where they live, and live near where they work.

f) Distribute office employment to all of the identified nodes.

g) Require mixed use for large commercial projects.

h) Require mixed use for large residential projects.

- Increase variety of housing opportunities

a) Identify additional land in nodes and between nodes for multi-family housing.
b) Develop appropriate design standards for multi-family housing development that encourages walking and biking and provide recreation opportunities.
c) Develop appropriate design standards for multi-family and townhouse developments.

Goal 3: Economic Development- Diversify, strengthen and sustain the economic base of Columbia County consistent with the prudent management of the county's environmental resources and infrastructure.

- Create opportunities for tourism

i) Consider enhancements to Lake Thurmond and/or Wildwood Park, such as a lodge retreat center.

j) Coordinate tourist- oriented improvements and marketing with the Augusta Canal National Heritage Area.

Goal 4: Historic Resources –Protect, enhance, and promote the historic identity and resources of Columbia County.

- Create and inventory of possible historic properties, their ownership, location, condition, and National Register status.

k) Apply for historic district status where appropriate such as Appling.

l) Apply for National Register status for historic buildings where appropriate.

Goal 5: Natural Resources –Protect and nurture the natural environment of Columbia County.

- Pursue Columbia County's Greenspace Master Plan, in order to serve recreational needs and protect sensitive lands.

m) Pursue the greenway network identified in Columbia County's Greenspace Master Plan.

n) Purchase and/or protect floodplains from development.

o) Provide connections between neighborhoods, nodes, and recreation areas with inter-linked greenways.

- Protect the tree cover and open space in urbanizing areas of county

p) Enhance minimum open space requirements for different development types.

q) Review the County's current landscaping and tree conservation regulations to see if they are adequate to limit unnecessary clear cutting and tree removal during the land development process.

- Protect scenic corridors that contribute to the County's unique character and aesthetically pleasing image.

r) Indentify current scenic corridors that are appropriate for protection.

s) Create a corridor preservation plan for scenic corridors according to public priorities and the guidance of Character Areas from the Growth Management Plan.

Goal 6: Transportation – Provide a transportation system that continues to keep pace with growth, mitigates congestion, and integrates various modes of travel in order to allow mobility options, promotes sustainable economic development and protects the natural and cultural resources of Columbia County.

- Increase bicycle and pedestrian access and mobility both County-wide and within nodes and corridors

t) Promote bikeway and pedestrian systems that connect from residential areas to nodal developments

u) Establish a formal network of designated bicycle and pedestrian pathways throughout the County. The county's planned Greenway system should be a part of this network.

v) Pursue pedestrian and bike facilities alongside major thoroughfares and designated corridors to provide these facilities where feasible.

w) Require new development to connect to the County's existing and planned greenway, pedestrian, and bicycle system.

x) Require sidewalks in higher density subdivisions, and encourage sidewalks in all developments.

y) Increase pedestrian and bike access within multi-use nodes.

z) Pursue a comprehensive pedestrian network within nodal developments.

aa) Enforce maximum block lengths in nodes.

ab) Establish minimum bike parking requirements for all commercial within nodes. For example, require one bike space per 20 parking spaces

ac) Encourage reduced and/or shared parking requirements within nodal developments.

ad) Designate and develop safe street crossing for both minor roads and arterials within nodes.

Goal 7: Community Facilities and Infrastructure - Ensure the provision of community facilities and services following the nodal development pattern that supports efficient growth and will protect and enhance the quality of life for existing and future residents of Columbia County, while maintaining existing neighborhoods and preserving the rural character prevalent in the western half of the county.

- Create a system of accessible open spaces that serves various recreational needs of county residents.

ae) Make the greenway plan an integral part of the County's land use plan.

af) Develop a connected greenway along creek basins with public access points to Lake Thurmond, the Savannah River, and the Augusta Canal.

ag) Develop public/private partnerships to maintain neighborhood parks.

ah) Enable and encourage Conservation Neighborhoods that would allow reduced lot sizes in order to protect valuable open space assets and environmentally fragile areas.

ai) Enhance the character and livability of nodes

aj) Encourage pedestrian connections within nodes and between nodes and between neighborhoods and nearby schools.

ak) Develop design overlays for nodes to establish a unique identity using architectural guidelines, sidewalk requirements, street trees, lamps, street furniture and other urban design features

al) Enhance the urban character of nodes with the provision of small open spaces and public squares within development, the protection of trees and the promotion of landscaped medians.

Goal 8: Future Development Policy – Focus and direct future growth and development in clearly identified nodes and corridors, thereby maximizing the use of existing and efficient and economical provision of additional county services to discourage sprawl.

- Make planned nodal developments pedestrian friendly and encourage circulation patterns that do not depend solely on arterial circulation.

am) Require wide sidewalks with setbacks from the street.

an) Increase pedestrian infrastructure.

ao) Require short block lengths within the nodes.

ap) Require large parking lots to be subject to the block size requirements and provide internal circulation.

aq) Require buildings to be street-oriented along internal streets where appropriate.

ar) Reduce parking requirements for individual uses that include shared or joint parking areas within the planned development.

as) Allow on-street parking in designated areas.

at) Require identification of pedestrian access between parcels and to and from greenways with all site plans within a node.

au) Require commercial areas to provide internal circulation systems.

- Develop enhanced design and site development standards for all types of development, including landscaping, buffering, screening, site placement , and sidewalks.
- Create urban design standards for nodes to promote pedestrian friendly development and high quality public spaces.

av) Establish usable space requirements for development in nodes.

aw) Establish landscaping, buffering, and tree protection requirements in key nodes and corridors.

ax) Establish signage controls as necessary for key nodes and corridors.

ay) Develop a recommended timing plan with measurable milestones for the implementation of nodal infrastructure.

Edgefield County SC Comprehensive Plan

Edgefield County is located directly west of Aiken County. A predominantly rural county, Edgefield is facing growth pressure from surrounding counties, including Aiken. Within the Comprehensive Plan, the relevant element of importance to bicycle and pedestrian planning is the Transportation Element. The Goals are as follows:

- Support safe and efficient alternatives for travel in the county
- Protect the public health, safety and general welfare

Local Municipality Plans

The Westobou Vision Master Plan (Augusta and North Augusta Urban Area) 2009

The Westobou Vision 2009 Master Plan was created "to develop and realize a shared vision, for both Augusta and North Augusta, of what this location…can become and what it can provide…whether they want to enjoy it as a place to work, live or play." (Page 3)

The plan suggests the development of several market creation projects within the urban areas, but suggestions were also made for initiatives that should be pursue within the broader framework of the urban area. Some of these improvements include the following:

Integrated Green Corridors and Nodes – The Westobou Plan states that "Public open space is the loom upon which Westobou's urban design plan is woven." With a critical component being the "connection via greenways, bike routes and streetscaping," It recommends not only the renovation of existing parks, but the creation of new parks and plazas. (Page 21)

Relocation/Modification/Removal of Problematic Public Infrastructure – The Westobou Plan highlights the need to address issues of problematic public infrastructure such as "highway interchanges, the eastern end of the J.C. Calhoun Expressway, and the railroad rights-of-way." (Page 21)

Comprehensive Transportation Planning Review – The plan recommends adjustments and improvements to the existing roadway networks, review of public infrastructure, as well as development of Bicycle and other alternative means of transportation in the urban area. (Page 21)

Augusta Public Transit Development Plan 2009

With the placement of bike racks on all of Augusta Public Transit buses in the last year, the transit system in Augusta provides an alternative for trip extension for those that not only walk, but also for those that use bicycles as an alternative mode of transportation.

Therefore, some of those goals listed in the recently completed Augusta Public Transit Development plan are directly related to the increased effectiveness of an improved bicycle and pedestrian infrastructure.

The recommended goals and objectives are as follows:

"Goal 1: Augusta Public Transit shall provide a family of services for the residents of Augusta Richmond County that: connects key activity centers, serving as the foundation for the system; provides transportation alternatives to those who lack other options, including elderly persons, persons with disabilities, students, and economically disadvantaged persons; and allows for system expansion to serve new markets and opportunities.

- Objective 1.1: Develop a core group of services that connect key activity points and commit to providing service along those corridors that as the primary objective.
- Objective 1.2: Establish goals of providing a minimum of thirty minute headways for all fixed route services and minimizing out of direction and one-way loop routing.
- Objective 1.3: Review all services to evaluate how the needs of the transportation disadvantaged, using the federal definition which includes seniors, people with disabilities and those with low income, are being addressed as a second objective.
- Objective 1:4: Consider the impact on core services and those to the transportation disadvantaged as part of requests for new or expanded services.

Goal 2: Augusta Public Transit shall provide safe, reliable and accessible transportation to the residents of Augusta Richmond County.

- Objective 2.1: Ensure that services are operated in a manner to maximize safety, to the riders and the public.
- Objective 2.2: Operate service in a manner that will maximize the reliability of those services.
- Objective 2.3: Consider potential for services to connect portions of the

community and include a variety of trip purposes: work; education; medical and other appointments; and recreation and leisure activities.

Goal 3: Augusta Public Transit shall work cooperatively with local communities, residents, and other affected agencies and groups to develop the best possible family of services within available resources.

- Objective 3.1: Develop an ongoing planning process with key agencies and organizations within Augusta Richmond County and neighboring service providers.
- Objective 3.2: Operate the agency in a manner that will encourage public input and participation.
- Objective 3.3: Ensure high levels of customer satisfaction.

Goal 4: Augusta Public Transit shall consistently work to improve its operating efficiency and service delivery effectiveness.

- Objective 4.1: Operate service in a manner that will maximize system productivity.
- Objective 4.2: Operate service in a manner that will maximize system efficiency.
- Objective 4.3: Operate service in a manner that will maximize use of subsidies." (Pages 4-18 & 4-19)

Realizing the Garden City: The Augusta Sustainable Development Agenda 2010

"The Augusta Sustainable Development Agenda (ASDA) originates from a sense within the city leadership that, more than a decade after consolidation with Richmond County, the diverse parts of the enlarged city had not yet coalesced into a unified community with a common and sustainable vision of how Augusta should evolve….." Built on Augusta's 2008 Comprehensive Plan, "this Agenda sets goals and then identifies, describes and prioritizes a set of discrete and accompanying policy recommendations on which the city should collaborate, both internally and with the state, local institutions and the private sector in the coming years." (Page 1-2, Executive Summary)

There are a number of policies outlined in Appendix 2: Recommendations for a Sustainable Augusta that have direct bearing on the character and development of bicycle and pedestrian facilities in the city. Some of these policies include:

- Integrating Green Infrastructure Analysis into the Development Approval Process – "Green Infrastructure is a pedestrian accessible interconnected network of natural resources, recreation resources and other open spaces…..Green Infrastructure seeks to insure that ecological functions continue to exist after development has happened." (Page 4-17) "This Agenda proposes that the city evaluate all new development proposals against how they support and enhance Augusta's Green Infrastructure network. A simple and strategic step for enhancing the quality and accessibility of Augusta's natural resources is to require a Site Context map, Existing Resources map, and Site Visit during the Sketch Plan review stage." (Page 4-26)
- Creation of Walkable Subdivision Neighborhoods – "Walkable Subdivision regulations should include the following urban design guidelines:

- Lot frontage requirements and situating guidelines to encourage a well designed 'street wall'.

- Allowance for alternative housing layouts, such as cottage subdivisions and subdivisions consisting entirely of attached housing,

- Requirement of alleyway access, to further protect the aesthetic value of the lot face.

- Maximum block lengths of 600 feet, with pedestrian connections easements required every 300 feet, or block perimeters not to exceed 2000 feet.

- Minimum sidewalk widths of 5 feet and a green zone of 5 feet, to ensure adequate room for pedestrian movement and greenway planting.

- Requirements for enhanced street design standards, as defined in the next chapter to ensure Complete Streets, which takes pedestrian accessibility into account.

- Urban parking requirements, with allowances for on-street parking and specific reduced off-street parking ratios." (Page 4-36)

- The Modification of Existing Land Subdivision Regulations – In addition to modifying overall development regulations triggers, and requiring more extensive environmental analysis. The ASDA also suggests including two new types of subdivision standard:

- "Conservation Subdivisions that reflect an outdoor lifestyle connection.

- Walkable Subdivisions, suggesting an urban lifestyle centered on convenience and community gathering." (Page 4-38)

- Requiring Street Connectivity – The ASDA suggested imposing general development design standards such as:

- "1. A proposed development shall provide multiple direct connections in its local street system to and between local destinations, such as parks, schools, and shopping, without requiring the use of arterial streets.

- 2. Each development shall incorporate and continue all collector or local streets stubbed to the boundary of the development plan by previously approved, but unbuilt development or existing development." (Page 4-39)

- The Application of a Context Sensitive Solutions Classification Approach - The ASDA suggests applying a context sensitive design approach for different thoroughfare types. "The idea of the CSS method is to use these context zones as an important factor to select a roadway type in conjunction with the functional classification to insure that each roadway design is supportive of the area and context it is intended to serve." (Page 4-48)

North Augusta Riverfront Redevelopment District Master Plan 1996

This plan proposed a Greeneway network, using new and existing streets, comprised of dedicated bicycle and pedestrian routes. The plan identified regional connections, including those from South Carolina to Georgia via the Savannah River, including a connection to the canal bikeway system on or under the Georgia Avenue Bridge. One other potential connection recommended was the former rail bridge between Hamburg and Augusta near the Fifth Street Bridge. Several of these segments have since been implemented.

North Augusta Community Needs Assessment 2003

This assessment was performed in conjunction with a Parks and Recreation Facilities Master Plan. Residents were surveyed regarding their bicycling and walking priorities. The top four park or facility types cited as being used most often were:

- Walking/biking trails/parks
- Riverview Park Activities Center
- Playgrounds
- Access to water bodies such as creeks and rivers

The top four additional facilities requested included:

- Walking and biking trails
- Recreation/activity center
- Playgrounds
- Water access

The top five facility improvements that survey respondents would support with tax dollars were:

- Continuing the northern Greeneway expansion
- Increasing visibility of law enforcement in parks
- Addition of swimming pools
- Creating walking, jogging and biking trails
- Lighting of facilities

North Augusta Parks and Recreation Facilities Master Plan 2003

Recommendations related to walking and bicycling include:

- Develop approximately 6-8 miles of new Greeneway and 6-8 miles of bikeway trails
- Expand the width of the Greeneway Trail
- Increase the number of connections with schools and other public use areas (all parks should be connected via the Greeneway)
- Develop paths along the river for viewing and interacting with the water

City of North Augusta Comprehensive Plan 2005

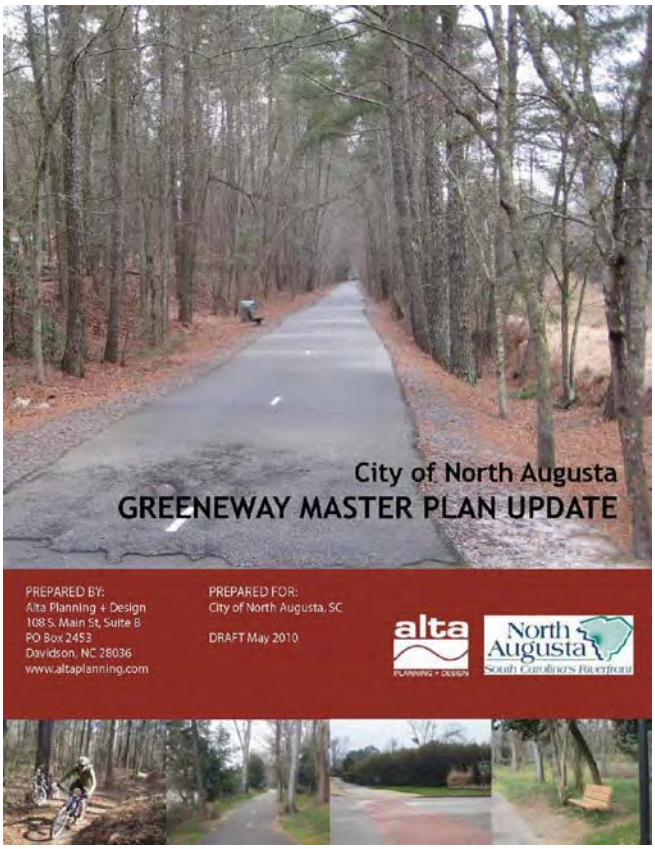
The following excerpts are relevant to the ARTS/ Aiken County Bicycle and Pedestrian Plan.

Greeneway: Greeneway extensions are major tributaries to the main Greeneway Trail. Extensions will be developed to tie substantial pedestrian and bicycle neighborhoods and parks that include their own internal pedestrian circulation systems to the citywide system. Greeneway connectors are shorter and generally narrower segments of trail that tie existing neighborhoods to the Greeneway Trial. Both Greeneway extensions and Greeneway connectors will utilize drainage ways include the Boeckh Ravine system.

Sidewalks: a relatively extensive network of sidewalks is present with the older areas of the City, but there are very few in newer neighborhoods and commercial centers. Sidewalks are located along some sections of arterial and collector roads but do not complete a network that pedestrians can utilize. Sidewalks are noticeably absent in the vicinity of public schools.

Goals and Objectives: these goals and objectives are relevant to the ARTS/Aiken County Bicycle and Pedestrian Master Plan.

1. Consider development regulations that require all new residential and commercial developments to install sidewalks and Greeneway extensions and connectors and to provide for adequate internal vehicular and pedestrian circulation, and external vehicular and pedestrian connectivity to adjacent developments, subdivisions and the Greenway (5.14.9)
2. Implement the citywide Greeneway Bicycle and Pedestrian Master Plan that included the primary Greeneway system, Greeneway extensions and connectors, multi-purpose trails adjacent to arterials highways, sidewalks and share-the-road bicycle lanes. The plan will emphasize and prioritize connections to parks, school, commercial areas, churches and other public facilities and is designed to ultimately connect every neighborhood and commercial area in the City. (5.14.10)
3. Continue the program of retrofitting existing streets to provide a citywide sidewalk network where reasonable, economically feasible and regular use will occur. (5.14.12)
4. Evaluate "downsizing" or narrowing existing streets, including some collectors and arterials, to calm traffic and make them more pedestrian friendly where road and lane width is not necessary to carry current and projected traffic volumes (5.14.20)
5. Cooperate with Augusta-Richmond County, Columbia County, Aiken County and the Augusta Canal Authority to provide interstate connections between the North Augusta Greeneway system, Augusta Riverwalk, the Augusta Canal Bikeway system and the Columbia County Bikeway System. (5.14.22)
6. Modify the subdivision and street design and construction standards to include minimum standards for street widths, block lengths, cul-de-sac lengths, street connectivity, trees, Greeneway and other pedestrian connections, sidewalks (a minimum of 5 feet wide) and driveways. (6.13.9)
7. Develop design standards and regulations for sidewalks and street to ensure safety and mobility for pedestrians and bicycles. (9.13.12)



North Augusta Greeneway, Pedestrian and Bicycle Master Plan 2011

This Plan proposes improvement projects that will create a comprehensive system of on-street and off-street bicycle and pedestrian improvements, including Greeneway trails, multi-purpose trails, bike lanes and bike routes.

The North Augusta Greeneway is a public multi-use trail, 13 miles in length and initially developed as a "Rails-to-Trails" project. Its unique name honors former North Augusta Mayor Thomas Greene, who was instrumental in the trail's creation. The current Greeneway network includes a number of extensions and connections to public facilities and neighborhoods and a five mile section that parallels the recently completed Palmetto Parkway (I-520).

Residents of North Augusta and the region who utilize the Greeneway speak highly of the City's trail system. While the Greeneway does provide excellent recreational opportunities, it is not directly connected to many desirable destinations in the community. Pedestrian and bicycle connectivity creates a more walkable community and can provide for alternative means of transportation as well as reduce dependency on automobiles. Improved connectivity will provide a circulation system that is more functional and safer.

City objectives for the Greeneway, Pedestrian and Bicycle Master Plan are continued expansion of the trail with additional connections to neighborhoods, parks, schools, the new Palmetto Parkway segment, and further out into Aiken County, the City of Aiken and Richmond and Columbia Counties in Georgia.

City of Aiken 2010 Strategic Plan

This booklet contains action items based on the premise of the first strategic plan, created in 1992 "How would we survive a major reduction in the work force at the Savannah River Site?" Since 1992, the Strategic Plan has been continually updated, with the last version created in 2010. The short term action items listed within the plan are those that were perceived to be most immediately important to the citizens of Aiken. The plan establishes long term goals by phasing in larger projects over multiple budget years. The following short and long term goals are in line with the goals and objectives of the Bicycle and Pedestrian Plan.

Table A-4: City of Aiken Strategic Plan Short and Long-Term Goals

Key Concern	Short Term Activities	Long Term Activities
Support Families and Family-Related Activities		Build more bicycle paths to connect with those already constructed
		Continue to install lighting, curbing, sidewalks and landscaping in appropriate areas of the city
Promote Environmental Stewardship	Re-establish the City Arboretum Trail	Interconnect our parkways with pedestrian friendly walkways
	Promote alternative modes of transportation	
Connect Our Parkways with Pathways	Use results of our pilot Green Infrastructure Project to identify opportunities to interconnect our parkways	Support a feasibility study for most efficient means to connect our parkways
	Study communities' efforts to establish pedestrian-friendly infrastructure for city green spaces and pathways	Phase in, over several cycles, amenities that make our parkways pedestrian friendly
		Build additional bike paths
Transportation Opportunities	Find alternative transportation choices and promote them	Find alternatives to merely widening roads that are more cost effective

City of Aiken Greenways Plan 1994

Major corridors recommended for greenways/separate paths include a ring around the city comprised of SC HWY 118 and East Pine Log Road. Additional greenway recommendations are as follows:

Road Name	From	To
Audubon Drive	Two Notch Road	Powder House Road
Park Avenue	Hayne Avenue	Union Street
South Boundary Avenue	York Street	Fairfield Street
Gregg Avenue	Hudson Road	Seneca Road
University Parkway	Medical Park Drive	SC HWY 118
Silver Bluff Road	Sirius Drive	Hitchcock Parkway
Dougherty Road	Silver Bluff Road	Spaulding Drive
Whiskey Road	Eastgate Drive	Hillbrook Avenue
South Aiken Lane	Whiskey Road	East Pine Log Road

Please note that this plan has not been updated in 17 years and was not adopted by Council.

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Appendix B

Policy and Ordinance Review

Overview

The following pages outline an extensive review of existing local and regional policies, codes, and ordinances conducted for individual counties within the ARTS MPO. The purpose of this review is to highlight existing local policies that support bicycle and pedestrian friendly practices as well as identify those which could be improved. For policies and regulations that are identified as needing improvement, suggestions have been made that if carried implemented, would help to improve the safety, ease, and functionality of the ARTS bicycle and pedestrian network.

Topic	Jurisdiction				
	Augusta/Richmond	Columbia County	City of North Augusta	City of Aiken	Aiken County
1. DEFINITIONS					
1.1. Does "Street" definition include pedestrian and cyclist reference?	No. Street types are described primarily in terms of their vehicular function.. "STREET" shall mean a public thoroughfare, where public title to land extends between right-of-way lines. Whenever the sense of the law or these regulations so require, the word "Street" shall include avenue, drive, circle, road, highway, or similar terms as they are generally understood." (CZO, Land Subdivision Regulations) " Right-of-way. A strip of land over which Augusta, Georgia has the right, by ownership or otherwise to construct a public street, sidewalk, or use for public utilities." (Tree Ordinance)	No. Street types are described primarily in terms of their vehicular function. *"Street.* The term "street" shall be construed to embrace streets, avenues, boulevards, roads, alleys, lanes, viaducts and all other public highways in the county." (Code of Ordinances (CO), Chapter 1, Section 2)*"Street*, collector, means a major street used for traffic of moderate speeds and high peak volumes between land service streets and arteries, or serving as principal entrance streets or primary circulation routes within a neighborhood or other limited area; control of access from abutting properties warranted, but to a lesser degree than arteries." (CO , Chapter 74 Section 3) *"Street, land service,* means a minor street used for traffic of relatively low speeds and volumes, and for primary access to abutting properties; access controls not necessarily warranted, but through-traffic should be discouraged by the street design." (CO , Chapter 74 Section 3)	No, not in the official definition section, but elsewhere pedestrians and cyclists are recognized as street users. "Street - Any street including Local, Subcollector, Collector Street or Arterial Street as defined in Article 14." (CDO) *ß Each classification has its own definition, primarily defined via ADT. "Local" streets are the only ones that mention pedestrians.* "Road, Street or Thoroughfare - The full width between property lines bounding every public way of whatever nature, with a part thereof to be used for vehicular traffic" (CDO) "The road system shall respect the function of streets as the shared domain of drivers, pedestrians and bicyclists. Street widths shall be adequate to accommodate vehicles and emergency services, but not excessively wide so as to encourage speeding. To the extent possible the street system shall incorporate pedestrian amenities including sidewalks, center medians, landscaping strips between the curb and sidewalk, street trees and narrow intersection radii so as to improve the walkability of the streetscape." (CDO, Section 14.2.1.)	No. Street types are described primarily in terms of their vehicular function or in relation to edges. "Road, Street, or Thoroughfare: A public or private right-of-way located on an approved plat used primarily for vehicular traffic" (Land Development Regulations) "HIGHWAY; STREET; ROAD: The entire width between right-of-way or boundary lines of a public way open for vehicular travel" (Zoning Regulations)	No. "Any publicly- or privately-maintained thoroughfare (drive, avenue, circle, or boulevard) or space more than 18 feet in right-of-way width which has been dedicated, deeded or designated for vehicular traffic. The term is synonymous with 'road'. The term does not include driveways." (Aiken County Land Management Regulations (LMR))
1.2 Definition of Sidewalk	"Sidewalk: That portion of a street or road available exclusively for pedestrian traffic" (Land Subdivision Regulation, only)	"The term "sidewalk" shall mean any portion of a street between the curbline and the adjacent property line intended for the use of pedestrians, excluding parkways" (CO , Chapter 1 Section 2)	None	"SIDEWALK: A paved or surfaced area, paralleling and usually separated from a public or private street, used as a pedestrian walkway." – (Zoning Regulations)	None
1.3 Definition of Bicycle	None	None	None	None	None
ASSESSMENT	**Needs improvement**	**Needs improvement**	**Needs improvement**	**Needs improvement**	**Needs improvement**

Topic	Jurisdiction				
	Augusta/Richmond	Columbia County	City of North Augusta	City of Aiken	Aiken County
2. STREET ELEMENTS AND CONFIGURATION					
2.1. Pedestrian accommodations (sidewalks, crosswalks, etc) required during new development or redevelopment	Not for all streets, and not for redevelopment. "Sidewalks shall be required at various locations in Augusta-Richmond County depending on location in urban areas and proximity to other public facilities in sub-urban and rural areas. Sidewalk requirements shall be determined by the City Engineer. Additionally, sidewalks are allowed in subdivision developments as desired by the owner. Design and construction of sidewalks, ramps, etc. shall be accomplished in accordance with the ASSHTO Green Book and Americans with Disabilities Act (handicap ramps, etc.)" (Land Subdivision Regulations, Section 7.0.1) "Sidewalks must be provided for on any existing arterial or collector street that is part of any subdivision plan that is adjacent to an existing street that is classified as an arterial or collector in the Highway Functional Classification System within the Augusta-Richmond County Urbanized Area as defined by the Augusta Regional Transportation Study. Where installed, sidewalks shall meet the construction standards of the Traffic Engineer." (Land Subdivision Regulations, Section 404 A)	No, though the PUD zoning district encourages these accommodations through the rezone process and by administrative request. (CO Chapter 90 Section 94) Specifically, "Sidewalks may be required where deemed by the planning commission as an integral part of a pedestrian traffic system within a one-mile radius of existing or planned schools, neighborhood recreation or commercial areas or other public places. Where provided, sidewalks shall be located not less than one foot from the property line to prevent interference or encroachment by fences, walls, hedges or other plantings or structures placed on the property line at a later date." (CO Chapter 74 Section 117(d))	Yes. Conservation Subdivision and TND "Use Patterns" require a sidewalk & pedestrian circulation system. All new streets (except alleys, lanes, and rural streets) must have sidewalks on both sides. Arterials under the purview of the SCDOT (subject to "Conventional Street Design") may or may not have sidewalks, depending on the specifications of the SCDOT.	Yes, on both sides of new arterial or collector roads. Not required on new local streets, unless within 1.5 miles of a school or park.	"Sidewalks shall be required on one side of each street in all subdivisions with 50 lots or more with an average lot size of one half acre or less. Sidewalks also may be required by the Planning Commission to continue an existing walk in an adjacent subdivision or along an existing street to access nearby schools and/or public recreation areas." In regards to Multifamily Housing, Residential Care Facilities, Group-occupied Dwellings, Townhouses, Duplexes, Triplexes, and Quadruplexes: "pedestrian facilities such as sidewalks shall be provided to connect structures and amenities. Connections must be provided to any existing adjoining pedestrian facilities. Sidewalks shall meet the construction standards specified by Section 7.15." (Sections 3.11 and 3.12, 2011 LMR).
2.2. Bike accommodations (bike lanes, shoulders, racks, etc) required during new or redevelopment	No, not required via guideline or regulation.	No.	Yes. All collectors and arterial street classifications plus rural streets have bike lanes specified. Other streets are expected to operate in a shared condition. "Applicants may also provide separate routes for bicyclists in lieu of a bike lane. Bike lanes shall connect with segments of the Greeneway system that are within the proposed development. Bike lanes shall conform to the minimum widths specified in Table 14-5, Bikeway Design Width" (SOURCE)	No, not required via guideline or regulation.	No, not required via guideline or regulation.

Topic	Jurisdiction				
	Augusta/Richmond	Columbia County	City of North Augusta	City of Aiken	Aiken County
2.3. Sidewalks or bike accommodations required by roadway type	No. Roadway types are oriented entirely towards vehicle mobility ("arterial", "collector", local", etc) Sidewalks are not required for any particular cross-section within the specified road hierarchy.	No.	Yes, see above.	Yes (sidewalks only), though roadway types are insufficient and are oriented entirely towards motorized vehicle mobility ("arterial", "collector", local", etc)	No.
2.4. New sidewalks, bike lanes, greenways, etc., connect to existing facilities	No, not required via guideline or regulation.	Listed as preferable, but not required.	Yes. "Subdivisions adjoining the Greeneway or a bikeway shall provide sidewalks with a minimum right of way of twenty (20) feet that connect the lots internal to the subdivision to the Greeneway or bikeway"	No, not required via guideline or regulation.	No.
2.5. Cross-Access between adjacent land parcels	No, not required via guideline or regulation.	Preferable, but not required. "In the opinion of the planning commission where it is necessary to provide for street access to adjoining property, proposed streets shall be extended by dedication and improvement of right-of-way to the boundary of such property. " "Unless approved otherwise by the planning commission, a subdivision shall provide a street connection to each public street that it adjoins, and shall provide direct or indirect continuity through the subdivision between each connection" (CO Chapter 74 Section 79(c)(1-2)	Yes. "Stubouts for future road connections to adjoining vacant parcels shall be provided where practicable". In commercial re/development areas, parking areas shall connect to each other. Also, provision of cross-access is the highest-ranked mitigation measure in response to Traffic Impact Analyses (CDO 8.7.2)	Land development regulations include the following provisions which may discourage walkability and easy access: - Curvilinear roads shall be used in residential subdivisions to the maximum extent feasible. - Local roads shall be designed to discourage through traffic. (LDR 5.6.2)	Yes "Proposed streets shall be coordinated with the existing street system in the surrounding area and, where possible, shall provide for the continuation of existing streets abutting the development. Existing roads shall be continued at the same or greater width, but in no case shall be less than the width required by the provisions of this Chapter." (7.3.2, 2011 LMR) In reference to the Traffic-Impact Study required by new, large developments: "The traffic-impact analysis also shall assess the connection of the property to adjoining properties. Where the use, scale of development, or size of adjoining properties is such that trips would be anticipated between the proposed uses and the other properties, the analysis shall make recommendations on interconnections. The analysis shall recommend interconnections to provide a smooth flow of traffic between uses along arterials and collector roads to ensure that as much traffic as possible uses secondary roads and other interconnections rather than major roads for short trips." (10.10.7 2011 LMR)

Topic	Jurisdiction				
	Augusta/Richmond	Columbia County	City of North Augusta	City of Aiken	Aiken County
2.6. Block size	No guidance.	"Length. Blocks shall not be less than 400 feet, nor more than 1,200 feet in length, except as the planning commission considers necessary to secure efficient use of land or desired features of street patterns. In blocks greater than 800 feet in length, the planning commission may require at locations it deems necessary one or more public crosswalks of not less than ten feet in width to extend entirely across the block, or pedestrian easements in lieu thereof. (See CO Chapter 74 Section 81(a)	TND: Average length of 400', maximum length of 700'. A link/node connectivity ratio is also used.	Block sizes are too large for walkability. Access management would be better addressed through specifying intersection control spacing. From Zoning Ordinances, 5.2.1 Residential areas: 600-2000' Along "Major Arterials": minimum of 1000' For blocks longer than 600', easements may be required for utilities or walkways (min 4' in width)	"(A) Block lengths shall be appropriate to topographic conditions and density to be served, but shall not exceed 1,200 feet in length, or be less than 300 feet in length. (B) Blocks should be of sufficient width to allow for two tiers of lots of appropriate depth, except where reverse-frontage lots are required along a major street, or where prevented by size, topographical conditions, or other inherent conditions of the property." (7.10.1, 2011 LMR)
2.7. Dead end streets	"Dead-end streets designed to be so permanently, shall not be longer than one thousand (1,000) feet except where land cannot be otherwise subdivided practicably... Dead-end streets intended to be continued at a later time shall be provided with the same turn-around as required for a permanent dead-end street, but only that portion to be required as right-of-way when the street is continued shall be dedicated and made a public street" – Land subdivision Regulations	"To the greatest extent practical, cul-de-sacs should be avoided in favor of loop streets or a curvilinear or grid system of streets." (CO Chapter 74 Section 79(c)(4)Culs-de-sac. Culs-de-sac shall not be more than 700 feet long unless necessitated by topographic or other conditions and approved by the planning commission. Such streets shall be provided at the closed end with a turnaround having an outside roadway diameter of at least 80 feet, and a street right-of-way diameter of at least 100 feet. (CO Chapter 74 Section 80(f))	"The street system shall balance the public goal of connectivity with market demands for privacy. While this Article does not ban cul-de-sacs, cul-de-sacs and dead-end streets shall be reserved for situations involving unique topography, environmental restrictions or similar considerations. Wherever possible, cul-de-sacs should be designed as closes" (14.2.3, CDO)	Allowed, up to 1000' feet in length.	"Dead-end streets designed to be permanently closed at one end shall not exceed 2,500 feet in length." "A turn-around shall be provided at the closed end of a street and shall have a minimum diameter of 80 feet to the outside edge of the pavement and 100 feet to the legal right-of-way line. Cul-de-sacs shall be avoided wherever possible by connecting new subdivision roads with nearby or adjacent existing roads. The Planning Commission shall determine whenever such connections are required. In all subdivisions, whether single-phase or multi-phased, all reasonable efforts shall be made to provide current or future connections with existing nearby roads and/or with proposed future roads in an attempt to eliminate excessively long cul-de-sacs." (7.3.4, 2011 LMR)
ASSESSMENT	**Needs improvement**	**Needs improvement**	**Exceptional**	**Needs improvement**	**Needs improvement**

Topic	Jurisdiction				
	Augusta/Richmond	Columbia County	City of North Augusta	City of Aiken	Aiken County
3. PEDESTRIAN FRIENDLY BUILDING AND SITE DESIGN STANDARDS					
3.1. Off-street motorized vehicle parking is behind or to side of buildings	No regulations on off-street parking layout.	In the Planned Development District (PDD), the parking shall be located in rear. (CO Chapter 90 Section 95(b)(1) The S-1 (Special) and PUD zoning districts can also require this if it's appropriate for the site.	In the TND use pattern, "parking is not allowed forward any portion of the front plane of the building". For other patterns, it may be desirable but does not appear to be required.	Downtown – Yes.	No, however for "Highway Corridor Overlay Districts": "No more than one bay of parking shall be allowed between a structure and the right-of-way of the primary street fronting the site." (2.12.8, 2011 LMR)
3.2. Maximum automobile parking requirements defined	No. Only minimum values are specified and they are excessive for most uses. A CBD zone has less required parking, but no maximums are given.	Yes, both minimum and maximum automobile parking requirements are defined, though minimums are excessive for most uses. (CO Chapter 90 Section 133(4))	Yes. Further, minimum parking requirements are waived for three of four "use patterns" (TND, Conservation Subdivision, and Commercial Redevelopment).	No. Only minimum values are specified and they are excessive for most uses. However, developers may submit alternative parking amount requests from accepted sources, subject to approval from the Planning Director.	Yes. "The maximum number of off-street parking spaces to be provided shall not exceed one hundred and ten (110%) percent of the minimum number required." (4.1, 2011 LMR)
3.3. Bicycle parking requirements	Not specified.	Not specified.	"Bicycle parking may be required where the Director finds that there is a sufficient need in a particular case" (CDO 12.4.2)	Not specified.	Not Specified.
3.4. Other place-supportive parking regulations (On-street parking, shared parking, pricing, employer incentives/programs, etc)	On-street parking may count towards off-street requirements in certain areas at a rate of .5 per 1 space. Further, "The Planning Commission may, at its discretion, reduce the minimum number of parking spaces required for a specific use… provided that sufficient evidence is presented justifying the need for reduction in the requirements and every effort has been made to provide off-street parking in accordance with the stipulations of this section" (CZO, 4-2-(g)).	Minimal provisions for shared parking are present. "Combination of required parking space: The required parking spaces for any number of separate uses may be combined in one lot, but the required parking spaces assigned to each use may not be assigned to another use, except where the parking spaces required for churches or other assembly halls whose peak attendance will be at night, on Sunday or another time, does not coincide with an adjacent use, such required parking spaces may be assigned to the adjacent use." (CO Chapter 90 Section 133(a)(1))	Shared parking calculations are allowed, with reductions up to 50% of required parking in the downtown district. On-street parking may not be counted towards the minimum requirements in any ratio.	ULI's "Shared Parking" manual is explicitly recognized as a source of alternative parking quantity calculations.	Yes. "The number of off-street parking spaces for uses requiring 100 or more spaces may be reduced by the Development Official up to twenty (20%) percent on the basis of such data as shared parking, ride-sharing programs, provision of public transit, or other acceptable provisions or standards. Up to fifty (50) percent of the parking spaces required for a proposed non-residential use may be provided and used jointly with an adjoining non-residential use not normally open, used, or operated during the same hours as the proposed use." (4.1, 2011 LMR) In "Highway Corridor Overlay Districts": "The Development Official at his discretion may accept a higher or lower number of parking spaces than required in 2.12.8(A) above (or a specific number of spaces for a use not listed) based on developer-submitted parking data such as a shared parking analysis or appropriate standards from another accepted source." (2.12.8, 2011 LMR)

Topic	Jurisdiction				
	Augusta/Richmond	Columbia County	City of North Augusta	City of Aiken	Aiken County
3.5. Form-based or design-based codes are used	No.	No, except in the Evans Town Center overlay district (ETCOD) where a number of architectural design guidelines are applicable (CO Chapter 90 Section 96). "Node Protection Overlays" may also be instituted to regulate architecture and urban design in applicable geographies. (CO Chapter 90 Section 100)	Yes. Four "use patterns" are anticipated to comprise the bulk of new development and redevelopment within zoning districts: Conservation Subdivision, TND, Neighborhood Center, and Commercial Redevelopment. Each of these patterns is governed by dimensions for lots, landscaping, streets, parking, and other elements.	Downtown – Yes. Elsewhere there is some guidance on form, but not much.	No. However, in Planned Unit Developments: "Variety in building types, heights, facades, setbacks, and size of open spaces shall be encouraged." (2.7.3, 2011 LMR)
3.6. Pedestrian entrances required on street frontage (regardless of parking location)	No.	No.	Yes.	Downtown – Yes. Elsewhere, no.	No.
3.7. Setback or build-to requirements	Zero foot setback is allowed for some zones.	Front setbacks are required and are significantly larger than side and rear setbacks. No build-to requirements exist. (CO Chapter 90 Section 53 & Section 98)	0' setbacks are acceptable for use patterns. Build-to lines may exist.	Downtown – Build-to is used instead of setback.	No.
3.8. Buffer requirement between adjacent buildings or uses	Yes, for private schools, home day cares, mobile homes, conservation subdivisions, and a number of other uses. A 10' buffer is required for anything adjacent to existing single family lots if new lots are less than 80% of the size of the existing adjacent ones. From the CZO, it appears that buffers are required between all adjacent non-identical land uses.	There are no 0' buffers, so by default there must be space. Buffers are also typically required between residential and other uses. (CO Chapter 90 Section 139)	No buffer requirements in areas covered by "use patterns". Elsewhere, large buffers (40'+) are required to separate industrial from other uses while small buffers separate various residential and commercial uses.	Downtown – No, urban design standards and dimensions are used instead. However, outside of downtown, minimum 10' landscape buffers must be placed between anything abutting a single-family residential area.	Yes, buffer requirements for all land-use types except single and two-family residential development. (5.1.3, 2011 LMR)
3.9. Mixed use buildings and blocks	"While mixed use buildings are not explicitly mentioned in the CZO, residential uses are allowed in commercial zones, so an existing or new building so zoned could be used for mixed uses (e.g. residential, retail, service, office). Residential uses are prevalent on upper floors of buildings in downtown Augusta." (Paul DeCamp, Augusta Planning and Development Department) PUD zones allows mixed-use blocks, though it is unclear whether mixed-use buildings are feasible (CZO ch. 19)	PUD districts allow mixed uses. (CO Chapter 90 Section 94)	Yes, commercially-oriented use patterns allow and encourage mixed use buildings and blocks	Downtown – Yes.	Yes, in "Residential Limited Mixed Use" and "Urban Development Districts" (2.2, 2011 LMR)
3.10. Active ground floor uses with engaging architecture	Not required.	Not required.	Yes, commercial ground floors are required in TND, Neighborhood center, and Commercial Redevelopment area.	Downtown – Yes.	Not required.

Topic	Jurisdiction				
	Augusta/Richmond	Columbia County	City of North Augusta	City of Aiken	Aiken County
3.11. Site Amenities for Cyclists and others (Showers, Changing areas, etc)	No guidelines found.	No.	No guidelines found.	No guidelines found.	No guidelines found.
3.12. Human-scale lighting (< 15' tall) required along paths and in parking areas	Overhead and underground utilities are not allowed in street yards according to Street Tree Ordinance.	No.	No standards found for height of street lighting. For exterior building lighting, 25' is listed as the maximum height.	Downtown – Yes.	No. "Maximum 20' at primary access points" (5.5, 2011 LMR) "The maximum height of streetlights shall be 25 feet." (7.7.2, 2011 LMR)
ASSESSMENT	**Needs improvement**	**Needs improvement**	**Exceptional**	**Adequate**	**Needs improvement**
4. PEDESTRIAN FACILITY DESIGN					
4.1. ADA Standards	5' Sidewalks meet ADA minimum width.	No.	5' Sidewalks meet ADA minimum width.	A ramp shall be provided at intersections in accordance with SC State law. However, specified sidewalk widths (4') do not meet ADA standards.	No guidelines found
4.2. Minimum sidewalk width by context	5' minimum.	Yes. Pedestrian pathways must be a minimum of five feet in width. (CO Chapter 90 Section 100(T)(2)(I)(III)(b))	5' minimum per ADA requirements.	Specified as 4' (not as minimum). This is insufficient.	"Within subdivisions, sidewalks shall be at least 4 feet wide; when providing access to public facilities, sidewalks shall be not less than five feet wide." (7.15, 2011 LMR)
4.3. Street Trees	Street trees and landscape strips (adjacent to curb) are required on all new streets according to the Tree Ordinance. Trees are to be spaced a maximum of 40 feet apart. The total area of a street yard is "equal to at a minimum ten (10) times the length of the right-of-way in square feet." (8-4-11: GREEN SPACE REQUIREMENTS FOR PRIVATE AND PUBLIC DEVELOPMENT)	No street tree ordinance. Although a list of recommended trees for development are listed. (CO Chapter 90 Section 145)	Landscaping based on street typology.	5' minimum landscape buffer required, with larger planting strips (up to 25') according to lot depth.	Not required, except as part of "Large Retail Projects" (2.12.11, 2011 LMR) and bufferyards (5.1.4, 2011 LMR).
4.4. Mid-Block Crossings	No guidelines found.	Midblock crossings are encouraged on blocks that are greater than 800 feet. (CO Chapter 74 Section 81(a))	No guidelines found in CDO or details.	No Guidelines.	Crosswalks are required to be at least 10-feet-wide and to be located in areas where deemed necessary to provide adequate pedestrian circulation or access to schools, shopping areas, recreation areas, or destination facilities. (4.1.1.1, 2003 ARTS Bicycle and Pedestrian MP)
ASSESSMENT	**Adequate**	**Needs improvement**	**Adequate**	**Needs improvement**	**Needs improvement**
5. BICYCLE FACILITY DESIGN					
5.1. Types of Facilities Specified or Allowed	Not specified.	Not specified.	In CDO: Sidewalks, Bike Lanes, Greeneways In Greeneway Plan: Greeneway (MUT), Side Path, Connectors, Bike Lanes, Wide Lanes, Shared Lanes, Bike Routes, Bike Boulevards.	Only facility mentioned is "bikeway" which is specified as six feet wide.	Greenways are linear green belts linking residential areas with other open-space areas. These greenways may contain bicycle paths, footpaths, and bridle paths. (5.3.5, 2011 LMR)

Topic	Jurisdiction				
	Augusta/Richmond	Columbia County	City of North Augusta	City of Aiken	Aiken County
5.2. Minimum Shoulder Width	No guidelines beyond AASHTO, GDOT (state roads only).	Not specified.	Depends on street type.	No guidelines beyond SCDOT (state roads only).	Only under construction standards for Subdivisions: 10' min for lots < 1 acre 6' min for lots > 1 acre. (7.3.9, 2011 LMR)
5.3. Bicycle accommodations at intersections	Not specified.	Not specified.	The Greeneway Plan discusses various bicycle facilities at intersections.	Not specified.	Not Specified.
ASSESSMENT	**Needs improvement**	**Needs improvement**	**Exceptional**	**Needs improvement**	**Needs improvement**
6. SUPPORTING POLICIES AND MANUALS					
6.1. Complete Streets Policy	No.	No. Encouraged in the PUD zoning district. (CO Chapter 90 Section 94)	Not known as such, but Complete Streets are part of guiding principles for Streets chapter in CDO.	No.	No.
6.2. Design Manual for Pedestrian and/or Bicycle Facilities	One chapter (1.5 pages) in general road design manual is devoted to sidewalks, but mainly refers back to "AASHTO Green Book" and ADA. No bicycle facility guidance is given.	No	Guidance on width and inclusion within CDO, but standard construction details do not yet include bike facilities. A single (5') sidewalk detail is provided.	No.	No.
6.3. Complete Street Design Guidelines for a variety of contexts	No. All curbed streets except for "arterials" have a paved width of 31'. ROW varies from 60-80'. Arterials are 53' from Back-of-curb to back-of-curb. Most Shoulder/Ditch streets primarily have paved width of 24' with 6' shoulders. Insufficient if shoulders are not at least partially paved.	No. Encouraged in the PUD zoning district. (CO Chapter 90 Section 94)	Yes, in text and intent, but no standard details for road types are available.	No.	No.
6.4. General and Pedestrian Connectivity Requirements	No.	No. Encouraged for developments within a one-mile radius of existing or planned schools, neighborhood recreation or commercial areas or other public places if deemed appropriate by the planning commission. (CO Chapter 74 Section 117(d))	Yes, both block size and connectivity ratio.	Minimal, larger than ideal pedestrian scale.	Minimal.
6.5. Existence of street hierarchy plan by context	No; streets have hierarchy according to vehicular mobility.	No. While there is an adopted classification and design procedure for streets. (CO Chapter 74 Section 78 & Section 80)	No. A functional classification map is contained in the Comprehensive Plan, but organizes streets but vehicular mobility ("arterial", "collector", etc)	The transportation plan was under development at the time of this review.	No. Streets are defined as having a vehicular hierarchy.
6.6. Existence of bicycle and pedestrian plan(s)	Jurisdiction relies on the current regional ARTS Bicycle and Pedestrian Plan for inventory and guidance.	Jurisdiction relies on the current regional ARTS Bicycle and Pedestrian Plan for inventory and guidance.	Yes, a detailed master plan has been prepared for both bicycle and pedestrian facilities.	Jurisdiction relies on the current regional ARTS Bicycle and Pedestrian Plan for inventory and guidance.	Relies on 2003 regional ARTS Bicycle and Pedestrian Plan.
6.7. Consideration of pedestrian and bicycle concerns in Site Planning	Not explicitly, though streets must be laid out to conform with the "latest transportation plan".	Bicycle and pedestrian improvements may be required by the planning commission where deemed appropriate. (CO Chapter 74 Section 117(d))	Yes.	Yes, "bike and pedestrian ways" are specifically mentioned in site plan requirements, though there is little additional guidance on appropriateness.	No, only considers vehicular traffic.

Topic	Jurisdiction				
	Augusta/Richmond	Columbia County	City of North Augusta	City of Aiken	Aiken County
6.8. Consideration of pedestrian and bicycle concerns and Level of Service (LOS) in Traffic Impact Analyses and other engineering studies	No guidance found.	No guidance found.	No, however, traffic mitigation measures are ranked as follows: 1. Improvements in connectivity internal to the site or between sites including cross-access improvements and cross-access easements; 2. New road connections to improve connectivity; 3. Access controls; 4. Median islands; 5. Intersection signalization; 6. The addition of turn lanes; 7. Pedestrian and transit infrastructure such as sidewalks and bus stops or passenger shelters; 8. Pavement widening; and 9. New road construction, either off site or internal to the site that provides connectivity in the impact area.	No guidance found.	No guidance found.
6.9. Traffic Calming programs, policies, and/or manuals	No guidance found.	No guidance found.	No guidance found, though street design guidelines (including pavement width, corner radii, street trees, and other urban design items) should keep vehicle speeds relatively low and appropriate to context.	No guidance found.	No guidance found.
6.10. Access management program or policy	No guidance found.	Proposed subdivision and non-residential driveways are reviewed by the Traffic Engineering Department and based on Georgia D.O.T.'s Driveway Manual, latest edition.	Detailed parcel access requirements are included within the development code.	Yes, access management guidelines are part of the zoning ordinance.	No guidance found.
6.11. Sidewalk retrofit program or policy	No guidance found.	No. Sidewalk retrofits are considered on a case-by-case basis using determining factors such as safety, projected use, connectivity, and cost to implement. Local funding for sidewalk retrofits is not used along roads constructed by private developers who opted to forgo the installation of sidewalks during the initial construction.	Not found in ordinances, but bike/ped plans reference this goal.	No guidance found.	No guidance found.
ASSESSMENT	**Needs improvement**	**Needs improvement**	**Adequate**	**Needs improvement**	**Needs improvement**

Topic	Jurisdiction				
	Augusta/Richmond	Columbia County	City of North Augusta	City of Aiken	Aiken County
7. ITEMS REVIEWED					
7.1. Names of Resources	GUIDELINES AND REGULATIONS 1. Comprehensive Zoning Ordinance (Dec 2010) 2. Land Subdivision Regulations (Nov 2009) 3. Street and Road Design Technical Manual (Sept 2004) 4. Tree Ordinance and Illustrated Guide (Jan 2011) ADDITIONAL PLANS 5. ARTS 2035 Long Range Transportation Plan (June 2010) 6. ARTS Bicycle and Pedestrian Plan (2003) 7. Augusta-Richmond County Comprehensive Plan and Community Agenda (Oct 2008) OTHER SOURCES 8. Comments from Paul DeCamp, Augusta Planning and Development Department (November 2011)	GUIDELINES AND REGULATIONS 1. Code of Ordinaces (Online, Current as of June 22, 2011, Accessed Aug 2011) ADDITIONAL PLANS 2. Long Range Transportation Plan (Aug 2004) 3. Growth Management Plan, Partial Update 2011-2016 (November 2010)	GUIDELINES AND REGULATIONS 1. North Augusta Development Code (Jan 2008) 2. North Augusta Code of Ordinances , ch. 19 (Online, Current as of June 2010, Accessed Aug 2011) 3. Construction Specifications, Road Details (Accessed Aug 2011) ADDITIONAL PLANS 4. Draft Greeneway, Pedestrian and Bicycle Master Plan (May 2011) 5. Comprehensive Plan (2005)	GUIDELINES AND REGULATIONS 1. Old Aiken Design Guidelines (Oct 2008) 2. City Code of Ordinances (Current as of Oct 25, 2010, Accessed Aug 2011) 3. Land Development Regulations (Sept 2008) 4. Zoning Ordinance (June 2009) 5. Landscaping Manual and Tree Protection (Aug 2005) ADDITIONAL PLANS 6. Old Aiken Master Plan (Apr 2005)	GUIDELINES AND REGULATIONS 1. Aiken County Land Management Regulations. (Online, Current as of Jan 2011, Accessed September 2011) 2. Aiken County Code of Ordinances (Online, Current as of May 2011, Accessed September 2011) ADDITIONAL PLANS 3. ARTS Bicycle and Pedestrian Plan (2003) 4. ARTS 2035 Long Range Transportation Plan (September 2005)

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Appendix C

Bike and Walk Friendly Community Applications

LEAGUE OF AMERICAN BICYCLISTS

Bicycle Friendly Community Application

Name of Community

* Name of Community

* State

* Mayor or top elected official
include title

* Phone

* Email

* Address

* Website

Applicant Profile

* Applicant Name

* Title

* Employer

* Address

* City

* State

* Zip

* Phone

* Email

Community Profile

The data in this section is gathered by the U.S. census. Click here to find the most recent information on your community.

* 1. Type of Jurisdiction
Check One

- ○ **Town/City/Municipality**
- ○ **County**
- ○ **Metropolitan Planning Organization or Council of Governments**
- ○ **Regional Planning Organization**
- ○ **Rural Planning Organization**
- ○ **Indian Nation**
- ○ **Other**

If other, describe
(50 word limit)

* 2. Population
Enter a positive whole number, 1 or larger

3. Square milage of community

* Total area
(sq. mi.)

* Water area
(sq. mi.)

* Land area
(sq. mi.)

* 4. Population Density
(Person per sq. mi.)

5. Climate

* Average temperature for January
in °F

* Average temperature for April
in °F

* Average temperature for July
in °F

* Average temperature for October
in °F

* Average precipitation for January
in inches

* Average precipitation for April
in inches

* Average precipitation for July
in inches

* Average precipitation for October
in inches

* 6. Median Household Income
Enter a whole number, 0 or larger

7. Age distribution

* % under 5

* % age 6-17

* % age 18-64

* % age 65+

* Totals
Total should equal 100

8. Race

* % White

* % Black or African American

* % American Indian and Alask Native

* % Asian

* % Native Hawaiian and Other Pacific Islander

* % Some other race

* % One race

* % Two or more races

* Totals
Total should equal 100

* % Hispanic or Latino (of any race)

* 9. What is the name of your community's bicycle program manager?

* 10. In which department does your bicycle program manager work?
- **Engineering/public works**
- **Planning**
- **Parks and Recreation**
- **Transportation**
- **Other**

If other, describe
(50 word limit)

* 11. Are you the Bicycle Program Manager?
- **Yes**
- **No**

* Bicycle Program Manager Phone

* Bicycle Program Manager Email

* 12. What percentage of the community's Bicycle Program Manager's time is spent on bicycling issues?
- **10% or less**
- **10-25%**
- **25-50%**
- **50-75%**
- **75-100%**

* 13. How many government employees, expressed in full-time equivalents, work on bicycle issues in your community?
Enter a positive whole number, 1 or larger

* 14. Do you have a Bicycle Advisory Committee
- **Yes**
- **No**

* 14a. How often does it meet?
- **Monthly**
- **Every two months**
- **Quarterly**
- **Annually**
- **Other (describe)**

If other, describe
(250 word limit)

* 14b. How many members serve on the committee?
Enter a positive whole number, 1 or larger

* 14c. Which of the following groups are represented or regularly attend the Bicycle Advisory Committee?
Check all that apply

- ☐ **User group**
- ☐ **Law enforcement**
- ☐ **Chamber of commerce**
- ☐ **Public health**
- ☐ **Planning department**
- ☐ **Transporation department**
- ☐ **School board**
- ☐ **Parks department**
- ☐ **Recreation department**
- ☐ **Transit agency**
- ☐ **Other (describe)**

If other, describe
(250 word limit)

* 14d. Name of Bicycle Advisory Committee Chair

* Email of Bicycle Advisory Committee Chair
e.g. myname@example.com

* 15. Is there a bicycle advocacy group(s) in your community?
- ○ **Yes**
- ○ **No**

15a. What is the name of the advocacy group(s) (if more than one, list them all)
(250 word limit)

* 15b. Are any of them working with you on this application?
- ○ **Yes**
- ○ **No**

* 15c. List the name of the primary group:

* 15d. Does this group have paid staff?
- ○ **Yes**
- ○ **No**

* 15e. Do you contract with this group for any services or programs?
- ○ **Yes**

- ( ) **No**

* 15f. Who is the primary contact for them?

* 15g. Email of primary contact of advocacy group
e.g. myname@example.com

* 16. What are the primary reasons your community has invested in bicycling?
check all that apply

- [ ] **Improved quality of life**
- [ ] **Improving public health**
- [ ] **Community connectivity**
- [ ] **Transportation options**
- [ ] **Climate change concerns**
- [ ] **Decrease traffic congestion**
- [ ] **Increase tourism**
- [ ] **Increase property values**
- [ ] **Cooperation with adjacent communities**
- [ ] **Public demand**
- [ ] **Economic development**
- [ ] **Traffic safety**
- [ ] **Other (describe)**

If other, describe
(250 word limit)

17. What was your community's most significant investment for bicycling in the past year?
(100 word limit)

18. What specific improvements do you have planned for bicycling in the following year?
(100 word limit)

Engineering

19. Does your community have

- a complete streets policy?
- a bicycle accomodation policy (a policy that requires the accommodation of cyclists in all new road construction and reconstruction and resurfacing)?
- Neither

19a. When was it adopted

19b. Provide a link or attach a copy of this legislation or policy.
(250 word limit)

19c. How was it adopted?

- Legislation
- Resolution
- Internal Policy
- Other

If other, describe
(250 word limit)

19d. What tools are in place to ensure implementation?
Check all that apply

- Implementation Guidance
- Design
- Manual
- Training
- Other

If other, describe
(500 word limit)

20. How do you ensure your engineers and planners accommodate cyclists according to AASHTO and MUTCD standards?
Check all that apply

- Training
- Offer FHWA/NHI Training Course
- Hire Outside consultants to train staff
- Send staff to bicycle-specific conferences/training
- Require project consultants to have bike/ped qualifications

- [ ] **Internal training or design manual**

20a. Describe each checked
(200 word limit)

* 21. What percentage of bridges and tunnels in your community are accessible to bicyclists?
Enter a whole number, 0 or larger

21a. What are the exceptions?
(500 word limit)

* 22. How do you ensure there are end-of-trip facilities for bicyclists?
Check all that apply

- [ ] **Bike parking ordinance**
- [ ] **Bike parking ordinance for all new developments**
- [ ] **Ordinance requiring showers and lockers**
- [ ] **Building accessibility ordinance**
- [ ] **On street bike parking**
- [ ] **Ordinance that allows bike parking to substitute for car parking**
- [ ] **Standards for bicycle parking that conform to APBP guidelines**
- [ ] **Other**

If other, describe
(500 word limit)

23. How many bike parking spaces are there in your community?
Answer all that apply

23a. Bike racks
Enter a whole number, 0 or larger

23b. Bike lockers
Enter a whole number, 0 or larger

23c. Bike depot (i.e. Bikestation)
Enter a whole number, 0 or larger

23d. In-street bike parking
Enter a whole number, 0 or larger

24. Approximately what percentage of these locations have bike racks or storage units?

24a. Schools

24b. Libraries

24c. Transit Stations

24d. Parks & Recreation Centers

24e. Government buildings

24f. Office buildings

24g. Shops

24h. Public Housing

* 25. Does your community have transit service?
- **Yes**
- **No**

* 25a. Are buses equipped with bike racks?
- **Yes**
- **No**

25b. What percentage?

25c. Are bikes allowed inside transit vehicles?
- **Yes**
- **Sometimes**
- **No**

If yes or sometimes, describe
(100 word limit)

* 26. What is the mileage of your total road network?
Enter a whole number, 0 or larger

* 27. What is the mileage of your total shared-use path network?
Enter a whole number, 0 or larger

28. List your current and planned bicycle accommodations?

Complete all that apply

a. Bike lanes

Current
Enter a whole number, 0 or larger

Planned
Enter a whole number, 0 or larger

b. Shared lane markings

Current
Enter a whole number, 0 or larger

Planned
Enter a whole number, 0 or larger

c. Bike boulevards

Current
Enter a whole number, 0 or larger

Planned
Enter a whole number, 0 or larger

d. Signed bike routes

Current
Enter a whole number, 0 or larger

Planned
Enter a whole number, 0 or larger

e. Paved shared use paths

Current
Enter a whole number, 0 or larger

Planned
Enter a whole number, 0 or larger

f. Natural surface shared use paths

Current
Enter a whole number, 0 or larger

Planned
Enter a whole number, 0 or larger

g. Singletrack

Current
Enter a whole number, 0 or larger

Planned
Enter a whole number, 0 or larger

* 29. What other innovative ways have you improved on-road conditions for bicyclists?
Check all that apply

☐ **Road diets**

- [ ] **Area wide traffic calming**
- [ ] **Cycle tracks**
- [ ] **Contra-flow bike lanes**
- [ ] **Speed limits 20 mph or less on residential streets**
- [ ] **Bike cut thrus**
- [ ] **Way-finding signage with distance and/or time information**
- [ ] **None**
- [ ] **Other**

If other, describe
(500 word limit)

* 30. What percentage of arterial streets have bike lanes or paved shoulders?
Enter a whole number, 0 or larger

* 31. What percentage of natural surface, trails and singletrack are open to bicyclists?
Enter a whole number, 0 or larger

31a. What are the exceptions?
(500 word limit)

32. What maintenance policies or programs ensure *bike lanes* and *shoulders* remain usable and safe?
Answer all that apply

* 32a. Street sweeping
- ( ) **Before other travel lanes**
- ( ) **Same time as other travel lanes**
- ( ) **Weekly**
- ( ) **Monthly**
- ( ) **Quarterly**
- ( ) **Annually**
- ( ) **Never**
- ( ) **Other**

If other, describe
(250 word limit)

* 32b. Snow clearance
- ( ) **Before other travel lanes**

- **Same time as other travel lanes**
- **Within 48 hours of storm**
- **Never**
- **Other**
- **Not applicable**

If other, describe
(500 word limit)

* 32c. Pothole maintenance
- **Within 24 hours of complaint**
- **Within one week of complaint**
- **Within one month of complaint**
- **Never**
- **Other**

If other, describe
(500 word limit)

32d. Other Maintenance policies or programs for bike lanes and shoulders (describe)
(500 word limit)

33. What maintenance policies or programs ensure *shared-use paths* remain safe and usable?
Answer all that apply

* 33a. Path sweeping
- **Weekly**
- **Monthly**
- **Quarterly**
- **Annually**
- **Never**
- **Other**

If other, describe
(250 word limit)

* 33b. Vegetation maintenance
- **Weekly**
- **Monthly**
- **Quarterly**
- **Annually**

- **Never**
- **Other**

If other, describe
(250 word limit)

* 33c. Snow clearance
- **Before roadways**
- **Same time as roadways**
- **Within 48 hours of storm**
- **Never**
- **Other**
- **Not applicable**

If other, describe
(250 word limit)

* 33d. Surface repair
- **Within 24 hours of complaint**
- **Within one week of complaint**
- **Within one month of complaint**
- **Never**
- **Other**

If other, describe
(500 word limit)

33e. Other Maintenance policies or programs for shared-use paths (describe)
(500 word limit)

* 34. How do you accommodate cyclists at intersections in your community?
Check all that apply

- [ ] **All /Most signals are timed for bicyclists**
- [ ] **All /Most signals are timed**
- [ ] **Loop detector markings**
- [ ] **Video detection**
- [ ] **Advance stop line or Bike Box**

- [ ] **Bicycle signal heads**
- [ ] **Other**
- [ ] **None of the above**

If other, describe
(500 word limit)

* 35. Are there other infrastructure improvements in your community to promote bicycling?
- ( ) **Yes**
- ( ) **No**

If yes, describe
(500 word limit)

Education

* 36. Do schools in your community offer a Safe Routes to School (or comparable) program that includes bicycling education?
- ( ) **Yes**
- ( ) **No**

What percentage of schools in your jurisdiction participates?

a. Elementary (percentage)
Enter a whole number, 0 or larger

b. Middle School (percentage)
Enter a whole number, 0 or larger

c. High School (percentage)
Enter a whole number, 0 or larger

* 37. Outside of schools, how are children taught safe bicycling skills?
Check all that apply

- [ ] **Youth bike clubs**
- [ ] **Bike clinics or rodeos**
- [ ] **Youth recreation programs**
- [ ] **Helmet fit seminars**
- [ ] **Safety town**
- [ ] **Trail riding classes**
- [ ] **Other**
- [ ] **None of the above**

If other, describe
(500 word limit)

* 38. Do you have a diversion program for cyclists or motorists?
- **Yes**
- **No**

If yes, describe
(500 word limit)

* 39. What have you done in the last 18 months to educate motorists and bicyclists on sharing the road safely?
Check all that apply

- **Public service announcements**
- **Community newsletter article**
- **New resident packet**
- **Utility bill insert**
- **Bicycle ambassador program**
- **Newspaper column/blog on bicycling**
- **Dedicated bike page on community Web site**
- **Billboards**
- **Share the Road Signs**
- **Share the road information in driver's education**
- **Other**
- **None of the above**

If other, describe
(500 word limit)

40. What of the following options are available on a regular basis to your community?

* 40a. Traffic Skills 101 (or equivalent) classes -- including classroom and on-bike instruction.
- **Weekly**
- **Monthly**
- **Quarterly**
- **Annually**
- **Never**
- **Other**

If other, describe
(250 word limit)

* 40b. Cycling Skills classes -- three to four hour classroom training courses
- **Weekly**
- **Monthly**
- **Quarterly**
- **Annually**
- **Never**
- **Other**

If other, describe
(250 word limit)

* 40c. Commuter classes - one/two hour classes
- **Weekly**
- **Monthly**
- **Quarterly**
- **Annually**
- **Never**
- **Other**

If other, describe
(250 word limit)

* 41. Has your community hosted a League Cycling Instructor seminar in the past two years?
- **Yes**
- **No**

* 42. How many League Cycling Instructors are there in your community?
Enter a whole number, 0 or larger

43. List active League Cycling Instructors (active means they have taught at least one class during the past 12 months).
(500 word limit)

44. Does your community have driver training for any of the following professional drivers that include information on sharing the road with cyclists?
Check all that apply

- [ ] **City staff**

- ☐ **Taxi drivers**
- ☐ **Transit operators**
- ☐ **School bus operators**
- ☐ **Delivery drivers**
- ☐ **Other**

* If other, describe
(250 word limit)

* 44a. If yes to any of the above, describe the program.
(500 word limit)

* 45. Describe any efforts your community has made to ensure your education programs reach traditionally underserved populations.
(500 word limit)

* 46. Are there other education efforts in your community to promote bicycling?
- ○ **Yes**
- ○ **No**

* 46a. If yes, describe
(1000 word limit)

Encouragement

* 47. How do you promote National Bike Month?
Check all that apply

- ☐ **City Proclamation**
- ☐ **Community Ride**
- ☐ **Mayor-led Ride**
- ☐ **Public Service Announcements**
- ☐ **Publish a guide to Bike Month Events**
- ☐ **Bike Month Web site**

- ☐ **Commuter Challenge**
- ☐ **Commuter Breakfasts**
- ☐ **Trail construction or maintenance day**
- ☐ **Other**
- ☐ **No promotion**

* If other, describe
(1000 word limit)

* 48. How many people participate in Bike Month events?
Enter a whole number, 0 or larger

* 49. How do you promote bicycling outside of National Bike Month?
Check all that apply

- ☐ **Community Ride**
- ☐ **Mayor-led Ride**
- ☐ **Public Service Announcements**
- ☐ **Trail construction or maintenance day**
- ☐ **Summer Streets/Ciclovia/Sunday Parkways**
- ☐ **Commuter Challenge**
- ☐ **Commuter Breakfasts**
- ☐ **Other**
- ☐ **No promotion**

* If other, describe
(500 word limit)

* 50. Do you actively promote Bike to Work Day or other bicycle commuting incentive programs?

- ○ **Yes**
- ○ **No**

* 50a. If yes, describe
(500 word limit)

* 50b. Approximately what percentage of the community workforce do you reach?

* 51. List the signature cycling events in your community?
(500 word limit)

* 52. Does the municipality sponsor or actively support any of these rides?

- **Yes**
- **No**

* 52a. If yes, how?
(500 word limit)

* 53. Does your local tourism board promote bicycling in your area?

- **Yes**
- **No**

* 53a. If yes, how?
(500 word limit)

* 54. Are there cycling organizations in your area?
Check all that apply

- ☐ **Recreational Bike Clubs**
- ☐ **Mountain Bike Clubs**
- ☐ **Friends of the Trail Groups**
- ☐ **National Mountain Bike Patrol**
- ☐ **Racing Clubs or Teams**
- ☐ **Bicycle Co-ops**
- ☐ **Other**
- ☐ **None**

* If other, describe.
(500 word limit)

* 54a. For each type of club checked, list names of the organizations.
(500 word limit)

* 55. How many specialty bicycle retailers (i.e shops dedicated primarily to selling bikes and bike-related equipment) are there in your community?
Enter a whole number, 0 or larger

* 55a. List their names.
(500 word limit)

* 56. Which of these bicycling areas or facilities do you have in your community?
Check all that apply

- ☐ **BMX track**
- ☐ **Velodrome**
- ☐ **Cyclocross course**
- ☐ **Mountain bike park**
- ☐ **Pump Tracks**
- ☐ **Other**
- ☐ **None**

* If other, describe.
(500 word limit)

* 57. Is there a skatepark in your community?
- ○ **Yes**
- ○ **No**

* 57a. If yes, do bikes have access to the skatepark?
- ○ **Always**
- ○ **Sometimes**
- ○ **Never**

* 58. Are there opportunities to rent bicycles in your community?
- ○ **Yes**
- ○ **No**

* 59. Does your community have a bike sharing program?
- ○ **Yes**
- ○ **No**

59a. If yes, of what use is it?
Check all that apply

- ☐ **Public use**

☐ **Other**

* If other, describe
(500 word limit)

* 60. Do you have any current Bicycle Friendly Businesses in your community?

○ **Yes**

○ **No**

* 60a. If yes, list the names of the businesses.
(500 word limit)

* 61. Does your community have youth recreation and/or intervention programs centered around bicycling?
Check all that apply

☐ **Recycle a Bicycle**

☐ **Trips for Kids chapter**

☐ **Earn a Bike program**

☐ **Co-op or Community Cycling Center**

☐ **Other**

☐ **None**

* If other, describe
(500 word limit)

* 62. What mapping and route finding information is available for your community which has been updated in the last 18 months?
Check all that apply

☐ **Online route finding service**

☐ **Online map**

☐ **Printed on-road bike-routes map**

☐ **Printed mountain bike trails map**

☐ **Other**

☐ **None available**

* If other, describe
(500 word limit)

* 63. Does your community have other programs or policies to encourage cycling?

- **Yes**
- **No**

* 63a. If yes, describe
(500 word limit)

Enforcement

* 64. How does your police department interact with the local cycling community?
Check all that apply

- [ ] **A police officer is an active member of bicycle advisory committee**
- [ ] **Identified law-enforcement point person to interact with cyclists**
- [ ] **No current formal interaction**
- [ ] **Other**

* If other, describe
(500 word limit)

* 65. What kind of training is offered to police officers regarding traffic law as it applies to bicyclists?
Check all that apply

- [ ] **Basic academy training**
- [ ] **International Police Mountain Bike Association or Law Enforcement Bicycle Association training**
- [ ] **National Highway Traffic Safety Administration Law Enforcement Training**
- [ ] **Completion of Smart Cycling course by Police**
- [ ] **Presentation by League Cycling Instructor or local cyclist**
- [ ] **Institute for Police Training and Development bicycle training**
- [ ] **Other**
- [ ] **No training currently offered**

* If other, describe
(500 word limit)

* 66. What enforcement campaigns are targeted at improving cyclist safety?
Check all that apply

- ☐ **Helmet/light giveaways**
- ☐ **Targeting motorist infractions**
- ☐ **Targeting cyclist infractions**
- ☐ **Share the road campaigns**
- ☐ **Other**
- ☐ **None of the above**

* If other, describe
(500 word limit)

* 67. Do you have police department employees on bikes?

- ○ **Yes**
- ○ **No**

* 67a. If yes, what percentage of police department employees is on bike?
Enter a whole number, 0 or larger

* 68. Are there any other public safety (e.g. fire department or EMS) employees on bikes?

- ○ **Yes**
- ○ **No**

* 68a. If yes, what percentage of police department employees is on bike?
Enter a whole number, 0 or larger

* 69. Do your local ordinances treat bicyclists equitably? (examples can be found on the BFC resources page).
Check all that apply

- ☐ **There are specific penalties for failing to yield to a cyclist when turning. It is illegal to park or drive in a bike lane (intersections excepted)**
- ☐ **There are penalties for motor vehicle users that 'door' cyclists**
- ☐ **There is a ban on cell phone use while driving.**
- ☐ **There is a ban on texting while driving.**
- ☐ **The community uses photo enforcement for red lights and/or speed**
- ☐ **There is a state or local law that requires cyclists to use sidepaths regardless of their usability.**
- ☐ **There is a state or local law that requires cyclists to use bike lanes where they are provided.**
- ☐ **Cyclists are required to ride as far to the right of the road as practicable without exceptions listed in Uniform Vehicle Code.**
- ☐ **There is a general restriction on bicyclists riding on the sidewalk.**

- ☐ **There are local or school policies that restrict youths from riding to school.**
- ☐ **None of the above**
- ☐ **Additional information on any of the above mentioned ordinances as it pertains to your community.**

* If Additional Information, describe
(500 word limit)

* 70. Are there any additional prohibitions or restrictions on cyclists in your community?
- ○ **Yes**
- ○ **No**

* 70a. If yes, describe
(500 word limit)

* 71. Does your community have other programs or policies to enforce safe cycling?
- ○ **Yes**
- ○ **No**

* 71a. If yes, describe
(100 word limit)

Evaluation and Planning

* 72. What is the most current journey-to-work data for your community? (this percentage can be found in the U.S. Census or the American Community Survey)
Enter a whole number, 0 or larger

* 73. What additional information do you have on bicycle use for your community?
(500 word limit)

* 74. How many cyclist/motor vehicle fatalities have occurred in your community in the past five years?
Enter a whole number, 0 or larger

* 75. How many cyclist/motor vehicle crashes have occurred in your community in the past five years?
Enter a whole number, 0 or larger

* 76. Do you have a specific plan or program to reduce these numbers?
- ○ **Yes**

- No

* 76a. If yes, provide the link to the plan or describe.
(500 word limit)

* 77. Does your community have a bicycle plan?
- **Yes**
- **No**

* 77a. When was it passed or most recently updated?

* 77b. Is there a dedicated funding source for implementation?
- **Yes**
- **No**

* 77c. If yes, describe.
(500 word limit)

* 77d. What percentage of the plan has been implemented?

* 77e. Are you meeting annual target goals for implementation?
- **Yes**
- **No**

* 77f. Provide a link to the plan or describe.
(250 word limit)

* 78. Do you have a trails master plan that addresses mountain bike access?
- **Yes**
- **No**

* 78a. If yes, provide the link to the plan or describe.
(500 word limit)

* 79. Is there formal cooperation between the mountain biking community and the community recreation and planning staff?
- **Yes**
- **No**

* 79a. If yes, describe.
(500 word limit)

* 80. Do you have trip reduction ordinances, policies or programs?
- **Yes**
- **No**

* 80a. If yes, describe.
(500 word limit)

* 81. Have you done an economic impact study on bicycling in your community?
- **Yes**
- **No**

* 81a. If yes, describe.
(500 word limit)

* 82. Do you have a mechanism to ensure facilities, programs and encouragement efforts are implemented in traditionally underserved communities?
- **Yes**
- **No**

* 82a. If yes, describe.
(500 word limit)

* 83. Does your community have other programs or policies to evaluate and/or plan bicycling conditions, programs, and facilities in your community?
- **Yes**
- **No**

* 83a. If yes, describe.
(500 word limit)

Final Overview

84. What are the three primary reasons your community deserves to be designated a Bicycle Friendly Community?

* 84a.
(100 word limit)

* 84b.
(100 word limit)

* 84c.
(100 word limit)

85. What are the three aspects of your community most in need of improvement in order to accommodate bicyclists?

* 85a.
(100 word limit)

* 85b.
(100 word limit)

* 85c.
(100 word limit)

* 86. Are you planning any new projects based on your completion of the Bicycle Friendly Community application?

- **Yes**
- **No**

* 86a. If yes, describe.
(500 word limit)

* 87. Has completing this application made you more aware of what your community needs to do to be bicycle friendly?

- **Yes**

No

* 87a. If yes, describe.
(500 word limit)

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Community Assessment Tool

UPDATED September 1, 2010

Pedestrian and Bicycle Information Center

THE UNIVERSITY OF NORTH CAROLINA HIGHWAY SAFETY RESEARCH CENTER

U.S. Department of Transportation Federal Highway Administration

FedEx®

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INSTRUCTIONS

Purpose of the WFC Assessment Tool

The purpose of this tool is twofold; it serves to both recognize existing walkable communities and to provide a framework for communities seeking to improve their walkability. This tool recognizes communities which have achieved high levels of walking and low rates of pedestrian crashes while also recognizing communities which are making progress in achieving these two goals through policies, projects and programs. Recognizing that there are many ways to achieve these outcomes, the range of questions in this tool attempts to capture the variety of factors that affect walkability.

There are several benefits of completing this form. First, the WFC assessment tool contains information and resources to assist agencies in improving walking conditions for your community. Through the questions and resources in this form, communities will be able to identify areas of needed improvement and use the tools to develop specific solutions. Completing this form also requires collaboration between government agencies, private not-for-profits, and the private sector, thus building stronger relationships in your community. Another advantage of this tool is that it creates a great internal resource for communities by documenting all walking-related programs, projects, and policies in one place. Most communities will be surprised by the amount they are already doing for walkability. Finally, submitting the assessment to the PBIC for scoring provides the opportunity for your community to be recognized with a designation of bronze, silver, gold, or platinum, in terms of conditions for increased and safer walking. This designation has many benefits of promoting walkability both within your community and through friendly competition with other cities.

Completing the WFC Assessment Tool

Most of the information requested for completion of this assessment tool can be soundly estimated or is relatively easy to find. The information needed to complete this assessment will likely come from a variety of municipal, county, and school district agencies and departments including the police, planning, public works, and engineering departments, and the local transit service provider. Additionally, other information that is requested may be most easily provided by local nonprofit organizations, advocacy groups, elected officials, or even a simple internet search. It is likely that the transportation agency will take the lead in this effort, but it will be important to coordinate across agencies when filling out this application. In some cases one department, such as the city or town's engineering department, will be able to complete an entire section. In other cases, it will make the most sense to have agencies or individuals, like a local Safe Routes to School task force or coordinator, answer certain questions.

How to Answer Questions

There are several different types of questions included in this assessment tool. We have described them here to clarify how each one should be answered.

For some questions, this assessment tool asks about your municipality's plans, policies, projects, and programs. In those cases, please include a link (web address) or attachment to those documents if possible. If the question requests a brief description, please summarize the policy, activity, or process in your own words. If a concise summary already exists, you may link to that summary or use that description. Include in your summary a description of the nature, scope, and results of the policy, program, or project in question.

Several questions request a substantial amount of information. Frequently, the checklists and examples are meant to act as a prompt or jog the applicant's memory, rather than to indicate that any municipality should be implementing all the measures listed. Please answer the questions to the best of your ability.

Some questions are simple yes/no or checkbox questions. In those cases, please check the appropriate box and include a hyperlink or attachment to the most up-to-date version of any requested ordinance, policy, plan, or relevant document.

Though this assessment tool is meant to be comprehensive, we recognize that each community is unique. Every city and town will have its own unique set of challenges and opportunities, so each will have a different approach to pedestrian issues. Accordingly, each section concludes with a question that offers applicants the opportunity to describe or elaborate on anything that your community is doing that may not have been addressed in the other questions.

What to Look For

When answering these questions please think broadly. Does any state or national programs (not directly implemented by you) have a positive impact in your community? Are there policies administered by other local departments that may affect the walking environment? Are there private organizations or advocacy groups doing work in your community?

When completing this assessment tool please be certain to mention any evidence-based programs or approaches your community is using, any in-depth or ongoing programs or activities, and any specific efforts to create a community-wide culture of walking. This assessment tool seeks to learn how communities are supporting walking and pedestrian safety and how well those efforts are working. Therefore, please describe both the nature of your policies, programs, and projects as well as any outcome or evaluation of those approaches.

Criteria and Scoring

This assessment tool is divided into eight sections:

- Community Profile
- Status of Walking
- Planning
- Education & Encouragement
- Engineering
- Enforcement
- Evaluation
- Additional Questions

All sections will be scored, including bonus points from the additional questions. The scoring system will be based on percent and scores are assigned based on the number of questions in the section, the depth of information required in those questions, and the potential impact on walkability of the content addressed in each question. Some cities may be at an advantage for certain questions, however these same cities will be negatively impacted by other questions. For example, an older city like Cambridge, MA has very narrow streets thus impacting sidewalk width and buffers but it has a high connectivety index and land use mix.

COMMUNITY PROFILE

This section is intended to provide applicants with a chance to describe their communities. Having an understanding of the geographic, demographic, and economic make up of the community can help explain the challenges and opportunities that the community faces when planning for walking.

1 Contact Information

_____
Name of Community

_____ _____
Mayor or top official (include title) Mayor's Phone

_____ _____
Community Contact Name Position/Employer

_____ _____
Contact Address Address (line 2)

_____ _____ _____
City State Zip

_____ _____ _____
Phone/Fax Email Website

2 Pedestrian Coordinator & Government Staff

List your official pedestrian coordinator or pedestrian issues contact person on government staff, and identify his/her department:

Contact Person: _____

Contact Person Department: _____

How many hours are spent per year in this capacity? _____

Is this person also the bicycle coordinator? ☐Yes ☐No

List all other government staff or contractors whose primary duties are devoted to walkability and pedestrian safety issues: _____

_____

Do you have a Pedestrian Advisory Committee, Ped/Bike Council or other venue for citizen input?
☐Yes ☐No

If yes, please provide the name of the Chair and their contact information:

_____

_____

Do you have an independent pedestrian advocacy organization? ☐Yes ☐No

If yes, please provide the name and contact information:

_____

3 Community Profile

Population* _____

Area of municipality (sq mi): _____ Population Density: _____

Total area: _____ Park land: _____ Land Area: _____

Climate:	January	April	July	October
Avg. Temperature				
Avg. Precipitation				

Median Household Income*: $ _____

Age Distribution*

% under 20: _____ % age 20-64: _____ % age 65-84: _____ % over 85: _____

Race/Ethnicity (categories based on the U.S. Census)*

% Hispanic or Latino (of any race): _____ % Not Hispanic or Latino: _____

% White: _____ % Black or African-American: _____ % Asian: _____

% American Indian/Alaska Native: _____ % Pacific Islander: _____

% Other: _____ % One race: _____ % Two or more races: _____

*Use U.S. Census data[1] to find demographic and socioeconomic information.

[1] http://factfinder.census.gov/

STATUS OF WALKING

This assessment tool seeks to learn how *much* people are walking and how *safe* they are when they are doing so. Therefore, the outcomes that are most significant for the purposes of this tool are the numbers of walkers and the number of pedestrian crashes. Walk Friendly Communities is looking for communities that have created environments in which many people walk *and* pedestrian crash rates are low, or those communities that are making significant progress towards those ends. These two questions focus on these specific outcomes, while other questions in this survey address what measures are used by communities to facilitate walking and improve safety.

1 According to the 1990 and 2000 Census, what percentage of residents used the following modes for their commute to work?

	1990	2000
Walking		
Bicycling		
Public transit		
Single-occupant vehicles		
Carpool		

Please also provide the latest walking percentage of commuting to work from the most recent 3-year estimates of the American Community Survey. ____%

If your community conducts its own travel counts, please include a link, attachment, or description of those count results:

Web Link: _____

Count Results Description:

_____

Rationale:

Census journey to work data and National Household Travel Survey (NHTS) data can help communities determine how people in their region are traveling. Census data can help provide information about the prevalence of walking. This data, as well as locally collected walking counts and NHTS data can be used in conjunction with crash data to provide justification for pedestrian safety improvements.

Resources:

Find Census and American Community Survey data here[2] or specific journey to work data here[3].

Other useful travel data comes from the National Household Travel Survey[4] and the National Survey of Pedestrian and Bicyclist Attitudes and Behaviors[5].

See how Cambridge, Massachusetts[6]used Census data to better understand the role of walking in the city.

2 How many pedestrian/motor vehicle crashes were reported in each of the last five years; and how many of these crashes resulted in injuries and fatalities?

	2005	2006	2007	2008	2009
Number of Pedestrian Motor Vehicle Crashes					
Number of Pedestrian Injuries					
Number of Pedestrian Fatalities					

Rationale:

Knowing how many pedestrians were reported is essential when planning for pedestrian safety. Understanding common accident types and locations can help communities determine the best countermeasures for improving the safety of pedestrians. However, since the number of fatalities alone can often be quite low, especially for small towns, agencies should also have a way of counting and tracking pedestrian-motor vehicle crashes that do not result in fatalities.

Resources:

For more information on finding pedestrian data and statistics, click here.

The National Highway Traffic Safety Administration hosts the Fatality Analysis Reporting System, a database of fatal motor vehicle crashes where users can find specific information about crashes, including those involving pedestrians.

3 What trends, major changes, or significant progress in walking volumes and pedestrian/motor vehicle crashes has your community witnessed over the past 20 years or since it has begun addressing pedestrian issues and concerns in a comprehensive way?

_____

_____

Resources:

See the 15-year status report[7] for trends and changes in bicycling and walking since the 1994 National Bicycling and Walking Study**.**

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[2] http://factfinder.census.gov/
[3] http://www.census.gov/population/www/socdemo/journey.html
[4] http://nhts.ornl.gov/
[5] http://www.bts.gov/programs/omnibus_surveys/targeted_survey/2002_national_survey_of_pedestrian_and_bicyclist_attitudes_and_behaviors/
[6] *Link to pg 34 of PSAP*

PLANNING

Pedestrian issues are addressed at many different levels of planning, ranging from neighborhood plans to city, county, state, and federal policies and plans. A comprehensive pedestrian plan should address all five Es (education, encouragement, enforcement, engineering and evaluation) along with public involvement. With thorough planning, a community can become proactive rather than reactive in addressing issues of pedestrian accessibility, safety, and aesthetics. Planning involves soliciting public input, collecting information about current and future conditions, and considering what policies, plans, programs and resources a municipality will require to meet your community's needs.

1 Has your community adopted a pedestrian plan or pedestrian safety action plan? ☐Yes ☐No

Please provide a link or attachment of the plan.

Link to action plan: _____

If yes…

- **What year was the plan adopted?** _____
- **What performance indicators or other techniques does your community use to monitor completion?**

  _____

  _____

- **Does your community's pedestrian plan or other adopted plan or policy establish a target mode share for walking?** ☐Yes ☐No

  If yes, what is the target walking share? _____
- **Does the plan have a safety goal (such as the reduction in pedestrian crashes)?** ☐Yes ☐No
- **What elements of the plan are complete? (Indicate what percent of the plan is complete, if possible.)** _____

Rationale:

Communities can address pedestrian issues using a variety of plan types, such as comprehensive plans, capital improvement plans, or long-range transportation plans. Indeed, it is essential that pedestrian planning be included in all such plans. However, dedicated pedestrian plans indicate a community's commitment to pedestrian issues and may help assure that these issues are given sufficient attention in the

[7] http://drusilla.hsrc.unc.edu/cms/downloads/15-year_report.pdf

planning process. Pedestrian plans can also focus attention on implementation, especially if the plan specifies responsibilities, creates accountability, and designates funding sources for projects and programs. In addition, having a documented pedestrian plan with specific priorities can help agencies plan to use limited resources, such as staff time and money, more efficiently.

By creating target mode shares, communities have specific goals and benchmarks by which they can measure their progress. Including (and making progress towards achieving) a goal to increase walking as a form of transportation indicates a community's commitment to supporting pedestrian issues and its ability to do so.

Resources:

High quality pedestrian plans will draw on public participation, comprehensive baseline data, safety concerns, and anticipated demand to prioritize projects and improvements. Plans should also include a community-driven vision and SMART (Specific, Measurable, Attainable, Relevant, and Time-bound) goals. For more information on specific pedestrian planning activities, click here[8].

An international scan team gathered information on European bicycle and pedestrian safety to provide ten recommendations[9] for effective approaches in the U.S.

Click here[10] for examples of local pedestrian plans or here[11] for more about the cost of developing a plan.

For guidelines on creating a safety-focused pedestrian plan, see *How to Develop a Pedestrian Safety Action Plan*[12]. To learn more about what policies can promote non-motorized transportation, refer to this guide.[13]

The cities of Bellevue, Washington[14] and Portland, Oregon[15] have established mode share targets.

New York City addressed specific demographic groups in the creation of the Safe Streets for Seniors[16] plan.

Florida's *Guide for the Review and Assessment of Local Mobility Plans*[17] provides goals and criteria for evaluating plans.

2 Has your community adopted an ADA Transition Plan for the public right of way? ☐Yes ☐No

If so, please provide a link or attachment of the plan: _____

If yes…

- **What year was it adopted? _____**
- **Has the ADA Transition Plan been updated?** ☐Yes ☐No

  If yes, what year? _____
- **Does the ADA Transition Plan address curb ramps and sidewalks?** ☐Yes ☐No **Explain:**

  _____

  _____

[8] http://www.walkinginfo.org/develop/activities.cfm
[9] http://www.international.fhwa.dot.gov/pubs/pl10010/pl10010.pdf
[10] http://www.walkinginfo.org/develop/sample-plans.cfm
[11] http://www.walkinginfo.org/faqs/answer.cfm?id=20
[12] http://drusilla.hsrc.unc.edu/cms/downloads/howtoguide2006.pdf
[13] http://www.walkinginfo.org/faqs/answer.cfm?id=4199
[14] http://www.ci.bellevue.wa.us/pdf/BELL-05-150_ModeShare_MMA_Report_FINAL_7_28_06.pdf
[15] http://www.altaplanning.com/metro+non_sov+mode+share+targets_+portland+_or_+.aspx
[16] http://www.walkinginfo.org/library/details.cfm?id=4553
[17] http://drusilla.hsrc.unc.edu/cms/downloads/FDOT_BDK84_GuideforReviewAssessmentofLocalMobilityPlans.pdf

- **Does the ADA Transition Plan address street crossings and signals?** ☐Yes ☐No

  Explain:

  _____

  _____

- **Who is responsible for the implementation of ADA Transition Plan?**_____

- **Is your transition plan being implemented?** ☐Yes ☐No

  Explain:

  _____

  _____

- **How is the ADA Transition Plan work funded?**

  _____

- **There are state roads in most communities. Has your state DOT adopted an ADA Transition Plan?** ☐Yes ☐No

  Is it being implemented? ☐Yes ☐No

  Explain:

  _____

  _____

Rationale:

The Americans with Disabilities Act of 1990 requires public agencies with more than 50 employees to develop and implement an ADA transition plan. The purpose of a transition plan is to make the agency's facilities and programs universally accessible. The improvements identified in agency transition plans should have been completed by January, 1995, and the plans should be regularly updated so that communities continue to ensure the accessibility of publicly maintained facilities.

Communities that are truly dedicated to creating safe, walkable communities will plan comprehensively for all types of pedestrians. The status of a municipality's transition plan and the means by which it is funded can indicate how a community prioritizes universal accessibility.

Resources:

See *A Checklist for Accessible Sidewalks and Street Crossings*[18] for a summary of ADA guidelines for curb ramps, sidewalks, and other pedestrian features or click here[19] for the full United States Access Board guidelines. Frequently asked questions about ADA requirements for transportation planners and other public agencies are available here[20].

[18] http://drusilla.hsrc.unc.edu/cms/downloads/Checklist_Accessible_Sidewalks_Crossings.pdf
[19] http://www.access-board.gov/prowac/
[20] http://www.fhwa.dot.gov/civilrights/ada_qa.htm#q11

The Department of Justice guidance ADA Best Practices Tool Kit for State and Local Governments[21] provides technical assistance to with ADA compliance.

For an example of an ADA Transition plan and compliance evaluation, see this report[22] from the City of Bellevue.

For guidance on designing facilities for accessibility see the U.S. Access Board's guide for trails here,[23] the Draft Guidelines for Accessible Public Rights-of-way here,[24] or a special report from the Public Rights of Way Access Advisory Committee called *Accessible Public Rights of Way: Planning and Designing for Alterations*[25].

3 Has your community adopted a Complete Streets policy or ordinance? ☐Yes ☐No **If yes, please provide a link or attachment of the document.**

Link to document: _____

- **Is the Complete Streets Ordinance being implemented and to what degree?**

  ☐Yes ☐No Percent completed: _____

- **Who is responsible for the implementation of the Complete Streets Ordinance?**

  _____

- **How is Complete Streets work funded? (i.e., is it routinely funded as part of the project, funded with other set-aside funds, etc.?)**

  _____

  _____

Rationale:

Complete Streets are designed and operate to enable safe and convenient access for all users. Pedestrians, bicyclists, motorists, and transit riders of all ages and abilities are able to safely move along and across a complete street. Complete Streets policies indicate a municipality's commitment to planning for all modes, all ages, and all abilities. By adopting an official Complete Streets policy, some communities have been able to leverage more funding for pedestrian infrastructure and improvements from transportation budgets.

Resources:

Click here,[26] here,[27] or here[28] for more information on the Complete Streets movement. See the Seattle Complete Streets Ordinance[29] for a model ordinance or the New York City Complete Streets Design Guidance[30] for information about design guidelines.

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[21] http://www.ada.gov/pcatoolkit/toolkitmain.htm
[22] http://www.bellevuewa.gov/pdf/Transportation/ada_plan_report.pdf
[23] http://www.access-board.gov/outdoor/
[24] http://www.access-board.gov/rowdraft.htm
[25] http://www.access-board.gov/PROWAC/alterations/guide.pdf
[26] http://www.completestreets.org/
[27] http://www.walkinginfo.org/library/details.cfm?id=3968
[28] http://www.fhwa.dot.gov/publications/publicroads/10julaug/03.cfm
[29] http://clerk.ci.seattle.wa.us/~scripts/nph-brs.exe?d=CBOR&s1=115861.cbn.&Sect6=HITOFF&l=20&p=1&u=/~public/cbor2.htm&r=1&f=G
[30] http://www.walkinginfo.org/library/details.cfm?id=4585

4 Please briefly describe how public input is used in the municipality's planning process. Mention the role that citizen participation, advisory board review, and/or the municipality's pedestrian/bicycle advisory council play in the process. How do you assure that individuals with disabilities are included in the public input process?

_____

_____

Provide any relevant links or attachments that indicate the formal and informal public participation and advocacy efforts in your community (i.e., a link to the pedestrian and bicycle advisory board website, if it exists, or documented guidelines for public participation in the planning process).

Website Link: _____

Rationale:

Citizen participation is a critical component of any local government and public input should be included in the planning and decision making processes. Including pedestrian stakeholders in the planning review process can help secure citizen support for projects and can help a municipality identify safety concerns that it may not have been aware of. Techniques to assure that individuals with disabilities are included in the public input process include providing announcements to agencies serving individuals with disabilities, holding meetings in accessible facilities, providing interpreters if requested, ensuring that web sites are accessible to people using screen reading or screen enlargement software, and providing Braille or large print documents on request. Public participation is integral to the success of transportation planning and should be considered at every stage of the planning process, from collecting baseline data to conducting post-implementation evaluation.

Resources:

Learn about a Pedestrian Safety Planning Group in Bethlehem, New York in this case study.[31]
Read about facilitating public participation[32] and the importance of pedestrian advisory councils.[33]
The Pedestrian and Bicycle Information Center's FAQ[34] provides further information and resources for collecting public input.

5 Does the city have a policy requiring sidewalks on both sides of arterial streets?

☐ Yes ☐ No

On both sides of collector streets? ☐ Yes ☐ No

Sidewalk funding and installation: (if applicable, please provide a link or attachment of the relevant ordinance or policy)

Sidewalk funds link: _____

- **Does the city require sidewalks to be constructed or upgraded with all (or the vast majority of) new private development?** ☐ Yes ☐ No

[31] http://drusilla.hsrc.unc.edu/cms/downloads/PLA.PedestrianSafetyPlanningGroup.pdf
[32] http://www.walkinginfo.org/develop/activities-participation.cfm
[33] http://www.walkinginfo.org/funding/institutionalization-building.cfm
[34] http://www.walkinginfo.org/faqs/answer.cfm?id=4121

- **Does the city have a sidewalk retrofit policy to fill gaps, repair sidewalks, and provide new sidewalks as needed?** ☐Yes ☐No

Rationale:

The presence of sidewalks in a community is associated with higher levels of walking and physical activity (Bureau of Transportation Statistics, 2004; Fulton, Shisler, Yore & Casperson, 2005; Institute of Medicine, 2005; Saelens & Handy, 2008). Requiring developers to build sidewalks in conjunction with new construction is an effective and efficient way to create a comprehensive sidewalk network. A stringently enforced sidewalk construction policy can help municipalities fill in gaps in their sidewalk system and prevent gaps from occurring in the future. Constructing sidewalks along with other development can also be less expensive than retrofitting the right-of-way.

Resources:

See this summary[35] of Greensboro, North Carolina's sidewalk ordinance, which was amended in 2002 to support the city's walkability policy.

6 Has your community established a connectivity policy, pedestrian-friendly block length standards and connectivity standards for new developments, or convenient pedestrian access requirements? If yes, please provide a link or attachment of the policy or ordinance.

☐Yes ☐No

Link to document: _____

Rationale:

Street connectivity is associated with higher levels of physical activity (Frank., Andresen & Schmid, 2004; Frank, Sallis, Conway, Chapman, Saelens & Bachman, 2006; Saelens, Sallis, Black, & Chen, 2003; Smith, Brown, Yamada, Kowaleski-Jones, Zick & Fan, 2008). Grid networks and short block lengths (less than 800 feet) help make cities more walkable by creating multiple direct routes that can decrease walking distance compared to longer blocks or curvilinear street systems (Dill, 2004). In addition, higher numbers of intersections reduce unmarked mid-block crossings and create street crossings that are typically shorter than those on arterial streets, thus providing more areas for pedestrians to cross the street safely (Ewing, nd; Zegeer, Sandt, Scully, Ronkin, Cynecki & Lagerwey, 2008). Communities may increase pedestrian connectivity by creating easements and paths connecting cul-de-sacs or across blocks longer than 800-1000 feet.

Resources:

Connectivity can be measured many different ways. These include block length, block size, intersection density, street density, the Connected Node Ratio (a measure that factors in the number of cul-de-sacs an area has), and more. Click here[36] for more information on using these indices.

Another great resource for the background and supporting research of connection between walkability and connectivity is found here[37].

The Victoria Transport Policy Institute[38] has more information on creating roadway and pathway connectivity.

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[35] http://www.greensboro-nc.gov/NR/rdonlyres/31F4744C-7F8B-4055-957A-C6A065BB8021/0/Sidewalk_Ordinance_Summary_Adopted_12302.pdf
[36] http://www.enhancements.org/download/trb/trb2004/TRB2004-001550.pdf
[37] http://pedshed.net/?p=71
[38] http://www.vtpi.org/tdm/tdm116.htm

7 Do you have a trails plan? ☐Yes ☐No

Is it routine policy to preserve rail corridors no longer needed for railroad purposes? ☐Yes ☐ No

How many miles of trails (paved/hard surface/natural) currently exist in your community? _____ **How many miles of trails are included in your current planning documents?**

_____

Please provide a link or attachment of relevant plan, if available.
Link to document: _____

Briefly describe trails and paths that are provided around the following locations. Include any relevant internet links that illustrate trail networks.

- **Lakes and waterways** _____
- **Utility corridors** _____
- **Municipal golf courses** _____
- **Private development (e.g. office parks, hospitals, residential developments)** _____
- **Other open space** _____

Is it routine policy to build trails and paths with all new and major re-developments?

☐Yes ☐No

Is it required through zoning regulations? ☐Yes ☐No

Are incentives provided to encourage trail construction? ☐Yes ☐No

If so, please provide a link or attachment of the policy or ordinance.

Link to trail incentive: _____

Rationale:

High quality trail networks (including rail trails and greenways) form the facility network backbone of many walkable communities. Not only do they help complete nonmotorized transportation networks, they also attract recreational walkers. Recreational trips make up approximately one-fifth of all walking trips in the United States. Well-designed trails can support economic development and tourism, encourage physical activity, and even raise property values. Access to trails is associated with higher levels of physical activity, particularly for low-income populations (Brownson, Bake, Housemann, & Bacak, 2001; Parks, Houseman, & Brownson, 2003). Constructing trails and paths near waterways or along utility corridors is a great way to use land that is unsuitable for development to create pedestrian facilities.

Resources:

The American Association of State Highway and Transportation Officials' *Guide for the Planning, Design, and Operation of Pedestrian Facilities*[39] and the Federal Highway Administration's *Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide*[40] provide guidance on planning and designing trails.

[39] http://www.walkinginfo.org/library/details.cfm?id=2067

Click here[41] for information on the benefits of trails, trail design, and types of trails or see the Rails-to-Trails Conservancy report *Active Transportation for America: A Case for Increased Federal Investment in Bicycling and Walking*[42] to learn about the importance of federal funding for pedestrian infrastructure like trails.

See Rails-to-Trails Conservancy[43] and American Trails[44] for information and resources on trails.

To learn how other communities are constructing trails, see these case studies:

- Irondequoit Lakeside Multi-Use Trail[45], Rochester, New York
- Ke Ala Hele Makalae Trail[46], Kauai, Hawaii
- Tempe Crosscut Canal Multi-Use Path[47], Tempe, Arizona
- Saranac Lake River Walk[48], Saranac Lake, New York
- Philip A. Rayhill Memorial Trail[49], New Hartford, New York
- Linear Shared Use Path[50], Piqua, Ohio
- Atlanta Beltline[51], Atlanta, Georgia

8 Is your community served by public transportation? If so, please list the agencies and whether they are city, regional, or both.

Please provide the following performance indicators and details to indicate how well your community is served by public transportation.

- **Percent of population living within a quarter mile of a bus stop or ½ mile of a rail station: _____**
- **Service miles per capita: _____**
- **Hours of operation for transit service:**

  Weekday: _____ Weekend: _____
- **Average headway on bus routes: _____**

  Average headway on train routes: _____
- **Average peak period bus headway: _____**
- **On time performance (%): _____**
- **Percent of bus stops that have wheelchair accessible shelters: _____**
- **What route planning software and trip information is provided? _____**

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[40] http://www.fhwa.dot.gov/environment/sidewalk2/
[41] http://www.walkinginfo.org/engineering/trails.cfm
[42] http://www.railstotrails.org/ourWork/advocacy/activeTransportation/makingTheCase/index.html
[43] http://www.railstotrails.org/index.html
[44] http://www.americantrails.org/
[45] http://drusilla.hsrc.unc.edu/cms/downloads/ENG.IrondequoitLakesideMulti-UseTrail.pdf
[46] http://drusilla.hsrc.unc.edu/cms/downloads/ENG.KeAlaHeleMakalaeTrail.pdf
[47] http://drusilla.hsrc.unc.edu/cms/downloads/ENG.TempeCrosscutCanalMulti-UsePath.pdf
[48] http://drusilla.hsrc.unc.edu/cms/downloads/OTH.SaranacLakeRiverWalk.pdf
[49] http://drusilla.hsrc.unc.edu/cms/downloads/ENG.PhilipA.RayhillMemorialTrail.pdf
[50] http://drusilla.hsrc.unc.edu/cms/downloads/ENG.LinearSharedUsePath.pdf
[51] http://drusilla.hsrc.unc.edu/cms/downloads/OTH.HealthImpactAssessmentofProposedAtlantaBeltline.pdf

- **Sidewalk, curb ramps, and street crossings around the majority of bus stops are ADA compliant (check one):**

  □ None □ Few □ Some □ Most □ All

Rationale:

Every transit trip includes walking at some point. In fact, transit riders are more likely to walk for 30 minutes or more daily than non-transit riders (Besser & Dannenberg, 2005) and transit-oriented areas may encourage walking (Institute of Medicine, 2005). Therefore, it is important to consider public transportation when planning for pedestrians and vice versa. Cities that are well served by transit can reduce automobile dependency and increase both walking (the number and frequency of pedestrian trips) and walkability (the human-scale land use and design elements that attract pedestrians).

Resources:

Click here[52] to learn more about planning for transit and walking or see how Washington, D.C.[53], New Jersey[54], and New York City[55] are improving walking and bicycling conditions for transit users. This case study[56] describes how Cleveland, Ohio prioritized bus shelter improvements.

See this study[57] to learn more about factors affecting pedestrian route choices to transit.

This Federal Highway Administration's Pedestrian Safety Guide for Transit Agencies[58] provides information on identifying and improving pedestrian safety and access issues.

9 Which of the following approaches does your community use when planning for parking? Please provide a link or attachment of relevant ordinance or policy and describe when and where these strategies are used.

☐ **Maximum parking standards or absence of minimum parking standards**

Link to standard: _____

Description of standards: _____

_____

☐ **Parking location requirements (i.e., parking below, beside, or behind a building; allowing on-street parking to meet minimum parking requirements)**

Link to location requirements: _____

Description of requirements: _____

_____

☐ **Surface lot size and design requirements, including pedestrian and vehicle separation, locating lots to the side or behind businesses, alternative use of parking lot, landscaping, etc.**

Link to size/design requirements: _____

[52] http://www.walkinginfo.org/transit/
[53] http://www.tooledesign.com/metro/
[54] http://www.state.nj.us/transportation/business/localaid/documents/ssttHandbook2.pdf
[55] http://www.nyc.gov/html/dot/html/sidewalks/safertstransit.shtml
[56] http://drusilla.hsrc.unc.edu/cms/downloads/OTH.TransitWaitingEnvironments.pdf
[57] http://transweb.sjsu.edu/mtiportal/research/publications/documents/06-06/MTI-06-06.pdf
[58] http://safety.fhwa.dot.gov/ped_bike/ped_transit/ped_transguide/transit_guide.pdf

Description of requirements: _____

☐ **Shared parking allowances**

Definition: Shared parking lots can reduce the total number of parking spaces needed in a particular area by coordinating peak parking demand times between different buildings and different uses. For instance, an office building might be able to share a parking lot with a restaurant that operates only in the evenings, as the former would use the lot during the day and the latter would use it at night.

Link to allowances: _____

Description of allowances: _____

_____

☐ **Priced public parking**

Link to prices: _____

Description of priced parking: _____

_____

☐ **Parking cashout incentives**

Definition: Parkng cashout is a financial incentive in which employees who do not drive and park at work receive a subsidy that approximates the cost employers bear to provide free parking to employees.

Link to incentives: _____

Description of incentives: _____

_____

☐ **Remote parking and/or park and ride**

Link to remote parking: _____

Description of remote parking: _____

_____

☐ **Other**

Link to other approach: _____

Description of other approach: _____

_____

Rationale:

The design, price, and amount of parking in a community affect an area's walkability. Surface parking lots reduce density, create conflict points between pedestrians and vehicles at driveways, and are visually unappealing. There are indications that minimum parking requirements result in surplus parking, increased automobile use, and decreased density (Wilson, 1995). In addition, a driver's use of parking tends to be quite price sensitive, indicating that an abundance of free parking may encourage automobile use and, consequently, discourage alternate modes like transit and walking (Richard, 2000). Careful attention to the quality of parking provided, rather than the quantity, can help create walk-friendly environments (Mukhija & Shoup, 2006).

Resources:

The San Francisco Metropolitan Transportation Commission has created a guideline for parking best practices[59], Alexandria, VA has a helpful fact sheet[60] on shared parking, or see the Environmental Protection Agency's *Parking Spaces/Community Places: Finding the Balance through Smart Growth Solutions*[61] for innovative parking solutions.

Donald Shoup and Douglas Kolozsvari discuss a policy in Pasadena, California,[62] that used parking meter revenue for sidewalk amenities and other improvements for pedestrians.

Todd Litman has developed a number of helpful resources and articles. His article, Parking Management: Strategies, Evaluation, and Planning[63], gives an excellent overview of parking strategies, policies, and costs.

10 Approximately what percentage of development in the last five years has been infill? _____%

What measures does your community use to encourage dense, mixed-use development? (check all that apply)

☐ **Secondary or accessory dwelling units are permitted**

Definition: These units are self-contained apartments on an owner occupied single-family lots.

Link to measure: _____

Description of measure: _____

_____

☐ **Retail/commercial uses are required on the ground floor of residential buildings in mixed use corridors or districts**

Link to measure: _____

Description of measure: _____

_____

☐ **Density bonuses to developers are provided for providing amenities that enhance walkability and liveability**

Definition: Density bonuses are used by local governments to allow a developer to build at a higher density than zoning permits in exchange for providing affordable residences or walk-friendly amenities.

Link to measure: _____

Description of measure: _____

_____

☐ **Form-based or design-based codes are used**

Definition: These codes are an alternative to conventional zoning that can be used to ensure a walk friendly environment by regulating the form, scale and massing of buildings rather than the use. They are typically presented with both diagrams and words.

Link to measure: _____

[59] http://www.mtc.ca.gov/planning/smart_growth/parking_seminar/BestPractices.pdf
[60] http://alexandriava.gov/uploadedFiles/planning/info/SharedParkingFactSheet.pdf
[61] http://www.epa.gov/smartgrowth/pdf/EPAParkingSpaces06.pdf
[62] http://shoup.bol.ucla.edu/SmallChange.pdf
[63] http://www.vtpi.org/park_man.pdf

Description of measure: _____

_____

☐ **Neighborhood school siting policies**

Link to measure: _____

Description of measure: _____

_____

☐ **Other (please describe): _____**

Rationale:

Dense development is associated with higher levels of walking and transit use and reduced automobile dependency (Ewing, nd). Compact , mixed-use development is fundamental to making communities walkable because more origins and destinations will be within walking distance of one another (Leinberger, 2007; Saelens & Handy, 2008). Proximity to schools and retail, commercial, and municipal uses can encourage walking. Additionally, large numbers of pedestrians tend to attract more walkers because they indicate the vitality of an area and can create a secure walking environment with more eyes on the street. High densities, walking, and transit use reinforce one another: higher residential and employment densities mean that more riders will live or work within a quarter mile of a transit stop; high ridership levels can improve transit service; and transit riders typically start their trip on foot, so high ridership levels likely indicate high pedestrian levels.

Resources:

This Environmental Protection Agency document[64] describes the many benefits of density and this one [65] describes the effects of school siting policies.

Vancouver, British Columbia, recently adopted an EcoDensity Charter[66], in which it explains how density can support sustainable, livable communities.

Reid Ewing and others review the relationship between urban development and climate change[67], and recommend high-density, mixed use urban development as a strategy for mitigating the effects of climate change.

11 Please briefly describe any urban design features or pedestrian amenities that your community uses or requires to create a comfortable and attractive walking environment. Include features such as sidewalk furniture, landscaping, art, and lighting; building and façade design requirements; and amenities like public restrooms, water fountains, and signs or wayfinding systems.

_____

_____

Please provide a link or attachment of the ordinance or policy that addresses these features.

Link: _____

[64] http://www.epa.gov/smartgrowth/pdf/density.pdf
[65] http://www.epa.gov/smartgrowth/pdf/school_travel.pdf
[66] http://www.vancouver-ecodensity.ca/webupload/File/ecodensity-charter-low.pdf
[67] http://postcarboncities.net/node/1466

Rationale:

While having pedestrian infrastructure in place is essential in making places safe for walking, pedestrian amenities and urban design elements are also important for making walking comfortable and enjoyable. A variety of elements can help create a walk friendly environment; though they may not amount to much in isolation, the combination of pedestrian friendly urban design features may increase walking in a particular area.

Resources:

The idea that design features and pedestrian amenities can affect the walking experience, while quite intuitive, is difficult to show empirically. This study[68] creates a framework for measuring the effect of urban design features on walkability.

The American Institute of Architects' document, *Livability 101*[69], describes the features that enhance pedestrian environments and, consequently, make communities more livable. Likewise, this guide[70] provides suggestions for creating places for people to walk and bike.

See an example[71] of a pedestrian-oriented overlay district from Greensboro, North Carolina.

Check out Seattle, Washington's municipal code[72] specifying design standards along streets with high pedestrian traffic. This ordinance specifies allowable street level uses, maximum building setback distances, sidewalk design requirements, and building and façade standards, such as transparency requirements and overhead weather protection.

12 Please briefly describe any other planning policies related to promoting or enhancing walking in your community.

_____

_____

_____

_____

[68] http://www.smartgrowth.umd.edu/research/pdf/EwingClementeHandyEtAl_WalkableUrbanDesign_093005.pdf
[69] http://www.aia.org/aiaucmp/groups/aia/documents/pdf/aias077944.pdf
[70] http://www.activelivingresources.org/assets/2010IPA_full.pdf
[71] http://www.greensboro-nc.gov/NR/rdonlyres/BD9D5EC8-893B-4CC0-BC05-9DD33855230F/0/springgardenoverlay.pdf
[72] http://clerk.ci.seattle.wa.us/~scripts/nph-brs.exe?d=CODE&s1=23.71.008.snum.&Sect5=CODE1&Sect6=HITOFF&l=20&p=1&u=/~public/code1.htm&r=1&f=G

EDUCATION & ENCOURAGEMENT

Education and encouragement are primary components in creating a successful walk friendly community. This section seeks information about the programs, policies and strategies your community uses to inform, inspire, motivate or reward walkers and other users of the public right of way. It also asks the question "Do your efforts result in a safe walking environment?" Effective pedestrian safety education begins at an early age, is age-specific, and continues through the years across all modes (i.e., motorists educated about pedestrian safety contribute to a safer, more pleasant walking environment for pedestrians; this environment enables and encourages more people to walk).

Encouragement programs can be fun and inclusive in seeking to establish good habits or change unhealthy or unsafe habits. The education and encouragement strategies listed below are common to many walkable communities. If your community uses other strategies to educate the public and encourage walking, please describe them as well.

1 Please describe any Safe Routes to School (SRTS) programming being implemented in your community in the space provided below. Check any of the following activities that are part of your SRTS programs and include information about the nature, scope, and results of these activities (as well as any others not listed below) in your description.

☐ **Walk to School Day/Week**

Definition: Walk to School Day is an international event that takes place annually in October. Schools from all over the country plan special activities to encourage students to walk to school. This special event can be a great way to start a Safe Routes to School program.

Description: _____

☐ **Walking Wednesdays or other walking events**

Definition: Some schools and communities promote walking to school by having regular Walking Wednesday events in which parents, teachers, and students may meet up near the school campus and walk to school together.

Description: _____

☐ **Walkability audits or SRTS maps**

Definition: By auditing and assessing walking routes and creating maps indicating the safest routes to school, communities can help educate students and families about the best routes to take.

Description: _____

☐ **Walking School Bus**

Definition: From saferoutesinfo.org : A group of children that walk or bicycle to school together accompanied by one or more adults.

Description: _____

☐ **Student safety patrol**

Definition: From saferoutesinfo.org: Student safety patrols enhance enforcement of drop-off and pick-up procedures at school by increasing safety for students and traffic flow efficiency for parents. Such efforts allow students to participate in promoting traffic safety where they learn skills they can use in their everyday lives.

Description: _____

☐ **Tracking system to count the number of children walking to school**

Description: _____

☐ **Other (please describe): _____**

Description: _____

Please estimate what percent of schools in your communities participate in the following:

- **Ongoing SRTS program: _____**
- **Special walk to school events only: _____**
- **No walk to school or SRTS activities: _____**

Rationale:

Federal transportation law includes a Safe Routes to School program. Program goals include more children walking and bicycling to school; encouragement of safe, healthy, active lifestyles; improved safety; reduced traffic, fuel consumption, and air pollution; and inclusion of children with disabilities in the program. The SRTS program exists because of policy concerns that fewer children are walking and bicycling to school today and about rising rates of childhood obesity and the attendant long-term health risks and impact on the nation's health care system. SRTS programs typically employ a multi-faceted approach to improving walking and bicycling to school that include education and encouragement activities like those listed above.

Resources:

The U.S. Department of Transportation offers a clearinghouse of SRTS information[73]. The National Center for Safe Routes to School provides resources for specific SRTS activities, such as Walk to School Day[74], Walking School Bus[75] programs, Walkability Checklists[76], SRTS maps[77], and student travel tally sheets[78] for tracking the number of students walking to school.

Click here[79] for SRTS case studies focusing on encouragement programs and here[80] for case studies on education activities.

In addition, each state department of transportation has a full-time SRTS coordinator who is available to provide information and funding to local communities. Such information may be provided in the form of SRTS-specific pages on the state DOT's Web site, a toolkit, educational sessions, and grant workshops.

The SRTS National Partnership also includes resources on its Website[81] for individuals, schools, and advocacy groups to help build support for and capacity of SRTS programs.

---

[73] www.saferoutesinfo.org
[74] http://www.walktoschool.org/
[75] http://www.saferoutesinfo.org/guide/walking_school_bus/pdf/wsb_guide.pdf
[76] http://drusilla.hsrc.unc.edu/cms/downloads/walkabilitychecklist.pdf
[77] http://www.saferoutesinfo.org/resources/collateral/walkbikeroutetipsheet.pdf
[78] http://www.saferoutesinfo.org/resources/collateral/SRTS_Two_Day_Tally_Scan2009.pdf
[79] http://www.saferoutesinfo.org/guide/case_studies/case_studies_list.cfm?CHAPTER_ID=C386
[80] http://www.saferoutesinfo.org/guide/case_studies/case_studies_list.cfm?CHAPTER_ID=C522

2 Please describe any education and training programs related to pedestrian education, safety, or design for staff in your municipality. Staff may include transportation officials, law enforcement officers, school staff and teachers, and advocates and public health professionals. Please include in this description the nature, frequency, scope, and results of these programs.

_____

_____

Rationale:

Ongoing education for professional staff underscores the priority a community places upon the importance of walking, walkability, and pedestrian safety. By educating public officials communities can help ensure that ordinances and policies that support walking are actually implemented. Education and training activities offer an opportunity to refresh current practices and learn new strategies. Such training can reduce or eliminate potential miscommunication between different professions such as judges and police officers.

Resources:

The Pedestrian and Bicycle Information Center offers training courses[82] on pedestrian safety, many of which are aimed at engineers, planners, traffic safety and enforcement professionals, public health and injury prevention professionals, and decision-makers.

See this case study[83] to learn more about efforts in Madison, WI, to train police officers on pedestrian safety laws.

3 Please check and briefly describe any education or encouragement campaigns that are implemented in your community regarding the following topics. Include information about the target audience, techniques used (e.g., posters, workshops, etc.), frequency, scope, and results of the programs. Please mention what measures your community has taken to make sure that education and encouragement campaigns are inclusive of all populations. Also mention your community partnerships (such as Public Health & Planning partnerships) that collaborate on these efforts. Provide any relevant links and attachments to help illustrate these descriptions, if available.

☐ **Walking safety training (e.g., targeted walking education or encouragement programs for children, older adults, college students, transit riders, etc.)**

Link to relevant material: _____

Description: _____

_____

☐ **Driving safety with respect to pedestrians (e.g., pedestrian safety included in drivers education curriculum, test, manual or bus driver training)**

Link to relevant material: _____

Description: _____

_____

[81] http://www.saferoutespartnership.org/
[82] http://www.walkinginfo.org/training/pdps/descriptions.cfm
[83] http://drusilla.hsrc.unc.edu/cms/downloads/EDU.PedestrianSafetyEnforcementDVDs.pdf

☐ **Public service announcements**

Link to relevant material: _____

Description: _____

_____

☐ **Public health campaigns related to walking**

Link to relevant material: _____

Description: _____

_____

☐ **Environmental campaigns related to walking**

Link to relevant material: _____

Description: _____

_____

☐ **Walk to work events**

Link to relevant material: _____

Description: _____

_____

☐ **Prescription walking or prescribed trails**

Definition: Prescription walking or prescribed trails are when doctors prescribe walking time/distance and location

Link to relevant material: _____

Description: _____

_____

☐ **Other (please describe): _____**

Link to relevant material: _____

Description: _____

_____

Rationale:

Education and encouragement programs can communicate the benefits of walking, as well as the rights and responsibilities of pedestrians and motorists, to school children, residents and visitors. Walkable communities can be cultivated by educating all roadway users to interact safely. There are major differences in the walking abilities, behavioral patterns, and learning capacities of different groups of pedestrians and other road users. Because of this, educational programs succeed when tailored to specific audiences and to the behaviors they seek to modify. For example, children have different physical and psychological abilities than adult pedestrians, a younger or new driver may exhibit different behaviors and driving skills than an older driver, and college-age pedestrians may respond to different educational outlets that might not be as effective in reaching other groups.

Resources:

See these resources[84] for more information on education programs.

Communities are also beginning to use social marketing techniques to change behavior. Learn more about social marketing strategies here[85] or read about a particularly successful example in Portland, Oregon called SmartTrips[86]. Between 2002 and 2006, the Centers for Disease Control and Prevention ran a social marketing campaign called VERB[87] that aimed to increase physical activity among preadolescents.

Check out the American Heart Association's public health campaign, Start[88], which aims to encourage walking as a form of physical activity or Montgomery County, Maryland's Drive Safe[89] program, which teaches new drivers pedestrian safety concepts.

Also see this NHTSA guide[90] on education children on safe street-crossing behaviors.

4 Please check and briefly describe any walking tours, guides, or maps that are available (on-line or printed) in your community. If available, please provide a link, attachment, or pictures of wayfinding devices and/or plans, maps, or brochures for these walking tours.

☐ **Walking maps (e.g., neighborhoods maps, school route maps, city-wide maps, etc.)**

Link to relevant material: _____

Description: _____

_____

☐ **Wayfinding and route signs for pedestrians**

Link to relevant material: _____

Description: _____

_____

☐ **History, historic district, architectural, or other themed walks**

☐ **Guided by a person**

Link to relevant material:

_____

Description:

_____

_____

☐ **Unguided using books and brochures, audio tours, or signs and wayfinding**

Link to relevant material:

_____

[84] http://www.walkinginfo.org/education/
[85] http://www.pednet.org/programs/social-marketing.asp
[86] http://drusilla.hsrc.unc.edu/cms/downloads/ENC.PortlandSmartTrips.pdf
[87] http://www.cdc.gov/YouthCampaign/
[88] http://startwalkingnow.org/home.jsp
[89] http://www.montgomerycountymd.gov/dirtmpl.asp?url=/Content/dot/dir/pedsafety/resource.asp
[90] http://www.walkinginfo.org/library/details.cfm?id=4479

Description:

_____

_____

☐ **Greenways and trail maps**

Link to relevant material: _____

Description: _____

_____

Rationale:

Communities that provide information about places to walk may enjoy higher rates of walking. Walking maps and tours may be especially useful to tourists, residents who are new to your community or residents who do not yet walk frequently as they can highlight important destinations and indicate which routes are best for pedestrians. Signs, maps, and tours indicate a community's support for walking culture and are a good way for municipalities to encourage and facilitate walking for many different purposes, including recreational, utilitarian, and fitness walking trips.

Resources:

Feet First, a pedestrian advocacy group in Seattle, Washington, produces neighborhood walking maps that highlight destinations like restaurants and grocery stores, transit stops, and schools. See examples of those maps here[91]. Learn how to create a walking map here[92].

See the variety of guided walking tours offered in San Francisco[93], Washington, DC[94], and Atlanta[95]. Or, see this downloadable map and audio tour[96] for the New Amsterdam trail in New York or these audio guided tours[97] of New York City.

5 Please briefly describe any events and activities in your community that promote walking. Include information about the target audience, nature, frequency, scope, and results of these events. Provide any relevant links and attachments, if available. Please mention any street closures (e.g., festivals, farmers markets, or Sunday Parkways),Walk to Work events, Main Street programs, or art or culture walks.

_____

_____

Rationale:

Walking-focused events or activities offer opportunity, incentive, and support for individual behavioral change. Special events and ongoing activities, such as Sunday Parkways or art walks, can make walking exciting, fun, and social and can create a critical mass of walkers that can attract more walkers.

[91] http://www.feetfirst.info/mapping/index_html
[92] http://www.eatsmartmovemorenc.com/WalkingMapGuide/Texts/WalkingMapGuide_lowrez.pdf
[93] http://www.sfcityguides.org/
[94] http://www.washingtonwalks.com/
[95] http://www.preserveatlanta.com/walkingtours.htm
[96] http://nyharborparks.org/visit/tour-new-amsterdam.html
[97] http://www.nytimes.com/ref/arts/tour-instructions.html

Resources:

Sunday Parkways programs involve closing the street to automobile traffic and creating a welcoming environment for all types of walkers and bicyclists. Learn more about Sunday Parkways programs in Chicago, Illinois[98], Portland, Oregon[99], and San Francisco, California[100].

Learn about Main Street programs here.[101]

6 Please briefly describe any other education or encouragement programs affecting walking in your community.

_____

_____

_____

_____

_____

_____

_____

[98] http://www.walkinginfo.org/library/details.cfm?id=4349
[99] http://www.portlandonline.com/Transportation/index.cfm?c=46103
[100] http://sundaystreetssf.com/
[101] http://www.preservationnation.org/main-street/about-main-street/the-programs/

ENGINEERING

Designing, engineering, operating, and maintaining quality roadways and pedestrian facilities is a critical element in producing a Walk Friendly Community. Designers and engineers have a diverse array of design elements and ever-developing technologies at their disposal that provide a safer, inviting, and more accessible street for pedestrians. These benefits aren't limited to pedestrians. By accommodating pedestrians in all roadway designs, roads become safer for all users. Therefore, it should be essential that pedestrian engineering and design tools are used throughout your community, including sidewalk accommodations and standards, crossings and intersections, traffic calming, trail design, and newer, innovative treatments.

1 Which of the following standards, if any, are included in your municipality's sidewalk design specifications? Please provide a link or attachment of the municipality's sidewalk design standard specifications.

☐ **Sidewalks at least 5' wide in residential areas, 10'-30' in commercial zones**

☐ **Required buffer zone between sidewalk and street**

☐ **Level and continuous sidewalks at driveways so that driveways do not look like roadways**

Sidewalk design link: _____

Rationale:

Both FHWA and the Institute of Transportation Engineers (ITE) recommend a minimum width of 5 ft for a sidewalk or walkway, which allows two people to pass comfortably or to walk side-by-side. Wider sidewalks should be installed near schools, at transit stops, in downtown areas, or anywhere with high concentrations of pedestrians. Sidewalks should be continuous along both sides of a street and sidewalks should be fully accessible to all pedestrians, including those in wheelchairs.

A buffer zone of 4 to 8 ft is should be provided to separate pedestrians from the street. Buffer zones also allow for the planting of trees which provide shade and comfort for the pedestrian realm. The buffer zone will vary according to the street type. In downtown or commercial districts, a street furniture zone is usually appropriate. Parked cars and/or bicycle lanes can provide an acceptable buffer zone. In suburban or rural areas, a landscape strip is generally most suitable. Careful planning of sidewalks and walkways is important in an area in order to provide adequate safety and mobility. The maximum cross-slope should be 2 percent to prevent wheelchair tilting and other difficulties. Providing a level sidewalk across driveways tells motorists they are crossing a sidewalk and that the pedestrian has the right-of-way.

Resources:

Learn more about sidewalk planning and design with the American Association of State Highway and Transportation Officials' *Guide for the Planning, Design, and Operation of Pedestrian Facilities*[102] or see the

[102] http://www.walkinginfo.org/library/details.cfm?id=2067

Federal Highway Administration's *Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide*[103].

2 Estimate the percent of arterial and non-arterial streets that have sidewalks on both sides of the road, one side of the road, or have paved shoulders (minimum of 4 ft) in your community.

	Arterial	Non-Arterial
Sidewalks on both sides		
Sidewalks on one side		
Paved shoulders ≥ 4'		

Please enter the following information about your road network:

- **What is the mileage of your total road network? _____**
- **How many miles of sidewalks are in your pedestrian master plan? _____**
- **How many miles of new sidewalk did you construct last year? _____**
- **How many miles of sidewalk did you construct in the last three years? _____**
- **How many miles of sidewalk do you plan to construct in the next three years?**

  _____

Rationale:

The presence of sidewalks in a community is associated with higher levels of walking and physical activity (Bureau of Transportation Statistics, 2004; Fulton et al., 2005; Institute of Medicine, 2005; Saelens & Handy, 2008). Sidewalks also have tremendous safety benefits as they have been found to reduce "walking along the roadway" type crashes by 86 percent (McMahon et al., 2002); paved shoulders reduce this type of crash by 71 percent (Gan et al., 2005). Walkways should be part of every new and renovated facility and every effort should be made to retrofit streets that currently do not have sidewalks. While sidewalks are typically made of concrete, less expensive walkways may be constructed of asphalt, crushed stone, or other materials if they are properly maintained and accessible (firm, stable, and slip-resistant).

Resources:

Click here[104] for more information on constructing sidewalks.

3 Does your community have a sidewalk condition and curb ramp inventory process?

Description: _____

_____

Does your community use government funds to repair broken sidewalks?

☐Yes ☐No

[103] http://www.fhwa.dot.gov/environment/sidewalk2/
[104] http://www.walkinginfo.org/engineering/roadway-sidewalks.cfm

What is the annual line item for sidewalk maintenance in your community's budget?_____

Estimate the percent of intersections that have ADA accessible ramps on all four corners. ____%

Estimate the percent of sidewalks that need to be repaired or replaced. _____%

Does your community have a program to install curb ramps? ☐Yes ☐No
How many ramps are installed per year? _____ **How many ramp installations are planned for next year?** _____

Does your community have a program to repair and replace broken sidewalks?
☐Yes ☐No
How many locations (or linear feet) were fixed last year? _____
How many repairs are planned for next year? _____

Is there a method for residents to report missing or broken sidewalks and curb ramps? ☐Yes ☐No
Please explain the process (e.g. on-line complaint form)? _____
_____
_____

Rationale:

A complete sidewalk network that includes continuous, well maintained, ADA-compliant sidewalks and curb ramps is one of the most important elements in making a community accessible to pedestrians of all abilities. In order to create a complete sidewalk network, communities need to determine the location and condition of existing sidewalks. There are many different ways to inventory a city's curb ramps and sidewalks. Some communities use aerial photographs to begin their inventories. Agencies are increasingly using personal digital assistant tools (PDAs), geographic information system (GIS) software, online data entry, and other newer technologies to complete their inventory (Quiroga & Turner, 2008).

Having an inventory of the sidewalk system can then help identify and prioritize areas for improvement. Funding the completion and maintenance of the sidewalk system can be challenging. Cities that have comprehensive sidewalk networks don't always have more money, but they frequently prioritize pedestrian projects differently than others.

Curb ramp design is especially important for wheelchair users. Corners should typically have two curb ramps, one for each street that is to be crossed. Curb ramps should also be designed to include level landings, without which the sidewalk can be quite difficult to navigate in a wheelchair. Additionally, detectable warnings, a distinctive surface pattern of domes detectable by cane or underfoot, are used to alert people with vision impairments of their approach to streets and hazardous drop-offs. The ADA Accessibility Guidelines (ADAAG) require these warnings on the surface of curb ramps (which remove a tactile cue otherwise provided by curb faces) and at other areas where pedestrian ways transition to vehicular ways.

Resources:

Sidewalk Inventories

These case studies describe how some communities have inventoried their sidewalk network:

- Creating a Pedestrian Facility Inventory[105], New Castle County, Delaware
- Sidewalk Construction Program[106], Alameda, California
- Sidewalk Planning: A GIS-Based Approach[107], Austin, Texas
- Tucson Regional Sidewalk Inventory[108], Tucson, Arizona

See this article[109] to learn how Seattle, Washington inventoried and assessed the quality of approximately 850 crosswalks in the city.

Funding

Funding for pedestrian facilities can come from a variety of sources and may sometimes require some ingenuity. (For some creative solutions, click here[110].) Click on the links below for more information on infrastructure funding mechanisms or see Chapter 6 of *How to Develop a Pedestrian Safety Action Plan*[111].

Routine accommodation[112] refers to the construction of good pedestrian infrastructure as part of normal public and private development. When pedestrian accommodation is institutionalized, it is automatically included in funding.

SAFETEA-LU[113] (Safe Accountable Flexible Efficient Transportation Equity Act) set up funding through programs such as Congestion Mitigation and Air Quality[114], Safe Routes to School[115], and Transportation Enhancements[116].

American Recovery and Reinvestment Act[117]

Funding can come from both State and local government sources[118] and private sources[119].

Point of sale requirements[120] (See "Putting Cities Back on Their Feet.") Point of sale requirements stipulate that property owners ensure that elements of their property (in this case, adjacent sidewalks) meet certain predetermined standards at the time that the property is sold.

Reporting of hazards

The pedestrian advocacy organization, PEDS, in Atlanta, GA has partnered with the City of Atlanta to develop an online tool[121] for reporting pedestrian safety hazards.

4 Please indicate the number of bridges or overpasses in your community and how many of those provide for pedestrians through shoulders, sidewalks, or multiuse paths.

	Number
Bridges (excluding freeways)	
Bridges with pedestrian provisions on at least one side	

[105] http://drusilla.hsrc.unc.edu/cms/downloads/PLA.CreatingaPedestrianFacilityInventory.pdf
[106] http://drusilla.hsrc.unc.edu/cms/downloads/ENG.SidewalkConstructionProgram.pdf
[107] http://www.walkinginfo.org/library/details.cfm?id=4408
[108] http://drusilla.hsrc.unc.edu/cms/downloads/PLA.TucsonRegionSidewalkInventory.pdf
[109] http://findarticles.com/p/articles/mi_qa3734/is_200401/ai_n9388855/
[110] http://www.walkinginfo.org/funding/sources-community.cfm
[111] http://drusilla.hsrc.unc.edu/cms/downloads/howtoguide2006.pdf
[112] http://www.walkinginfo.org/funding/institutionalization.cfm
[113] http://www.fhwa.dot.gov/safetealu/index.htm
[114] http://www.fhwa.dot.gov/safetealu/factsheets/cmaq.htm
[115] http://www.fhwa.dot.gov/safetealu/factsheets/saferoutes.htm
[116] http://www.fhwa.dot.gov/environment/te/1999guidance.htm
[117] http://www.enhancements.org/recovery.asp
[118] http://www.walkinginfo.org/funding/sources-government.cfm
[119] http://www.walkinginfo.org/funding/sources-private.cfm
[120] http://shoup.bol.ucla.edu/
[121] http://atlantaga.gov/government/publicworks/sidewalkmain_091604.aspx

Pedestrian overpasses (or bridges)	
Pedestrian underpasses	

Identify the last three bridges built (or major reconstruction) in your community. Do the bridges provide pedestrian provisions on at least one side?

Bridge #1 _____

Bridge #2 _____

Bridge #3 _____

Identify bridges currently under design. Do the bridges provide pedestrian provisions on at least one side? _____

_____

Rationale:

Bridges often provide the only safe pedestrian route across certain barriers in a community (freeways, railroad tracks, and natural barriers). Therefore, pedestrians should have access and safe facilities on all bridges in a community. Barriers between the pedestrian facility and vehicle travel lanes increase the comfort and safety for pedestrians. Pedestrian overpasses and underpasses should be built when there are no other convenient crossing options with proper consideration given to lighting, drainage, graffiti removal, security, and ADA requirements.

Resources:

For more information, see the American Association of State Highway and Transportation Officials' *Guide for the Planning, Design, and Operation of Pedestrian Facilities*[122].

This PBIC guide[123] has information and resources on design considerations and best practices.

5 Does your community maintain a pedestrian signaling system? ☐Yes ☐No

Please briefly describe initiatives your community has taken to ensure or improve pedestrian access, safety and convenience at signalized intersections. In your description please address the following questions. Provide a link or attachment of the relevant policy or ordinance, if available.

Link: _____

Description: _____

_____

- **Do you provide pedestrian recall (pedestrians receiving a walk signal during every phase without using a push button) in high pedestrian corridors?**

  ☐Yes ☐No

- **At locations where pedestrian push buttons are used, are the push buttons reachable from a level landing and located in line with the crosswalk line furthest from the intersection?**

  ☐Yes ☐No

[122] http://www.walkinginfo.org/library/details.cfm?id=2067
[123] http://www.walkinginfo.org/faqs/answer.cfm?id=4126

- **Approximately what percentage of intersections have accessible pedestrian signals with audible walk indications? _____%**
- **Approximately what percentage of intersection have pushbutton-integrated accessible pedestrians signals with audible and vibrotactile indications? _____%**
- **What is the average walk speed used to determine signal timing? _____ ft/s**
- **Do you operate your signals that have dedicated left turn arrows with a protected only phase or with protective permissive phases?**

  Explain: _____

  _____
- **Do you use right-turn-on-red restrictions? If yes, when and where? _____**

  _____
- **What percentage of intersections have countdown signals? _____%**

Rationale:

Pedestrian signal indications should be used at all traffic signals, unless the signal is located on a highway where walking is prohibited. In general, shorter cycle lengths and longer walk intervals provide better service to pedestrians and encourage better signal compliance. For optimal pedestrian service, fixed-time signal operation usually works best. Pedestrian pushbuttons may be installed at locations where pedestrians are expected intermittently and should be located close to the crosswalk they serve. Signals may be supplemented with audible or other messages to make crossing information accessible for all pedestrians, including those with vision impairments. Accessible pedestrian signals provide information to pedestrians who are unable to see the visual walk indication and have also been found to help all pedestrians. Many older pedestrians may have poor visual contrast sensitivity and may be unable to see the visual walk indication reliably, particularly in bright sunlight.

Countdown signals are required for all pedestrian signals by the MUTCD and all existing pedestrian signal indicators must be replaced within 10 years. They may be designed to begin counting down at the beginning of the clearance (flashing DON'T WALK) interval and can be on fixed-time or pushbutton operation. A 25 percent reduction in pedestrian crashes when compared to ordinary pedestrian signals has been found with countdown signals (Markowitz et al. 2006).

Prohibiting RTOR should be considered where and/or when there are high pedestrian volumes, or where there is a proven problem with motorists conflicting with pedestrians. This is due to motorists being so intent on looking for traffic approaching on their left that they may not be alert to pedestrians approaching on their right. A similar scenario exists with permissive left turns, which can be rectified with protected left turn phasing only.

Resources:

For more information on engineering treatments for pedestrian safety consult the Federal Highway Administration's *Manual on Uniform Traffic Control Devices*,[124] the American Association of State Highway and Transportation Officials' *Guide for the Planning, Design, and Operation of Pedestrian Facilities*,[125] accessibility guidelines here[126], or see Chapter 5 of *How to Develop a Pedestrian Safety Action Plan*[127].

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[124] http://mutcd.fhwa.dot.gov/
[125] http://www.walkinginfo.org/library/details.cfm?id=2067
[126] http://www.access-board.gov/prowac/
[127] http://drusilla.hsrc.unc.edu/cms/downloads/howtoguide2006.pdf

Click here[128] for guidance on using accessible pedestrian signals (APS) or here[129] for more signal information.

St. Petersburg, Florida provides an evaluation[130] of the implementation of a new pedestrian signal.

The PedSafe Web site[131] and manual[132] provide the latest information available for improving the safety and mobility of those who walk. These online tools provide the user with a list of possible engineering, education, or enforcement treatments to improve pedestrian safety and/or mobility based on user input about a specific location.

6 Please briefly describe initiatives your community has taken to ensure or improve pedestrian access, safety and convenience at crosswalks. In your description please address the following questions. Provide a link or attachment of the relevant policy or ordinance, if available.

Link to policy or ordinance: _____

- **How are marked crosswalk locations selected?** _____

  _____

- **What is your standard crosswalk marking type (e.g., parallel lines, ladder style, high visibility, etc.)?** _____
- **Are crosswalk markings regularly maintained?** ☐Yes ☐No
- **Are in-road stop/yield signs[133] used?** ☐Yes ☐No

  How are these locations selected? _____
- **Are advance stop/yield lines placed at multilane uncontrolled marked crosswalks in order to reduce multiple threat crashes?** ☐Yes ☐No
- **Are there other pedestrian safety practices being used at crosswalks?**

  _____

  _____

Rationale:

Marked crosswalks serve to highlight the right-of-way where motorists can expect pedestrians to cross. Various crosswalk marking patterns are given in the Manual on Uniform Traffic Control Devices; however, the international (also known as "ladder" or "zebra") markings are strongly preferred, particularly at uncontrolled locations, because they are far more visible, which is particularly important at night or in low light conditions (e.g., rain).

At midblock marked crosswalks, an advance stop/yield line can help prevent multiple threat crashes at crosswalks on multilane roads. This type of crash occurs when a driver stops too close to the crosswalk to let a pedestrian cross, masking visibility of the adjacent travel lane. An advance stop/yield line placed 6 to 15 m (20 to 50 ft) ahead of the crosswalk can greatly reduce the likelihood of a multiple-threat crash, as this

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[128] http://www.apsguide.org/

[129] http://www.walkinginfo.org/engineering/crossings-signals.cfm

[130] http://drusilla.hsrc.unc.edu/cms/downloads/FDOT_BA784%20EvaluationRectangularRapidFlashBeaconStPetersburgFlorida.pdf

[131] http://www.walkinginfo.org/pedsafe/

[132] http://www.walkinginfo.org/pedsafe/pedsafe_downloads.cfm

[133] http://mutcd.fhwa.dot.gov/htm/2009/part2/fig2b_02_longdesc.htm

encourages drivers to stop back far enough so a pedestrian can see if a second motor vehicle is not stopping and take evasive action. The advance yield/stop line should be supplemented with "Stop Here For Pedestrians" signs (R1-5 or R1-5a) to alert drivers where to stop to let a pedestrian cross.

Resources:

For best practices for crosswalk installation, see the FHWA's *Manual on Uniform Traffic Control Devices*,[134] the American Association of State Highway and Transportation Officials' *Guide for the Planning, Design, and Operation of Pedestrian Facilities*,[135] or see Chapter 5 of *How to Develop a Pedestrian Safety Action Plan*[136].

Click here[137] for guidance on using accessible pedestrian signals (APS) or here[138] for more general information on pedestrian signs and signals.

Columbia, MO has helpful policy and standards for pedestrian crossings[139].

Recommended guidelines and priorities for crosswalk installation at uncontrolled locations are given in the FHWA document, Safety Effect of Marked Versus Unmarked Crosswalks at Uncontrolled Locations: Final Report and Recommended Guidelines[140].

Find information about model snow removal policies for city sidewalks here.[141]

You can also find more information on crosswalk installation and crossing enhancements here[142], here[143], or here[144].

7 Does your community design and build its own roadways? ☐Yes ☐No

What geometric features are being used to ensure or improve pedestrian access, safety and convenience? In your description please address the following questions. Provide a link or attachment of the relevant policy or ordinance, if available.

- **Are median crossing/refuge islands used? Is there a standard or typical roadway that these are used on? How many have been installed in the last three years? Are any more planned?**

  Link to island policy: _____

  Description: _____

  _____

- **Do you routinely install curb extensions? How many have been installed in the last three years? Are any more planned?**

  Link to curb extension policy: _____

  Description: _____

  _____

[134] http://mutcd.fhwa.dot.gov/
[135] http://www.walkinginfo.org/library/details.cfm?id=2067
[136] http://www.walkinginfo.org/library/details.cfm?id=2067
[137] http://www.walkinginfo.org/aps/
[138] http://www.walkinginfo.org/engineering/crossings-signals.cfm
[139] http://www.gocolumbiamo.com/PublicWorks/Documents/Engineering/cwpolicy.pdf
[140] http://www.tfhrc.gov/safety/pubs/04100/index.htm
[141] http://www.walkinginfo.org/faqs/answer.cfm?id=4125
[142] http://www.walkinginfo.org/engineering/crossings-crosswalks.cfm
[143] http://www.walkinginfo.org/engineering/crossings-enhancements.cfm
[144] http://www.walkinginfo.org/pedsafe/

- **What is the standard curb radius (10’, 15’, 20’, 25’ 30’, 35’) for local, collector, and arterial streets?**

  Link to curb radius policy: _____

  Description: _____

  _____

- **What other geometric design features are implemented for pedestrian safety?**

  Link to other design features: _____

  Description: _____

  _____

- **Has your community taken initiatives to increase safety for people crossing the street at bus stops that are not located at signalized intersections or crosswalks?**

  Link to bus stop policy: _____

  Description: _____

  _____

Rationale:

Crossing 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 let pedestrians to deal with only one direction of traffic at a time: they allow pedestrians to stop partway across the street and wait for an adequate gap in traffic before crossing the second half of the street. This kind of facility has been demonstrated to significantly decrease the percentage of pedestrian crashes by 25-50 percent (Zegeer et al. 2002, ITE 2004) and reduce all crashes by 30-35 percent (Bahar et al. 2007), thus making the roadway safer for all users.

Curb extensions—also known as bulb-outs or neckdowns—extend the sidewalk or curb line out into the parking lane, which reduces the effective street width. Curb extensions significantly improve pedestrian crossings by reducing the pedestrian crossing distance, visually and physically narrowing the roadway, improving the ability of pedestrians and motorists to see each other, and reducing the time that pedestrians are in the street. Curb extensions are only appropriate where there is an on-street parking lane. The turning needs of larger vehicles, such as school buses, need to be considered in curb extension design. Bicycle lanes (or shoulders, or whatever space is being used for bicycle travel) must not be eliminated or squeezed in order to create the curb extensions or islands.

One common pedestrian crash type involves a pedestrian who is struck by a right-turning vehicle at an intersection. A wide curb radius typically results in high-speed turning movements by motorists. Reconstructing the turning radius to a tighter turn will reduce turning speeds, shorten the crossing distance for pedestrians, and also improve sight distance between pedestrians and motorists. Curb radii can, in fact, be tighter than any modern guide would allow: older and some neo-traditional cities frequently have radii of 10 to 15 ft (3 to 4.6 m) without suffering any detrimental effects. More typically, in new construction, the appropriate turning radius is about 15 ft (4.6 m) for residential streets and about 25 ft (7.6 m) for arterial streets with a substantial volume of turning buses and/or trucks.

The Bureau of Transportation Statistics 2000 report *Freedom to Travel*[145] discusses the barrier effect of roadways included problems due to wide roadways and complex signals.

One of the significant variables identified in the development of Intersection Safety Indices (ISI)[146] for pedestrians was the number of through lanes. More lanes mean wider roadways, creating a longer crossing distance which is less safe for pedestrians.

Resources:

For more information on geometric design, see the Federal Highway Administration's *Manual on Uniform Traffic Control Devices*,[147] the American Association of State Highway and Transportation Officials' *Guide for the Planning, Design, and Operation of Pedestrian Facilities*[148] or its *A Policy on Geometric Design of Highways and Streets*[149]. Also see Chapter 5 of *How to Develop a Pedestrian Safety Action Plan*.[150]

The Federal Highway Administration's Guidance Memorandum on Consideration and Implementation of Proven Safety Countermeasures [151] provides guidance for sidewalks and pedestrian refuges.

8 Please briefly describe any innovative pedestrian treatments installed in your community? Treatments may include special pedestrian phasing such as a leading pedestrian interval or scramble timing, crossing aids such as a HAWK beacon or rapid flash beacon, or passive pedestrian detection. Include any relevant links or attachments, if available.

Link to special treatment document: _____

Description of treatments: _____

_____

Rationale:

A simple, useful change at signalized intersections is the leading pedestrian interval (LPI). An LPI gives pedestrians an advance walk signal before the motorists get a green light, giving the pedestrian several seconds to start in the crosswalk where there is a concurrent signal. Pedestrians are more visible to motorists and motorists are more likely to yield to them. This advance crossing phase approach has been used successfully for two decades in places such as New York City; studies have demonstrated reduced conflicts for pedestrians. The LPI is particularly effective where there is a two-lane turning movement. To be useful to pedestrians with vision impairments, an LPI needs to be accompanied by an audible signal to indicate the walk interval.

The HAWK (High-intensity Activated crosswalk) beacon is an effective traffic control device that uses traditional traffic and pedestrian signal heads but in a different configuration. These beacons are named Pedestrian Hybrid Beacons in the MUTCD and can be used to aid pedestrians and bicyclists at unsignalized crossings, particularly at high speed or volume locations.

Another effective traffic control device is the rectangular rapid flash beacon. Studies have found motorist yield rates of over 80 percent with these devices on roadways with medians (Van Houten, 2004). These beacons are yellow, rectangular, and have a rapid "wig-wag" flash activated through active or passive detection.

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[145] http://www.bts.gov/publications/freedom_to_travel/
[146] http://www.tfhrc.gov/safety/pedbike/pubs/06125/06125.pdf
[147] http://mutcd.fhwa.dot.gov/
[148] http://www.walkinginfo.org/library/details.cfm?id=2067
[149] https://bookstore.transportation.org/Item_details.aspx?id=110
[150] http://drusilla.hsrc.unc.edu/cms/downloads/howtoguide2006.pdf
[151] http://safety.fhwa.dot.gov/policy/memo071008/

Since pedestrian pushbutton devices are not activated by about one-half of pedestrians (even fewer activate them where there are sufficient motor vehicle gaps), new "intelligent" microwave or infrared pedestrian detectors are now being installed and tested in some U.S. cities. These automatically detect pedestrians and activate the red traffic and walk signals when pedestrians are present. Detectors can also be used to extend the crossing time for slower moving pedestrians in the crosswalk.

Resources:

See this case study[152] from Phoenix, Arizona or this report[153] from the FHWA, to learn more about HAWK beacons.

This analysis[154] describes St. Petersburg, Florida's experience with rapid flash LED beacons at crosswalks.

See here[155] or here[156] for information on crosswalk treatments or read this case study of innovative crosswalk treatments in Arlington, Virginia[157].

The *Manual on Uniform Traffic Control Devices*[158] also provides information on a variety of signaling, signage, and other engineering techniques.

9 Please briefly describe your community's traffic calming practices and/or policies and cite any relevant examples. Traffic calming practices may include road diets, lane diets (reduction in lane width) or streets with a pedestrian focus. Provide any relevant links or attachments, if available.

Link to calming practices document: _____

Description of practices: _____

_____

Rationale:

Traffic calming is a way to design streets that uses physical and visual cues to encourage motorists to drive more slowly. If done correctly, traffic calming reduces traffic speeds, the number and severity of crashes, and noise levels. It can also encourage walking because reduced speeds and improved aesthetics improve pedestrian comfort. Types of traffic calming techniques include horizontal shifts, vertical deflection, and closures.

A road diet typically reduces the number of travel lanes on a road, reallocating this space for other needs (pedestrian paths, bicycle lanes, transit facilities, etc.). Road diets provide many benefits to pedestrians, including reduced crossing distance, room for median islands to break the crossing into two simpler crossings, and a buffer zone for the sidewalk through the addition of wider sidewalks, parking, or bicycle lanes. As many roadways have been overbuilt, most communities have many road diet candidates. A typical road diet reduces a four lane road to a three lane road; this can often be done on roads with less that 15,000 ADT. Road diets also make roads safer. One study found that a traditional 4-to-3 road diet resulted in a 29 percent crash reduction for all users (Harkey et al. 2008).

Resources:

Click here[159] for more information on traffic calming solutions.

Pima County, AZ provides an example of a Neighborhood Traffic Management Program[160].

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[152] http://drusilla.hsrc.unc.edu/cms/downloads/ENG.BringingLifetoTransportation.pdf
[153] http://www.fhwa.dot.gov/publications/research/safety/10042/10042.pdf
[154] http://mutcd.fhwa.dot.gov/resources/interim_approval/ia11/stpetersburgrpt/stpetersburgrpt.pdf
[155] http://www.walkinginfo.org/faqs/answer.cfm?id=46
[156] http://www.walkinginfo.org/engineering/crossings-signals.cfm
[157] http://www.walkinginfo.org/library/details.cfm?id=2880
[158] http://mutcd.fhwa.dot.gov/
[159] http://www.walkinginfo.org/engineering/calming.cfm

Chapter 5 of *How to Develop a Pedestrian Safety Action Plan*[161] provides information on traffic calming techniques.

Learn more about road diets in *Road Diets: Fixing the Big Roads*[162] and *Evaluation of Lane Reduction "Road Diet" Measures and Their Effects on Crashes and Injuries*[163].

10 Please briefly describe any other engineering projects or policies affecting walking in your community.

_____

_____

_____

_____

[160] http://www.dot.co.pima.az.us/trafeng/NTMP/
[161] http://drusilla.hsrc.unc.edu/cms/downloads/howtoguide2006.pdf
[162] http://www.walkable.org/assets/downloads/roaddiets.pdf
[163] http://www.tfhrc.gov/safety/hsis/pubs/04082/index.htm

ENFORCEMENT

In many communities, enforcement is often neglected as a technique for making communities safer for walking. Communities that have created comfortable walking environments through engineering improvements or urban design features may still have safety concerns if traffic laws are not properly understood or adequately enforced. Enforcement activities work best when implemented in conjunction with education and awareness activities. Therefore, well-implemented enforcement campaigns will include public education campaigns, law enforcement officer training, and strategic law enforcement and ticketing strategies. A successful enforcement program will usually require the involvement of community members, law enforcement officials, city council members, and the media.

1 How many officers does your community have? _____

How many of these are involved in enforcement and what is the average amount of work time per officer devoted to enforcement?

- **Number in enforcement: _____**
- **Average hours (officers/month) of enforcement: _____**

Does your community have a traffic safety officer? ☐Yes ☐No

If so, please estimate the amount of work time that is devoted to responsibilities concerning pedestrian laws and safety. _____

Rationale:

Demands on a police department and the level of support departments can offer vary from community to community. Law enforcement agencies are stretched thin in most communities, and the typical response to requests for pedestrian enforcement support is "we don't have enough officers." By designating a traffic safety officer, communities can prioritize traffic safety enforcement.

Resources:

Some states and communities, like South Carolina[164], have Traffic Safety Officer Training Programs.

2 Does your community use targeted enforcement programs to promote pedestrian safety in crosswalks? Indicate which of these elements, if any, are part of the enforcement program.

☐ **Pedestrian decoys (aka crosswalk stings)**

Definition: From walkinginfo.org: These are well-prepared and coordinated operations designed to warn motorists that the yield-to-pedestrian laws will be enforced at target locations. Officers prepare a site by establishing the safe stopping distance to a crosswalk, with a 10 mi/h over the speed limit leeway. Cones are set out in that location. An

[164] http://www.nhtsa.dot.gov/people/outreach/safedige/spring2003/spr03_w13_SC.htm

officer in plain clothes steps into the crosswalk just before a vehicle passes the cone. If the motorist doesn't yield, either a warning or a citation is given, based on the severity of the incident.

☐ **Media campaigns regarding enforcement**

☐ **Speed feedback signs**

☐ **Progressive ticketing**
Definition: From walkinginfo.org: Progressive ticketing is a method for introducing ticketing through a three-staged process: educating, warning, and ticketing.

☐ **Other (please describe): _____**

Rationale:

Enforcement may be the most important element in getting drivers to yield to pedestrians in crosswalks. Enforcement programs should be coupled with an education component to ensure that drivers and pedestrians understand traffic rules. The awareness and education messages should tell people about the problem and why enforcement action is necessary. This will help generate public support and offset any complaints from those who are caught breaking the law. The public also needs to know what the enforcement activities will be and when they will start. Get the word out by mailing materials to residents living within a certain distance of the program area and using local television stations and newspapers to spread the message. For some drivers, raising that awareness may be enough to cause them to alter their unsafe actions; for others, seeing that traffic laws are being regularly enforced may change their behavior.

Resources:

For more information on improving yield-to-pedestrian compliance, look here[165] or read case studies about a successful education and enforcement programs in Amherst, Massachusetts[166] and Missoula, Montana[167]. This case study[168] describes a successful pedestrian decoy operation.

More general information on law enforcement approaches can be found here[169].

For more information on the impact of crosswalk signs, click here[170].

Click here[171] to learn more about relaying important messages to target audiences, including child and college-age pedestrians, alcohol consumers, and older adults. The Federal Highway Administration has created education materials[172] for Spanish speaking bicyclists and pedestrians and the National Highway Traffic Safety Administration has created *Guidelines for Developing Traffic Safety Materials for Spanish-Speaking Audiences*[173].

See these case studies to learn about how law enforcement officers have helped implement targeted education campaigns.

- Comprehensive School-Age Pedestrian Safety Program,[174] Orange County, Florida
- Bicycle and Pedestrian Safety Campaign,[175] Burlington, Vermont

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[165] http://www.walkinginfo.org/faqs/answer.cfm?id=3921
[166] http://drusilla.hsrc.unc.edu/cms/downloads/EDU.CrossSafelyDriveSafely.pdf
[167] http://drusilla.hsrc.unc.edu/cms/downloads/COM.MissoulaPedestrianSafetyCampaign.pdf
[168] Link to pg. 101 in PSAP
[169] http://www.walkinginfo.org/enforcement/programs-enforcement.cfm
[170] http://www.walkinginfo.org/faqs/answer.cfm?id=3455
[171] http://www.walkinginfo.org/education/messages.cfm
[172] http://www.walkinginfo.org/library/details.cfm?id=3467
[173] http://www.walkinginfo.org/library/details.cfm?id=2321
[174] http://drusilla.hsrc.unc.edu/cms/downloads/EDU.ComprehensiveSchool-AgePedestrianSafetyProgram.pdf
[175] http://drusilla.hsrc.unc.edu/cms/downloads/COM.BicycleandPedestrianSafetyCampaign.pdf

3 How many citations does your local police department give annually for traffic infractions that relate to road safety? _____

Is this up or down from previous years? ☐Up ☐Down

Please list the number of citations given for the following infractions:

- **Speeding: _____**
- **Failure to yield: _____**
- **Parking on sidewalks or too close to intersections or crosswalk:**

  _____

Does your community use photo enforcement technology that targets speeding and/or red light running? Explain. _____

_____

Rationale:

It is important for law enforcement agencies to regularly enforce traffic violations, and those that relate to pedestrian safety should be enforced with the same rigor as others. Tracking traffic citations can help communities better understand what types of traffic safety problems exist. Note that it is important to have cooperation with the court system to ensure conviction of these violations.

Police departments may choose to use a progressive ticketing approach or a combined enforcement and education approach, as these tend to be better received and more effective than unexplained ticketing. Studies by Van Houten (2004) and others have found that enforcement aimed at motorists is more effective than enforcement aimed at pedestrians.

Speed photo-radar enforcement (SPE) has also been shown to be effective in reducing automobile speeds. One study by Medina et al. (2009) showed that SPE significantly reduced downstream speeds among both cars and trucks.

Photo enforcement is also helpful in reducing the rate of red light running. Two 1999 studies by Retting et al. showed 42 and 40 percent reductions in red-light violators after a publicized photo enforcement system was introduced.

Resources:

See the National Highway Traffic Safety Administration *Resource Guide on Laws Related to Pedestrian and Bicycle Safety*[176], a downloadable, interactive program, for more information pedestrian safety focused legislation from around the country. For more information on pedestrian crossing ordinances, refer to this guide.[177]

See Chapter 8 in *Countermeasures That Work*[178] for more information on effective enforcement techniques to improve pedestrian safety.

This guide[179] provides information and other resources on the effectiveness of citations.

Communities may use red light cameras[180] or photo speed enforcement[181] in addition to citations given by law enforcement officers.

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[176] http://www.walkinginfo.org/library/details.cfm?id=842
[177] http://www.walkinginfo.org/faqs/answer.cfm?id=4127
[178] http://ntl.bts.gov/lib/32000/32300/32356/6626_Countermeasures_01-06-10-v1.pdf
[179] http://www.walkinginfo.org/faqs/answer.cfm?id=4119
[180] http://www.walkinginfo.org/pedsafe/casestudy.cfm?CS_NUM=68
[181] Link to pg. 101 in PSAP

4 Which, if any, of the following approaches does your community take to ensure the safety and security of pedestrians and runners on city streets, trails, and walkways?

- ☐ **Emergency call boxes. Describe: _____**
- ☐ **Police patrols on foot or bike. Describe (include the number of officers that are bike patrol certified): _____**
- ☐ **Neighborhood watch programs. Describe: _____**
- ☐ **Drunk driving and drunk walking enforcement. Describe: _____**
- ☐ **Street lighting. Estimate the number of streets with lighting on one or both sides: arterial _____% non-arterial _____%**
- ☐ **Other (please describe):_____**

Rationale:

There are a variety of ways that law enforcement officers, community members, city planners, and public works departments can increase the safety of pedestrians from traffic dangers as well as crime. Lighting, eyes on the street, and police presence can be important elements in creating a safe and secure walking environment.

Resources:

See this case study[182] to learn more about a neighborhood speed watch program in Phoenix, Arizona or see Chapter 8 in *Countermeasures That Work*[183] for more information on effective techniques to improve pedestrian safety.

This case study[184] documents the use of specially-created DVDs for training traffic officers.

Click here[185] to learn what steps your community can take if crime is preventing people from walking.

5 Please briefly describe your community's policies and practices regarding the use of adult crossing guards at elementary and middle schools. Include any information about the criteria for placement of adult crossing guards, training programs, crossing procedures, crossing guard signs and equipment, and law enforcement strategies at crossing guard locations.

_____

_____

Provide a link or attachment of any relevant policies, if available.

Link: _____

Rationale:

Adult school crossing guards play an important role in the lives of children who walk or bicycle to school. They help children safely cross the street at key locations. They also remind drivers of the presence of pedestrians. The presence of adult crossing guards can lead to more parents feeling comfortable about their children walking or bicycling to school. While the primary role of an adult school crossing guard is to guide

[182] http://www.walkinginfo.org/pedsafe/casestudy.cfm?CS_NUM=71
[183] http://ntl.bts.gov/lib/32000/32300/32356/6626_Countermeasures_01-06-10-v1.pdf
[184] http://drusilla.hsrc.unc.edu/cms/downloads/EDU.PedestrianSafetyEnforcementDVDs.pdf
[185] http://www.walkinginfo.org/problems/problems-crime.cfm

children safely across the street, children also remain responsible for their own safety. In this respect, a guard plays another key function—a role model who helps children develop the skills necessary to cross streets safely at all times.

The design and implementation of an adult school crossing guard program is largely the decision of local communities. Some federal guidance exists and there are some state and local requirements pertaining to the operation of guard programs, but these vary across the country. Ideally, the development of an adult school crossing guard program involves a community partnership that includes the expertise of law enforcement agencies, traffic engineering or planning departments, and school systems. Working together with parents, this community group identifies the locations where adult school crossing guards are needed and the appropriate number of guards for each location. The group establishes crossing procedures for a variety of traffic situations, hires, trains and equips the guards, and secures long-term funding for the program.

Resources:

For guidance on implementing a school crossing guard program, see the *Adult Crossing Guard Guidelines*[186], developed by the National Center for Safe Routes to School.

6 Does your community's police department have a systematic strategy for selecting locations and countermeasures for traffic and pedestrian safety?

Describe: _____

_____

Rationale:

Some communities target enforcement in areas where there is a known safety problem. This can be an effective strategy if the safety problem is caused by pedestrian or driver behavior. Unlike vehicle crashes, crash rates for pedestrians are typically not used, since pedestrian volumes are usually not known. Instead, high pedestrian crash locations, corridors, and targeted areas should be initially identified by comparing the total number of pedestrian crashes.

Resources:

See Chapter 4 in *How to Develop a Pedestrian Safety Action Plan*[187] or Chapter 8 in *Countermeasures that Work*[188] for more information on selecting areas for targeted enforcement and other safety countermeasures.

This case study[189] from San Jose, California describes how the Department of Transportation and Police Department worked together and used crash and citation data to guide a comprehensive education and enforcement campaign.

See how communities in Oakland, California[190] and Miami Dade, Florida[191] are using crash data to identify potential traffic improvements.

Sweden compiles national traffic crash data using both police crash reports and traffic related hospital admissions. This report[192] uses the Swedish Traffic Accident Data Acquisition (STRADA) Database to analyze nonmotorized crashes.

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[186] http://www.saferoutesinfo.org/guide/crossing_guard/pdf/crossing_guard_guidelines_web.pdf
[187] http://drusilla.hsrc.unc.edu/cms/downloads/howtoguide2006.pdf
[188] http://ntl.bts.gov/lib/32000/32300/32356/6626_Countermeasures_01-06-10-v1.pdf
[189] http://drusilla.hsrc.unc.edu/cms/downloads/EDU.StreetSmarts.pdf
[190] Pg. 27 of PSAP
[191] Pg. 29 of PSAP
[192] http://www.vti.se/templates/Report____2797.aspx?reportid=11753

7 Do police work regularly with traffic engineers and planners to review sites in need of safety improvement for motorists and pedestrians? ☐Yes ☐No

Describe: _____

_____

Does your community use crash and/or fatality data to identify problem areas and potential solutions? ☐Yes ☐No

Please describe any other ways that your community's police department addresses the pedestrian concerns in your community. _____

_____

_____

Rationale:

Improving pedestrian safety in a community or region is typically the result of implementing different safety treatments and changing agency design policies. Crash countermeasures, or treatments intended to address pedestrian safety concerns, can take several forms: operational and construction projects intended to fix specific problems; changes in design guidelines to help improve streets and intersections in future projects; and education and enforcement programs aimed at achieving changes in motorist and pedestrian behavior or attitude. By partnering with engineers, law enforcement officers can help identify and improve pedestrian safety problems. Addressing pedestrian safety is an interdisciplinary undertaking that will require communication among agencies.

Resources:

See here[193] and here[194] to learn more about developing diverse partnerships to address pedestrian safety issues.

[193] http://www.walkinginfo.org/problems/help.cfm
[194] http://www.walkinginfo.org/enforcement/partnerships.cfm

EVALUATION

By incorporating planning, education, encouragement, engineering, and enforcement countermeasures, a community can have a direct impact on pedestrian safety and walkability. Evaluation of the pedestrian environment and behavior plays a crucial role in problem identification and countermeasure selection. In order to truly understand local pedestrian needs and safety issues, a community should utilize effective evaluation strategies.

1 Does your community have an ongoing pedestrian counting and/or survey program that allows for long-term trend analysis of walking trips?

Please describe:

_____

_____

Rationale:

While surveys such as the Census, the National Household Travel Survey, and the National Survey of Pedestrian and Bicyclist Attitudes and Behaviors can shed some light on national mode share and travel behavior, they do not necessarily reflect local trends. The best way to estimate the numbers of people who walk in a particular city or town is to conduct frequent, comprehensive pedestrian counts. Local counts allow municipalities to understand where, when, and how often people are walking in a community. This can help when determining how to prioritize walking improvements; walk counts can also help communities evaluate if infrastructure treatments or other programs have affected walking volumes.

Resources:

The Federal Highway Administration document Pedestrian and Bicycle Data Collection Systems in United States Communities[195] describes how communities across the country are conducting walking counts. Arizona's use of pedestrian surveys to gather information is described here[196].

The National Bicycle and Pedestrian Documentation Project[197], co-sponsored by Alta Planning and Design and the Institute of Transportation Engineers Bicycle and Pedestrian Documentation Committee, has created a model for collecting bicycle and pedestrian data in the hopes of collecting more accurate measures of use and demand of pedestrian and bicycle facilities.

2 Has your community used any of the following tools to evaluate major pedestrian areas (town centers, major activity areas, routes to school, etc.) in order to identify problem areas and potential solutions?

☐ **Walkability Checklists**

☐ **Pedestrian Intersection Safety Index**

[195] http://drusilla.hsrc.unc.edu/cms/downloads/PBIC_Data_Collection_Case_Studies2005.pdf
[196] Pg. 33 of PSAP
[197] http://www.walkinginfo.org/library/details.cfm?id=4313

☐ **Pedestrian Level of Service (LOS)**

☐ **Pedestrian Road Safety Audit Guidelines and Prompt Lists**

☐ **Health Impact Assessment**

☐ **Other Evaluation Tools (Please describe)**

_____

Rationale:

Audits can help with pre/post evaluation of a particular roadway or traffic calming project. They should be conducted on a regular basis by a team of agency representatives to identify pedestrian problems and countermeasures/solutions. It is very important that the audit team is comprised of individuals with diverse backgrounds (such as engineering, planning, health, and law enforcement) to ensure that the audit will be comprehensive in nature and that the necessary solutions can be implemented.

Resources:

Walkability checklists[198] are a quick way to determine if your neighborhood has any major safety concerns for pedestrians. This educational video[199] details how to begin assessing your community's sidewalks.

The Pedestrian and Bicyclist Intersection Safety Indices[200] can help users identify the intersections that most merit pedestrian safety improvements.

The Pedestrian Road Safety Audit Guidelines and Prompt Lists[201] are intended to provide guidance for independent audit teams that are assessing pedestrian safety on particular roadways.

Health Impact Assessments[202] predict the health effects that a project will have prior to implementation.

Read about Florida's use a level of service (LOS) model for signalized intersections for pedestrians here[203].

3 Does your community routinely conduct pre/post evaluations of road projects and traffic calming with respect to pedestrian crashes, volumes and motor vehicle speeds? ☐Yes ☐No

Rationale:

While agencies often evaluate the impact of a project or development on auto traffic with a traffic impact assessment, other modes may not be considered. Road projects of any size can have serious implications for pedestrians; your community should include them in any assessment.

Resources:

The Federal Highway Administration's Pedestrian Road Safety Audit Guidelines and Prompt Lists[204] can help plan for and evaluate pedestrian safety of particular infrastructure projects.

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[198] http://www.walkinginfo.org/library/details.cfm?id=12
[199] http://www.walkinginfo.org/videos/pubdetail.cfm?picid=55
[200] http://www.walkinginfo.org/library/details.cfm?id=2802
[201] http://www.walkinginfo.org/library/details.cfm?id=3955
[202] http://www.who.int/hia/en/
[203] Pg. 37 of PSAP
[204] http://www.walkinginfo.org/library/details.cfm?id=3955

4 Using Walk Score[205], what is the average (mean) walk score of the following locations in your community?

	Walk Score
Geographic center	
Northernmost point (City boundary directly north of geog. center)	
Easternmost point (City boundary directly east of geog. center)	
Southernmost point (City boundary directly south of geog. center)	
Westernmost point (City boundary directly west of geog. center)	
Midpoint of geographic center and northernmost point	
Midpoint of geographic center and easternmost point	
Midpoint of geographic center and southernmost point	
Midpoint of geographic center and westernmost point	
Urban school location	
Suburban school location	

Please describe any other ways that your community evaluates pedestrian accommodation, walking rates, and pedestrian safety. _____

_____

Rationale:

Walk score will give a community a sense of its development density and the diversity of land uses, which can roughly translate into walkability. While Walk Score analysis does not include pedestrian infrastructure or pedestrian safety in its analysis, the scores from places around town can indicate whether development and land use patterns in a community support walking.

Resources:

Walk Score[206] is a website that calculates how walkable a geographic area is based on the variety and number of destinations, such as grocery stores, schools, and parks that are within walking distance.

[205] http://www.walkscore.com/
[206] http://www.walkscore.com

ADDITIONAL QUESTIONS

1 What are the three primary reasons your city deserves to be designated as a Walk Friendly Community? _____

_____

_____

_____

_____

_____

2 What are the three aspects of your community most in need of improvement in order to accommodate pedestrians? _____

_____

_____

_____

_____

_____

3 How can your community leverage its designation as a Walk Friendly Community to increase the number of people walking and make walking safer? _____

_____

_____

_____

_____

_____

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Wilson, R.W. (1995). Suburban parking requirements: A tacit policy for automobile use and sprawl. *Journal of the American Planning Association, 61*(1), 29-43.

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Zegeer, C.V., Stewart, J.R., Huang, H.H., and Lagerwey, P.A. (2002). *Safety effects of marked vs. unmarked crosswalks at uncontrolled locations: Executive summary and recommended guidelines*. (FHWA-RD-01-075). Washington, DC: Federal Highway Administration. http://drusilla.hsrc.unc.edu/cms/downloads/Effects_Un_MarkedCrosswalks_Summary.pdf

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Appendix D

Detailed Results of Public Workshops

ARTS/Aiken County Bicycle and Pedestrian Plan: A Guide for Community Involvement and Consensus

The Augusta Regional Transportation Study (ARTS) and Aiken County recognize that the success of any community improvement plan is dependent upon a meaningful community involvement effort. ARTS/Aiken County is committed to conducting a pro-active stakeholder and public involvement program for the development of the ARTS/Aiken County Bicycle and Pedestrian Plan focused on soliciting local government and community interaction throughout the study process. The value of implementing a strong stakeholder and public involvement effort is to ensure that the needs of the community are identified and to develop public awareness of and support for the study.

The ARTS/Aiken County Bicycle and Pedestrian Plan team is committed to providing broad based and continuous opportunities for stakeholder and public involvement throughout the plan development process. The process is designed to be responsive to citizen participants and is committed to utilizing the knowledge and understanding of citizens to address important issues. The outreach plan offers multiple opportunities for engagement – at varying levels of involvement. All public input and the responses to the input will be included as an appendix to the ARTS/Aiken County Bicycle and Pedestrian Plan.

Public Participation Committee Structure

The public participation framework includes four primary groups that will guide the development of the ARTS/Aiken County Bicycle and Pedestrian Plan. The four groups are: (1) Project Steering Committee; (2) Stakeholder Interviews (3) Targeted Focus Groups; and (4) Community Organizations and General Public. The roles and membership for each of these groups is outlined below.

(1) Project Steering Committee

The Project Steering Committee will be comprised of government agencies responsible for developing and implementing the ARTS/Aiken County Bicycle and Pedestrian Plan plus representatives from interested bicycle and pedestrian community organizations. The committee will review and comment on materials to be presented to the public, help advertise the plan process, and distribute information to the larger community. The committee will meet during the study to establish study goals, identify needs and opportunities, review preliminary improvement alternatives, and select preferred improvement alternatives. A subcommittee for Aiken County will be formed to address Aiken County specific plan elements. The Project Steering Committee will meet up to five times (3 ARTS regional committee meetings and 2 Aiken County subcommittee meetings) during the course of the study. One joint meeting of the Project Steering Committee and the general community will be held at the close of the study process. To conserve costs, the ARTS and Aiken County steering committee meetings will be scheduled to occur on the same day with public outreach events or field investigations, when possible. ARTS staff will be responsible for meeting logistics, meeting notification, and assistance with meeting summaries for the regional committee meetings. The consultant staff will attend, facilitate, and provide meeting materials and presentations. The Project Steering Committee will participate in a walking and bicycling tour to gain first hand knowledge of the study area and to identify potential system improvements. The ARTS/Aiken County staff will select an area to be examined and provide tour arrangements and notification. Consultant staff will facilitate the tour activities

and discussion. Anticipated meeting times are illustrated on the study schedule in Appendix A.

A preliminary membership list for the Project Steering Committee is included in Appendix B.

(2) Stakeholder Interviews

Together with the Steering Committee, the Alta/Greenways Team will identify appropriate interviews with key local agencies and stakeholder groups. Interviews will be conducted regarding local needs, goals, desires, attitudes and concerns for the ARTS/ Aiken County area's bicycle/pedestrian network and related facilities and programs. The interviews will be conducted in-person or via telephone. Some stakeholder interviews will be conducted with agencies/organizations represented on the Steering Committee. Up to five stakeholder interviews will be conducted for the regional plan including one in Aiken County. ARTS staff will contact the stakeholders and arrange for the interviews. Two additional interviews will be conducted for the Aiken County plan.

(3) Targeted Focus Groups

To assist ARTS/Aiken County and the Study Team in identifying specific needs throughout the study area, the consultant team will conduct up to four targeted focus group meetings during the needs assessment phase of the study. Three focus groups will be conducted for the regional plan (2 in Georgia and 1 in South Carolina) and one focus group will be specifically targeted towards Aiken County. ARTS Staff will identify potential participants, make logistical arrangements and send notifications for the focus group meetings. The consultant staff will provide focus group meeting materials, facilitate the meetings, and document the meetings. Based on guidance from the Project Steering Committee and the study team regarding the need for additional focused input, the focus group targets may include:

- Transit Users
- Special Needs Citizens such as the elderly and sight and hearing-impaired
- Employment, Education, and Housing Providers
- Recreation and Equestrian Users
- Safe Routes to Schools

Focus Group participants will be recommended by ARTS/Aiken County staff, consultant team staff, and the Project Steering Committee. Focus group membership will be approved by ARTS/Aiken County Staff.

(4) Community Organizations and General Public

The Community Organizations and General Public group will be comprised of representatives from civic organizations with a general interest in the betterment of the ARTS community. Initial groups identified for inclusion are predominantly neighborhood associations and economic development organizations. Other organizations will be added as they are identified during the study process. Individual citizens will be added to the list as they express interest in the study. Additionally, all public involvement activities will be advertised using free media outreach engaged through the release of meaningful press releases and paid display advertisements as needed. Database membership will be maintained by ARTS/Aiken County staff utilizing input from the consultant team.

Public Workshops

The Community Organizations and General Public database will serve as a basis for organizing public workshops during the study period. Two rounds (each round consisting of two locations) of public workshops will be held. Each round will consist of two meetings conducted in two locations in the ARTS area. Two regionally focused meetings will be held in Georgia and one regionally focused meeting plus one Aiken County specific meeting will be held in South Carolina. The first round of public workshops will take place during the needs assessment phase and the second round of public workshops will occur when draft recommendations are available. The public will also be invited to attend the final Project Steering Committee Meeting which will serve as an additional opportunity for the public to participate in the plan development process.

Notification will be issued to the Community Organizations and General Public Database maintained by ARTS Staff. The meetings will

be advertised using both meaningful press releases to generate community interest and display advertisements as needed. Display advertisements will be paid for by ARTS if they are deemed necessary to effectively notify the public of involvement opportunities. One very important method of generating community interest will be reliance on e-mail distribution lists maintained by members of the Project Steering Committee, Targeted Focus Group Participants, and Community Organizations and General Public groups. Prior to each public meeting, a flyer will be developed by the consultant team and distributed electronically by the ARTS/ Aiken County staff to the membership of the study committee organizations. Each member will be requested to share the information with their members or associates. A Facebook Group could also be established for distribution of notification materials.

Public Event Booths

The consultant team will host up to two education and information booths at public events during the plan development process (1 event in Georgia and 1 event in Aiken County). The booths will offer educational materials about bicycling and walking in the ARTS/Aiken County area, give citizens an opportunity to speak with the study team members about local issues, and a survey of citizens to gather information about needs and visions for bicycling and walking in the ARTS/Aiken County area. ARTS staff will assist with logistical arrangements for the booth events and staffing of the booth in Georgia.

Public Participation & Involvement Plan Tools

The tools outlined in this section are designed to aid in public and media education regarding the ARTS/Aiken County Bicycle and Pedestrian Plan. They are also designed to encourage involvement in the planning process through participation and by providing feedback. The following tools will be utilized during the course of the study.

Stakeholder and Public Involvement Plan (SPIP)

The Stakeholder and Public Involvement Plan (SPIP) will be updated and amended throughout the study process. The SPIP outlines the public involvement approach to be taken during the plan development and includes lists of all plan development committee members. Collection of public input will occur throughout the duration of the study. The purpose of the SPIP is to define how all stakeholders, public, and study team staff will be involved throughout the planning effort and how the community will be provided opportunities to participate in and comment on the plan development.

Study Website

The consultant team will provide materials to be placed on the ARTS/Aiken County websites during the course of the study. The website materials will include a downloadable study factsheet, an on-line survey, and information about opportunities to participate in the study process. The study website will provide a portal for the Steering Committee, through password protected access, to view documents under review, exchange comments, view scheduled events, and post links. The website will also provide the general public with the opportunity to gain knowledge and share comments. ARTS/Aiken County staff will be responsible for updating and maintaining the websites. Consultant staff will provide regularly updated materials for inclusion on the websites.

The consultant team recommends establishing a website devoted to bicycling and walking in the study area, providing a one-stop location for maps, documents, news stories, event calendars, and links to related websites. This website can serve as the basis for a permanent on-line forum available to citizens after the completion of the plan.

On-line Survey

The consultant will provide information for development of an on-line survey allowing citizens to provide input regarding the area's needs surrounding bicycling and walking in the region. The consultant will also provide survey materials to be included in local electric bills or other region-wide mailings. The team will make the survey available for posting on websites, at public workshops, in press releases, and other public avenues. ARTS/Aiken County staff will assist by including survey materials on the study websites. ARTS staff will assist in data entry for hard copy surveys. The consultant team will provide survey data compilation assistance for Aiken County specific survey results.

Fact Sheet

A study fact sheet will be developed to provide background information regarding the study. An overview of the study process and study schedule will be included. Contact information for the study team will be included to ensure that stakeholders and the public are able to obtain information about the progress, findings, and recommendations resulting from the study process. The fact sheet will be distributed at all meetings and will be available as community members request information about the study.

Press Releases

Press releases will be prepared by the consultant team and distributed by the ARTS/Aiken County staff for release during the study period just prior to each round of public involvement. The press releases will cover the study process, status, and key findings. The press release will be issued by ARTS/Aiken County staff to local newspapers, television, and radio media.

Database Development and Maintenance

Three databases will be developed and maintained by ARTS staff with input from the consultant team during the course of the study. The study team will develop Project Steering Committee, Targeted Focus Groups, and Community Organizations and General Public databases. Throughout the study, the databases will be used to contact people for meeting announcements, to distribute deliverables for review, and to request input into the planning process.

Media Education and Advertisement

Print, radio, and television media will be used to promote the ARTS/Aiken County Bicycle and Pedestrian Plan. Paid advertising as well as press releases and feature articles or coverage may be pursued.

The Augusta Chronicle and Aiken Standard (daily publication) and the Augusta Focus, Metro Spirit, and North Augusta Star (Thursdays only) will be used to promote the ARTS/Aiken County Bicycle and Pedestrian Plan. Public meetings related to the study process will be advertised using both display advertisements and meaningful press releases to generate community interest. Should the ARTS/Aiken County staff feel additional coverage is necessary, display advertisements will be run one time prior to each public meeting. The consultant team will prepare display advertisements to be released by ARTS/Aiken County. The display advertisement will be funded using ARTS Special Study funds and/or Aiken County funds.

Press releases will be sent to the newspapers, television stations, and radio stations at least one week prior to the desired publication date. The study team will prepare the press releases and the ARTS/Aiken County staff will send the press releases to the media as the media is more comfortable receiving information directly from the government entity as opposed to requiring time for verification of the source of the information.

The following media will receive announcements of upcoming meetings:

Adam Folk	adam.folk@augustachronicle.com
Allen Cooke	Acooke@aug.edu
Comcast - Bill Botham	bill_botham@cable.comcast.com
Deborah Moody	rnorris@augustafocus.com
Lynn Hola Augusta	Lynnhola@bellsouth.net
Spirit - Joe White	joe.white@metrospirit.com
Michael @ WAGT	michaelb@wagt.com
Aiken Standard	MGibbons@aikenstandard.com
Michelle Bostic	mbostic@wagt.com
The North Augusta Star	editor@northaugustastar.com
WAFJ	info@wafj.com
WAGT Channel 26	producers@nbc26news.com
WAGT News	producers@wagt.com
WAKB WGAC WAEG	Augustaproduction@radio-one.com
WCHZ WGAC WGOR	MaryLiz@WGAC.com
WFAM News	wfam@wilkinsradio.com

WGAC Radio	news@wgac.com
WJBF Channel 6	mrosen@wjbf.com and Yarnell@wjbf.com
WKZK	wkzk1600@bellsouth.net
WRDW Channel 12	mark.cowan@wrdw.com
WSLT	chuckw@wslt.com
WSLT WKXC Steve WKXC	SteveS@kicks99.com

Comment Forms

Comment forms will be distributed at each public meeting and will be available for distribution as interested parties inquire about the study. ARTS/Aiken County staff will compile the comments and submit them to the study team for use in guiding the development of the ARTS/Aiken County Bicycle and Pedestrian Plan.

Advisory, Stakeholder, and Public Meetings

Each of the three groups identified to assist in guiding the development of the study will meet periodically during the study development. Anticipated meeting times are illustrated on the study schedule in Appendix A.

Evaluation of Public Involvement Efforts

Evaluation of the effectiveness of public involvement efforts is a key aspect of developing a public involvement plan. Spurred by federal interest, regional planning organizations and other agencies have started evaluating all public involvement efforts in order to determine which public involvement tools are effective for specific situations and under what circumstances they are not effective. Evaluation measures are also important in documenting the level of public involvement achieved. Table 1 outlines the major tasks and key performance measures.

Table 1: Public Involvement Plan Performance Measures

Technique	Performance Measures
Stakeholder and Public Involvement Plan	Successful implementation of strategies and techniques Participant feedback Comprehensiveness of the identification of stakeholders
Project Steering Committee	Number of members that attend meetings Usefulness of feedback received
Targeted Focus Groups	Number of participants that attend meetings Number of completed surveys received Usefulness of feedback received
Public Workshops	Number of attendees Number of comments received Types of comments received Participant Feedback on meeting process
Media Partnerships	Amount of media coverage Accurate information was delivered to citizens Accessibility of public to the variety of media outlets
On-line survey	Number of surveys completed Usefulness of input received
Fact Sheets	Number of fact sheets distributed Reader feedback Number of avenues used to reach the public
Meeting Notification & Flyers	Number of notifications/flyers distributed Timeliness of distribution Number of avenues used to reach the public

Based on plan performance, existing communication and outreach techniques will be modified and new techniques will be added to ensure plan success. In order to evaluate the effectiveness of the outreach efforts, a debriefing will be held with the study team after each meeting and input will be solicited from appropriate ARTS/Aiken County staff regarding the outreach effort outcomes. A brief summary of each activity will also be developed. An overview of the success of the public involvement program will be presented in the final public involvement report, in addition to supporting documentation.

Evaluation surveys will be provided at each of the public outreach activities to gather input regarding the quality of each activity (an example of the evaluation form is included in Appendix C). These surveys will ask participants to evaluate the Stakeholder and Public Involvement process and will ask for feedback on how to better reach the community. This is an internal tool used to measure the effectiveness of the public involvement activities and will be separate from the comment sheets which will ask for public input on the plan development.

Study Schedule

PROJECT SCHEDULE												
ARTS Regional Bicycle and Pedestrian Plan Update												
ALTA/GREENWAYS TEAM												
Task				2011				2012				
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Project Management	●	●	●	●	●	●	●	●	●	●	●	●
Task 1 – Project Initiation	●											
Task 2 – Existing Conditions Inventory and Mapping												
Task 3 – Steering Committee Meetings	▲		▲		▲		▲		▲			
Task 4 - Public Involvement				▲				▲				
Task 5 – User Needs Assessment												
Task 6 – Recommended Bikeway, Walkway, and Trail Network												
Task 7 – Education, Encouragement, Enforcement and Evaluation												
Task 8 – Plan Implementation												
Task 9 – Draft and Final Bicycle and Pedestrian Plan Update												▲
● Staff Coordination Meeting (in-person or teleconference)												
▲ Steering Committee/Public Workshop												

Project Steering Committee
Matt Aitken, Augusta-Richmond County Commissioner
Stacie Adkins, Recreation and Events Manager, Columbia County Recreation Department
Aiken Running Club Representative
Brett Ardrey or German Chavarria, Outspokin' Bicycles
Officer Rick Brown, Aiken Public Safety
Glen Bollinger, Columbia County Traffic Engineering
Joe Bowles, Augusta-Richmond County Commission
Brad Barnes, Aiken County Recreation.
Bob Brooks, City of NA, Park and Recreation
David Caver, Deputy Superintendent-Aiken County
Beverly Clyburn, Aiken City Council Member
Corporal C.M. Coats, South Carolina Highway Patrol, Emergency Traffic Management (ESF-16)
Steve Cassell, Richmond County Traffic Engineering
Martin D. (Gator) Cochran, Randonneurs USA (RUSA)
John Cock, Alta Planning
Kedrick Collins, GDOT
Deke Copenhaver, Mayor
Tom Dodds, SCDOT Pedestrian and Bicycle Engineer
Paul DeCamp, Augusta Richmond County Planning Commission
Randy DuTeau, Event Manager, Augusta Sports Council
Steve Exley, Road Construction Manager, Columbia County Road Construction Department
Rebecca Gallos, Aiken Mom's Club Representative, or Melissa Devine
Kathy B. Hamrick, Augusta State University
Ron Houk, Planning Manager, Richmond County Recreation, Parks, and Facilities
Gerald Jefferson, Transportation Planner, Aiken County
Drew Jordan, Andy Jordan's Bicycle Warehouse
Susanna King, Aiken Sidewalk Appreciation Society
David Kjellquist, Member Aiken Bicycle Club
Sandra Korbelik, Planner, City of Aiken
Christian Lentz, Special Projects Manager, CSRA Regional Commission
Juriah Lewis, APT
Tom Lex, Aiken Bicycle Club
Mrs. Toni Marshall
Honorable LaWana McKenzie, Aiken City Council
John T. Manley, South Carolina Department of Public Safety
Amanda McDougal, Healthy Augusta
Helen Minchew, Richmond County Board of Education
Nayna Mistry, Columbia County Planning and Engineering Division Manger, Development Services
Marya Moultrie, Transportation Planner, ARCPC
Jenette Murray, Aiken Vocational Rehab
Charles Nagle, Columbia County Superintendent of Schools

Project Steering Committee
David Nance, President, Augusta Striders
Glenn Parker, Director, Aiken City Parks, Recreation and Tourism
Richard L. Pearce, City Manager, City of Aiken
Byron Rushing, Bicycle and Pedestrian Coordinator, GDOT
Matt Schelachter, Director, Columbia County Board of Commissioners, Construction & Maintenance
Jimmy Smith, GDOT
Stephen Strohminger, Director Aiken County P & D
Dennis Stroud, Augusta Public Services, Maintenance
Jennifer Tinsley, LSCOG
Wheel Movement Representative

Public Outreach Evaluation Form

Let Us Know What You Think!

We don't want to miss an opportunity to hear your opinion! Please take a few minutes to let us know any last thoughts, and how our public involvement efforts are working for you.

Public Involvement Process

How would you rate this event overall?
Very Good Good Average Poor Very Poor

Are the presentations and display boards informative and easy to understand? If not, please explain.

Has project staff been helpful in answering your questions? If not, please explain.

What did you like most about the event?

In what areas do you feel the event could have been improved?

What do you think this project is trying to accomplish? Do you agree?

Regarding what you have learned, how would you rate the following statements?
(1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, 5 = strongly disagree)

____ I learned new information.

____ I was given an opportunity to provide input.

How did you find out about today/tonight's meeting?

Pease provide any additional comments on any aspect of the ARTS/Aiken County Bicycle and Pedestrian Plan. _____

Please provide your contact information if you would like to be added to the study mailing list.

Name:			
Address:	Street:		
	City:	State:	Zip:
Phone:		Email:	

ARTS/Aiken County Bicycle and Pedestrian Plan

Focus Group: Aiken County

Conducted at City of Aiken Municipal Building

October 3, 2011

Focus Group Participants:

- **Liz Lewis**; liz4jesus@gmail.com; (803) 642-9940 (Visually impaired, local chapter of National Federation of the Blind)
- **Renee Staggs**; rstaggs@aikenydc.org; (803) 642-8832 (Tri Development Learning Center (involved in Eat Smart Move More) and many patrons of the center have disabilities that prevent them from driving)
- **John McMurtrie**; jmcmurtrie@scvrd.state.sc.us; (803) 641-7730 (Aiken Vocational Rehabilitation Center, and many patrons do not drive and rely on alternate transportation – where they live is where they have to work)
- **Glenn Parker**; gparker@cityofaikensc.gov; (803) 642-7632 (City of Aiken Parks, Recreation & Tourism, which includes senior commission)
- **LaWana McKenzie**; lmckenz7@gmail.com; (803) 593-5532 (Aiken County Council)
- **Will Williams**; wwilliams@edpsc.org; (803) 641-3300 (Director of Economic Development Partnership for Aiken County – supports existing industry and also tries to bring in new business (also personally a cyclist and triathlete))
- **Scott Sterling**; ssterling@northaugusta.net; (803) 441-4225 (City of North Augusta Planning Department)

Staff Attending:

- **Gerald Jefferson,** Aiken County
- **Stephen Strohminger,** Aiken County
- **Sandra Korbelik,** City of Aiken
- **Mary Huffstetler**, MPH and Associates, Inc.
- **Jean Crowther**, Alta Planning + Design

Let's talk about what we have in the region that is already good.

- The changes in downtown Aiken have really improved wheelchair access
- The new signalized systems with a pedestrian countdown for crossing
- Increased amount of two foot shoulders along roads in the area is beneficial
- City of Aiken adopted a strategic plan that includes biking and walking language which has a long-term effect on mindset of local leadership
- Senior commission that has newly formed is helpful
- Greater awareness of health impacts for residents in the area

Who would be the best partners for programs and initiatives?

- Aiken ESMM was chartered 2 months ago – Aiken County is one of the fattest counties in one of the fattest states
- SCDHEC helped to initiate the effort
- Aiken Bicycle Club is very active in these types of efforts.

Where are the ideal places to bike and walk, right now?

- Hitchcock Woods – though it needs a bike trail surrounding it
- North Augusta Greeneway
- Citizens' Park and Odell Weeks Park
- Harrison Caver Park has facilities that are well-used, though not necessarily ideal

What are the barriers to people biking and walking?

- The Rudy Mason Parkway (SR 118) is not maintained which prevents people from wanting to use it.
- Also, if something were to happen along the Rudy Mason Parkway there is no way for others to see/respond.
- Banks Mill is a physical barrier to get to Citizens' Park which would connect to the grocery store (from Hopeland)
- Inconsistencies to where there is a sidewalk and where there isn't – sidewalk gaps
- Bike trials end also

- Being connected to what is already available would be an improvement

What are the key destinations that should be connected?

- McKenzie would like a trial to follow Horse Creek from Aiken to Augusta
- Most populated area is Graniteville (whole Valley area) but not very well connected
- As a cyclist, SR 421 is where I feel most comfortable.
- Milbrook, Kennedy, South Aiken Schools (and other schools), North Aiken has a Safe Routes to School grant.
- Aiken Tech has no walkable neighborhoods around it – sidewalks extended to USC Aiken (but on wrong side of street)
- Certain schools are not allowed to walk or ride bikes to school – talk to bus transportation office
- Aiken Elementary on Pine Log Road serves a huge neighborhood and no safe access
- School siting is an issue
- Create a staging area to schools and industrial parks where people can get to that point, and then walk or bike from there
- Citizens Park is a transit stop for Best Friend Express – access to the fixed route bus stops is difficult
- Where each bus route starts, there are no sidewalks
- Stop at Odell Weeks Activity Center is not safe
- Need bus shelters – all that is present now is a sign on a telephone pole
- Best Friends Express has bicycle racks on all buses, APT does also
- North Augusta now requires bicycle parking in all new development – this has been in effect since 2008 for all commercial development
- Bicycle racks need to be installed at public buildings

What programs would be most helpful?

- There is no way to identify bicyclists or pedestrians that are breaking the law (but a drivers license plate number is available for cars).
- Safety is a major concern
- Need to promote the economic development aspect of biking and walking
- There is a real concern in Aiken that the municipalities will go into neighborhoods and take pieces of their property and build a trail – protecting private property is an issue.
- Provide examples of neighborhoods that improved through new biking/walking infrastructure and the benefits that they gained from that.
- Use the North Augusta Greeneway as an example – the biggest complaint now is that it isn't being built fast enough and that it is crowded.
- Educational workshop with elected officials discussing the benefits of biking and walking
- Start with the low-hanging fruit so that you do not set yourself up for failure
- Share the road signs.... Needs to be more clear exactly what share the road means.

What is the low-hanging fruit? What projects are those?

- Within the cities
- Safe crossing across Whiskey Road
- Wayfinding signage
- Educating citizens about the places where it is safe to walk (with safe parking)
- Expand North Augusta Greeneway paths out into the county... beyond the North Augusta city boundaries... need intergovernmental coordination to connect those dots
- Whiskey Road is dangerous for bicycling
- Target groups – people using alternative transportation and leisure bicyclists

Where are the challenging intersections or corridors?

- Dixie Clay Road is very challenging, but beautiful/scenic. Trucks use the corridor and are driving too fast. (Major concern of McKenzie) Road is part of state bike route
- Five Notch Road
- SR 118 Bypass
- Pine Log Road
- Intersection of Hampton Ave NW and York Street in City of Aiken – 90% of pedestrians do not cross at either of the crosswalks.
- Shiloh Heights Area – come to town along SR 19
- Whiskey Road South... open ditches, no sidewalks – have some money to add that,

but public works department does not want to include buffer
- Belvedere Clearwater Road (back to I-520 is in LRTP)
- Clearwater needs better pedestrian crossing
- Graniteville Recreation Center – children crossing US 1 (near Greenville-Aiken Road) – possibly need a mid-block crossing there
- Cherokee Drive and US 1 – trying to get to retail businesses (motels, fast food restaurants, etc)
- UPS call center on Clifford – sidewalk from Whiskey to the corporate center
- Aiken Tech – shopping center is planned across the street (long-term, in future), but how would students access that center – how would they cross the street
- USC Aiken is going to build multi-million-dollar elevated bridge across University Parkway from Convocation Center to the campus
- Gregg Park across Trolley Line Road

What are the preferred facility types?

- Educational and philosophical difference in addressing bicyclists on the road
- Cyclists want to have the same right of way as vehicles but a separated area which creates a design issue
- The cycling clubs want to ride in the road
- Aiken wants to look at routes – however the facility falls out during design
- Need to not forget the "necessity" bicyclists and walkers

What are the maintenance needs?

- Whiskey Road sidewalk is narrow
- Cobblestones downtown are not very wheelchair friendly
- Mailboxes hang over sidewalks on Pine Log Road

Final Thoughts – Important Focus Points of the Plan

- Philosophically we want to move in this direction but how do we get to implementation on the private side – need to incorporate into regulations
- Safety is the selling point
- Newspaper is the best way to get the word out
- Capitalize on the areas that are already easy and nice to bike
- Courtesy among drivers, bicyclists and pedestrians have equal value; maybe hold a summit between each of these groups in the communities that would focus on increasing awareness/respect for each other
- Bike paths
- All planning for new facilities should address walking and biking
- Encourage people to use alternative transportation
- Combined City and County funding source for the long-term plan
- Connection between cities of North Augusta and Aiken
- Connectivity to the great "pockets" available in the region
- Route between Aiken up to Edgefield – Northwest connectivity (create a triangle)
- Implement it! Don't put it on a shelf!
- North Augusta Greeneway to Augusta Canal – connecting those is a positive regional resource.
- Be mindful of the fact that in the more economically, depressed neighborhoods, the only way for some people to get from Point A to point B is to walk or bike. Therefore, using bikes for recreational purposes may not be a higher priority with most people in those neighborhoods.

ARTS/Aiken County Bicycle and Pedestrian Plan

Focus Group: Recreation

Conducted at Augusta Public Transit

October 4, 2011

Focus Group Participants:

- **Bill Waters**; wheeliamwaters@hotmail.com; 803-514-7872 (Recreational and commuter pending member in wheel movement board.)
- **Martin "Gator" Cochran**; gator@gatorcochran.com; 706-823-3066 (Wants to connect communities; long distance cyclist)
- **Brett Audrey**; brett@outspokinga.com; 706-736-2486 (Owner of Outspokin Bicycle Shop and wants to enhance commuting)
- **Christian Lentz**; ucflentz@yahoo.com and clentz@csrarc.ga.gov; 912-536-8167 and 706-210-2009 (CSRA RC Staff Member, interest in biking, commuting, pending member in wheel movement board)
- **Tom Lex**; TJLEXC5@aol.com; 803-295-2379 (Palmetto Cycling from Aiken. Wants more routes)
- **Lora Walczak**; lora.walczak@gmail.com; 912-398-5008 (Medical College of Georgia)
- **Steve Exley**; sexley@columbiacountyga.gov; 706-447-7600 (Columbia County)

Staff Attending:

- **Marya Moultrie**; mmoutrie@augustaga.gov; 706-821-1796 (Study Project Manager)
- **Mary Huffstetler**, MPH and Associates, Inc.
- **Jack Cebe**, Alta Planning + Design

Discussion Notes:

General Comments

There is a revived Greenway committee. They have priorities:

- Extend Greenway
- Maintenance of what we have (like gravel on Saint Sebastian Way)

What is currently good for biking in the study area?

- Greeneway and Canal are good facilities
- Beginning of a promising off-street network
- Bike paths in the works, but not connected
- If emergency lane on SR 28 were cleaned up –very wide, good for bikes
- Focus on "hubs" like Augusta, North Augusta, SR 421—good corridor to connect Aiken and Augusta
- Stagecoach Rd, Whiteoak Rd, good alternative routes
- From Evans, Patriots Park...lots of good alternative routes. Columbia road has a nice shoulder to Patriots Park
  - Signage would be good
  - Cyclists already present in the area
  - Have to cross I-20
- Wrightsboro Road is a good road
- Parkways are asset, need to connect to them though
- Banks Mill Rd, Silver Bluff, Hampton Road, Trolley Line Road, Vaucluse Road in South Carolina—could provide connection but currently dangerous
- SR 421 is great road for biking in Aiken County
- Highway 1 is fairly good, students biking to school
  - Could use more signage, paint, currently inadequate

What Type of Program Improvements would benefit this Area?

- Need to education early through drivers education and drivers license testing, both bikers and motorists.
  - People need to know bikes have a right to the road, understand laws, understand penalties for breaking laws, need to have at least 10 questions on drivers license test
- Signage, education, exposure, encouragement
- Mapping with alternative routes
- Cyclists need education regarding riding

against traffic in the road, helmets
- Educate Law Enforcement
- Currently, enforcement defaults to cyclist as at fault
- Most local law enforcement are required to have continuing education,
- Peter Wilbourne mybikelaw.com knows laws across multiple states and does law enforcement training, doesn't charge; does general public training (doesn't train children)

- Need a national or state PSA —Palmetto Cycling has campaign *Safe Streets Save Lives* to educate cyclists and motorists. Have $75,000 grant, but not enough for TV time; Airing for target audiences
- Safe Routes to School; Kids should be able to walk to school
- Mentoring Program
- Bicycle rodeos, late spring—getting out of school need to get them tied in with school or maybe utilize Parks and Recreation departments
- Boy Scouts and Girl Scouts
- Police Department; police need to ticket and have violators attend education workshops run by local bike organizations.
- When people buy bikes from places like Wal-Mart, have them fill out a card/read a questionnaire regarding road rules and safety; Maybe make it so that manufacturers are required to supply test/information; There are no warning labels when you buy a bike; bike manufacturers should be proactive and may be willing to be proactive
- A bicyclist license
- Difference between commuters by choice and by necessity; commuters by obligation aren't necessarily going to associate with bicycle shops
- Wheel Movement, Parks and Recreation, Law Enforcement
- Medical Care - Pediatricians for young kids may be good to distribution of information
- Insurance Companies
  - Involved in reporting of accidents with cyclists
  - Should be proactive in prevention
- Decision Makers regarding Land-Use
- Education and Encouragement - Let people know where to go for information; where there are safe paths; which routes are low-volume, and which are high volume. Until infrastructure is there, map out best roads
- Consistent, identifiable signage, turn by turn

What types of Facility improvements would benefit this area?

- Multi-use paths where people can ride golf-carts
- Effective transportation facilities need stop signs, directional signs
- Consistent, identifiable signage, turn by turn directions
- Dedicated Bike lanes; If can't do it currently, at least utilize sharrows
- Capitalizing on natural assets in the area
- Need to balance money and need
- Biggest impact is education and enforcement
- On road system, but fill in gaps off-road
- Utilize alleyways as bike boulevards (like near Walton way up to Daniel Village, Broad Street, Division Street)
- Creek-beds, canals
- Bike system will provide more opportunities for low - income
- Use what we have currently (alleyways, clean up alleys, ect)
- Signs for cars to give 3' to cyclists
- Connectivity with new development
- Need to connect to new development
- Bike route dedicated streets
- No paint, signs, direction for side paths (like near Knox road)

Low Hanging Fruit, Priorities

- North Augusta
- Connecting Augusta Canal to North Augusta Greeneway
- Connect the end of the North Augusta Greeneway to Walnut Lane in Aiken County down US 25 near to facility along I- 520 (Palmetto Parkway)
- Grant money and DOT help for parking facility near Palmetto Pkwy to Ascauga Lake Road.
- Carolina Springs Road and Atomic Road, easy connection from there to

end of existing North Augusta Greeneway
- Also connection from Aiken into that system (maybe via SR 421 due to low traffic)
- Near Clearwater elementary, goes from 4 to 2 lanes—no shoulder, maybe 4 ft.
- Adding shoulders on rural roads
- Maybe small tax law (1/3 cent)
- Identify routes and mark and sign them and improve facilities
- Connect to other outlying, rural areas via signed routes
- Columbia County via Augusta Canal
- Better mid-point access to Augusta Canal/I-20 is needed
- South Augusta Gordon Hwy Fort Gordon Gate 5 to Downtown Augusta Spur 56 (Doug Bernard) from Airport to downtown Hwy1
- Ellis Street in downtown Augusta should be converted for pedestrian and cyclists only/not even used for traffic
- Put money into it, and businesses will follow
- Look at Miami for example
- East and West Buena Vista in North Augusta
- Striping and signage on current roadways
- Broad Street in Augusta
- Improvements should be phased in conjunction with repaving
- Georgia Avenue in North Augusta and 13th street in Augusta to connect current trails
- Robinson Ave. in Grovetown (Fort Gordon Gate1)
- Pavement condition an issue to improve biking
- Intersection on East Buena Vista on Brookside Ave. needs improvement; Spur trail terminates, park and residential areas are across the street, not easily crossed with children/families
- In front of Salvation Army Kroc Center on Broad Street, above 15th Street. Between Crawford and Eve in Augusta
- Connect Broad to Lake Olmsted/alternative routes. Maybe via King's Mill?
- Stagecoach Road, Whiteoak Road, good alternative routes
- From Evans, Patriots Park, lots of good alternative routes.
- Connect Grovetown to downtown Augusta
- Columbia Road has a nice shoulder to Patriots Park
  - Signage would be good
  - Cyclists already present
  - Have to cross I-20
- Wrightsboro Road is a good road
- All ways into the City of Aiken are a little scary
- Bike racks in downtowns
- Share the road signs are invisible
- Trolley Line Road—between Aiken and Graniteville to connect YMCA, USA Aiken, Manufacturing companies, and residential
- Route designations with signage would be helpful
- There is a memorandum for 4ft shoulders in DOT, but can't afford them when project comes up.
- Focus on routes that are along the Heritage Corridor Friends of the Greeneway and Greeneway Trust; 100,000 dollars in trust; Has to stay in banks; Has to be used for bettering the Greeneway
- We need to make easy connections such as Augusta, Edgefield, McCormick, Belton, etc.

Additional Columbia County Notes from Steve Exley from Columbia County

- N. Belair Widening – Washington Road to Industrial Park Avenue, why no bike lanes?
- Baston Rd., Bike lanes?
- Evans to Locks Road has multi-use path but has no bike lane, needs a bike lane
- N. Belair Road from Washington Road to Fury's Ferry would link parks to residential
- Stevens Creek Rd. sidewalks and bike lanes needed Riverwatch Parkway to Evans to Locks Road
- Hereford Farm from Belair Road to Columbia Road will and should be widened
- Gibbs Road about to widen needs bike lanes
- Hardy McManus Rd and William Few Parkway bike lane and sidewalks needed, connection to Fury's Ferry would connect to Riverwoods subdivision

- Flowing Wells Pleasant Home to Washington Rd. include bike lanes and sidewalks

ARTS/Aiken County Bicycle and Pedestrian Plan

Focus Group: Transit and Alternative Transportation

Conducted at Augusta Public Transit

October 3, 2011

Focus Group Participants:

- **Willy Jones**; (visually impaired)
- **Karen Bellany**; kbellamy@waltonoptions.org; (706) 955-0665 (hearing impaired)
- **Shantee Reed;** sreed@waltonoptions.org; (706) 724-6363 (visually impaired)
- **Bob Munger;** mungerassociates@gmail.com; (706) 231-3037
- **Janet Zimmerman**; jzimmermann@lscog.org; (803) 649-7981(works for LSCOG, also has a visually impaired daughter who lives in Denver)
- **Rhonda Mitchell**; rmitchell@lscog.org; (803) 649-7981 (works for LSCOG as the regional mobility manager, and Aiken manager for Best Friends Express System)
- **Mike Rossen**; Augusta Public Transit
- **Maurice McDowell**; mmcdeowell@augustaga.gov; (706) 796-5025; City of Augusta Parks & Recreation & Facilities

Staff Attending:

- **Marya Moultrie**; mmoutrie@augustaga.gov; 706-821-1796 (Study Project Manager)
- **Mary Huffstetler**, MPH and Associates, Inc.
- **Jean Crowther**, Alta Planning + Design

Let's talk about what we have in the region that is already good.

- A sidewalk has just been added in Aiken County by Aiken Regional that will connect to the shopping center near the new Wal-Mart and help connect to USCA (University of South Carolina – Aiken)
- A bus will leave the Augusta Mall and go over to the doctor's hospital and that is a positive addition

What needs to be connected?

- Mall on SR 56 Spur near Augusta Regional Airport and the transit would help people to get out there
- The last bus closes down at 8:30pm, at the K-mart transfer point.
- There is a problem that results in terms of individuals being able to take transit to get to locations, but then potentially, not being able to get home if it is too late.
- Augusta has the fixed route system, but also has paratransit (shuts down at 8:30)
- We (Augusta) have an inadequate sidewalk system and those that we have are hazardous.
- On 11th Street, going to Walton Options, there are cars parked on the sidewalk that you have to move around.
- Could easily fall because the sidewalks are uneven.
- Addressed to Parks & Recreation – trees growing across the sidewalks, and hanging limbs, that are hazardous.
- Two different things – sidewalk hazards and hanging limbs

Where are the gaps in the system?

- Greater emphasis on alternative transportation to be able make those connections that are a mile or longer
- Imagine a transit station that has condensed parking spaces with a recharging station for use by low-speed electric vehicles
- We hear concerns about transit facilities themselves – in terms of having areas for people to wait on the bus to transfer, bathroom facilities, etc. it is a little difficult for some people. There is not a sidewalk that connects all the way down.
- Best Friends Express has 3 routes and operates an express route that goes to the south side of Aiken and operates a metro route that connects down to Aiken Tech to bring riders to Augusta Public Transit; 2 hour headway.
- A greenway would be a very good thing
- Bicyclists are getting killed in this area because they are coupled with high speed vehicles

- Would like to see 25 mph roads coupled with low speed electric vehicles and bicycle paths coupled with low speed electric vehicles

Key destinations that should be connected?

- Fort Gordon area is important. Transit riders would like to have service there.
- Some of the shopping centers in Columbia County are destinations that transit riders would like to get to as well.
- In the core part of Richmond-Augusta riders are relatively happy.
- Lack of connection to Fort Gordon is due to lack of funding – APT is looking at that and considering a temporary route to see what the ridership would be like. Used to have express routes to Fort Gordon in past.
- Many jobs are located at Fort Gordon and would be a very positive thing to reestablish that right now. Could possibly even charge a bit more for riding to that area.
- Transportation is a key element in any community. Without transportation there is no food, no water, no shelter.
- At a shelter halfway between Aiken and North Augusta (Mt. Salem Outreach Mission, 2121 Augusta Road, Gloverville, SC 29828; 803-593-2276) there is a bicycle rehabbing program and tennis shoe distribution program to enable the homeless to access destinations in the area.
- Medical District is a huge traffic generator. Create a connection from downtown to the medical district.
- There is a growing recognition across the country that the suburban lifestyle that we have developed across the country is not sustainable. The Augusta Sustainability Plan encourages more downtown residential development.
- New YMCA is being constructed on Trolley Line Road in Aiken and University of South Carolina Aiken is nearby and need to connect the two.
- Bike Share would be a good initiative - would help pollution as well.

What programs would be most helpful?

- There is a lot of negative perception about bicyclists on the road. And there are also bicyclists who are not following the rules. There needs to be a big education push for both sides – both drivers and bicyclists. Help motorists accept the fact that they need to be sharing the road.
- Something in the school systems would help to teach young persons from the start.
- It is a double perspective – Janet's husband cycles now. He came from the side of the motorist and being angered by bicyclists and now he is a cyclist and he understands what it means when the shoulders of the road are crumbling. Bicyclists should not take up the whole road.
- Kids need to get out of the house and they need to be biking and it needs to be safe to do so.
- Need to target the senior population also. Making it safe and educate seniors how to do it safely.
- Educating people as to where the safe areas are.
- On legislative side – making bike lanes, etc. a part of development, adding bike parking spaces, etc.
- Need parking spaces downtown for bicyclists

- Part of the problem is in law enforcement. Bicyclist behavior needs to be enforced.
- Public safety could get involved. Need to see cops on bicycles.
- Need some incentives as well. Abatement with car insurance, etc. give them a reason to want to go to alternative transportation.
- Medical College of Georgia has a green team and recently held a bike to work day that involved an incentive.
- City of Augusta has a wellness program that could (in the future) include bicycling and walking to work. The City of Aiken has a wellness program and so does LSCOG.
- It is vital for employers to get on board.
- People travel from Aiken to get to the VA Hospital using the Best Friend Express.
- Get off of the Best Friend Express at the transit center and walk .5 mile to 1 mile to get to the Augusta Public Transit.
- More commuters go from Augusta to North Augusta than vice versa. APT does not provide service to North Augusta.
- Connect to North Augusta from Augusta for shopping activity. Currently APT does not do that because of federal regulations (took many many years to get the Best Friend Express to cross state lines).
- Old trolley line would potentially allow service to cross the river (arrange it as a rural service – receives different federal funding than transit)
- Augusta Canal Path and North Augusta Greeneway – need to connect the two.
- What is the plan for the 5th Street bridge? Considerations to update/upgrade or close it, but no consensus on that yet.

Who would be the best partners for programs and initiatives?

- Wheel Movement
- Aiken Bicycle Club
- Annual event of national scale that was held in Augusta
- Mountain biking system in the area is strong – that group could be a partner
- DNR state funds but much of that is for motorized trails

Where are the challenging intersections or corridors?

- Deans Bridge Road at Gordon Highway
- Gordon Highway can be crossed at Wheeler
- At the Red Lobster, Willy (sight impaired) will cross
- 15th Street is tough around the medical district
- 15th and Walton Way across the Walton Way from the Rite Aid (rather goes across Fifteenth first and then make a left, bank on the corner) – otherwise there are cars coming from the east and turning on fifteenth street and that is a very difficult place to go across.
- 15th Street and Broad Street; Going toward North Augusta, traffic is going up onto the bridge; Coming from Broad and taking a right and getting on
- There is not a good way to get from Columbia County to downtown
- One more mile to the Evans town center – from the north end of the Augusta Canal – path continues west to Evans to Locks Road (if it continued you could get to major shopping district); People are taking their children to Stephens Creek Elementary in golf carts on that trail.
- One visually impaired participant said she uses a telescope to see the ped heads but otherwise she wouldn't know what they were saying. She also said that some intersections do not have tactile curb ramps to indicate crosswalk entry. Need to have those at every intersection.
- The bus stops have signs for people who can see, but it can be difficult to find the bus stop or figure out if you are at the proper bus stop. Something with audio voice would solve that problem. San Francisco has tactile maps as well as audio.
- How does the rider let the driver know when they need to get off of transit? Visually impaired persons need more confidence to know when to get off for their destination. ADA requires that drivers call out every intersection, but some drivers do not do that.
- Best Friend Express does not have funding for audio stop announcements on all buses. Any time a passenger gets on the bus they can tell them when they need to stop and

then give personalized announcement.

- A number of people would like to see the Canal Trail paved but Canal authority thinks that would detract from the historical use of it.
- Painted stripe on a high speed road is not a good idea.

ARTS/Aiken County Bicycle and Pedestrian Plan

Public Workshop – City of Aiken Municipal Building

October 3, 2011

Meeting Agenda

Welcome/Introductions (Gerald Jefferson)

- Welcome
- Introduce/recognize elected officials (Mayor Fred Cavanaugh welcomed the meeting participants and spoke several minutes regarding his support for creating a friendly community for biking and walking. He thanked everyone for their interest and support and encouraged them to remain involved in the planning and implementation process.)
- Introduce local staff
- Introduce consultant team
- Describe agenda

Presentation (John Cock, Jean Crowther, Mary Huffstetler)

- National Bike-friendly, Walk-friendly Trends
- The 6 E's: intro and local accomplishments
- Existing Conditions – recognize recent local tragedies
- Goals and Objectives Discussion
- Public Outreach efforts and opportunities

Break-out Groups: 4 stations (John Cock, Jean Crowther, Martin Guttenplan, and Mary Huffstetler)

- Bicycling Infrastructure – identification of areas of need and opportunity, gaps in network
- Bicycling Education, Encouragement, Enforcement, Evaluation - issues, opportunities, priorities
- Walking Infrastructure – identification of areas of need and opportunity, gaps in network
- Walking Education, Encouragement, Enforcement, Evaluation - issues, opportunities, priorities

Break-out Groups Report Back (John Cock)

General Questions and Closing Comments (John Cock)

- Plan schedule
- Next steps
- Ways to get involved

Meeting Summary:

About two dozen citizens attended the ARTS/Aiken County Bicycle and Pedestrian Plan Public Workshop on October 3rd at the City of Aiken Municipal Building. By a show of hands, the audience showed itself to be primarily City of Aiken residents. Three attendees indicated they were residents of Aiken County. Most attendees expressed interest in both bicycling and walking infrastructure and about six persons identified themselves as members of the Aiken Bicycle Club.

Workshop participants marked locations for infrastructure improvements on the maps provided. In addition, the following comments represent the preferences and priorities of local residents who attended the meeting regarding bicycling and walking in the Aiken County community.

Bicycle Infrastructure

- Avoid impacting emergency vehicles
- Bicycle parking is needed
- Shoulders should be provided on all rural roads
- Rudy Mason Parkway multi-use path is not well maintained
- In the past, a survey of senior residents showed that bike paths are

preferred for the benefit of motorist comfort
- Recreational trails are preferred because they are more scenic ("pretty") than walk/bikeways along roads
- Abandoned rails should be used to create rail-trails – there is a 4-mile stretch of rail available outside of the City of Aiken
- Motorist speed limits should be lowered
- The new road at the Cracker Barrel should be bicycle and pedestrian friendly
- Infrastructure convenient for running errands and accessing shopping areas is important.
- Actuated signals in Aiken will trigger with bicyclists if the cyclist positions in the center of the lane; better signal actuation should be provided
- Shoulders on rural roads would provide adequate facilities for bicycling club members
- Protected bikeways close to town would provide adequate facilities for families and others
- Connect equestrian trails and expand access

Walking Infrastructure

- More ramps are needed throughout the city for wheelchairs and mobility carts
- Handrails along sidewalks and steps would assist senior citizens
- Signage is needed to warn that the sidewalk ends on the 13th street bridge

Bicycle Programs

- Targeted enforcement is needed to ensure both motorists and bicyclists understand the rights and responsibilities of the road
- Educate law enforcement officers in regards to the law and reporting bicycle and pedestrian collisions (partner with Bikelaw.com)
- Partner with the Chamber of Commerce – the Chamber is supportive of bicycling and walking and could sponsor a bike ride, an encouragement program, or help to secure private sector sponsors of bikeways and trails
- Bicyclists should wear reflective clothing, use lights, and ride on the right side of the road
- Safety education for adult bicyclists is needed.
- Neighborhood outreach would be beneficial to explain the benefits of walking and biking for residential communities
- Retirees wanting to live active lifestyles could be reached through the hospital
- Partner with public safety officers to teach safe bicycling practices (through on-bike outreach, a pamphlet, brochure, or other means)
- Ensure proper maintenance of roadside landscaping to allow for sufficient motorist sight lines
- Ensure that signs are visible
- Include bicycle safety as a part of school curriculum, or as a school assembly
- Promote Safe Routes to School
- Partner with employers to provide bike safety materials to their employees (regarding commuting to work safely and how to identify bike-friendly routes)
- Create an online tool for planning bicycling and walking routes

Walking Programs

- Walking infrastructure (sidewalks) is needed outside of downtown
- Public transportation needs to be improved to make walking a more viable option
- Downtown Merchants Association and merchants in other parts of town could be tapped as partners
- Speed of traffic in downtown should be lowered or better controlled
- Signals outside of downtown are not timed to allow pedestrians to cross safely
- Signs could be placed in crosswalks reminding drivers to slow down and respect pedestrians
- Homeowners' Associations – creating direct access through walking (Riverbluff to East Gate)
- Suzanne King hosts a webpage for a walking group in Aiken
- The "Mom's" groups in Aiken could be a partner for walking programs
- Real time speeds (speed trailers) could help to slow speeds
- Pedestrians should be given blinking lights
- Emphasize economic development and target merchants and the Chamber of Commerce as partners
- Sidewalks should be required (More handrails and ramps at sidewalks throughout the city. In other words, more ADA compliant.)
- Retirees are a large, growing segment of the population; Tie retiree community to walking programs and heart health
- Partner with the senior citizens/aging council (Lynda Bassham at the City of Aiken)
- Tie walking programs to health and wellness – currently you have to drive to Odell Weeks to walk/exercise
- Change the focus from nutrition/diet to exercise/active living
- Connect the YMCA to the University and to residential neighborhoods
- Ensure roadside landscaping is maintained to ensure driver visibility
- Pedestrians and bicyclists should wear visible, bright clothing

Comment Forms:

- The silent majority is a barrier to walking – i.e. the "good ole boys." They tell you that bicycling and walking access has never been an issue before… until the "out-of-towners" moved in.
- Sidewalks are needed south of the Mitchell Shopping Center
- The Odell Weeks Recreation Center would be a partner/lead agency for walking programs
- Retirees that move to the area need to maintain good health and walking is a free and easy way to do that
- Selecting from a list of potential ideas presented by the study team, participants expressed support for the implementation of the following programs:
  - Media campaign to educate motorists, bicyclists, and pedestrians (if required for drivers license) (2 responses)
  - Senior citizens walking programs
  - Safety campaign encouraging pedestrians to wear bright clothing
  - Local police enforcement programs targeting motorists

- Media campaign encouraging active lifestyle
- Safe Route to Schools (2 responses)
- Safe Routes to Transit
- Walking School Bus program

ARTS/Aiken County Bicycle and Pedestrian Plan
Public Workshop – City of Aiken Municipal Building
October 3, 2011

Meeting Agenda

Welcome/Introductions (Gerald Jefferson)

- Welcome
- Introduce/recognize elected officials (Mayor Fred Cavanaugh welcomed the meeting participants and spoke several minutes regarding his support for creating a friendly community for biking and walking. He thanked everyone for their interest and support and encouraged them to remain involved in the planning and implementation process.)
- Introduce local staff
- Introduce consultant team
- Describe agenda

Presentation (John Cock, Jean Crowther, Mary Huffstetler)

- National Bike-friendly, Walk-friendly Trends
- The 6 E's: intro and local accomplishments
- Existing Conditions – recognize recent local tragedies
- Goals and Objectives Discussion
- Public Outreach efforts and opportunities

Break-out Groups: 4 stations (John Cock, Jean Crowther, Martin Guttenplan, and Mary Huffstetler)

- Bicycling Infrastructure – identification of areas of need and opportunity, gaps in network
- Bicycling Education, Encouragement, Enforcement, Evaluation - issues, opportunities, priorities
- Walking Infrastructure – identification of areas of need and opportunity, gaps in network
- Walking Education, Encouragement, Enforcement, Evaluation - issues, opportunities, priorities

Break-out Groups Report Back (John Cock)

General Questions and Closing Comments (John Cock)

- Plan schedule
- Next steps
- Ways to get involved

Meeting Summary:

About two dozen citizens attended the ARTS/Aiken County Bicycle and Pedestrian Plan Public Workshop on October 3rd at the City of Aiken Municipal Building. By a show of hands, the audience showed itself to be primarily City of Aiken residents. Three attendees indicated they were residents of Aiken County. Most attendees expressed interest in both bicycling and walking infrastructure

and about six persons identified themselves as members of the Aiken Bicycle Club.
Workshop participants marked locations for infrastructure improvements on the maps provided. In addition, the following comments represent the preferences and priorities of local residents who attended the meeting regarding bicycling and walking in the Aiken County community.

Bicycle Infrastructure

- Avoid impacting emergency vehicles
- Bicycle parking is needed
- Shoulders should be provided on all rural roads
- Rudy Mason Parkway multi-use path is not well maintained
- In the past, a survey of senior residents showed that bike paths are preferred for the benefit of motorist comfort
- Recreational trails are preferred because they are more scenic ("pretty") than walk/bikeways along roads
- Abandoned rails should be used to create rail-trails – there is a 4-mile stretch of rail available outside of the City of Aiken
- Motorist speed limits should be lowered
- The new road at the Cracker Barrel should be bicycle and pedestrian friendly
- Infrastructure convenient for running errands and accessing shopping areas is important.
- Actuated signals in Aiken will trigger with bicyclists if the cyclist positions in the center of the lane; better signal actuation should be provided
- Shoulders on rural roads would provide adequate facilities for bicycling club members
- Protected bikeways close to town would provide adequate facilities for families and others
- Connect equestrian trails and expand access

Walking Infrastructure

- More ramps are needed throughout the city for wheelchairs and mobility carts
- Handrails along sidewalks and steps would assist senior citizens
- Signage is needed to warn that the sidewalk ends on the 13th street bridge

Bicycle Programs

- Targeted enforcement is needed to ensure both motorists and bicyclists understand the rights and responsibilities of the road
- Educate law enforcement officers in regards to the law and reporting bicycle and pedestrian collisions (partner with Bikelaw.com)
- Partner with the Chamber of Commerce – the Chamber is supportive of bicycling and walking and could sponsor a bike ride, an encouragement program, or help to secure private sector sponsors of bikeways and trails
- Bicyclists should wear reflective clothing, use lights, and ride on the right side of the road
- Safety education for adult bicyclists is needed.
- Neighborhood outreach would be beneficial to explain the benefits of walking and biking for residential communities
- Retirees wanting to live active lifestyles could be reached through the hospital

- Partner with public safety officers to teach safe bicycling practices (through on-bike outreach, a pamphlet, brochure, or other means)
- Ensure proper maintenance of roadside landscaping to allow for sufficient motorist sight lines
- Ensure that signs are visible
- Include bicycle safety as a part of school curriculum, or as a school assembly
- Promote Safe Routes to School
- Partner with employers to provide bike safety materials to their employees (regarding commuting to work safely and how to identify bike-friendly routes)
- Create an online tool for planning bicycling and walking routes

Walking Programs

- Walking infrastructure (sidewalks) is needed outside of downtown
- Public transportation needs to be improved to make walking a more viable option
- Downtown Merchants Association and merchants in other parts of town could be tapped as partners
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- Selecting from a list of potential ideas presented by the study team, participants expressed support for the implementation of the following programs:
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  - Safe Route to Schools (2 responses)
  - Safe Routes to Transit
  - Walking School Bus program

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Augusta Regional Transportation Study

Appendix E: Bicycle and Pedestrian Facility Design Guidelines

February 2012

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February 07, 2012

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PLANNING + DESIGN

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Introduction

This technical handbook is intended to assist the Augusta Regional Transportation Study in the selection and design of pedestrian and bicycle facilities. The following chapters pull together best practices by facility type from public agencies and municipalities nationwide. Within the design chapters, treatments are covered within a single sheet tabular format relaying important design information and discussion, example photos, schematics (if applicable), and existing summary guidance from current or upcoming draft standards. Existing standards are referenced throughout and should be the first source of information when seeking to implement any of the treatments featured here.

Guiding Principles

The following are guiding principles for these bicycle and pedestrian design guidelines:

- **The walking and bicycling environment should be safe.** All bicycling and walking routes should be physically safe and perceived as safe by all users. Safe means minimal conflicts with external factors, such as noise, vehicular traffic and protruding architectural elements. Safe also means routes are clear and well marked with appropriate pavement markings and directional signage.

- **The pedestrian and bicycle network should be accessible.** Sidewalks, Shared-use paths, bike routes and crosswalks should permit the mobility of residents of all ages and abilities. The pedestrian and bicycle network should employ principles of universal design. Bicyclists have a range of skill levels, and facilities should be designed with a goal of providing for inexperienced/recreational bicyclists (especially children and seniors) to the greatest extent possible.

- **Pedestrian and bicycle network improvements should be economical.** Bicycle improvements should achieve the maximum benefit for their cost, including initial cost and maintenance cost, as well as a reduced reliance on more expensive modes of transportation. Where possible, improvements in the right-of-way should stimulate, reinforce and connect with adjacent private improvements.

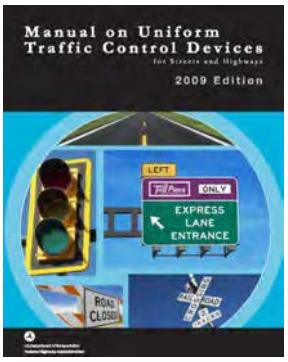
- **The pedestrian and bicycle network should connect to places people want to go.** The pedestrian and bicycle network should provide continuous direct routes and convenient connections between destinations such as homes, schools, shopping areas, public services, recreational opportunities and transit. A complete network of on-street bicycling facilities should connect seamlessly to existing and proposed multi-use trails to complete recreational and commuting routes.

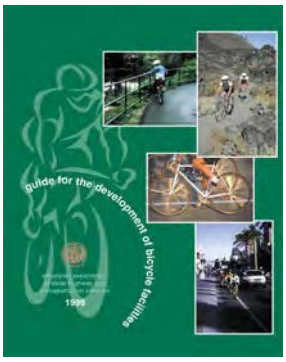
- **The walking and bicycling environment should be clear and easy to use. Sidewalks** Shared-use paths and crossings should allow all people to easily find a direct route to a destination with minimal delays, regardless of whether these persons have mobility, sensory, or cognitive disability impairments. All roads are legal for the use of bicyclists (except those roads designated as limited access facilities, which prohibit bicyclists). This means that most streets are bicycle facilities and should be designed, marked and maintained accordingly.

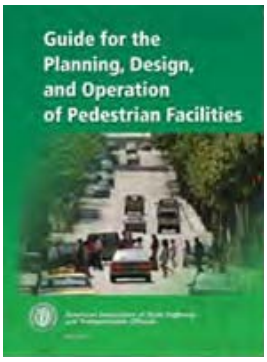
- **The walking and bicycling environment should be attractive enhance community livability.** Good design should integrate with and support the development of complementary uses and should encourage preservation and construction of art, landscaping and other items that add value to communities. These components might include open spaces such as plazas, courtyards and squares, and amenities like street furniture, banners, art, plantings and special paving. These along with historical elements and cultural references, should promote a sense of place. Public activities should be encouraged and the municipal code should permit commercial activities such as dining, vending and advertising when they do not interfere with safety and accessibility.

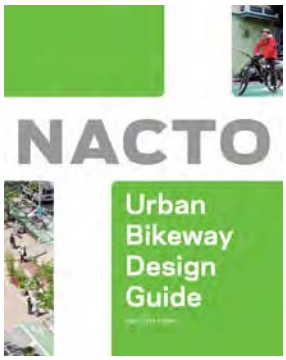
- **Design guidelines are flexible and should be applied using professional judgment.** This document references specific national guidelines for bicycle and pedestrian facility design, as well as a number of design treatments not specifically covered under current guidelines. Statutory and regulatory guidance may change. For this reason, the guidance and recommendations in this document function to complement other resources considered during a design process, and in all cases sound engineering judgment should be used.

National Standards









The Federal Highway Administration's **Manual of Uniform Traffic Control Devices** (MUTCD) defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. The MUTCD is the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings.

To further clarify the MUTCD, the FHWA created a table of contemporary bicycle facilities that lists various bicycle-related signs, markings, signals, and other treatments and identifies their official status (e.g., can be implemented, currently experimental). See **Bicycle Facilities and the Manual on Uniform Traffic Control Devices.**[1]

Bikeway treatments not explicitly covered by the MUTCD are often subject to experiments, interpretations and official rulings by the FHWA. The **MUTCD Official Rulings** is a resource that allows website visitors to obtain information these supplementary materials. Copies of various documents (such as incoming request letters, response letters from the FHWA, progress reports, and final reports) are available on this website.[2]

American Association of State Highway and Transportation Officials (AASHTO) **Guide for the Development of Bicycle Facilities** last updated in 1999 provides detailed guidance on dimensions, use, and layout of specific facilities.

The standards and guidelines presented by AASHTO provide basic information about the design of bicycle and pedestrian facilities, such as minimum sidewalk widths, bicycle lane dimensions, more detailed striping requirements and recommended signage and pavement markings. An update to this guide is in progress, and is likely to provide revised guidance on standard facilities and new information on more contemporary bikeway designs.

Offering similar guidance for pedestrian design, the 2004 AASHTO **Guide for the Planning, Design and Operation of Pedestrian Facilities** provides comprehensive guidance on planning and designing for people on foot.

The National Association of City Transportation Officials' (NACTO) 2011 **Urban Bikeway Design Guide**[3] is the newest publication of nationally recognized bikeway design standards, and offers guidance on the current state of the practice designs. The NACTO Urban Bikeway Design Guide is based on current practices in the best cycling cities in the world. The intent of the guide is to offer substantive guidance for cities seeking to improve bicycle transportation in places where competing demands for the use of the right of way present unique challenges. All of the NACTO Urban Bikeway Design Guide treatments are in use internationally and in many cities around the US.

Some of these treatments are not directly referenced in the current versions of the AASHTO Guide to Bikeway Facilities or the Manual on Uniform Traffic Control Devices (MUTCD), although many of the elements of these treatments are found within these documents. 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.

1 *Bicycle Facilities and the Manual on Uniform Traffic Control Devices. (2011). FHWA. http://www.fhwa.dot.gov/environment/bikeped/mutcd_bike.htm*

2 *MUTCD Official Rulings. FHWA. http://mutcd.fhwa.dot.gov/orsearch.asp*

3 *http://nacto.org/cities-for-cycling/design-guide/*

Local Standards

The South Carolina Department of Transportation (SCDOT) offers additional local guidance regarding the design of non-motorized transportation facilities. This guidance can be found in SCDOT Engineering Directive Memorandums (EDM) covering specific topics. The EDMs most relevant to the content in this guide are listed below and attached to this document:

SCDOT EDM 22: Considerations for Bicycle Facilities and **SCDOT EDM 53: Installation of Rumble Strips** provide guidance on the design of shared roadways and the application of rumble strips on SCDOT's state highway system. In addition, typical sections for both the design of bicycle facilities on new projects and restriping of existing five-lane sections to accommodate bicycle facilities are included. Other design considerations for bicycle accommodations are also discussed.

The Georgia Department of Transportation (GDOT) also offers guidance on the design of non-motorized transportation facilties.

Georgia Department of Transportation's Design Policy Manual is the primary source for highway design standards to be used in roadway construction plans for Federal-Aid projects and State-Aid projects. Chapter 9 focuses on the specifics of bicycle and pedestrian accommodations.

Additional References

In addition to the previously described national standards, the basic bicycle and pedestrian design principals outlined in this chapter are derived from the documents listed below. Many of these documents are available online and provide a wealth of public information and resources.

Additional U.S. Federal Guidelines

- American Association of State Highway and Transportation Officials. (2001). *AASHTO Policy on Geometric Design of Streets and Highways*. Washington, DC. www.transportation.org
- United States Access Board. (2007). *Public Rights-of-Way Accessibility Guidelines (PROWAG)*. Washington, D.C. http://www.access-board.gov/PROWAC/alterations/guide.htm

Best Practice Documents

- Association of Pedestrian and Bicycle Professionals (APBP). (2010). *Bicycle Parking Design Guidelines, 2nd Edition.*
- City of Portland Bureau of Transportation. (2010). *Portland Bicycle Master Plan for 2030.* http://www.portlandonline.com/transportation/index.cfm?c=44597
- Federal Highway Administration. (2005). *BIKESAFE: Bicycle Countermeasure Selection System.* http://www.bicyclinginfo.org/bikesafe/index.cfm
- Federal Highway Administration. (2005). *PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System.* http://www.walkinginfo.org/pedsafe/
- Federal Highway Administration. (2005). *Report HRT-04-100, Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations.* http://www.tfhrc.gov/safety/pubs/04100/
- Federal Highway Administration. (2001). *Designing Sidewalks and Trails for Access.* http://www.fhwa.dot.gov/environment/sidewalk2/contents.htm
- Oregon Department of Transportation. (1995). *Oregon Bicycle and Pedestrian Plan.* http://www.oregon.gov/ODOT/HWY/BIKEPED/planproc.shtml
- Rosales, Jennifer. (2006). *Road Diet Handbook: Setting Trends for Livable Streets.*

Glossary

The following list is comprised of common terms, acronyms and concepts used in bicycle transportation planning, design and operation.

AASHTO – American Association of State Highway and Transportation Officials

Accessible route – in the ADA, a continuous route on private property that is accessible to persons with disabilities. There must be at least one accessible route linking the public sidewalk to each accessible building.

Actuated signal – a signal where the length of the phases for different traffic movements is adjusted for demand by a signal controller using information from detectors.

ADA – Americans with Disabilities Act of 1990; broad legislation mandating provision of access to employment, services, and the built environment to those with disabilities.

At-grade crossing – A junction where bicycle path or sidewalk users cross a roadway over the same surface as motor vehicle traffic, as opposed to a grade-separated crossing where users cross over or under the roadway using a bridge or tunnel.

Audible pedestrian signals – pedestrian signal indicators that provide an audible signal to assist visually impaired pedestrians in crossing the street.

BAFUL - Bicycles Allowed Full Use of Lane

Bicycle boulevard - See neighborhood greenway. Streets designed to give bicyclists priority by limiting or prohibiting motor vehicle through traffic by using barriers or other design elements, in order to enhance bicycle safety and enjoyment.

Bicycle facilities - A general term used to describe all types of bicycle-related infrastructure including linear bikeways and other provisions to accommodate or encourage bicycling, including bike racks and lockers, bikeways, and showers at employment destinations.

Bike lane - A striped lane for one-way bike travel on a street or highway.

Bicycle level of service (BLOS) – Indication of bicyclist comfort level for specific roadway geometries and traffic conditions. Roadways with a better (lower) score are more attractive (and usually safer) for bicyclists.

Bike path – A paved pathway separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent alignment. Bike paths may be used by pedestrians, bicyclists, skaters, wheelchair users, runners, and other non-motorized users.

Bike route - A shared roadway specifically identified for use by bicyclists, providing a superior route based on traffic volumes and speeds, street width, directness, and/or cross-street priority; designated by signs only.

Bikeway – A generic term for any road, street, path or way that in some manner is specifically designed for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

Bollard – Post used to restrict motor vehicle use of bicycle paths.

Clearance interval – the length of time that the DON'T WALK indication is flashing on a pedestrian signal indication. **Clearance, lateral** – Width required for safe passage of bicycle path users as measured on a horizontal plane.

Clearance, vertical – Height required for safe passage of bicycle path users as measured on a vertical plane.

Crosswalk – any portion of a roadway at an intersection or elsewhere that is distinctly indicated for pedestrian crossing. Where there are no pavement markings, there is a crosswalk at each leg of every intersection, defined by law as the prolongation or connection of the lateral lines of the sidewalks.

Curb extension – an area where the sidewalk and curb are extended into the parking lane, usually in order to shorten pedestrian crossing distance. Also called "bulb-out" or "curb bulb."

Curb ramp – a combined ramp and landing to accomplish a change of level at a curb in order to provide access to pedestrians using wheelchairs.

Directional signs – Signs typically placed at road and bicycle path junctions (decision points) to guide bicycle path users toward a destination or experience.

Geometry - The vertical and horizontal characteristics of a transportation facility, typically defined in terms of gradient, degrees,

and super elevation.

Grade separation - Vertical separation of travelways through use of a bridge or tunnel so that traffic conflicts are minimized.

Grade-separated crossing – A bridge or tunnel allowing bicycle path users to cross a major roadway without conflict.

HCM - Highway Capacity Manual

HDM – Highway Design Manual

Level of service (LOS) - Term for the measurement of how well traffic "flows" on a roadway system or how well an intersection functions.

Loop detector - A device placed under the pavement at intersections to detect a vehicle or bicycle and subsequently trigger a signal to turn green.

Medians – Area in the center of the roadway that separates directional traffic; may provide a striped crossing and halfway point for pedestrians (also can be effective traffic calming design). Medians may be level with the surrounding roadway or "raised" using curb and gutter. Medians may include landscaping, concrete, paint/striping or any combination thereof.

Multi-use path – A trail that permits more than one type of user, such as a trail designated for use by both pedestrians and bicyclists.

MUTCD – Federal Manual of Uniform Traffic Control Devices

Neighborhood Greenways – Streets designed to give bicyclists priority by limiting or prohibiting motor vehicle through traffic by using barriers or other design elements, in order to enhance bicycle safety and enjoyment. See bicycle boulevard.

Paved shoulder – The edge of the roadway beyond the outer stripe edge that provides a place for bicyclists; functions as this only when it is wide enough (4-5 feet), free of debris, and does not contain rumble strips or other obstructions.

Pavement marking – An assortment of markings on the surface of the pavement that provide directions to motorists and other road users as to the proper use of the road (the "Manual on Uniform Traffic Control Devices" determines these standard markings).

Pedestrian – a person afoot; a person operating a pushcart; a person riding on, or pulling a coaster wagon, sled, scooter, tricycle, bicycle with wheels less than 14 inches in diameter, or a similar conveyance, or on roller skates, skateboard, wheel-chair or a baby in a carriage.

Pedestrian signal indication – the lighted WALK/DON'T WALK (or walking man/hand) signal that indicates the pedestrian phase.

Refuge islands – Corner raised triangles or medians, used by pedestrians and bicyclists at intersections or mid-block crossings for assistance with crossing wide streets, especially where motor vehicle right turn lanes exist.

Right-of-way (ROW) - The right of one vehicle, bicycle or pedestrian to proceed in a lawful manner in preference to another vehicle, bicycle, or pedestrian. Also the strip of property in which a transportation facility or other facility is built.

Shared lane marking (SLM) or **Sharrow** – Shared Lane Pavement Marking

Shared roadway - A roadway where bicyclists and motor vehicles share the same space with no striped bike lane. Any roadway where bicycles are not prohibited by law (i.e. interstate highways or freeways) is a shared roadway.

Sidewalk – an improved facility intended to provide for pedestrian movement; usually, but not always, located in the public right-of-way adjacent to a roadway. Typically constructed of concrete.

Sight distance - The distance a person can see along an unobstructed line of sight.

Traffic calming - Changes in street alignment, installation of barrier, and other physical measures to reduce traffic speeds and/or cut-through traffic volume in the interest of street safety, livability, and other public purposes.

Traffic control devices - Signs, signals or other fixtures, whether permanent or temporary, placed on or adjacent to a travelway by authority of a public body having jurisdiction to regulate, warn, or guide traffic.

Traffic volume - The number of vehicles that pass a specific point in a specific amount of time (hour, day, year).

Wide curb lane – A 14 foot (or greater) wide outside lane adjacent to the curb of a roadway that provides space for bicyclists to ride next to (to the right of) motor vehicles. Also referred to as a "wide outside lane". If adjacent to parking, 22 foot wide pavement may also be considered a wide curb lane.

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 the highest quality facilities and minimize risk to their users.

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.

Figure 2-1 illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. The bicyclist requires 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 is minimally acceptable.

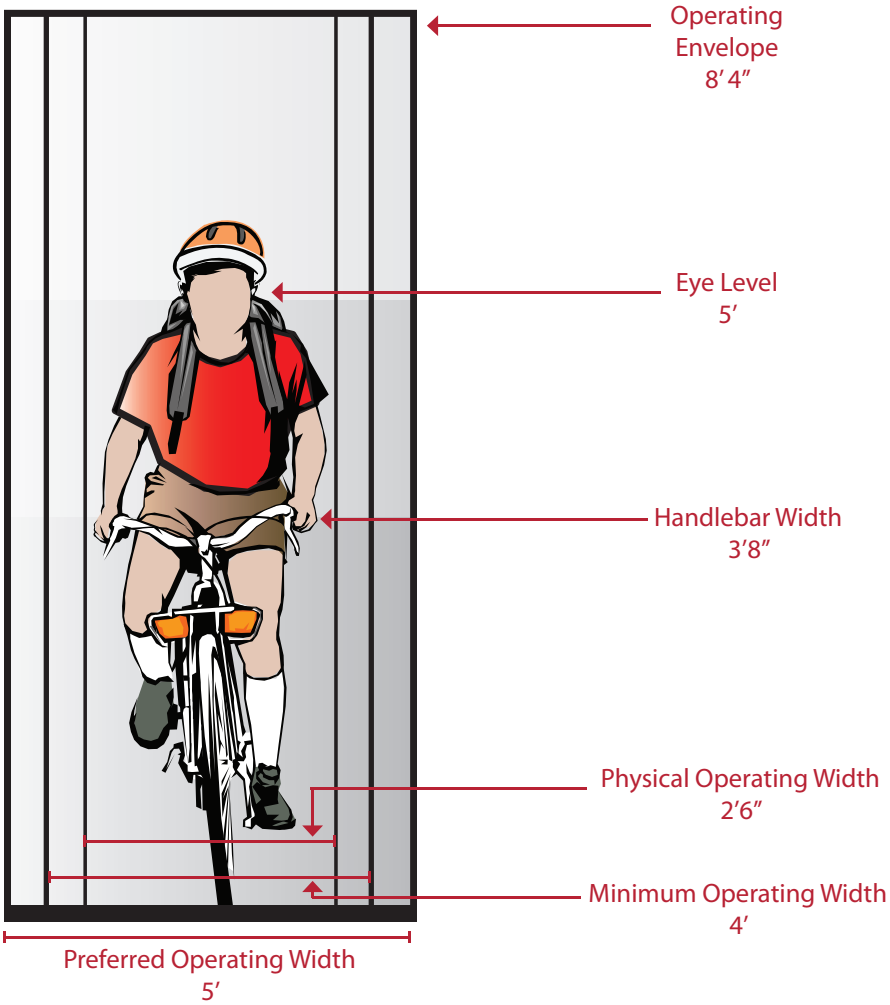


Figure 2-1 Standard Bicycle Rider Dimensions

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

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. Figure 2-2 and Table 2-1 summarize the typical dimensions for bicycle types.

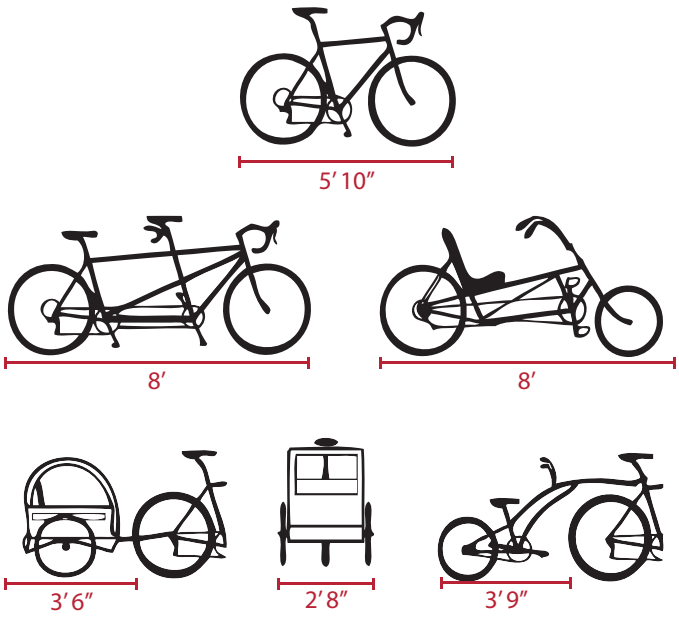


Figure 2-2 Bicycle as Design Vehicle - Typical Dimensions

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

Table 2-1 Bicycle as Design Vehicle - Typical Dimensions

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
	Vertical clearance to obstructions (tunnel height, lighting, etc)	10 ft
	Approximate center of gravity	2 ft 9 in - 3 ft 4 in
Recumbent Bicyclist	Physical length	8 ft
	Eye height	3 ft 10 in
Tandem Bicyclist	Physical length	8 ft
Bicyclist with child trailer	Physical length	10 ft
	Physical width	2 ft 6 in

Design Speed Expectations

The expected speed that different types of bicyclists can maintain under various conditions also influences the design of facilities such as shared use paths. Table 2-2 provides typical bicyclist speeds for a variety of conditions.

The skill level of the bicyclist also provides dramatic variance in expected speeds and behavior. There are several systems of classification currently used within the bicycle planning and engineering professions. These classifications can be helpful in understanding the characteristics and infrastructure preferences of different bicyclists.

It should be noted that these classifications may change in type or proportion over time as infrastructure and culture evolve. Often times an instructional course can change a less confident bicyclist into one that can comfortably and safely share the roadway with vehicular traffic. Bicycle infrastructure should be planned and designed to accommodate as many user types as possible with the consideration of separate or parallel facilities to provide a comfortable experience for the greatest number of bicyclists.

Table 2-2 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 bicyclists.

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*[1]. A more detailed understanding of the US population as a whole is illustrated in Figure 2-3. Developed by planners in the City of Portland, OR[2] 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** (Very low percentage 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 greenways.

- **Enthused and Confident** (5-10% of population) -This user group encompasses 'intermediate' bicyclists who are fairly comfortable riding on all types of bicycle facilities but usually choose low traffic streets or greenways 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 greenways under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These bicyclists may become "Enthused & 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.

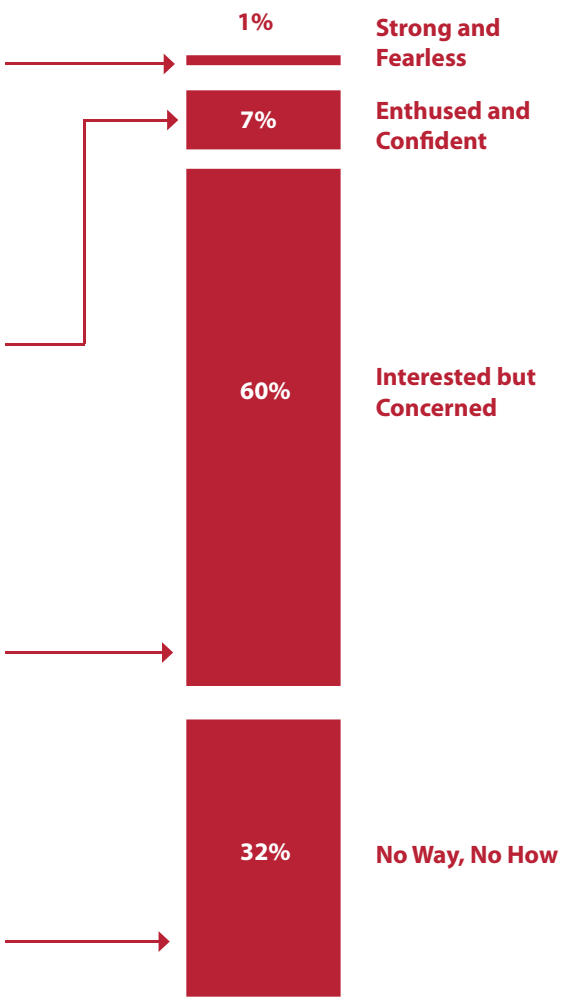


Figure 2-3 Typical distribution of bicyclist types

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*

Planned Bikeway Facilities

These design guidlines describe a wide range of bicycle facilties, including some that are not specifically called for in the Augusta Regional Transportation Study. The facilities listed below are included in the Study and are the foundation of the bicycle network. Follow the references below for full guidance on each treatment.

Bike routes without any specific bicycle facilities are **shared roadways** (page 31) where bicyclists and cars operate within the same travel lane, either side by side or in single file depending on roadway configuration. This facility provides continuity with other bicycle facilities (usually bike lanes), or designates preferred routes through high-demand corridors.

Shared lane markings may be used to enhance bike routes by providing clear direction to motorists and bicylists about riding postition and route.

Paved shoulders, **striped bike lanes** and **buffered bike lanes** are all types of **separated bikeways** (page 43). Separated Bikeways 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.

Greenways (page 79) are facilities separated from roadways for use by bicyclists and pedestrians. These corridors offer excellent transportation and recreation opportunities for bicyclists of all ages and skills. Greenways are frequently located in railroad or utility corridors.

Multi-use paths along roadways (page 86) offer separation from parallel motor vehicle traffic. These facilties are most appropriate along roads with infrequent intersections or driveways.

Design Needs of Pedestrians

Types of Pedestrians

Similar to bicyclists, 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 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. Table 3-1 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 3-1 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

Source: AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities (July 2004), Exhibit 2-1.

Table 3 2 summarizes common physical and cognitive impairments, how they affect personal mobility, and recommendations for improved pedestrian-friendly design.

Table 3-2 Disabled Pedestrian Design Considerations

Impairment	Effect on Mobility	Design Solution
Wheelchair and Scooter Users	Difficulty propelling over uneven or soft surfaces.	Firm, stable surfaces and structures, including ramps or beveled edges.
	Cross-slopes cause wheelchairs to veer downhill.	Cross-slopes to less than two percent.
	Require wider path of travel.	Sufficient width and maneuvering space
Walking Aid Users	Difficulty negotiating steep grades and cross slopes; decreased stability.	Smooth, non-slipperly travel surface.
	Slower walking speed and reduced endurance; reduced ability to react.	Longer pedestrian signal cycles, shorter crossing distances, median refuges, and street furniture.
Hearing Impairment	Less able to detect oncoming hazards at locations with limited sight lines (e.g. driveways, angled intersections, right-turn slip lanes) and complex intersections.	Longer pedestrian signal cycles, clear sight distances, highly visible pedestrian signals and markings.
Vision Impairment	Limited perception of path ahead and obstacles	Accessible text (larger print and raised text), accessible pedestrian signals (APS), guide strips and detectable warning surfaces, safety barriers, and lighting.
	Reliance on memory	
	Reliance on non-visual indicators (e.g. sound and texture)	
Cognitive Impairment	Varies greatly. Can affect ability to perceive, recognize, understand, interpret, and respond to information.	Signs with pictures, universal symbols, and colors, rather than text.

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 the 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.

Zones in the Sidewalk Corridor

Sidewalk Widths

Sidewalk Obstructions and Driveways

Pedestrian Access in Construction Areas

This Section Includes:

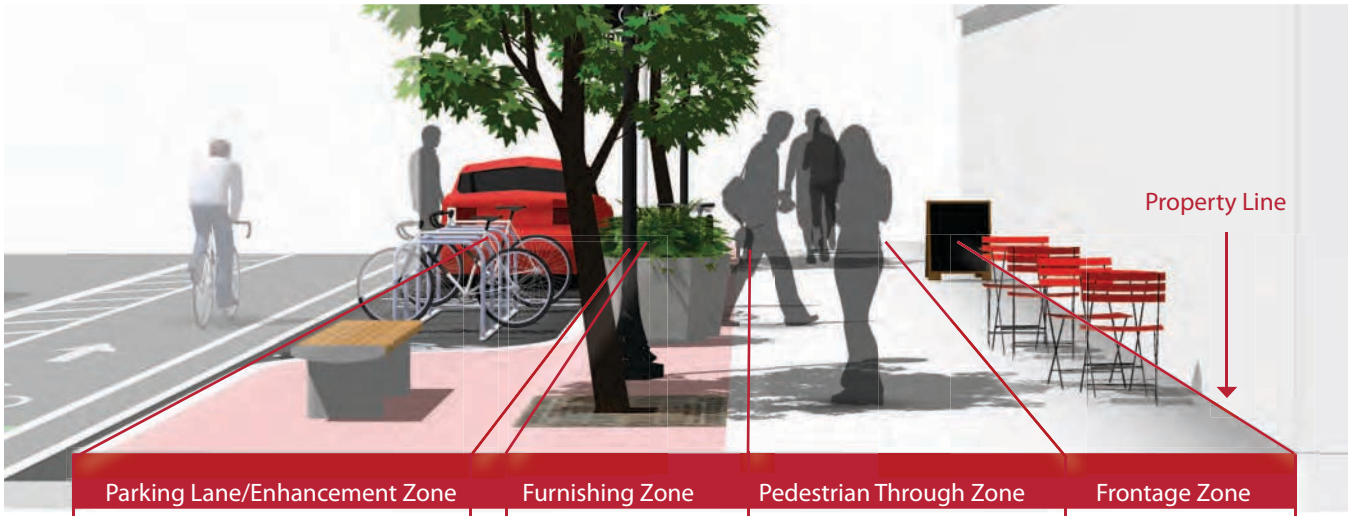
- Zones in the Sidewalk Corridor
- Sidewalk Widths
- Sidewalk Obstructions and Driveway Ramps
- Pedestrian Access in Construction Areas

Sidewalks

Zones in the Sidewalk Corridor

Description

Sidewalks are the most fundamental element of the walking network, as they provide an area for pedestrian travel separated from vehicle traffic. A variety of considerations are important in sidewalk design. Providing adequate and accessible facilities can lead to increased numbers of people walking, improved safety, and the creation of social space.



Parking Lane/Enhancement Zone

The parking lane can act as a flexible space to further buffer the sidewalk from moving traffic. Curb extensions, and bike corrals may occupy this space where appropriate.

In the edge zone there should be a 6 inch wide curb.

Edge Zone

Furnishing Zone

The furnishing zone buffers pedestrians from the adjacent roadway, and is also the area where elements such as street trees, signal poles, signs, and other street furniture are properly located.

Pedestrian Through Zone

The through zone is the area intended for pedestrian travel. This zone should be entirely free of permanent and temporary objects.

Wide through zones are needed in downtown areas or where pedestrian flows are high.

Frontage Zone

The Frontage Zone allows pedestrians a comfortable "shy" distance from the building fronts. It provides opportunities for window shopping, to place signs, planters, or chairs.

Not applicable if adjacent to a landscaped space.

Discussion

Sidewalks should be more than areas to travel; they should provide places for people to interact. There should be places for standing, visiting, and sitting. Sidewalks should contribute to the character of neighborhoods and business districts, strengthen their identity, and be an area where adults and children can safely participate in public life.

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

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. Colored, patterned, or stamped concrete can add distinctive visual appeal.

Sidewalks

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.

Street Classification	Parking Lane/ Enhancement Zone	Furnishing Zone	Pedestrian Through Zone	Frontage Zone	Total
Local Streets	Varies	2 - 6 feet	5 - 6 feet	N/A	6.5 - 10 feet
Commercial Areas	Varies	4 - 6 feet	6 - 12 feet	2 - 10 feet	12 - 28 feet
Arterials and Collectors	Varies	2 - 6 feet	5 - 8 feet	2 - 5 feet	9 -19 feet

GDOT recommends a 6-ft wide buffer space between the back of curb and the sidewalk.

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

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. GDOT recommends the minimum width of sidewalk be 5-ft of clear unobstructed space.

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.
GDOT. (2011). Design Policy Manual. Ch. 9

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. Colored, patterned, or stamped concrete can add distinctive visual appeal.

Sidewalks

Sidewalk Obstructions and Driveway Ramps

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.

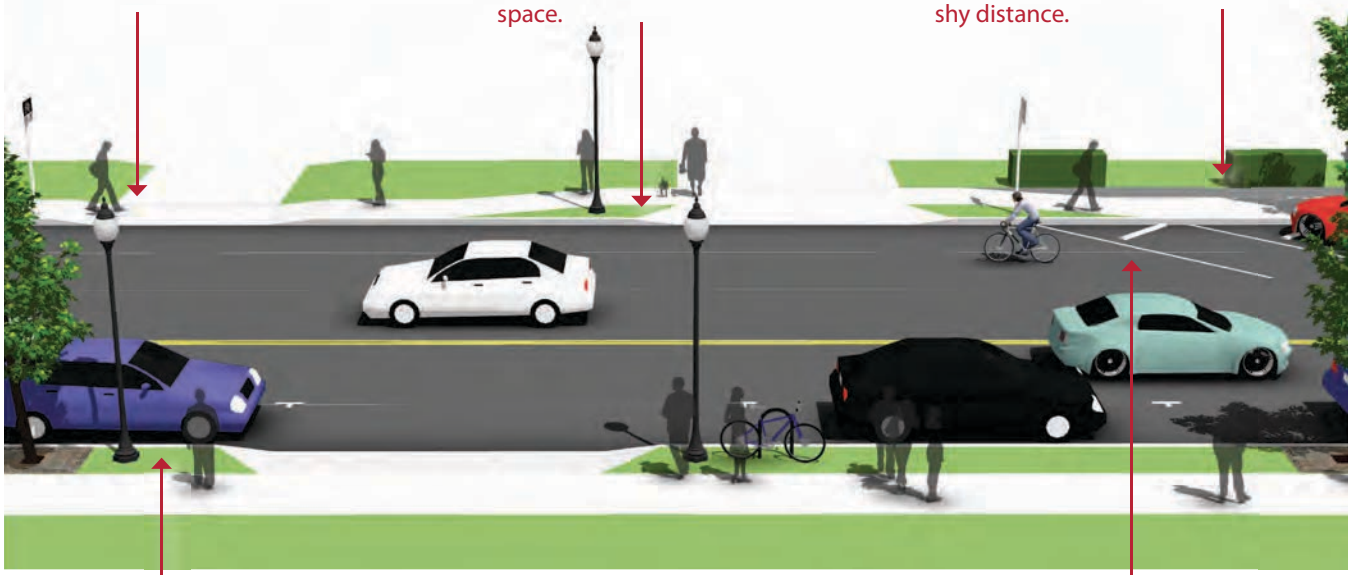
Description

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.

Dipping the entire sidewalk at the driveway approaches keeps the cross-slope at a constant grade. (The least preferred driveway option)

Where constraints preclude a planter strip, wrapping the sidewalk around the driveway provides adequate driveway ramp space.

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



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

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

Discussion

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

Additional References and Guidelines

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

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.

Construction and Repair Zones

Pedestrian Access Through Construction Areas

Description

Measures should be taken to provide for the continuity of a pedestrian's trip through a construction closure. Only in rare cases should pedestrians be detoured to another street when travel lanes remain open.

Guidance

- Pedestrians should be provided with a safe, accessible, convenient path that replicates as nearly as practical the most desirable characteristics of the existing sidewalks or a footpaths. The alternate circulation path shall be parallel the disrupted pedestrian access route, be located on the same side of the street, and accommodate the disabled.
- The alternate route should have a width of 5 feet minimum, and an additional foot of width for each vertical element along the route.
- In rare cases where access is not available on the same side of the street, the alternate pedestrian route may be located on the opposite side of the street as long as the distance of the disrupted pedestrian route does not exceed 300 feet.
- Signage related to construction activities shall be placed in a location that does not obstruct the path of bicycles or pedestrians, including bicycle lanes, wide curb lanes, or sidewalks.

Discussion

The removal of a pedestrian access route, curb ramp, or pedestrian street crossing, even for a short time, may severely limit or totally preclude pedestrians, especially those with a disability, from navigating in the public right-of-way. It might also preclude access to buildings, facilities, or sites on adjacent properties.

Additional References and Guidelines

FHWA. (2009). Manual of Uniform Traffic Control Devices.
AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Materials and Maintenance

The alternate route should include sidewalks and pedestrian access routes, curb ramps, pedestrian crossings, lighting, and all other elements included in these standards.

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.

See **Crossing Beacons and Signals** for a discussion of signalization in support of pedestrians.

This Section Includes:

- Marked Crosswalks
- Raised Crosswalks
- Reducing Crossing Distance
  - Median Refuge Islands
  - Curb Extensions
  - Minimizing Curb Radii
- Minimizing Conflict with Automobiles
  - Advance Stop Bars
  - Parking Control
- ADA Compliant Curb Ramps

Marked Crosswalks

Raised Crosswalks

Median Refuge Islands

Curb Extensions

Minimizing Conflict with Automobiles

ADA Compliant Curb Ramps

Marked Crosswalks

Guidance

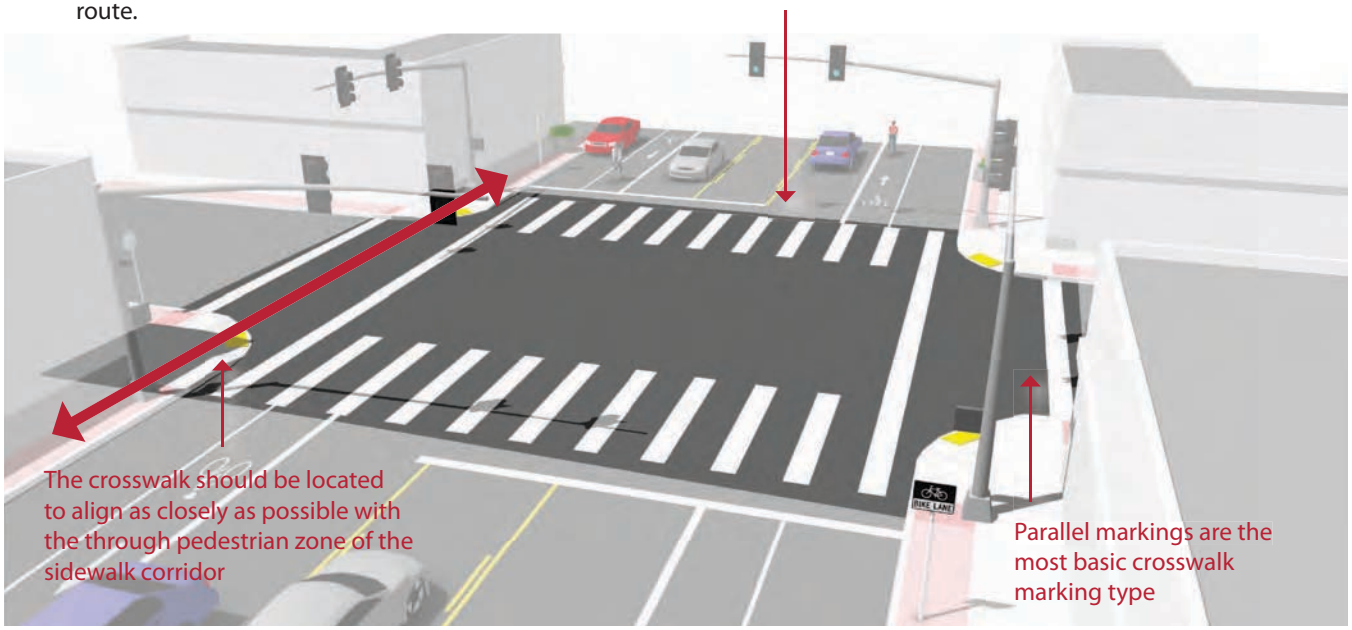
At signalized intersections, all crosswalks should be marked. At un-signalized intersections, crosswalks may be marked under the following conditions:

- 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.

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.



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, at intersections where there is expected high pedestrian use and the crossing is not controlled by signals or stop signs.

See **Crossing Beacons and Signals** for a discussion of enhancing pedestrian crossings.

Additional References and Guidelines

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

Materials and Maintenance

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

Marked Crosswalks

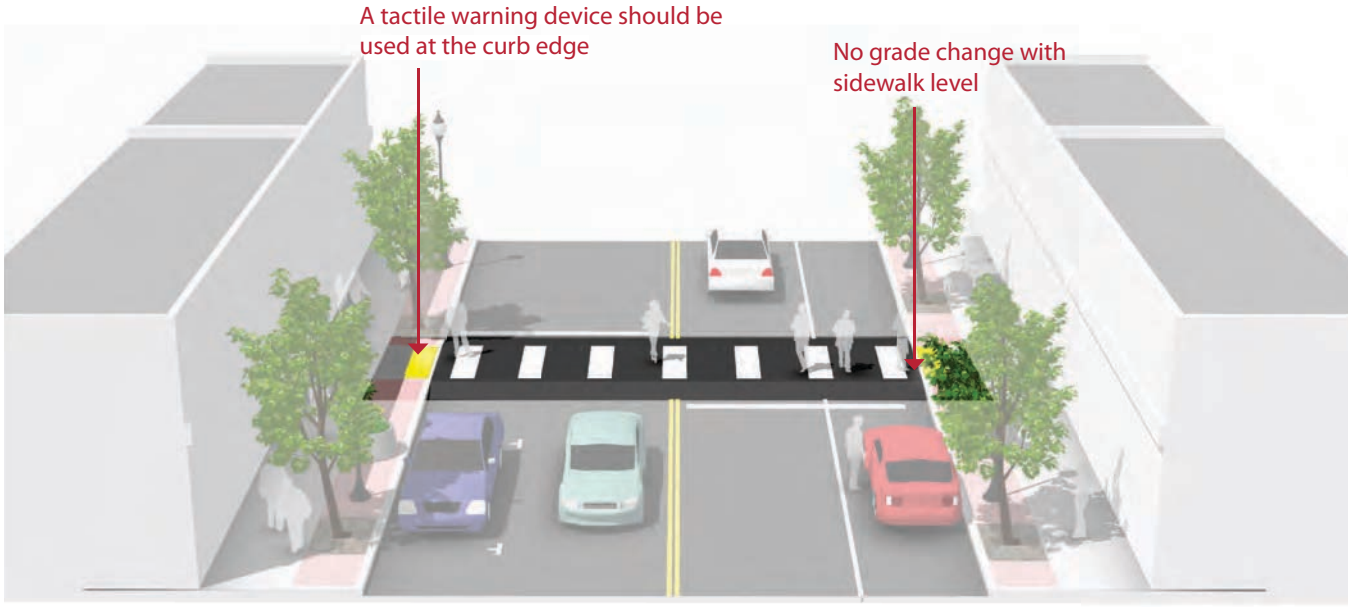
Raised Crosswalks

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.

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; review on case-by-case basis.



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 of 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.

Materials and Maintenance

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

Reducing Crossing Distance

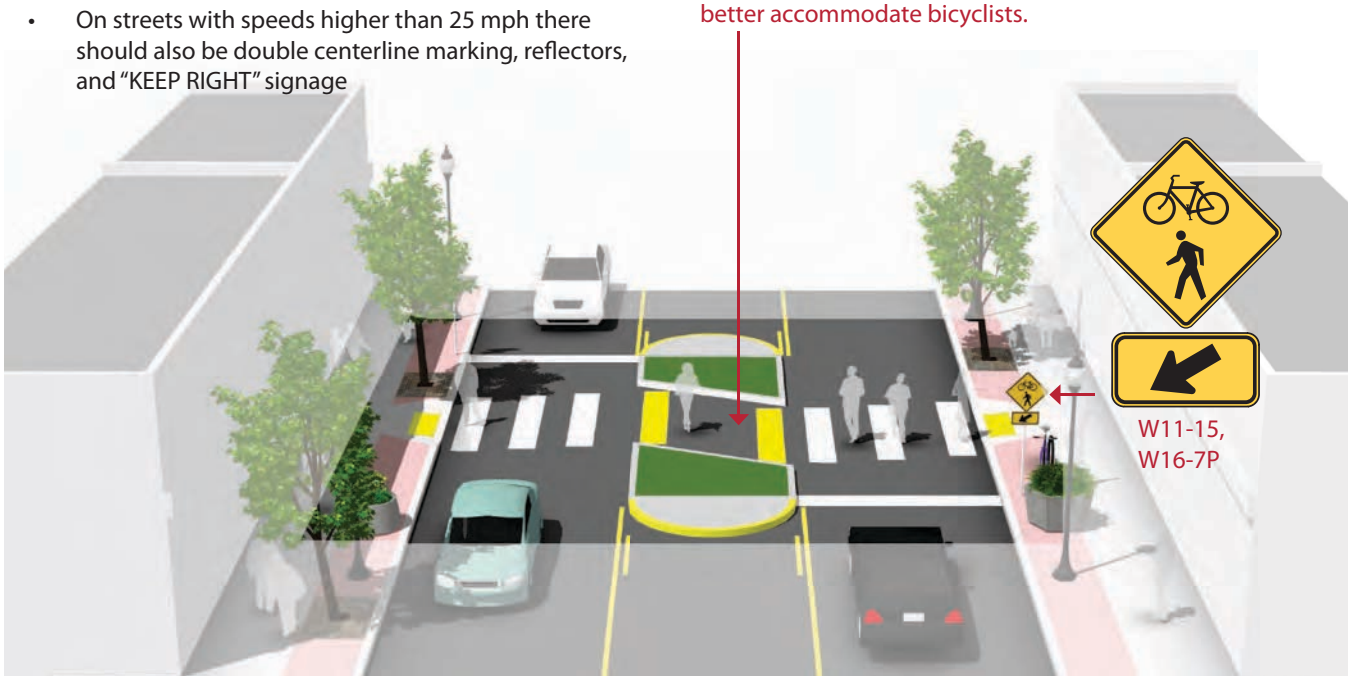
Median Refuge Islands

Guidance

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

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.



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 of Uniform Traffic Control Devices.
AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.
NACTO. (2011). Urban Bikeway Design Guide.

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.

Reducing Crossing Distance

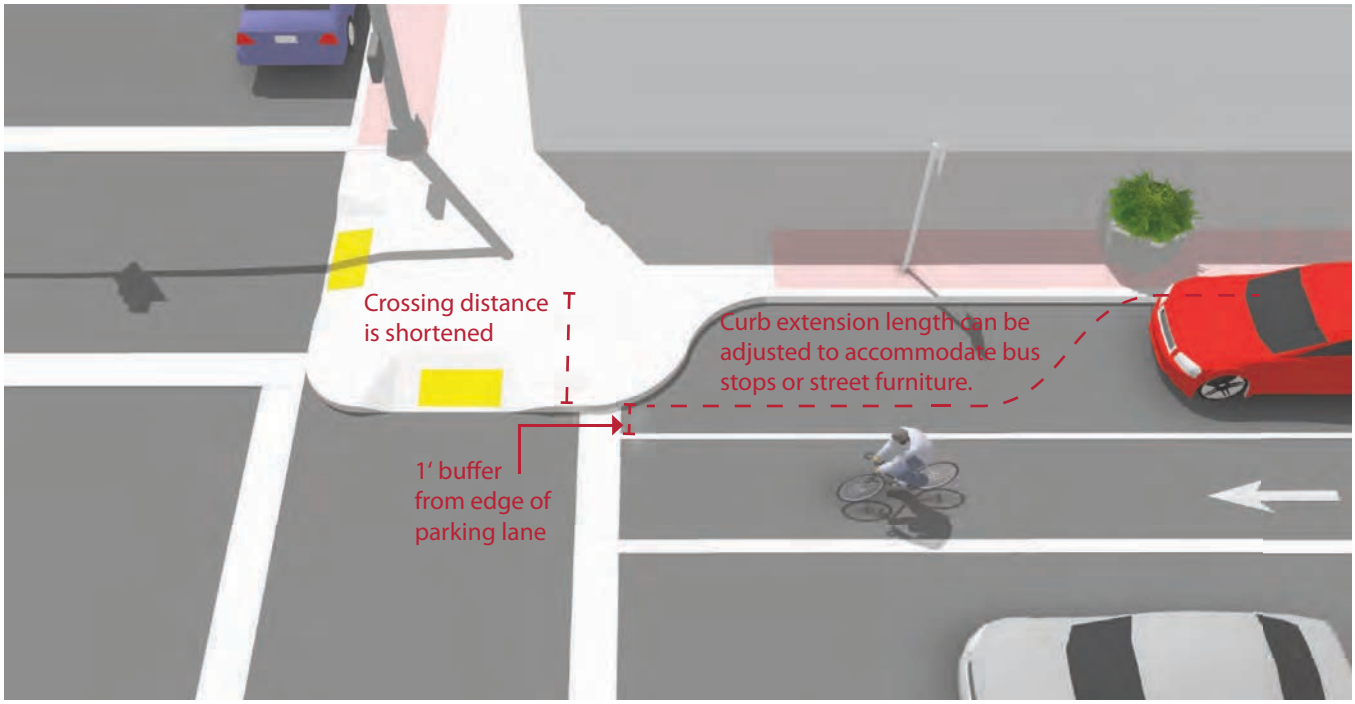
Curb Extensions

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.

Description

Curb extensions minimize pedestrian exposure during crossing by shortening crossing distance and give 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.



Discussion

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

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.

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.

Materials and Maintenance

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

Reducing Crossing Distance

Minimizing Curb Radii

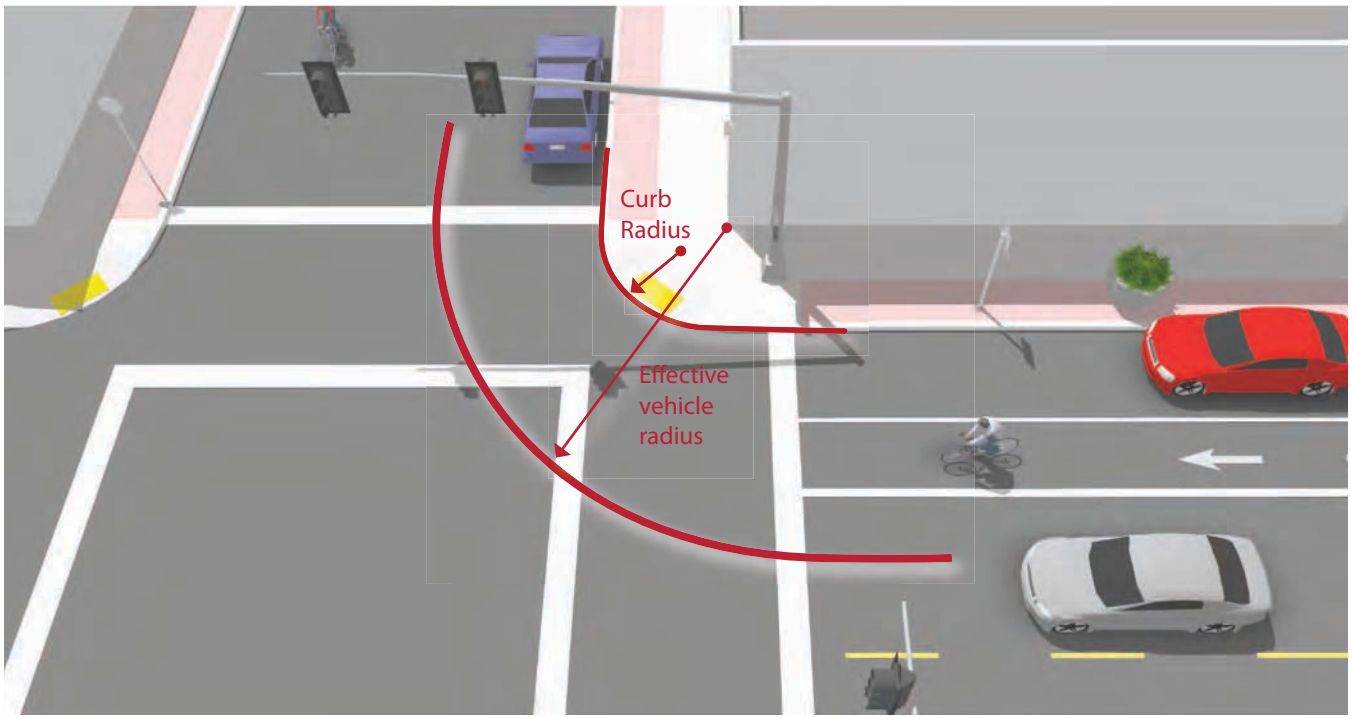
Guidance

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

Description

The size of a curb's radius can have a significant impact on pedestrian comfort and safety. A smaller the 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.

A small curb radius is also beneficial for street sweeping operations.



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, the turning radius of the design vehicle, the geometry of the intersection, the street classifications, 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.

Materials and Maintenance

A small curb radius is also beneficial for street sweeping operations.

Minimizing Conflict with Automobiles

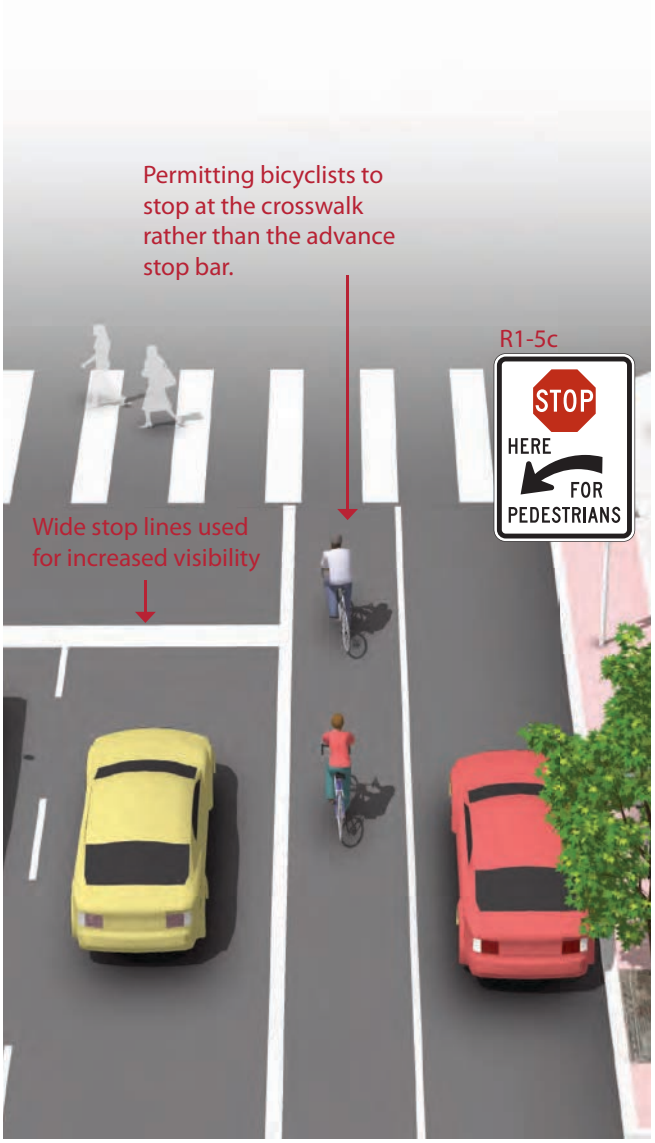
Advance Stop Bar

Description

Advance stop bars increase pedestrian comfort and safety by stopping motor vehicles well in advance of marked crosswalks, allowing vehicle operators a better line of sight of pedestrians and giving inner lane motor vehicle traffic time to stop for pedestrians.

Guidance

- On streets with at least two travel lanes in each direction.
- Prior to a marked crosswalk
- In one or both directions of motor vehicle travel
- Recommended 30 feet in advance of the crosswalk
- A "Stop Here for Pedestrians" sign should accompany the advance stop bar



Discussion

If a bicycle lane is present, mark the advance stop bar to permit bicyclists to stop at the crosswalk ahead of the stop bar.

If the State law requires drivers to YIELD to pedestrians in crosswalks, a Yield Line marking must be used rather than a stop line in these cases.

Additional References and Guidelines

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

Materials and Maintenance

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

Minimizing Conflict with Automobiles

Parking Control

Guidance

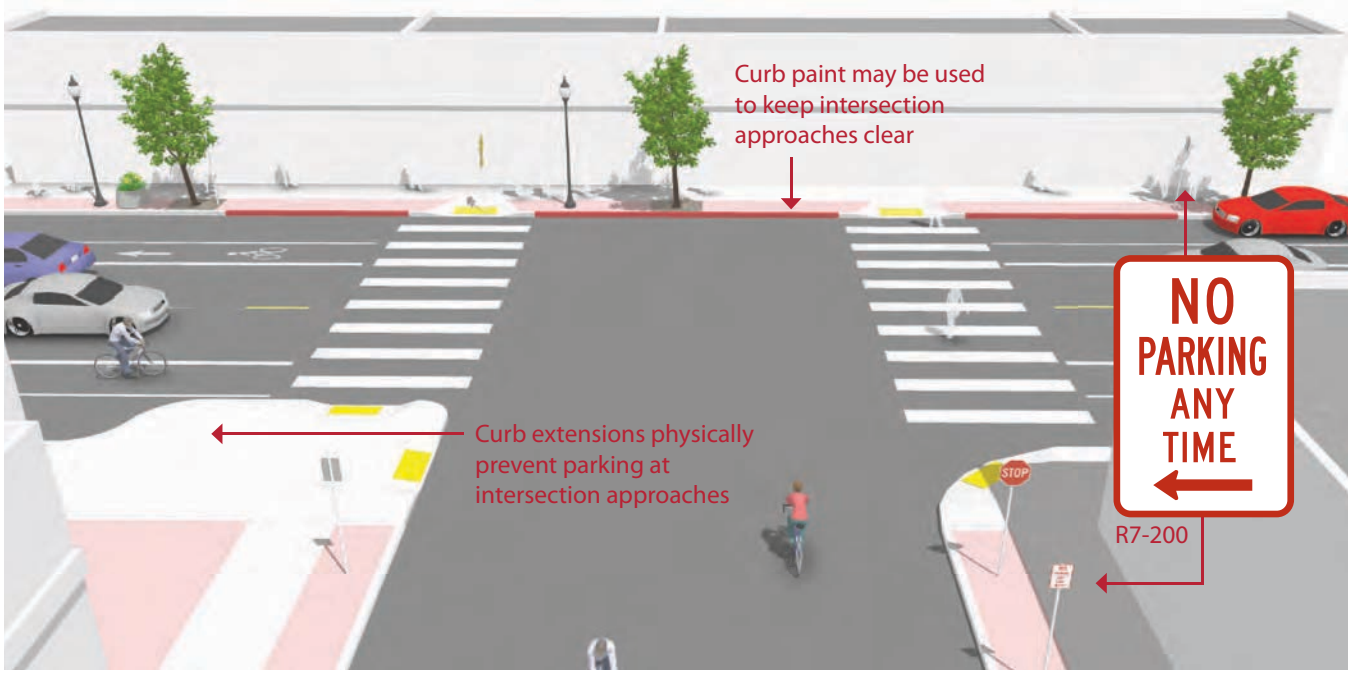
Curb extensions, 'No Parking' signage, or curb paint can be used to keep the approach to intersections clear of parked vehicles.

At "T" and offset intersections, where the boundaries of the intersection may not be obvious, this prohibition should be made clear with signage.

Parking shall not be allowed within any type of intersection adjacent to schools, school crosswalks, and parks. This includes "T" and offset intersections.

Description

Parking control involves restricting or reducing on-street parking near intersections with high pedestrian activity. Locating parking away from the intersection improves motorist's visibility on the approach to the intersection and crosswalk. Improved sight lines at intersections reduces conflicts between motorists and pedestrians.



Discussion

In areas where there is high parking demand parking compact vehicles may be allowed within "T" or offset intersections and on either side of the crosswalk. At these locations, signs will be placed to prohibit parking within the designated crosswalk areas, and additional enforcement should be provided, particularly when the treatment is new.

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.

Materials and Maintenance

Signage and striping require routine maintenance.

ADA Compliant Curb Ramps

ADA Compliant Curb Ramps

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.

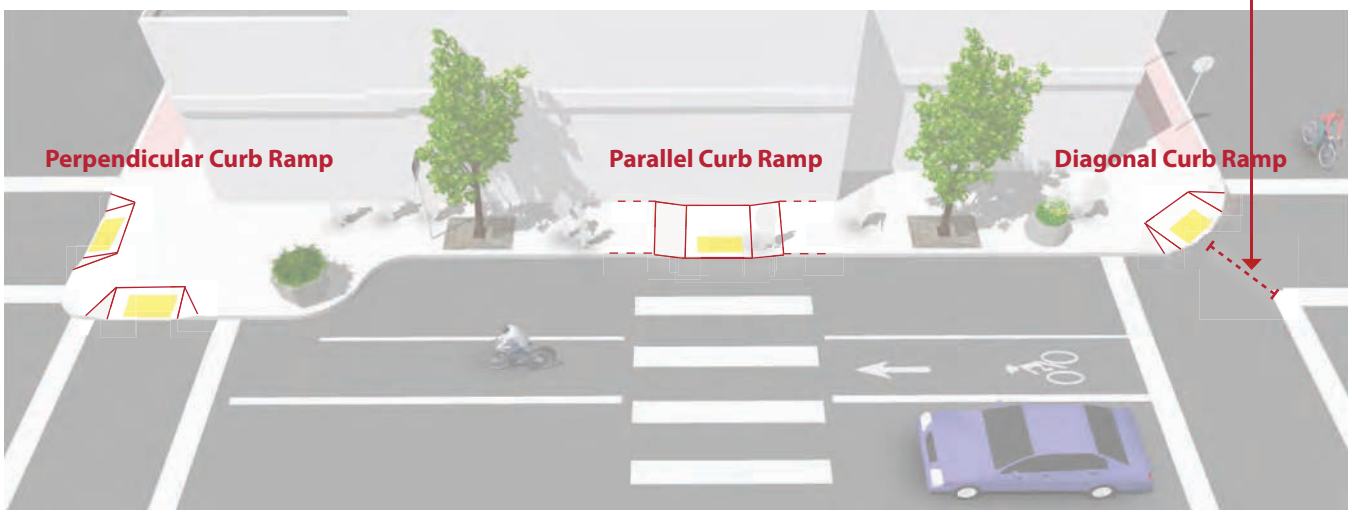
Description

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.

Curb ramps shall be located so that they do not project into vehicular traffic lanes, parking spaces, or parking access aisles. Three configurations are illustrated below.

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 in the at the foot of the ramp, which can catch the front wheels of a wheelchair.

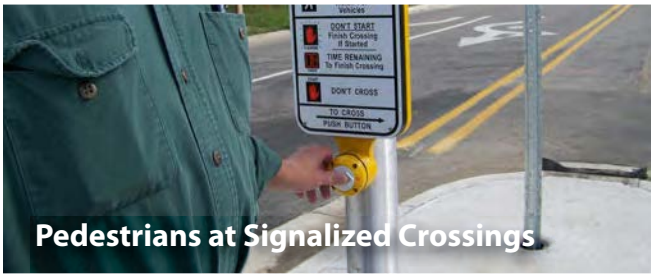
Crossing Beacons and Signals

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 in the crosswalk.

Flashing amber warning beacons can be utilized at un-signalized 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, Average Daily Traffic (ADT), and the anticipated levels of pedestrian and bicycle crossing traffic.

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



Pedestrians at Signalized Crossings

Bicycle Detection and Actuation

Active Warning Beacons

Hybrid Beacons

This Section Includes:

- Accommodating Pedestrians at Signalized Crossings
- Bicycle Detection and Actuation
- Active Warning Beacons
- Hybrid Beacon for Mid-Block Crossing

Crossing Beacons and Signals

Accommodating Pedestrians at Signalized Crossings

Description

Pedestrian Signal Head

Pedestrian signal indicators demonstrate to pedestrians when to cross at a signalized crosswalk. All traffic signals should be equipped with pedestrian signal indications except where pedestrian crossing is prohibited by signage.

Countdown pedestrian signals are particularly valuable for pedestrians, as they indicate whether a pedestrian has time to cross the street before the signal phase ends. Countdown signals should be used at all signalized intersections.

Signal Timing

Providing adequate pedestrian crossing time is a critical element of the walking environment at signalized intersections. The MUTCD recommends traffic signal timing to assume a pedestrian walking speed of 4' per second, meaning that the length of a signal phase with parallel pedestrian movements should provide sufficient time for a pedestrian to safely cross the adjacent street.

At crossings where older pedestrians or pedestrians with disabilities are expected, crossing speeds as low as 3' per second may be assumed. Special pedestrian phases can be used to provide greater visibility or more crossing time for pedestrians at certain intersections.

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.

Discussion

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

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

Additional References and Guidelines

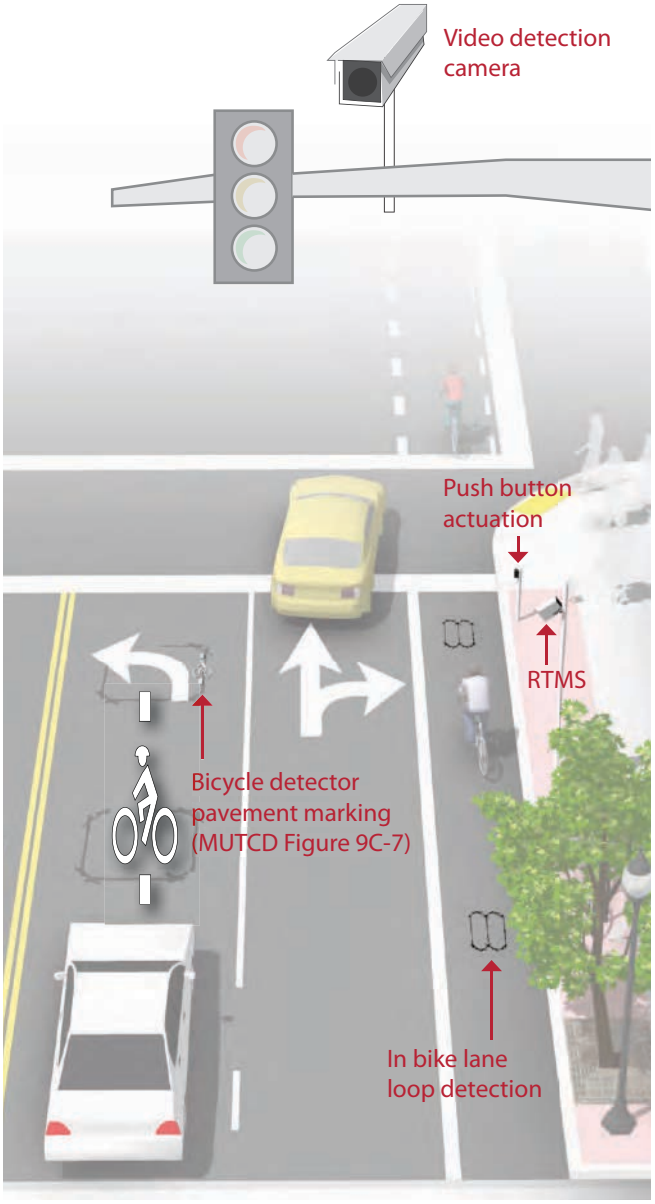
United States Access Board. (2007). Public Rights-of-Way Accessibility Guidelines (PROWAG).
AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Materials and Maintenance

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

Crossing Beacons and Signals

Bicycle Detection and Actuation



Description

Push Button Actuation

User-activated button mounted on a pole facing the street.

Loop Detectors

Bicycle-activated loop detectors are installed within the roadway to allow the presence of a bicycle to trigger a change in the traffic signal. This allows the bicyclist to stay within the lane of travel without having to maneuver to the side of the road to trigger a push button.

Loops that are sensitive enough to detect bicycles should be supplemented with pavement markings to instruct bicyclists how to trip them, as well as signage.

Video Detection Cameras

Video detection cameras can also be used to determine when a vehicle is waiting for a signal. These systems use digital image processing to detect a change in the image at a location. Video detection can be calibrated for bikes, bike lanes, and bike pockets. Video camera system costs range from $20,000 to $25,000 per intersection.

Remote Traffic Microwave Sensor Detection (RTMS)

RTMS is a system which uses frequency modulated continuous wave radio signals to detect objects in the roadway. This method marks the detected object with a time code to determine its distance from the sensor. The RTMS system is unaffected by temperature and lighting, which can affect standard video detection.

Discussion

Proper bicycle detection should meet two primary criteria: 1) accurately detects bicyclists and 2) provides clear guidance to bicyclists on how to actuate detection (e.g., what button to push, where to stand).

Bicycle loops and other detection mechanisms can also provide bicyclists with an extended green time before the light turns yellow so that bicyclists of all abilities can reach the far side of the intersection.

Additional References and Guidelines

AASHTO. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of Uniform Traffic Control Devices.
NACTO. (2011). Urban Bikeway Design Guide.

Materials and Maintenance

Signal detection and actuation for bicyclists should be maintained with other traffic signal detection and roadway pavement markings.

Crossing Beacons and Signals

Active Warning Beacons

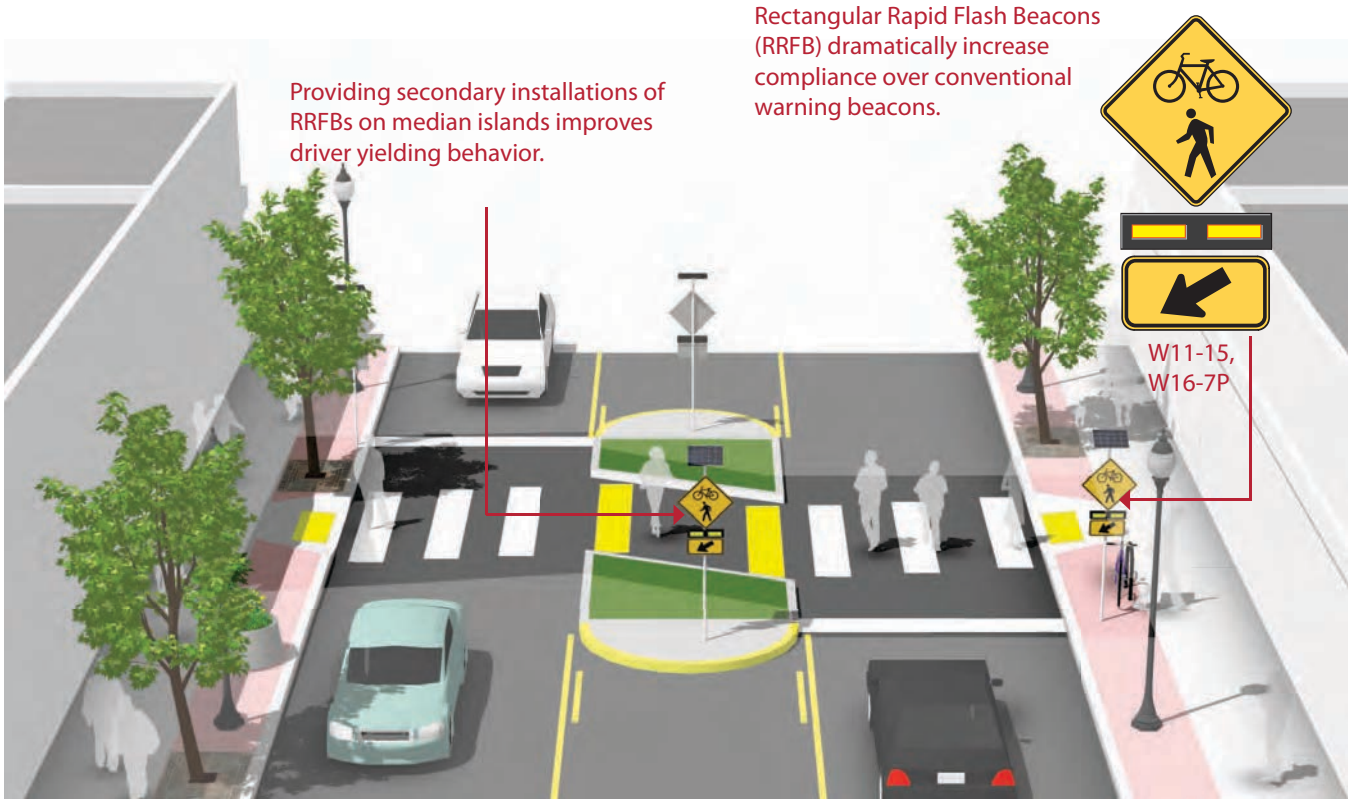
Guidance

- 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.

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).



Discussion

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

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

Additional References and Guidelines

NACTO. (2011). Urban Bikeway Design Guide.
FHWA. (2009). Manual of 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 should run for years without issue.

Crossing Beacons and Signals

Hybrid Beacon for Mid-Block Crossing

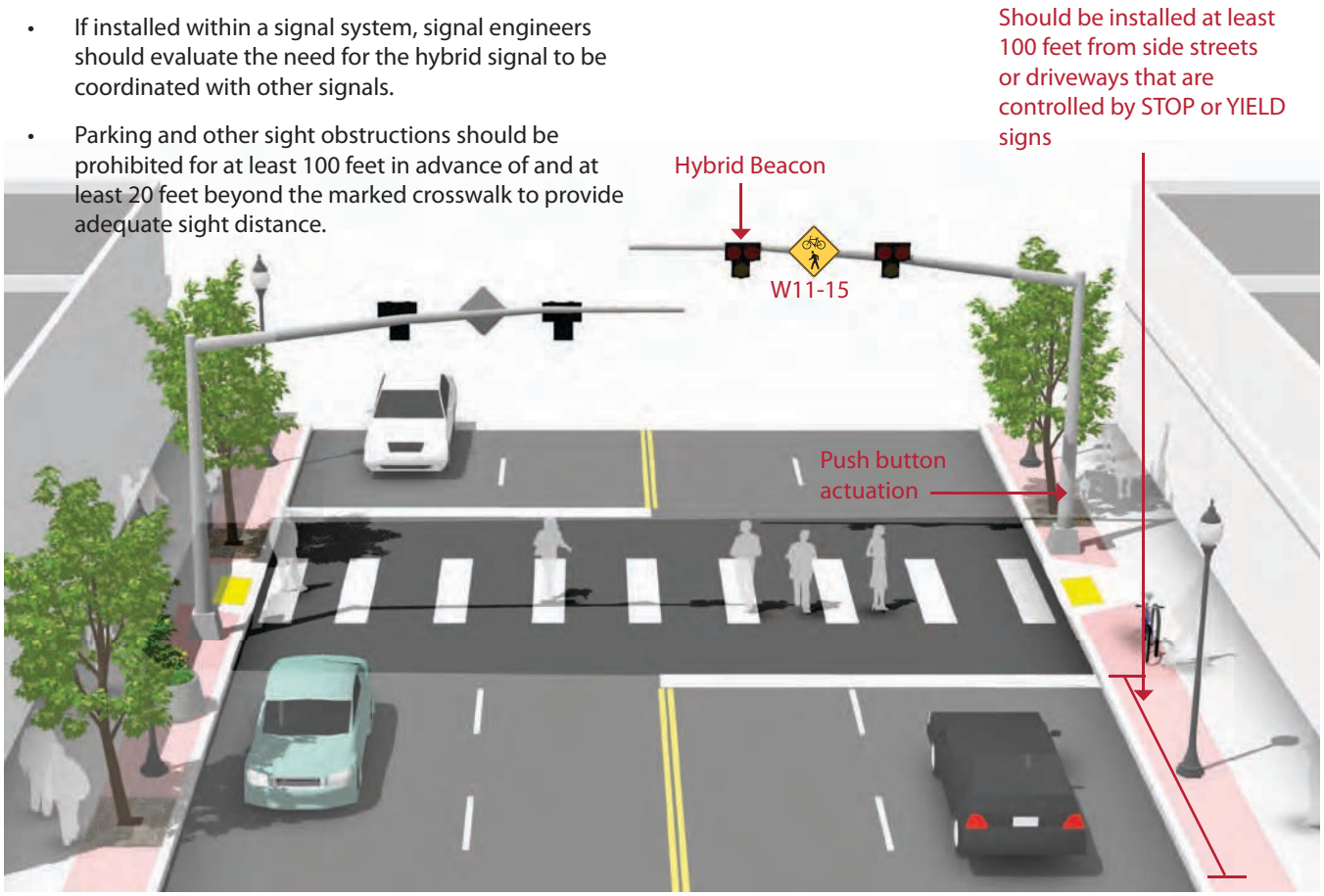
Guidance

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.

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



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 of Uniform Traffic Control Devices.
NACTO. (2011). Urban Bikeway Design Guide.

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.

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.

Bicycle boulevards

Bicycle boulevards are a special class of shared roadways designed for a broad spectrum of bicyclists. They are low-volume local streets where motorists and bicyclists share the same travel lane. Treatments for bicycle boulevards are selected as necessary to create appropriate automobile volumes and speeds, and to provide safe crossing opportunities of busy streets.

Bike Routes

Shared Lane Markings

Bicycle Boulevards

This section includes:

- Bike Routes
- Shared Lane Markings
- Bicycle Boulevards

Bike Routes

Guidance

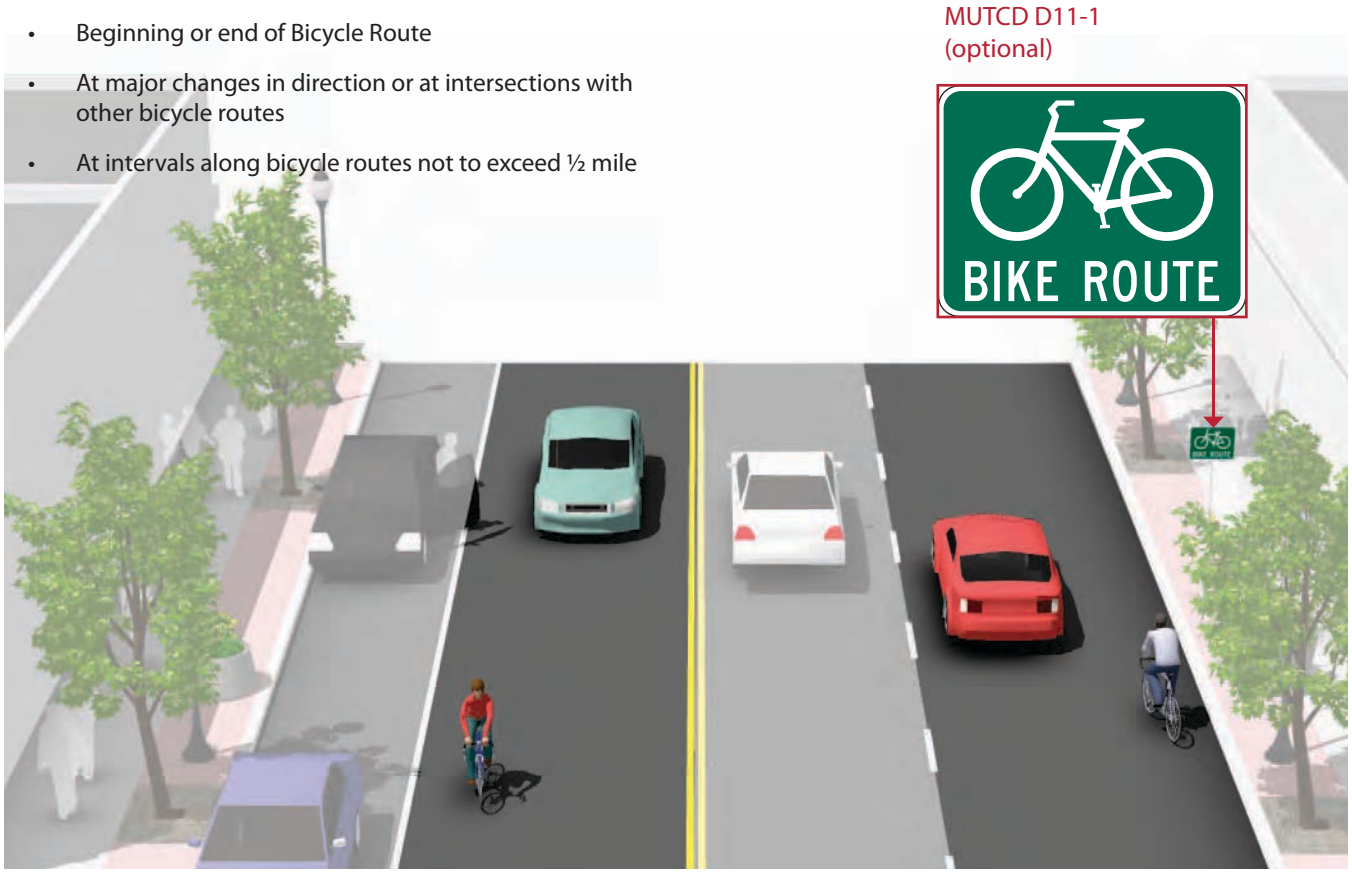
Lane width varies depending on roadway configuration.

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

Description

Bike routes are regular streets 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.



Discussion

Bike routes 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 **bicyle 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. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of 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.

Shared Lane Marking

Guidance

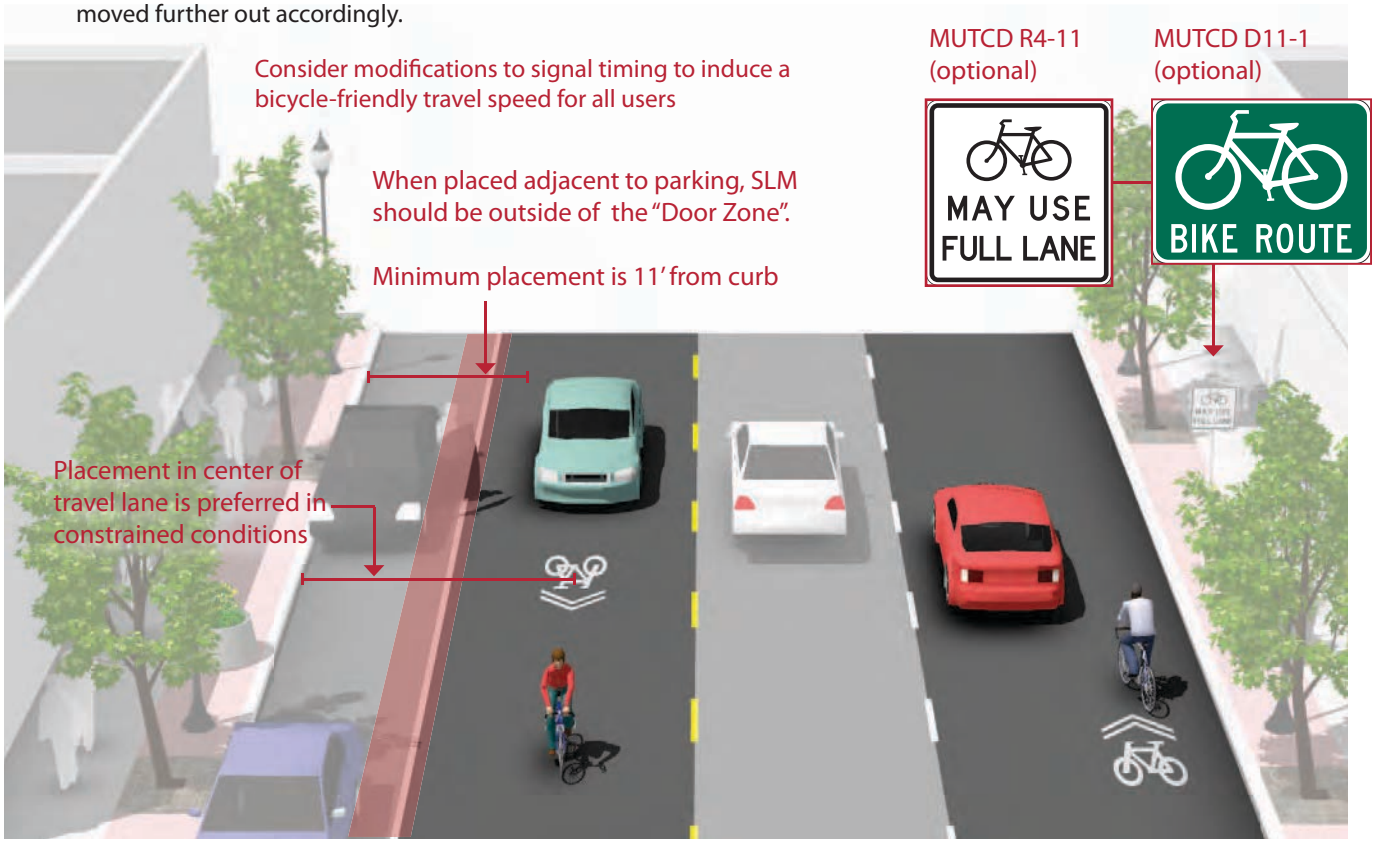
- In constrained conditions, preferred placement is in the center of the travel lane to minimize wear and promote single file travel.
- Minimum placement of SLM marking centerline is 11 feet from edge of curb where on-street parking is present, 4 feet from edge of curb with no parking. If parking lane is wider than 7.5 feet, the SLM should be moved further out accordingly.

Description

Shared lane markings (SLM) are used on shared roadways to encourage bicycle travel and proper positioning within the lane.

In constrained conditions, the SLMs are placed to discourage unsafe passing by motor vehicles. On a wide outside lane, the SLMs can be used to promote bicycle travel next to (to the right of) motor vehicles.

In all conditions, SLMs should be placed outside of the door zone of parked cars.



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. Shared Lane Markings shall not be used on shoulders, in designated **bicycle lanes**, or to designate **bicycle detection** at signalized intersections. (MUTCD 9C.07 03)

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. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of Uniform Traffic Control Devices.
NACTO. (2011). Urban Bikeway Design Guide.

Materials and Maintenance

Placing the SLM markings between vehicle tire tracks will increase the life of the markings and minimize the long-term cost of the treatment.

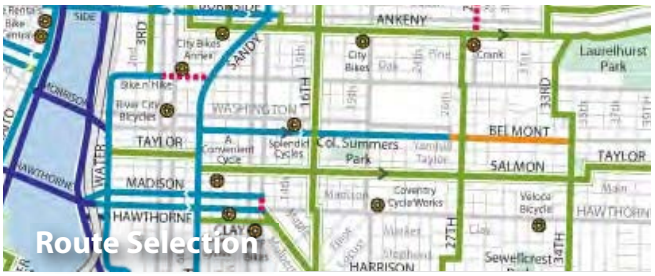
Bicycle Boulevards

Bicycle Boulevards are a special class of shared roadway designed to accommodate a broad spectrum of bicyclists.

Also known as neighborhood greenways, bicycle boulevards are low-volume, low-speed streets that have been optimized for bicycle travel 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.

Jurisdictions throughout the country use a wide variety of strategies to determine where specific treatments are applied. While no federal guidelines exist, several best practices have emerged for the development of bicycle boulevards. At a minimum, bicycle boulevards should include distinctive pavement markings and wayfinding signs. They can also use combinations of traffic calming, traffic diversion, and intersection treatments to improve the bicycling environment. The appropriate level of treatment to apply is dependent on roadway conditions, particularly motor vehicle speeds and volumes.

Traffic conditions on bicycle boulevards should be monitored to provide guidance on when and where treatments should be implemented. When motor vehicle speeds and volumes or bicyclist delay exceed the preferred limits, additional treatments should be considered for the bicycle boulevard.



Route Selection

Basic Treatments

Traffic Calming

Traffic Diversion

Intersection Treatments

This section includes:

- Route Selection
- Basic Treatments
- Traffic Calming
- Traffic Diversion
- Intersection Treatments

Bicycle Boulevards

Route Selection

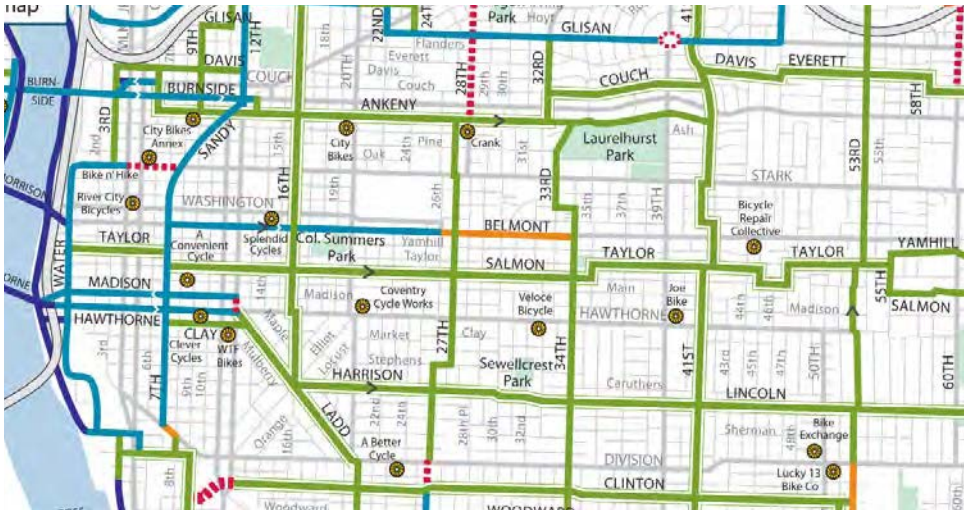
Guidance

- Streets are signed at 25 mph or less to improve the bicycling environment and decrease risk and severity of crashes.
- Traffic volumes are limited to 3,000 vehicles per day (ideally less than 1,500) to minimize passing events and potential conflicts with motor vehicles.
- Use of streets that parallel major streets can discourage non-local motor vehicle traffic without significantly impacting motorists.
- Use of streets where a relatively continuous route for bicyclists exists and/or where treatments can provide wayfinding and improve crossing opportunities at offset intersections.
- Use of streets where bicyclists have right-of-way at intersections or where right-of-way is possible to assign to bicyclists.

Description

Bicycle boulevards should be developed on streets that improve connectivity to key destinations and provide a direct route for bicyclists. Local streets with existing traffic calming, traffic diversions, or signalized crossings of major streets are good candidates, as they tend to be existing bicycle routes and have low motor vehicle speeds and volumes. Other streets where residents have expressed a desire for traffic calming are also good options.

Bicycle boulevards parallel to commercial streets improve access for 'interested but concerned' bicyclists and complement bike lanes on major roadways.



In Portland, OR, the bicycle network includes a high density of neighborhood greenways parallel to streets with bike lanes.

Discussion

Bicycle boulevards should form a continuous network of streets or off-street facilities that accommodate bicyclists who are less willing to ride on streets with motorized traffic. Most bicycle boulevards are located on residential streets, though they can also be on commercial or industrial streets. Due to the presence of trucks and commercial vehicles, as well as the need to maintain good traffic flow and retain motor vehicle parking, bicycle boulevards on commercial or industrial streets can tolerate higher automobile speeds and volumes than would be desired on neighborhood streets. Vertical traffic calming can minimize impacts to large vehicles and parking.

Additional References and Guidelines

Alta Planning + Design and IBPI. (2009). Bicycle Boulevard Planning and Design Handbook.
City of Berkeley. (2000). Bicycle Boulevard Design Tools and Guidelines.
City of Emeryville. (2011). Bicycle Boulevard Treatments.

Materials and Maintenance

Repaving, street sweeping and other maintenance should occur with higher frequency than on other local streets.

Bicycle Boulevards

Basic Treatments

Description

Signs and pavement markings are the minimum treatments necessary to designate a street as a bicycle boulevard. Together, they visibly designate a roadway to both bicyclists and motorists. Signs, and in some cases pavement markings, provide wayfinding to help bicyclists remain on the designated route.

Guidance

Pavement Markings

Place symbols every 250-800 feet along a linear corridor, as well as after every intersection.

On narrow streets where a motor vehicle cannot pass a bicyclist within one lane of traffic, place stencils in the center of the travel lane.

See **marked shared roadway** guidance for additional information on the use of shared lane markings.

A bicycle symbol can be placed on a standard road sign, along with distinctive coloration.

Signs

See **bikeway signing** for guidance on developing bicycle wayfinding signage. Some cities have developed unique logos or colors for wayfinding signs that help brand their bicycle boulevards.

Be consistent in content, design, and intent; colors reserved by the Manual on Uniform Traffic Devices (MUTCD) for regulatory and warning road signs are not recommended.

Signs can include information about intersecting bikeways and distance/time information to key destinations.

Discussion

Wayfinding signs displaying destinations, distances, and "riding time" can dispel common misperceptions about time and distance while increasing users' comfort and accessibility to the bicycle boulevard network. Bicycle boulevards frequently include offset intersections or 'jog' onto another street. Signs and pavement markings can help bicyclists remain on the route. In addition, fewer businesses or services are located along local streets, and signs inform bicyclists of the direction to key destinations, including commercial districts, transit hubs, schools and universities, and other bikeways.

Additional References and Guidelines

City of Milwaukie. (2009). Milwaukie Bicycle Wayfinding Signage Plan
City of Oakland (2009). Design Guidelines for Bicycle Wayfinding Signage
NACTO. (2011). Urban Bikeway Design Guide.

Materials and Maintenance

Pavement markings should be repainted and signs replaced as needed. Wayfinding signs should be regularly updated with new major destination and bicycle facilities.

Vertical Traffic Calming

Description

Motor vehicle speeds affect the frequency at which automobiles pass bicyclists as well as the severity of crashes that can occur. Maintaining motor vehicle speeds closer to those of bicyclists' greatly improves bicyclists' comfort on a street. Slower vehicular speeds also improve motorists' ability to see and react to bicyclists and minimize conflicts at driveways and other turning locations.

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

Guidance

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

Speed Hump

Offset Speed Hump

Temporary Speed Cushion

Raised Crosswalk

Discussion

Emergency vehicle response times should be considered where vertical deflection is used. Because emergency vehicles have a wider wheel base than passenger cars, speed lumps/cushions allow them to pass unimpeded while slowing most other traffic. Alternatively, speed tables are recommended because they cannot be straddled by a truck, decreasing the risk of bottoming out.

Traffic calming can also deter motorists from driving on a street. Monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

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

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

Horizontal Traffic Calming

Description

Horizontal speed control measures are obstacles on the side of the travel lane, which cause motorists to slow down to either navigate the travel feature or because the roadway narrows.

Horizontal speed control measures may reduce the design speed of a street, and they can be used in conjunction with reduced speed limits to reinforce the expectation that motorists lower their speeds.

Guidance

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

Temporary Curb Extension

Chicane

Choker or Neckdown

Pinchpoint with Bicycle Access

Discussion

Horizontal speed control measures should not infringe on bicycle space. Where possible, provide a bicycle route outside of the element so bicyclists can avoid having to merge into traffic at a narrow pinch point. This technique can also improve drainage flow and reduce construction and maintenance costs.

Traffic calming can also deter motorists from driving on a street. Monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

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

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

Traffic Diversion

Description

Motor vehicle traffic volumes also affect the operation of a bicycle boulevard. Higher vehicle volumes reduce bicyclists' comfort and can result in more potential conflicts.

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, above which the route should be striped as a **bike lane** or considered a **signed shared roadway**.

Guidance

- Traffic diversion treatments reduce motor vehicle volumes by completely or partially restricting through traffic on a bicycle boulevard.
- Partial closures allow full bicycle passage while restricting vehicle access to one way traffic at that point.
- Diagonal diverters require all motor vehicle traffic to turn.
- Median diverters (see **major intersections**) restrict through motor vehicle movements while providing a refuge for bicyclists to cross in two stages.
- Street closures create a "T" that blocks motor vehicles from continuing on a bicycle boulevard, while bicycle travel can continue unimpeded. Full closures can accomodarte emergency vehicles with the use of mountable curbs (maximum of six inches high).

Partial Closure

Diagonal Diverter

Median Diverter

Full Closure

Discussion

Bicycle boulevards on streets with volumes higher than 3,000 vehicles per day are not recommended, although a segment of a bicycle boulevard may accommodate more traffic for a short distance if necessary to complete the corridor. Providing additional separation with a **bike lane**, **cycle track** or other treatment is recommended where traffic calming or diversion cannot reduce volumes below this threshold.

Additional References and Guidelines

Alta Planning + Design and IBPI. (2009). Bicycle Boulevard Planning and Design Handbook.
Ewing, Reid. (1999). Traffic Calming: State of the Practice.
Ewing, Reid and Brown, Steven. (2009). U.S. Traffic Calming Manual.
Oregon Department of Transportation. (1998). Right-In Right-Out Channelization.

Materials and Maintenance

Depending on the diverter type, these treatments can be challenging to keep clear of snow and debris. Vegetation should be regularly trimmed to maintain visibility and attractiveness.

Minor Intersection Treatments

Description

Treatments at minor roadway intersections are designed to improve the visibility of a bicycle boulevard, raise awareness of motorists on the cross-street that they are likely to encounter bicyclists, and enhance safety for all road users.

Guidance

- On the bicycle boulevard, the majority of intersections with minor roadways should stop-control cross traffic to minimize bicyclist delay. This will maximize through-bicycle connectivity and preserve bicyclist momentum.
- Traffic circles are a type of **horizontal traffic calming** that can be used at minor street intersections. Traffic circles reduce conflict potential and severity while providing traffic calming to the corridor.
- If a stop sign is present on the bicycle boulevard, a second stop bar for bicyclists can be placed closer to the centerline of the cross street than the motorists' stop bar to increase the visibility of bicyclists waiting to cross the street.
- Curb extensions can be used to move bicyclists closer to the centerline to improve visibility and encourage motorists to let them cross.

Stop Signs on Cross-Street

Traffic Circles

Bicycle Forward Stop Bar

Curb Extension

Discussion

Stop signs increase bicycling time and energy expenditure, frequently leading to non-compliance by bicyclists and motorists, and/or use of other less desirable routes. Bicycle boulevards should have fewer stops or delays than other local streets; a typical bicycle trip of 30 minutes can increase to 40 minutes if there is a STOP sign at every block (*Berkeley Bicycle Boulevard Design Tools and Guidelines*). If several stop signs are turned along a corridor, speeds should be monitored and traffic-calming treatments used to reduce excessive vehicle speeds on the bicycle boulevard.

Additional References and Guidelines

City of Berkeley. (2000). Bicycle Boulevard Design Tools and Guidelines.
City of London Transport for London. Advanced stop lines (ASLS) background and research studies.
Transportation Research Board. (2006). Improving Pedestrian Safety at Unsignalized Crossings. NCHRP Report # 562.

Materials and Maintenance

Vegetation in traffic circles and curb extensions should be regularly trimmed to maintain visibility and attractiveness. Repaint bicycle stop bars as needed.

Major Intersection Treatments

Description

The quality of treatments at major street crossings can significantly affect a bicyclist's choice to use a bicycle boulevard, as opposed to another road that provides a crossing treatment.

Guidance

- **Bike boxes** increase bicyclist visibility to motorists and reduce the danger of right "hooks" by providing a space for bicyclists to wait at signalized intersections.
- Median islands provided at uncontrolled intersections of bicycle boulevards and major streets allow bicyclists to cross one direction of traffic at a time as gaps in traffic occur.
- **Hybrid Beacons**, **active warning beacons** and **bicycle signals** can facilitate bicyclists crossing a busy street on which cross-traffic does not stop.
- Select treatments based on engineering judgment; see National Cooperative Highway Research Program (NCHRP) Report # 562 *Improving Pedestrian Safety at Unsignalized Crossings* (2006) for guidance on appropriate use of crossing treatments. Treatments are designed to improve visibility and encourage motorists to stop for pedestrians; with engineering judgement many of the same treatments are appropriate for use along bicycle boulevards.

Bike Box

Median Island

Hybrid Beacon (HAWK)

Rectangular Rapid Flash Beacon (RRFB)

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.

Additional References and Guidelines

Transportation Research Board. (2006). *Improving Pedestrian Safety at Unsignalized Crossings.* NCHRP Report # 562.
Federal Highway Administration. (2004). *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations.* FHWA-RD-04-100

Materials and Maintenance

Maintain signs, markings, and other treatments and replace as needed. Monitor intersections for bicyclist delay to determine if additional treatments are warranted.

Offset Intersection Treatments

Description

Offset intersections can be challenging for bicyclists who are required to briefly travel along the busier cross street in order to continue along the bicycle boulevard.

Guidance

- Appropriate treatments depend on volume of traffic including turning volumes, the speed limit or 85th percentile speed of the main street and the type of bicyclist using the crossing.
- **Contraflow bike lanes** allow bicyclists to travel against the flow of traffic on a one-way street and can improve bicycle boulevard connectivity.
- Bicycle left-turn lanes can be painted where a bicycle boulevard is offset to the right on a street that has sufficient traffic gaps. Bicyclists cross one direction of traffic and wait in a protected space for a gap in the other direction. The bike turn pockets should be at least 4 feet wide, with a total of 11 feet for both turn pockets and center striping.
- Short **bike lanes** on the cross street assist with accessing a bicycle boulevard that jogs to the left. Crossing treatments should be provided on both sides to minimize wrong-way riding.
- A **cycle track** can be provided on one side of a busy street. Bicyclists enter the cycle track from the bicycle boulevard to reach the connecting segment of the bicycle boulevard. This maneuver may be signalized on one side.

Contraflow Bike Lane

Left Turn Bike Lanes

Short Bike Lanes on the Cross Street

Cycle Track Connection

Discussion

Because bicycle boulevards are located on local streets, the route is often discontinuous. Wayfinding and pavement markings assist bicyclists with remaining on the route.

Additional References and Guidelines

Hendrix, Michael. (2007). *Responding to the Challenges of Bicycle Crossings at Offset Intersections.* Third Urban Street Symposium.

Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Facilities should be cleared of snow through routine snow removal operations.

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.

Paved Shoulders

Conventional Bicycle Lanes

Buffered Bike Lanes

This section includes:

Paved Shoulders

Conventional Bike Lanes

- Bike Lane With No On-Street Parking
- Bike Lane Next to Parallel Parking
- Bike Lane Next to Diagonal Parking

Additional Bike Lane Configurations

- Buffered Bike Lanes

Separated Bikeways

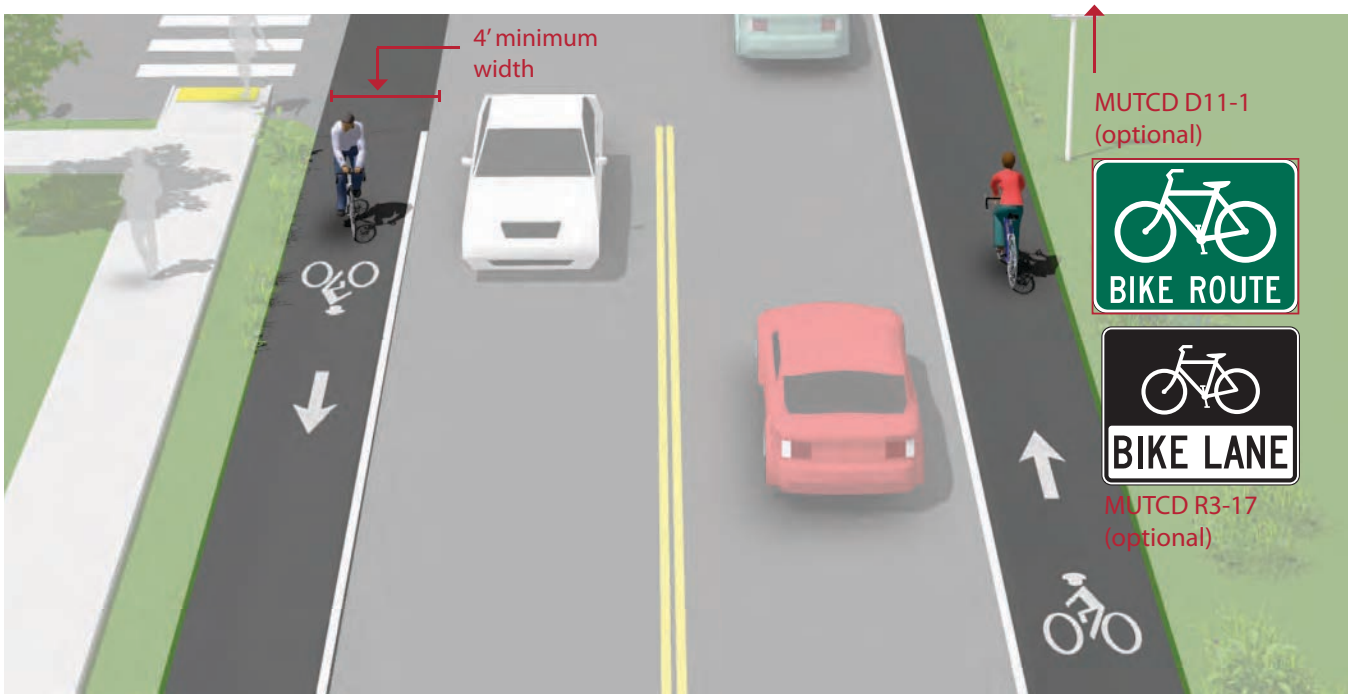
Paved Shoulders

Guidance

- On rural sections (shoulder) with ADT greater than 500, bike lanes/paved shoulders should be a minimum of 4 feet wide in each direction to accommodate bicycle travel.
- Where motor vehicle speeds exceed 50 mph or the percentage of trucks, buses, and recreational vehicles is greater than 5 percent consider providing a 6 foot minimum width.
- If it is not possible to meet minimum bicycle lane dimensions, a reduced width paved shoulder can still improve conditions for bicyclists.

Description

Typically found in less-dense areas, paved shoulders are paved roadways with striped shoulders (4'+) wide enough for bicycle travel. Paved shoulders often, but not always, include signage alerting motorists to expect bicycle travel along the roadway. Paved shoulders 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.



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, but not exceeding desirable bike lane widths.

Additional References and Guidelines

AASHTO. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of Uniform Traffic Control Devices.

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.

Bike Lane with No On-Street Parking

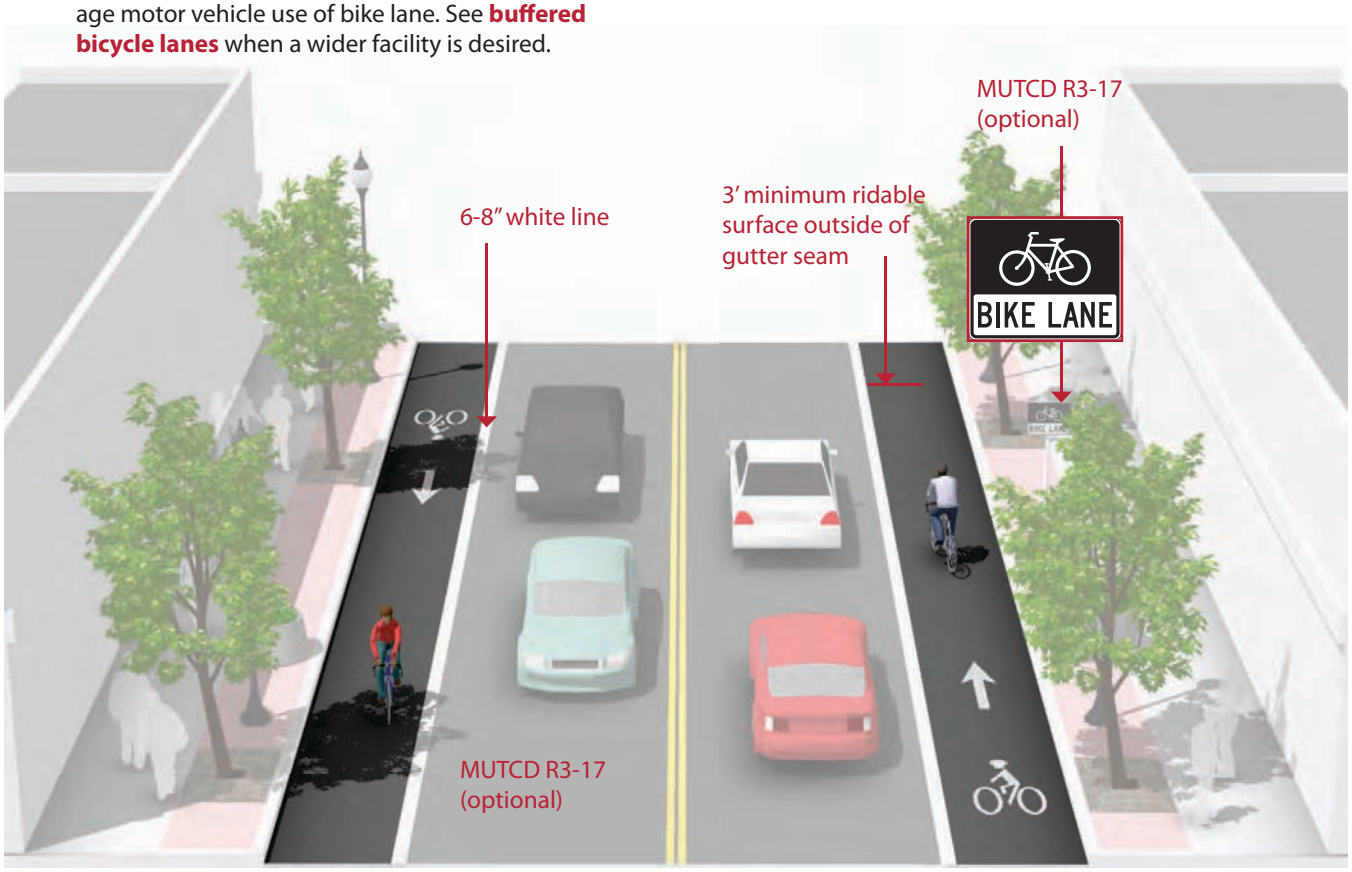
Guidance

- 4 foot minimum width. The gutter pan is not to be included in the width of the bike lane.
- 7 foot maximum width for use adjacent to arterials with high travel speeds. Greater widths may encourage motor vehicle use of bike lane. See **buffered bicycle lanes** when a wider facility is desired.

Description

Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is typically located on the right side of the street, between the adjacent travel lane and curb, and is used in the same direction as motor vehicle traffic.

A bike lane width of 7 feet makes it possible for bicyclists to ride side-by-side or pass each other without leaving the bike lane, thereby increasing the capacity of the 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. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of Uniform Traffic Control Devices.
NACTO. (2011). 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.

Bike Lane Adjacent to On-Street Parallel Parking

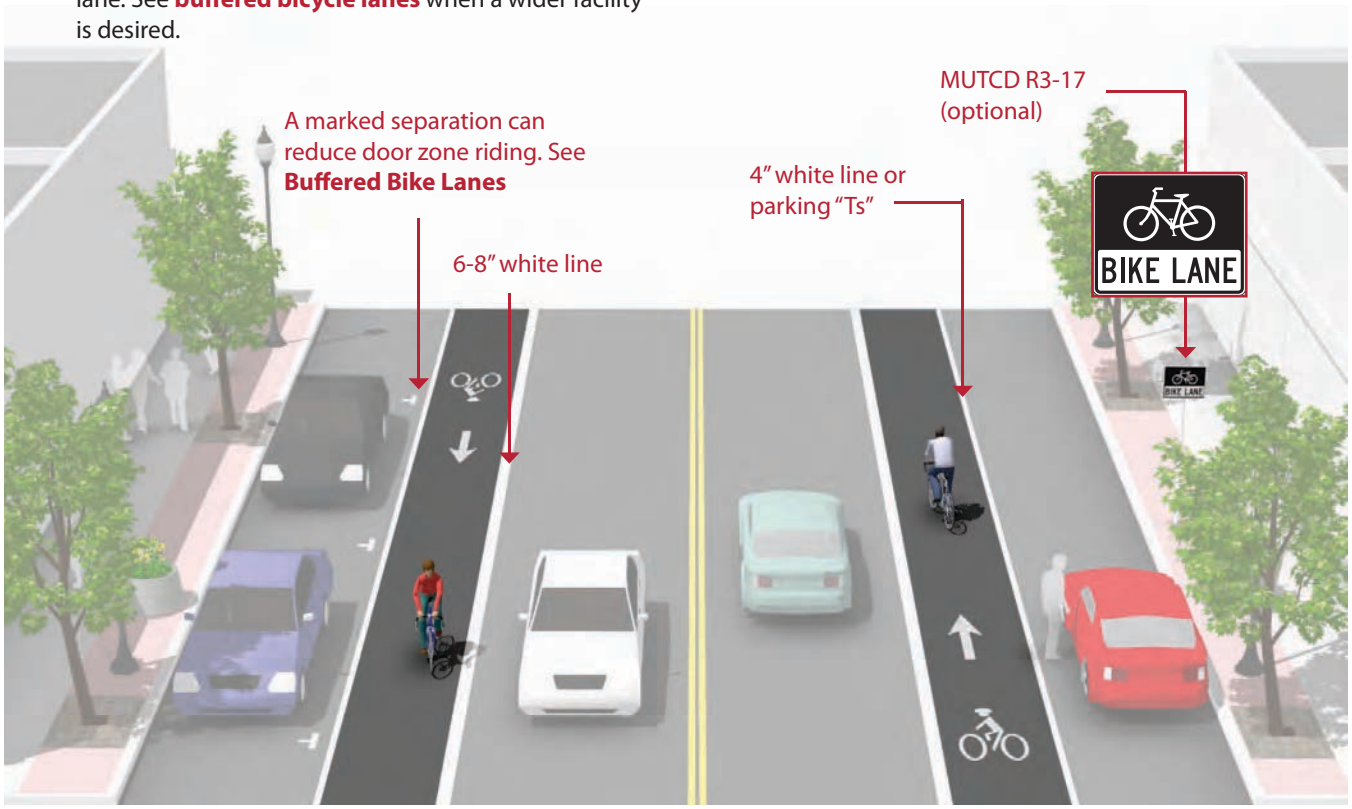
Guidance

- 12 foot minimum from curb face to edge of bike lane.
- 14.5 foot preferred from curb face to edge of bike lane.
- 7 foot maximum for marked width of bike lane. Greater widths may encourage vehicle loading in bike lane. See **buffered bicycle lanes** when a wider facility is desired.

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.



Discussion

Bike lanes adjacent to on-street parallel parking require special treatment in order to avoid crashes caused by an open vehicle door. The bike lane should have sufficient width to allow bicyclists to stay out of the door zone while not encroaching into the adjacent vehicular lane. Parking stall markings, such as parking "Ts" and double white lines create a parking side buffer that encourages bicyclists to ride farther away from the door zone.

Additional References and Guidelines

AASHTO. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of Uniform Traffic Control Devices.
NACTO. (2011). 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.

Bike Lane Adjacent to On-Street Back-in Diagonal Parking

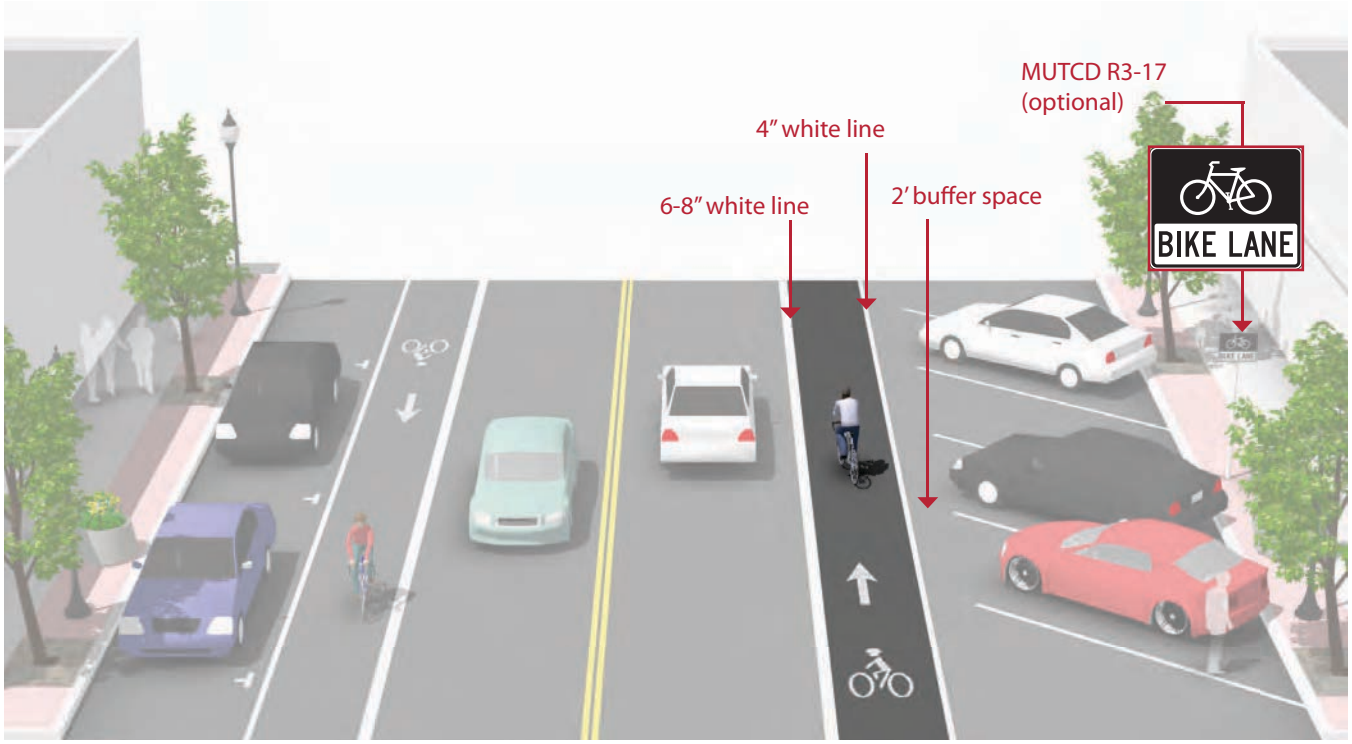
Guidance

- 5 foot minimum marked width of bike lane.
- Parking bays are sufficiently long to accommodate most vehicles (so vehicles do not block bike lane).

Description

In certain areas with high parking demand such as urban commercial areas, diagonal parking can be used to increase parking supply.

Back-in diagonal parking improves sight distances between drivers and bicyclists when compared to conventional head-in diagonal parking. Back-in diagonal parking provides other benefits including loading and unloading of the trunk at the curb rather than in the street, passengers (including children) are directed by open doors towards the curb and there is no door conflict with bicyclists. While there may be a learning curve for some drivers, back-in diagonal parking is typically an easier maneuver than conventional parallel parking.



Discussion

Conventional front-in diagonal parking is not compatible or recommended in conjunction with high levels of bicycle traffic or with the provision of bike lanes, as drivers backing out of conventional diagonal parking have limited visibility of approaching bicyclists.

Additional References and Guidelines

There is no currently adopted Federal or State guidance for this treatment.

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 Lane

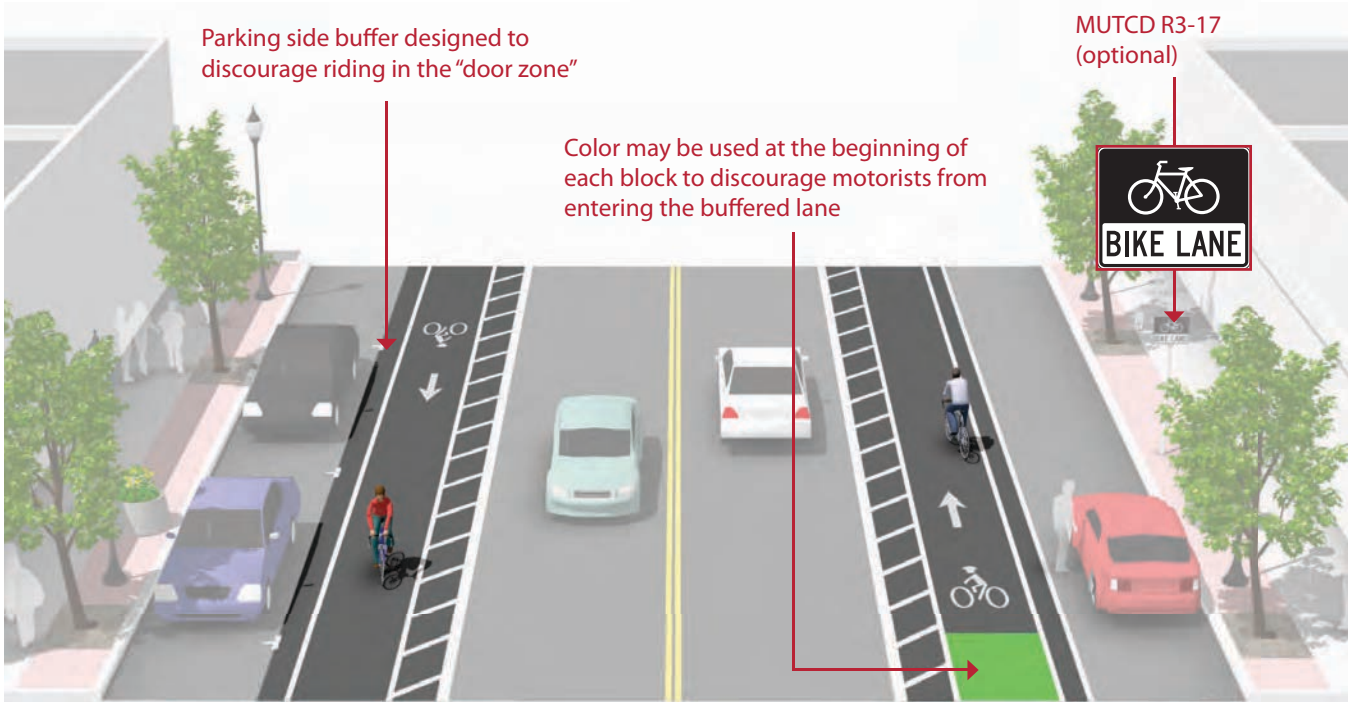
Guidance

- 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 for the inside buffer boundary where cars are expected to cross.

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.



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

FHWA. (2009). Manual of Uniform Traffic Control Devices. (3D-01)
NACTO. (2011). 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.

Cycle Tracks

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. In situations where on-street parking is allowed, cycle tracks are located to the curb-side of the parking, (in contrast to bike lanes).

Cycle tracks may be one-way or two-way, and may be at street level, sidewalk level or at an intermediate level. If at sidewalk level, a curb or median separates them from motor traffic, while different pavement color/texture separates the cycle track from the sidewalk. If at street level, they can be separated from motor traffic by raised medians, on-street parking or bollards.

A two-way cycle track is desirable when more destinations are on one side of a street (therefore preventing additional crossings), if the facility connects to a path or other bicycle facility on one side of the street, or if there is not enough room for a cycle track on both sides of the road.

By separating bicyclists from motor traffic, cycle tracks can offer a higher level of comfort than bike lanes and are attractive to a wider spectrum of the public.

Intersections and approaches must be carefully designed to promote safety and facilitate left-turns from the right side of the street. See **separated bikeways at intersections** for more information.

One Way Cycle Tracks

Two-Way Cycle Tracks

This section includes:

Cycle Tracks

- Cycle Track Separation and Placement
- One-Way Cycle Tracks
- Two-Way Cycle Tracks

Cycle Tracks

Cycle Track Separation and Placement

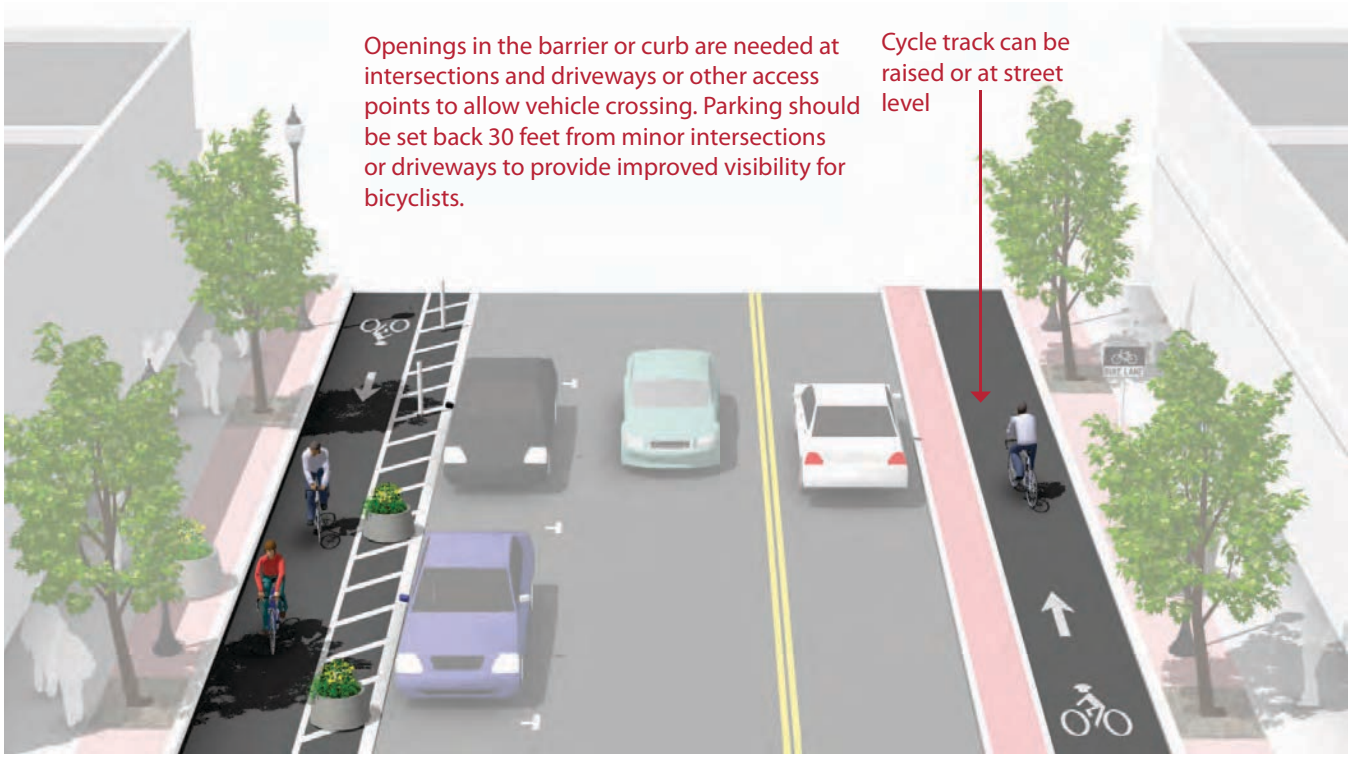
Guidance

- Cycle tracks should ideally be placed along streets with long blocks and few driveways or mid-block access points for motor vehicles. Cycle tracks located on one-way streets have fewer potential conflict areas than those on two-way streets.
- In situations where on-street parking is allowed, cycle tracks shall be located between the parking lane and the sidewalk (in contrast to bike lanes).

Description

Protection is provided through physical barriers and can include bollards, parking, a planter strip, an extruded curb, or on-street parking. Cycle tracks using these protection elements typically share the same elevation as adjacent travel lanes.

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.



Discussion

Sidewalks or other pedestrian facilities should not be narrowed to accommodate the cycle track as pedestrians will likely walk on the cycle track if sidewalk capacity is reduced. Visual and physical cues (e.g., pavement markings & signage) should be used to make it clear where bicyclists and pedestrians should be travelling. If possible, separate the cycle track and pedestrian zone with a furnishing zone.

Additional References and Guidelines

NACTO. (2011). 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.

Cycle Tracks

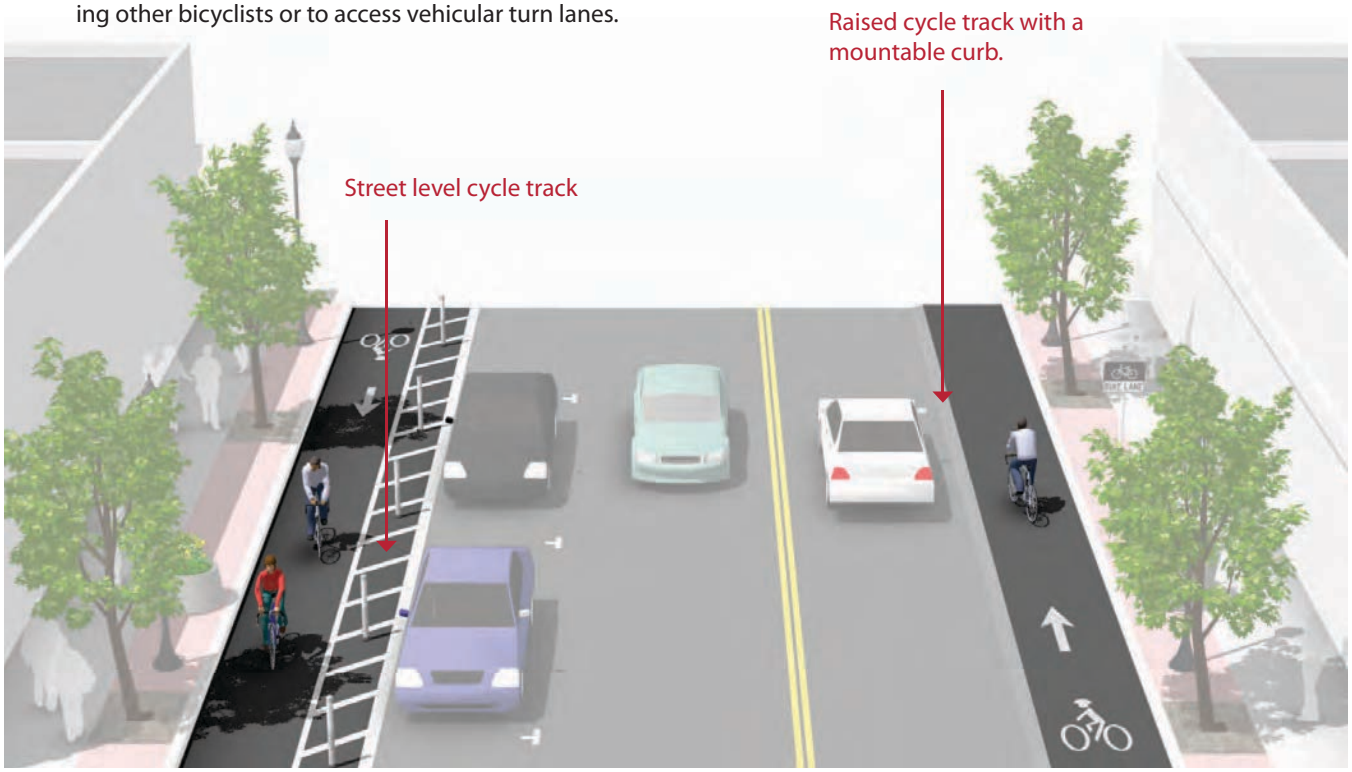
One-Way Cycle Tracks

Guidance

- 7 foot recommended minimum to allow passing.
- 5 foot minimum width in constrained locations.
- When placed adjacent to parking, the parking buffer should be three feet wide to allow for passenger loading and to prevent door collisions.
- When placed adjacent to a travel lane, one-way raised cycle tracks may be configured with a mountable curb to allow entry and exit from the bicycle lane for passing other bicyclists or to access vehicular turn lanes.

Description

One-way cycle tracks are physically separated from motor traffic and distinct from the sidewalk. Cycle tracks are either raised or at street level and use a variety of elements for physical protection from passing traffic.



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. (2011). 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.

Cycle Tracks

Two-Way Cycle Tracks

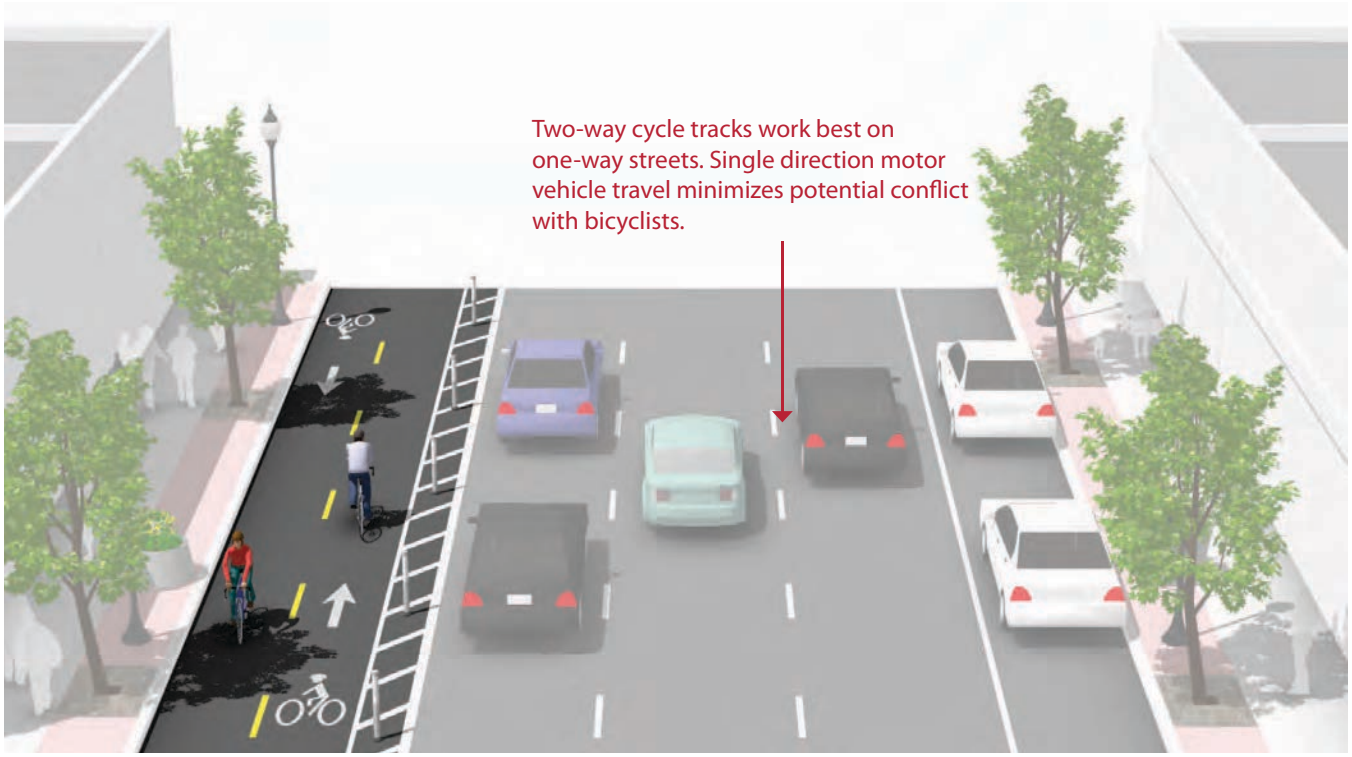
Guidance

- 12 foot recommended minimum for two-way facility
- 8 foot minimum in constrained locations
- When placed adjacent to parking, the parking buffer should be three feet wide to allow for passenger loading and to prevent door collisions.

Description

Two-way cycle tracks are physically separated cycle tracks that allow bicycle movement in both directions on one side of the road. Two-way cycle tracks share some of the same design characteristics as **one-way cycle tracks**, but may require additional considerations at driveway and side-street crossings.

A two-way cycle track may be configured as a protected cycle track at street level with a parking lane or other barrier between the cycle track and the motor vehicle travel lane and/or as a raised cycle track to provide vertical separation from the adjacent motor vehicle lane.



Discussion

Two-way cycle tracks require a higher level of control at intersections to allow for a variety of turning movements. These movements should be guided by separated signals for bicycles and motor vehicles. Transitions into and out of two-way cycle tracks should be simple and easy to use to deter bicyclists from continuing to ride against the flow of traffic.

At driveways and minor intersections, bicyclists riding against roadway traffic in two-way cycle tracks may surprise pedestrians and drivers not expecting bidirectional travel. Appropriate signage is recommended.

Additional References and Guidelines

NACTO. (2011). 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 Boxes
- Bike Lanes at Right Turn Only Lanes
- Colored Bike Lanes in Conflict Areas
- Shared Bicycle/Right Turn Lanes
- Intersection Crossing Markings
- Bicycles at Single Lane Roundabouts
- Bicycles at High Speed Interchanges

Bike Boxes

Colored Bike Lanes in Conflict Areas

Bike Lanes at Right Turn Only Lanes

Shared Bicycle/Right Turn Lane

Intersection Crossing Markings

Bicycles at Roundabouts

Separated Bikeways at Intersections

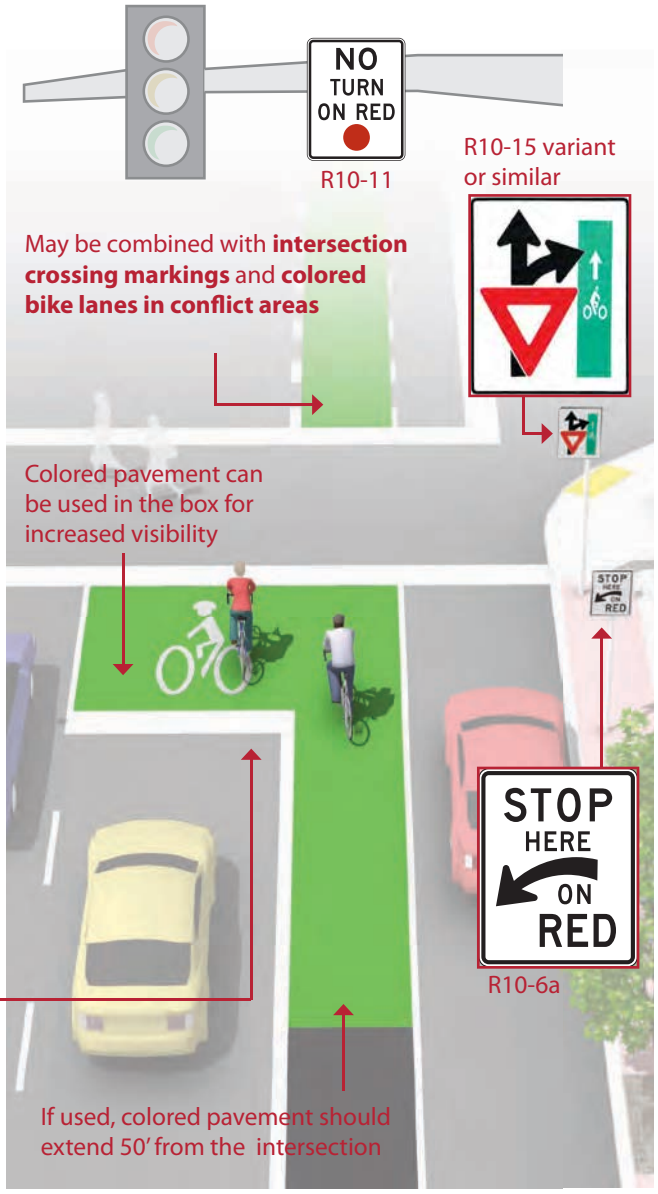
Bike Box

Description

A bike box is a designated area located at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible space to get in front of queuing motorized traffic during the red signal phase. Motor vehicles must queue behind the white stop line at the rear of the bike box.

Guidance

- 14' minimum depth
- A "No Turn on Red" (MUTCD R10-11) sign shall be installed overhead to prevent vehicles from entering the Bike Box.
- A "Stop Here on Red" sign should be post-mounted at the stop line to reinforce observance of the stop line.
- A "Yield to Bikes" sign should be post-mounted in advance of and in conjunction with an egress lane to reinforce that bicyclists have the right-of-way going through the intersection.
- An ingress lane should be used to provide access to the box.
- A supplemental "Wait Here" legend can be provided in advance of the stop bar to increase clarity to motorists.



Discussion

Bike boxes should be placed only at signalized intersections, and right turns on red shall be prohibited for motor vehicles. Bike boxes should be used in locations that have a large volume of bicyclists and are best utilized in central areas where traffic is usually moving more slowly. Prohibiting right turns on red improves safety for bicyclists yet does not significantly impede motor vehicle travel.

Additional References and Guidelines

NACTO. (2011). Urban Bikeway Design Guide.
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

Materials and Maintenance

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

Separated Bikeways at Intersections

Bike Lanes at Right Turn Only Lanes

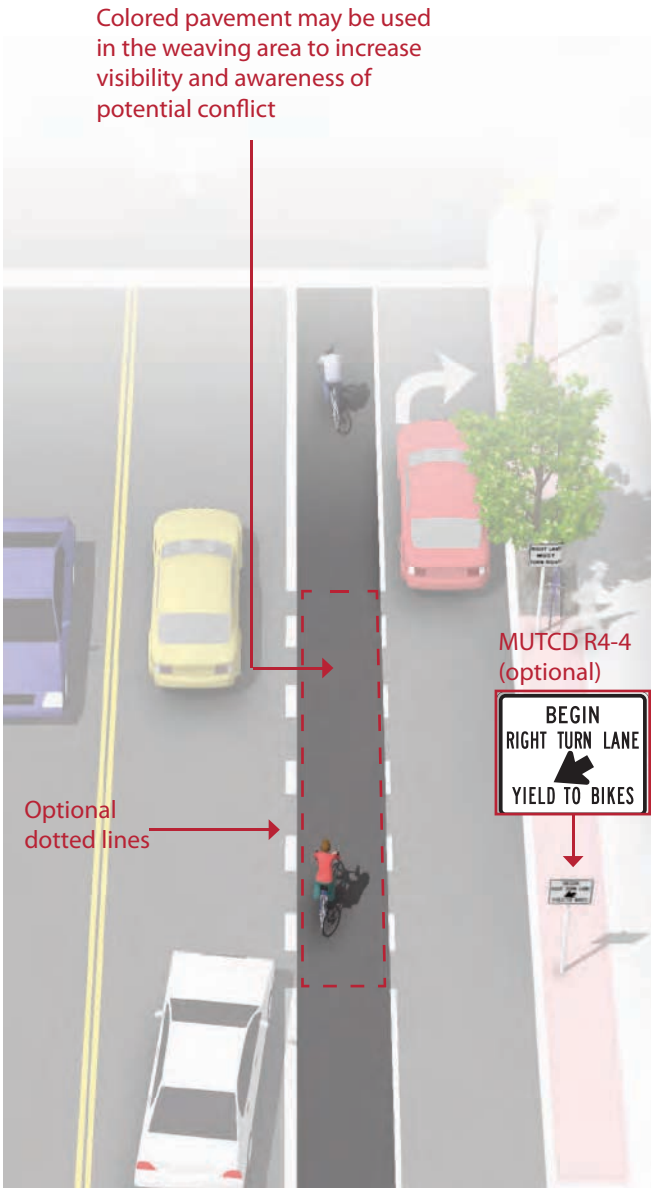
Description

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

- 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.



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. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of Uniform Traffic Control Devices.
NACTO. (2011). Urban Bikeway Design Guide.

Materials and Maintenance

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

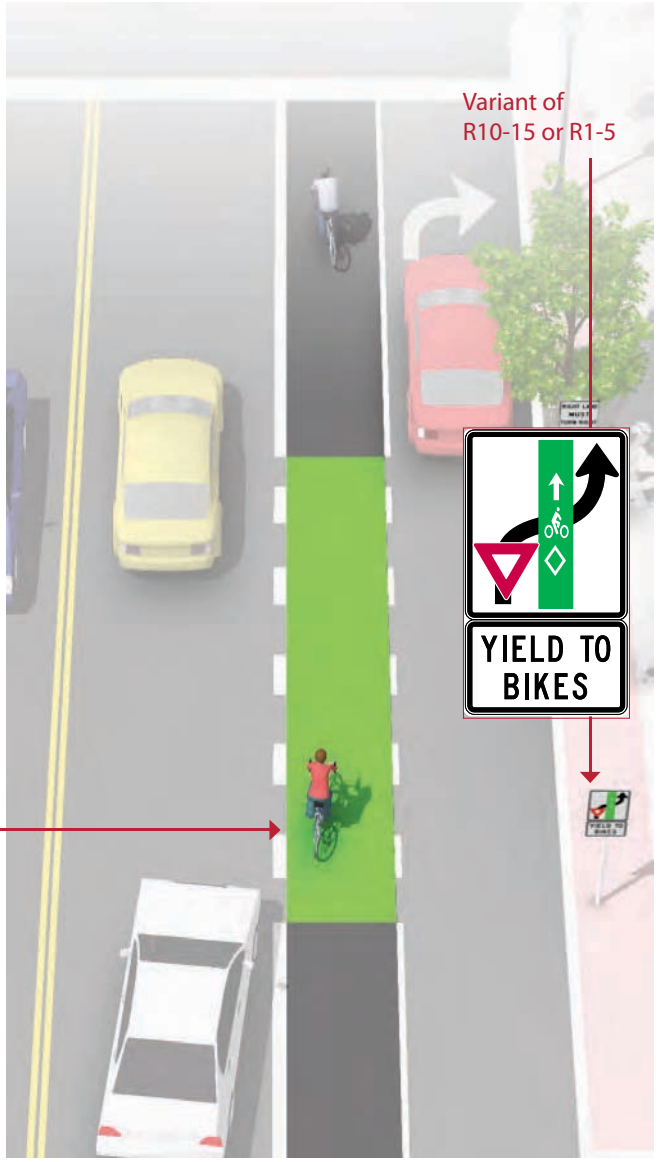
Colored Bike Lanes in Conflict Areas

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.



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. (2011). Urban Bikeway Design Guide.

Materials and Maintenance

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

Separated Bikeways at Intersections

Shared Bike Lane / Turn Lane

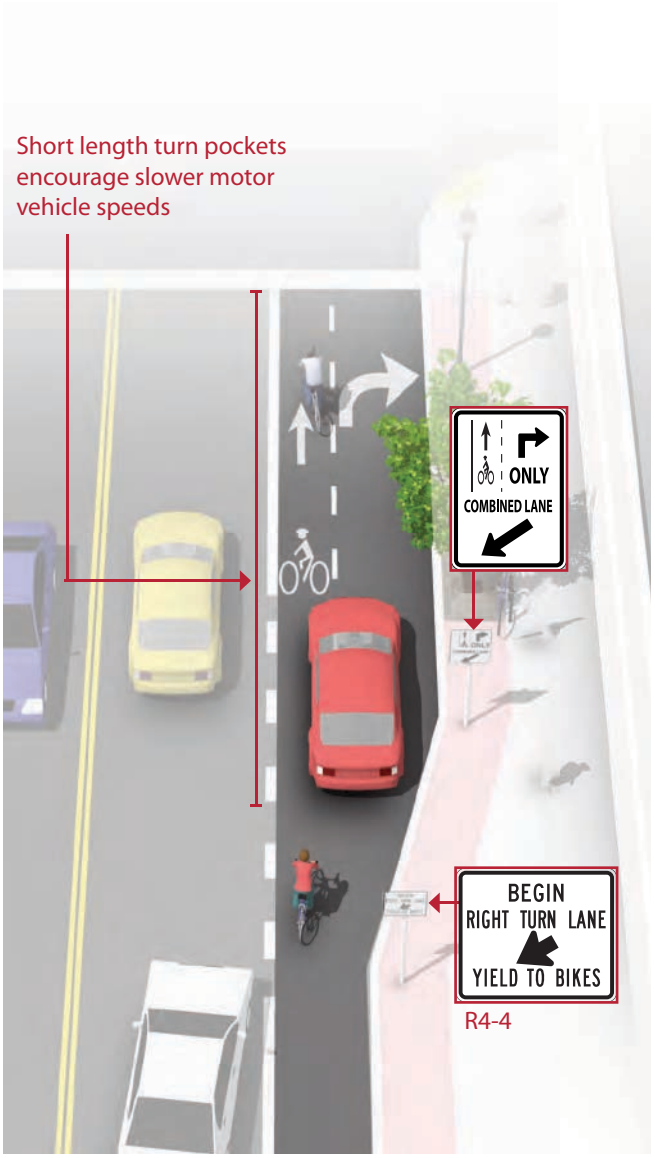
Description

The shared 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.
- 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. (2011). 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

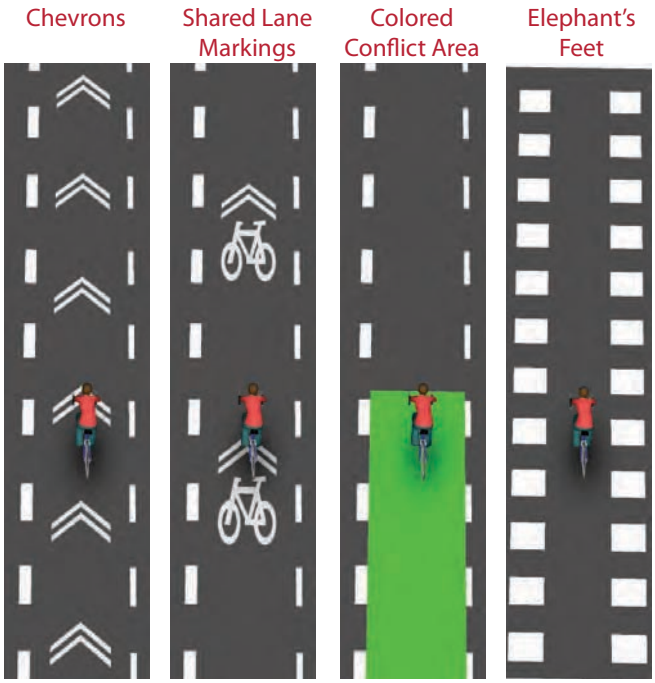
Locate markings out of tire tread to minimize wear. Because the effectiveness of markings depends on their visibility, maintaining markings should be a high priority.

Separated Bikeways at Intersections

Intersection Crossing Markings

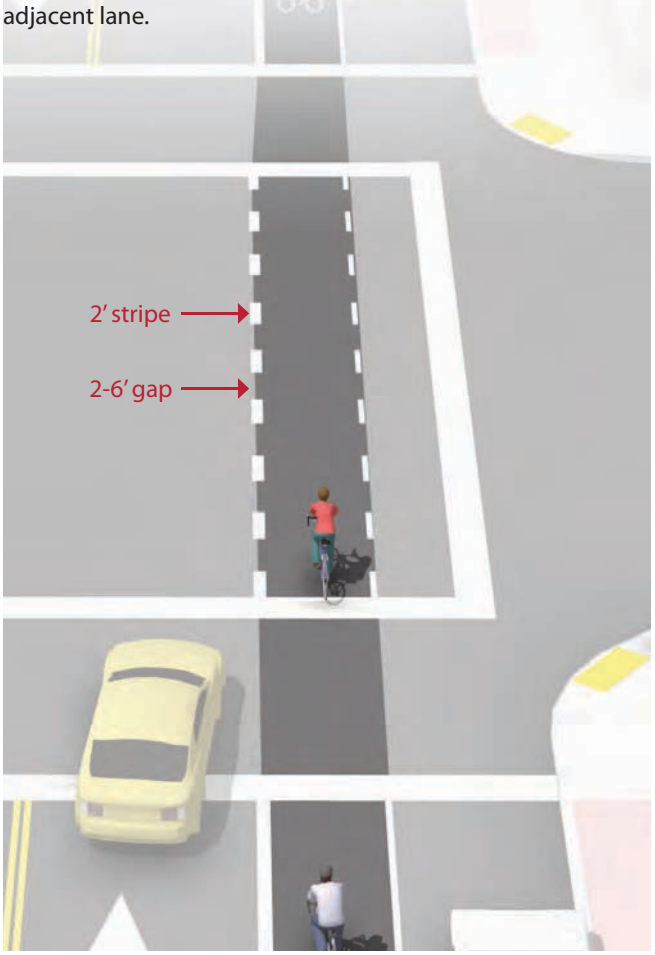
Guidance

- 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 Europe and Canada.



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.



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

FHWA. (2009). Manual of Uniform Traffic Control Devices. (3A.06)
NACTO. (2011). 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.

Separated Bikeways at Intersections

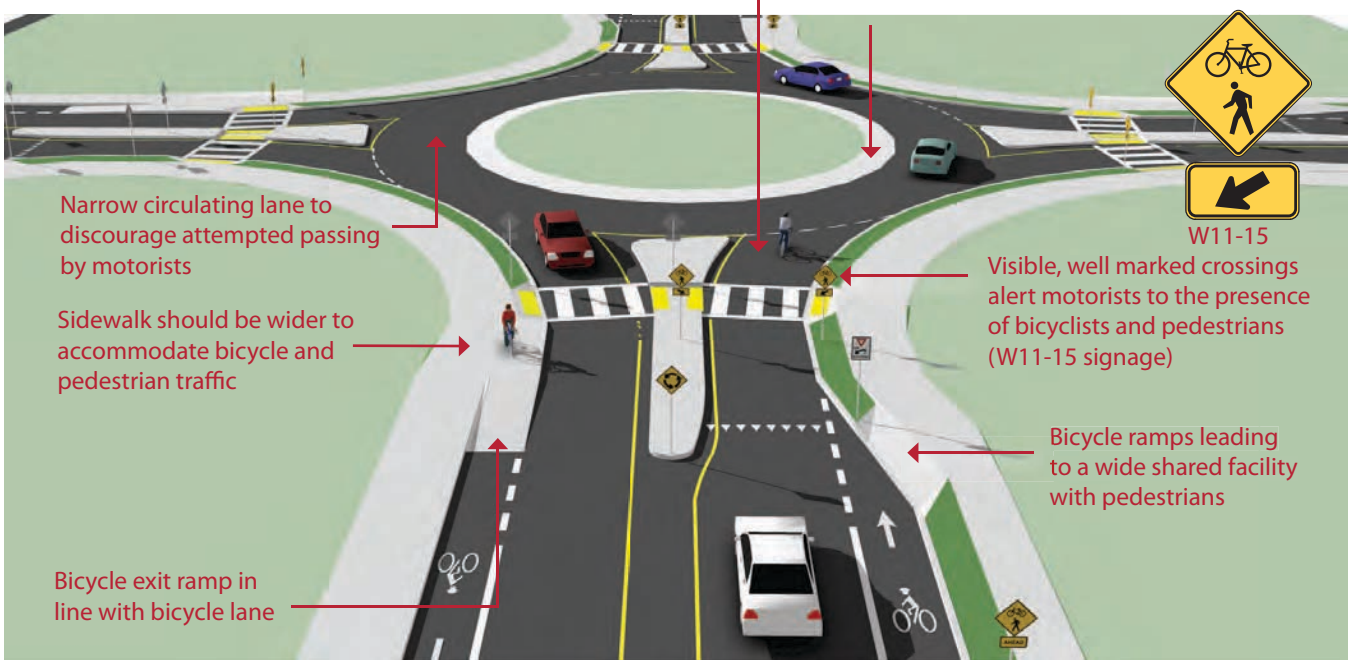
Bicyclists at Single Lane Roundabouts

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.

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.



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

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.

Separated Bikeways at Intersections

Bike Lanes at High Speed Interchanges

Guidance

Entrance Ramps:

Angle the bike lane to increase the approach angle with entering traffic. Position crossing before drivers' attention is focused on the upcoming merge.

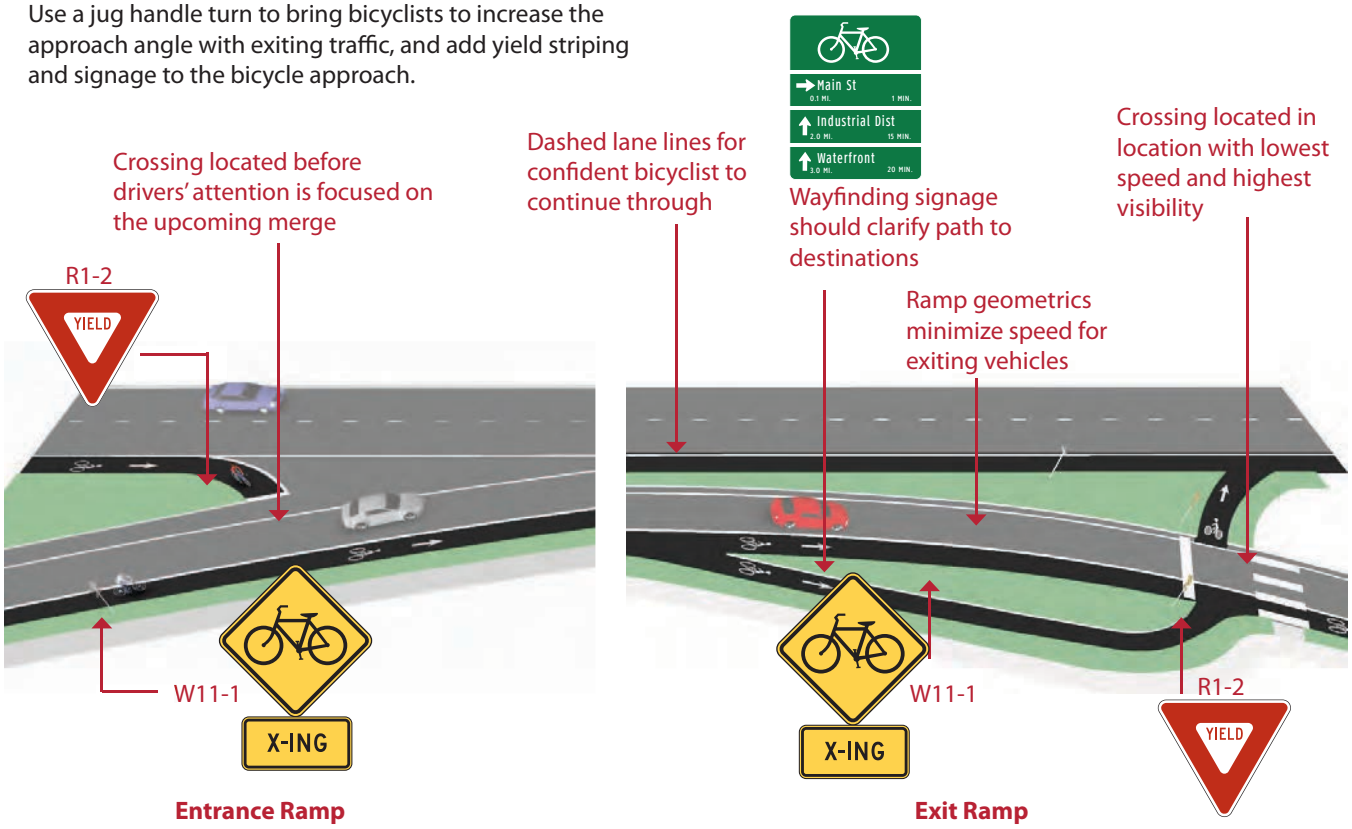
Exit Ramps:

Use a jug handle turn to bring bicyclists to increase the approach angle with exiting traffic, and add yield striping and signage to the bicycle approach.

Description

Some arterials may contain high speed freeway-style designs such as merge lanes and exit ramps, which can create difficulties for bicyclists. The entrance and exit lanes typically have intrinsic visibility problems because of low approach angles and feature high speed differentials between bicyclists and motor vehicles.

Strategies to improve safety focus on increasing sight distances, creating formal crossings, and minimizing crossing distances.



Discussion

While the jug-handle approach is the preferred configuration at exit ramps, provide the option for through bicyclists to perform a vehicular merge and proceed straight through under safe conditions.

Additional References and Guidelines

FHWA. (2009). Manual of Uniform Traffic Control Devices.
Bicycle and Pedestrian Transportation. Lesson 15: Bicycle Lanes

Materials and Maintenance

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

Bikeway Signing

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

- Direction of travel
- Location of destinations
- Travel time/distance to those destinations

These signs will increase users' comfort and accessibility to the bicycle systems.

Signage can serve both wayfinding and safety purposes including:

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

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.

Wayfinding Sign Types

Wayfinding Sign Placement

This section includes:

- Wayfinding Sign Types
- Wayfinding Sign Placement

Bikeway Signing

Wayfinding Sign Types

Description

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

Confirmation Signs

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

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

Turn Signs

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

Include destinations and arrows.

Decisions Signs

Mark the junction of two or more bikeways.

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

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

Discussion

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

Additional References and Guidelines

FHWA. (2009). Manual of Uniform Traffic Control Devices.
NACTO. (2011). 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.

Bikeway Signing

Wayfinding Sign Placement

Guidance

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

Decisions Signs

Near-side of intersections in advance of a junction with another bicycle route.

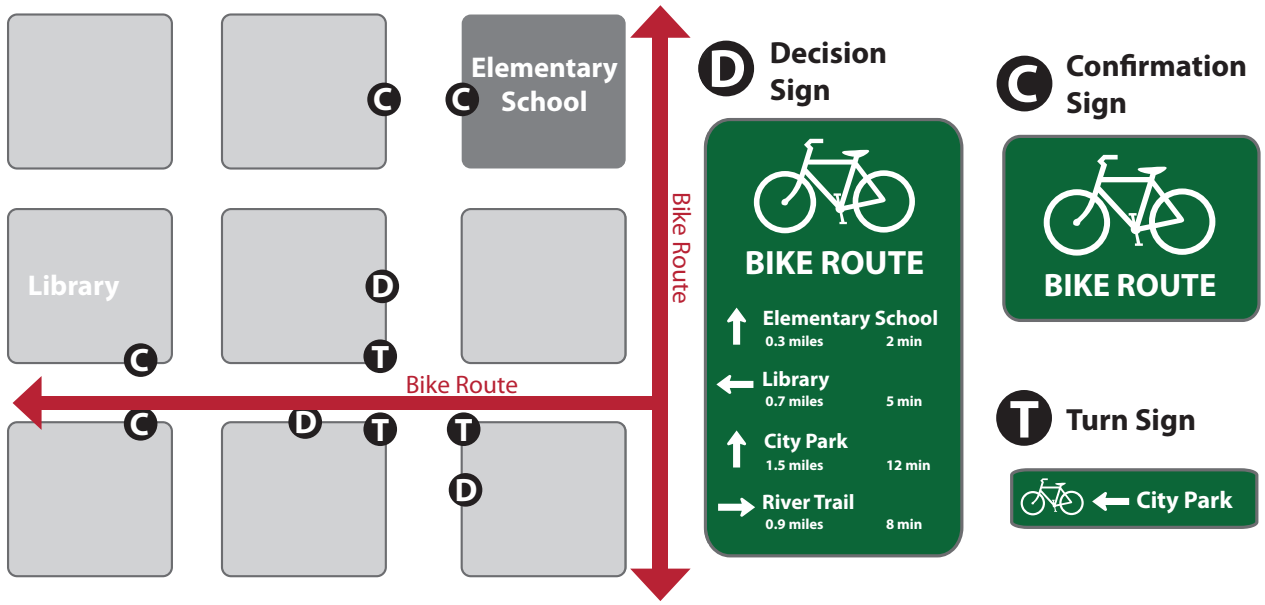
Along a route to indicate a nearby destination.

Confirmation Signs

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

Turn Signs

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



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

FHWA. (2009). Manual of Uniform Traffic Control Devices.
NACTO. (2011). 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

Retrofitting Existing Streets

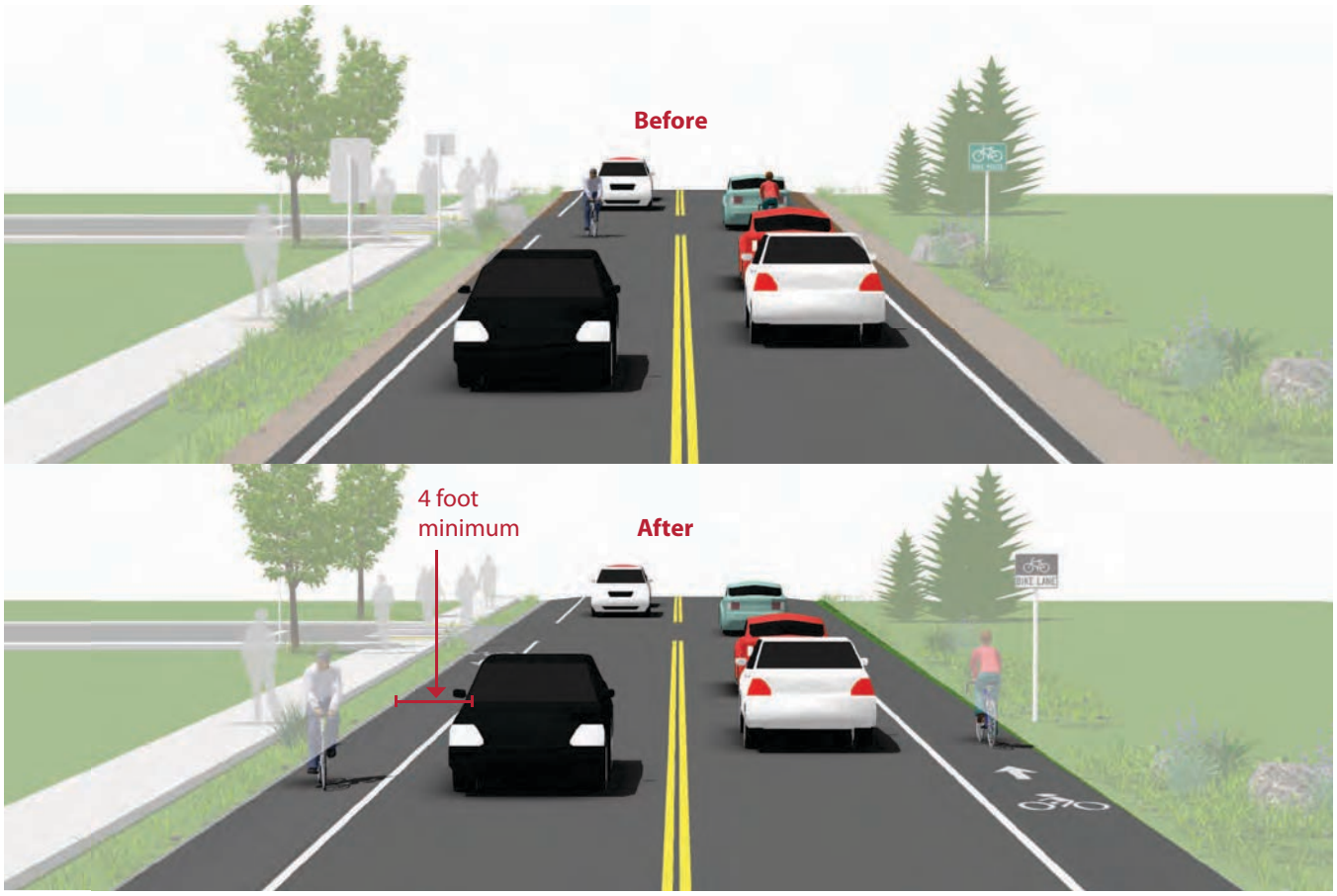
Roadway Widening

Guidance

- Guidance on **bicycle lanes** applies to this treatment.
- 4 foot minimum width when no curb and gutter is present.
- 6 foot width preferred.

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.



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. (1999). 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.

Retrofitting Existing Streets

Lane Narrowing

Guidance

Vehicle lane width:

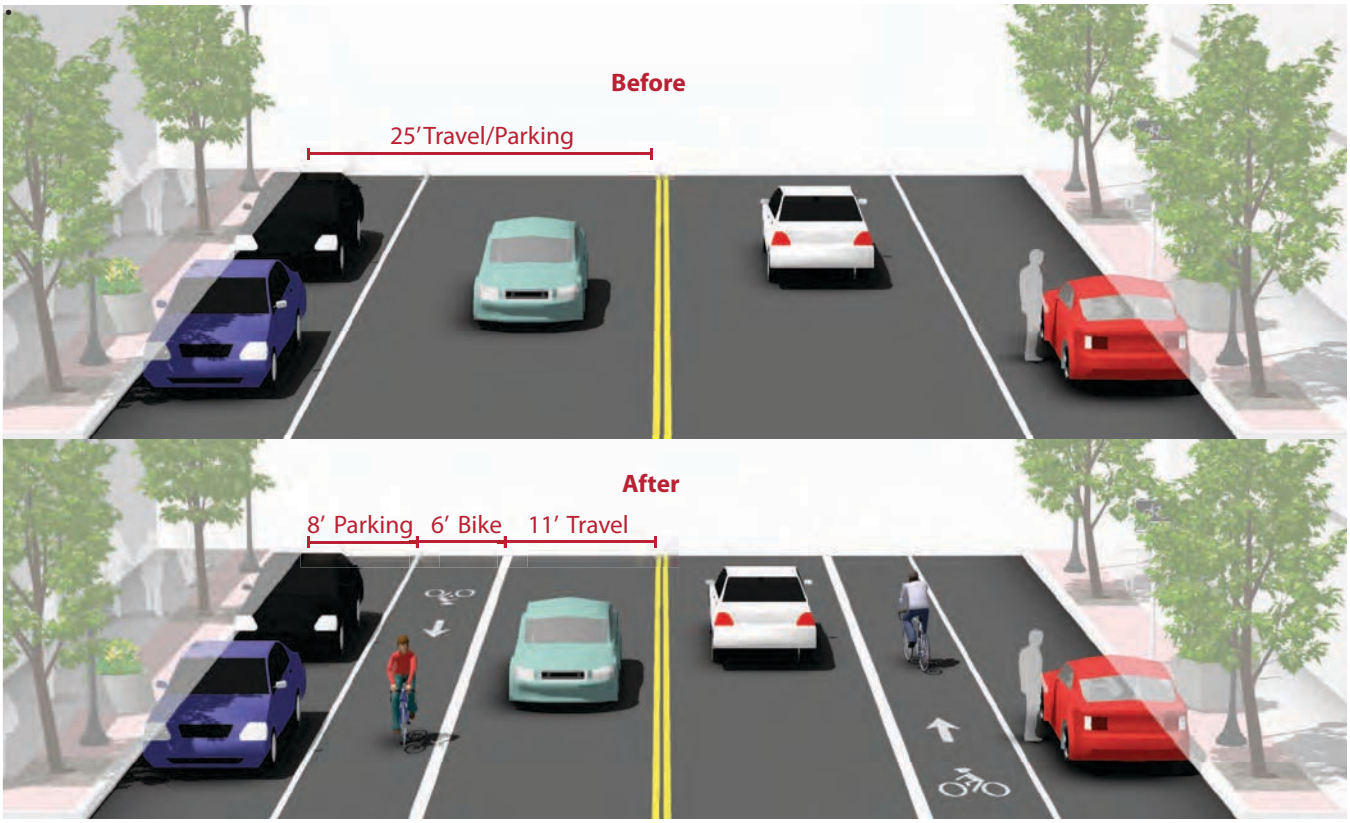
- Before: 10-15 feet
- After: 10-11 feet

Bicycle lane width:

- Guidance on **Bicycle Lanes** applies to this treatment.

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.



Discussion

Roadways designated as being on the National Truck Network or South Carolina Truck Network or roadways where the percentage of trucks, buses, and recreational vehicles is greater than 5 percent of the ADT should have lane widths of 12 feet. Guidance on selecting the proper lane width for a roadway can be found in Chapters 19 through 22 of the SCDOT Highway Design Manual. In Georgia, GDOT requires design variances for lane width reductions below 12' unless a street meets specific criteria, such as low speeds and CBD/Historic District characteristics. 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. (2004). A Policy on Geometric Design of Highways and Streets.
GDOT. (2003). Georgia DOT Bike/Ped Design Policy Memo

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.

Retrofitting Existing Streets

Lane Reconfiguration

Guidance

Vehicle lane width:

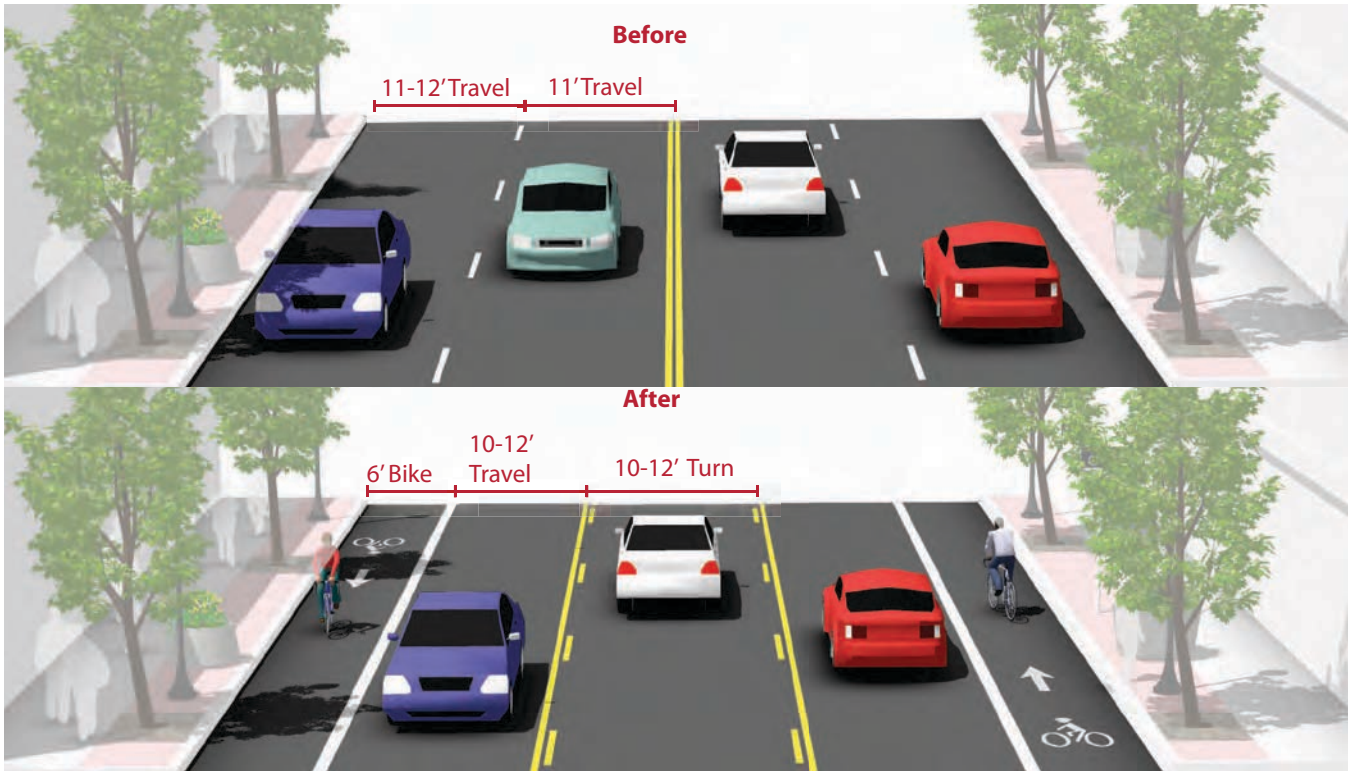
- Width depends on project. No narrowing may be needed if a lane is removed.

Bicycle lane width:

- Guidance on **Bicycle Lanes** applies to this treatment.

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.



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

FHWA. (2010). Evaluation of Lane Reduction "Road Diet" Measures on Crashes. Publication Number: FHWA-HRT-10-053
GDOT. (2003). Georgia DOT Bike/Ped Design Policy Memo

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.

Retrofitting Existing Streets

Parking Reduction

Guidance

Vehicle lane width:

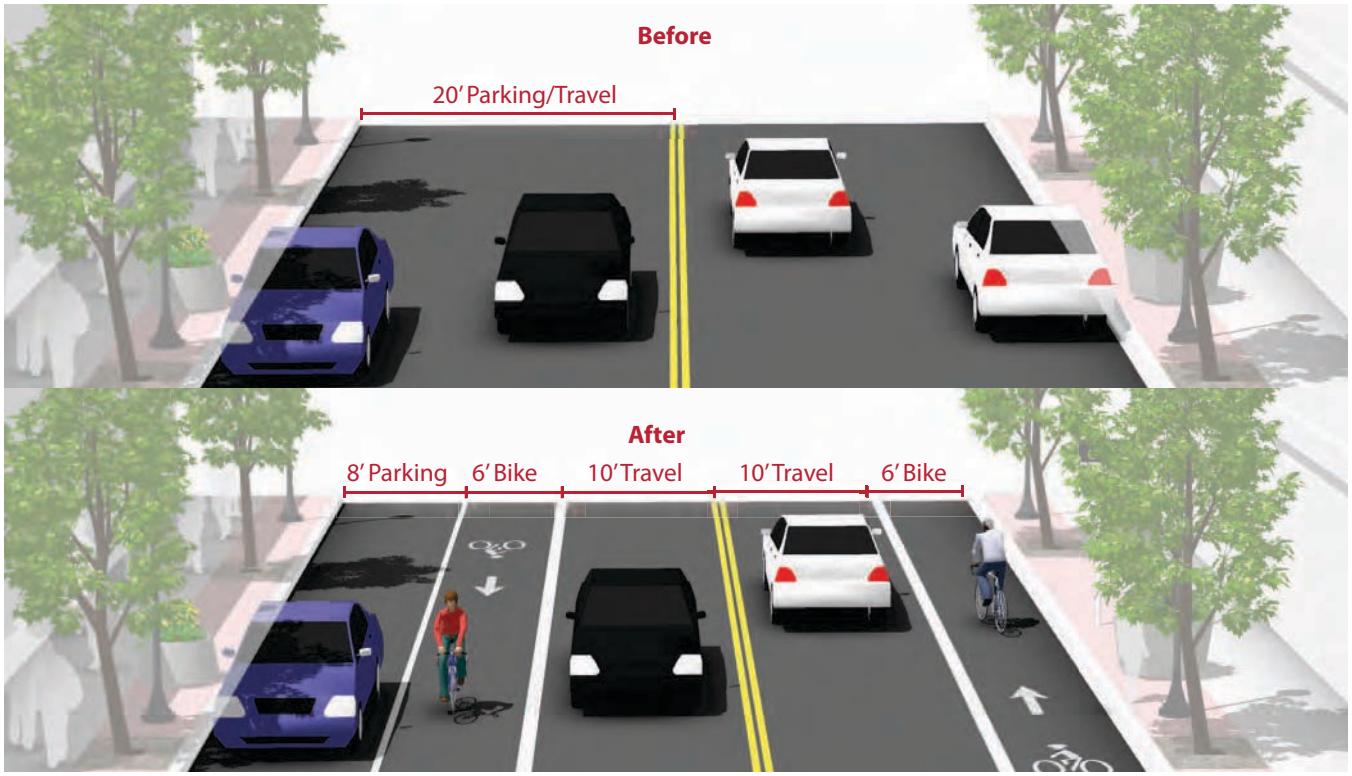
- Parking lane width depends on project. No travel lane narrowing may be required depending on the width of the parking lanes.

Bicycle lane width:

- Guidance on **Bicycle Lanes** applies to this treatment.

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.



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. (2004). A Policy on Geometric Design of Highways and Streets.

There is no currently adopted Federal or State guidance for this treatment.

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

Bicycle Support Facilities

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.

Access to Transit

Safe and easy access to bicycle parking facilities is necessary to encourage commuters to access transit via bicycle. Providing bicycle access to transit and space for bicycles on buses can increase the feasibility of transit in lower-density areas, where transit stops are beyond walking distance of many residences. People are often willing to walk only a quarter- to half-mile to a bus stop, while they might bike as much as two or more miles to reach a transit station.

Roadway Construction and Repair

Safety of all roadway users should be considered during road construction and repair. Wherever bicycles are allowed, measures should be taken to provide for the continuity of a bicyclist's trip through a work zone area.

Only in rare cases should pedestrians and bicyclists be detoured to another street when travel vehicle lanes remain open. Contractors performing work should be made aware of the needs of bicyclists and be properly trained in how to safely route bicyclists through or around work zones.

Bicycle Parking

Bicycle Access to Transit

Access through Construction Areas

This Section Includes:

- Bicycle Parking
  - Bicycle Racks
  - On-Street Bicycle Corral
  - Bicycle Lockers
- Bicycle Access through Construction Areas
- Bicycle Access to Transit

Short Term Bicycle Parking

Bicycle Racks

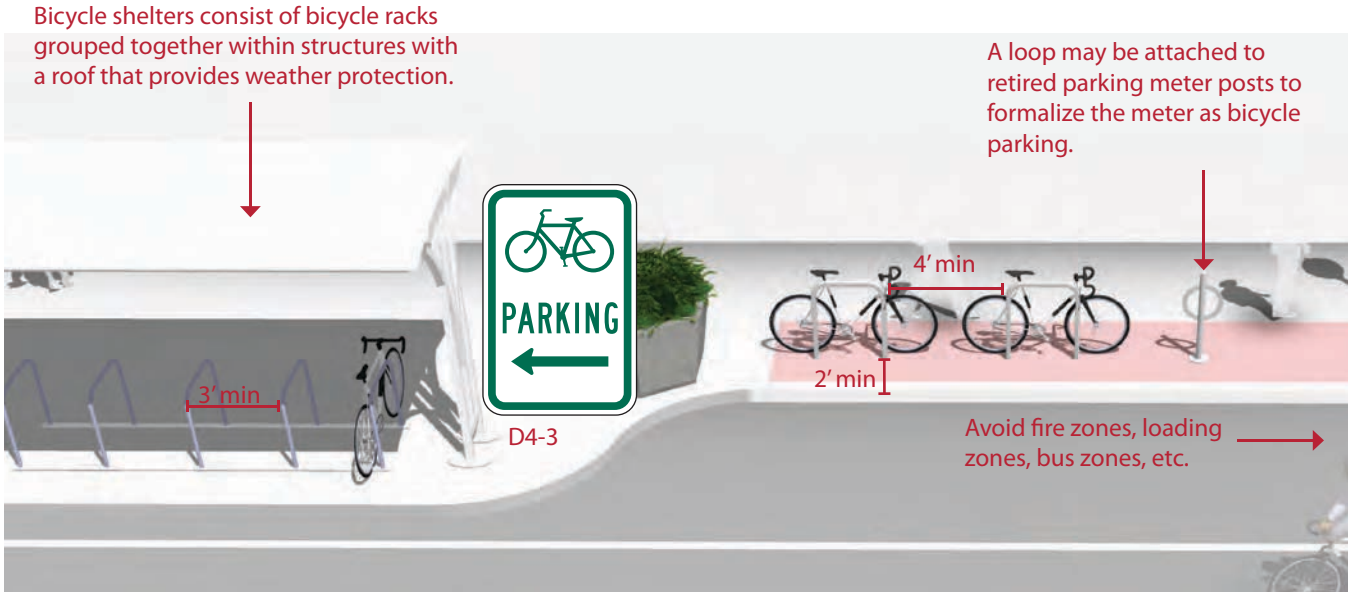
Guidance

- 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.
- Should be highly visible from adjacent bicycle routes and pedestrian traffic.
- Locate racks in areas that cyclists are most likely to travel.

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. The Association for Pedestrian and Bicycle Professionals (APBP) recommends selecting a bicycle track that:

- Supports the bicycle in at least two places, preventing it from falling over.
- Allows 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.



Discussion

Where the placement of racks on sidewalks is not possible (due to narrow sidewalk width, sidewalk obstructions, street trees, etc.), bicycle parking can be provided in the street where on-street vehicle parking is allowed in the form of **on-street bicycle corrals**.

Some types of bicycle racks may meet design criteria, but are discouraged except in limited situations. This includes undulating "wave" racks, schoolyard "wheel bender" racks, and spiral racks.

Additional References and Guidelines

APBP. (2010). Bicycle Parking Guide 2nd Edition.

Materials and Maintenance

Use of proper anchors will prevent vandalism and theft. Racks and anchors should be regularly inspected for damage. Educate snow removal crews to avoid burying racks during winter months.

Short Term Bicycle Parking

On-Street Bicycle Corral

Guidance

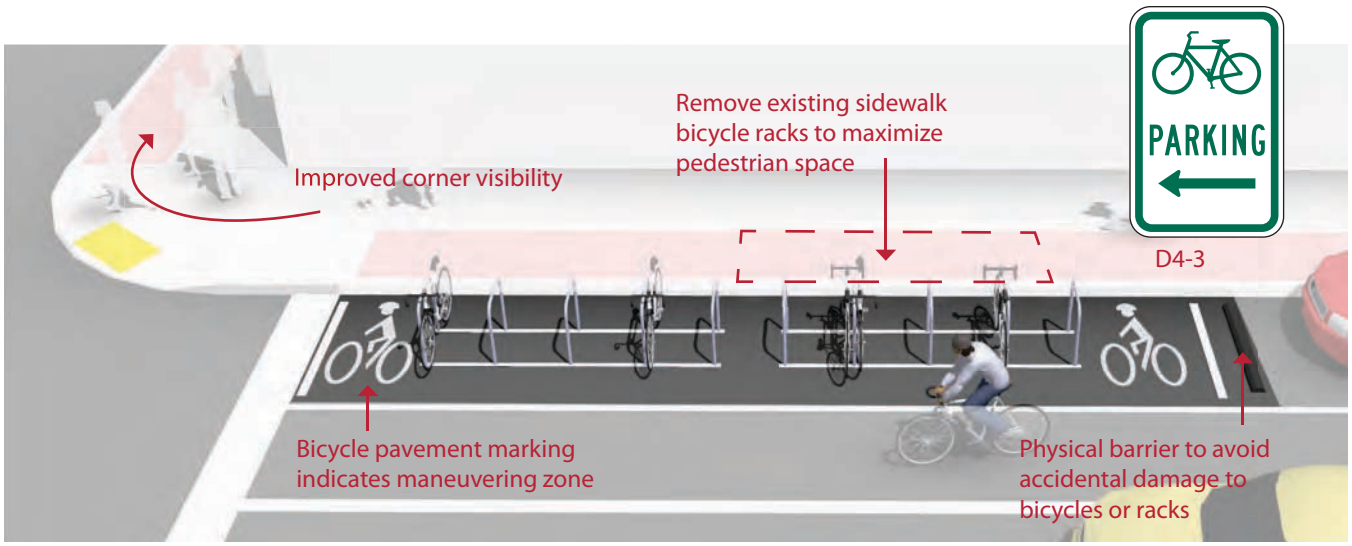
See guidelines for sidewalk **bicycle rack** placement and clear zones.

- Bicyclists should have an entrance width from the roadway of 5′ – 6′.
- Can be used with parallel or angled parking.
- Parking stalls adjacent to curb extensions are good candidates for bicycle corrals since the concrete extension serves as delimitation on one side.

Description

Bicycle corrals (also known as "on-street" bicycle parking) consist of bicycle racks grouped together in a common area within the street traditionally used for automobile parking. Bicycle corrals are reserved exclusively for bicycle parking and provide a relatively inexpensive solution to providing high-volume bicycle parking. Bicycle corrals can be implemented by converting one or two on-street motor vehicle parking spaces into on-street bicycle parking. Each motor vehicle parking space can be replaced with approximately 6-10 bicycle parking spaces.

Bicycle corrals move bicycles off the sidewalks, leaving more space for pedestrians, sidewalk café tables, etc. Because bicycle parking does not block sightlines (as large motor vehicles would do), it may be possible to locate bicycle parking in 'no-parking' zones near intersections and crosswalks.



Discussion

In many communities, the installation of bicycle corrals is driven by requests from adjacent businesses, and is not a city-driven initiative. In such cases, the city does not remove motor vehicle parking unless it is explicitly requested. In other areas, the city provides the facility and business associations take responsibility for the maintenance of the facility. Communities can establish maintenance agreements with the requesting business. Bicycle corrals can be especially effective in areas with high bicycle parking demand or along street frontages with narrow sidewalks where parked bicycles would be detrimental to the pedestrian environment.

Additional References and Guidelines

APBP. (2010). Bicycle Parking Guide 2nd Edition.

Materials and Maintenance

Physical barriers may obstruct drainage and collect debris. Establish a maintenance agreement with neighboring businesses. In snowy climates the bicycle corral may need to be removed during the winter months.

Long Term Bicycle Parking

Bicycle Lockers

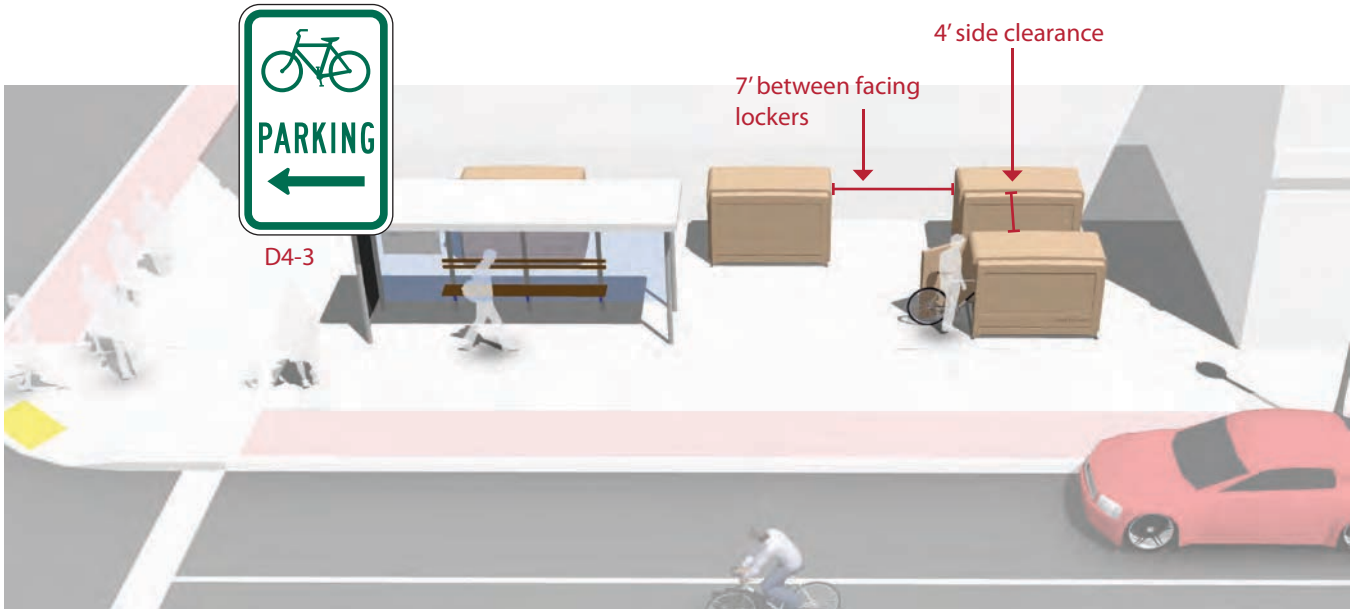
Guidance

- Minimum dimensions: width (opening) 2.5'; height 4'; depth 6'.
- 4 foot side clearance and 6 foot end clearance
- 7 foot minimum distance between facing lockers
- Locker designs that allow visibility and inspection of contents are recommended for increased security.
- Access is controlled by a key or access code.

Description

Bicycle lockers are intended to provide long-term bicycle storage for employees, students, residents, commuters, and others expected to park more than two hours. Long-term facilities protect the entire bicycle, its components and accessories against theft and against inclement weather, including snow and wind-driven rain.

Bicycle lockers provide space to store a few accessories or rain gear in addition to containing the bicycle. Some lockers allow access to two users - a partition separating the two bicycles can help users feel their bike is secure. Lockers can also be stacked, reducing the footprint of the area, although that makes them more difficult to use.



Discussion

Long-term parking facilities are more expensive to provide than short-term facilities, but are also significantly more secure. Although many bicycle commuters would be willing to pay a nominal fee to guarantee the safety of their bicycle, long-term bicycle parking should be free wherever automobile parking is free. Potential locations for long-term bicycle parking include transit stations, large employers, and institutions where people use their bikes for commuting and not consistently throughout the day.

Additional References and Guidelines

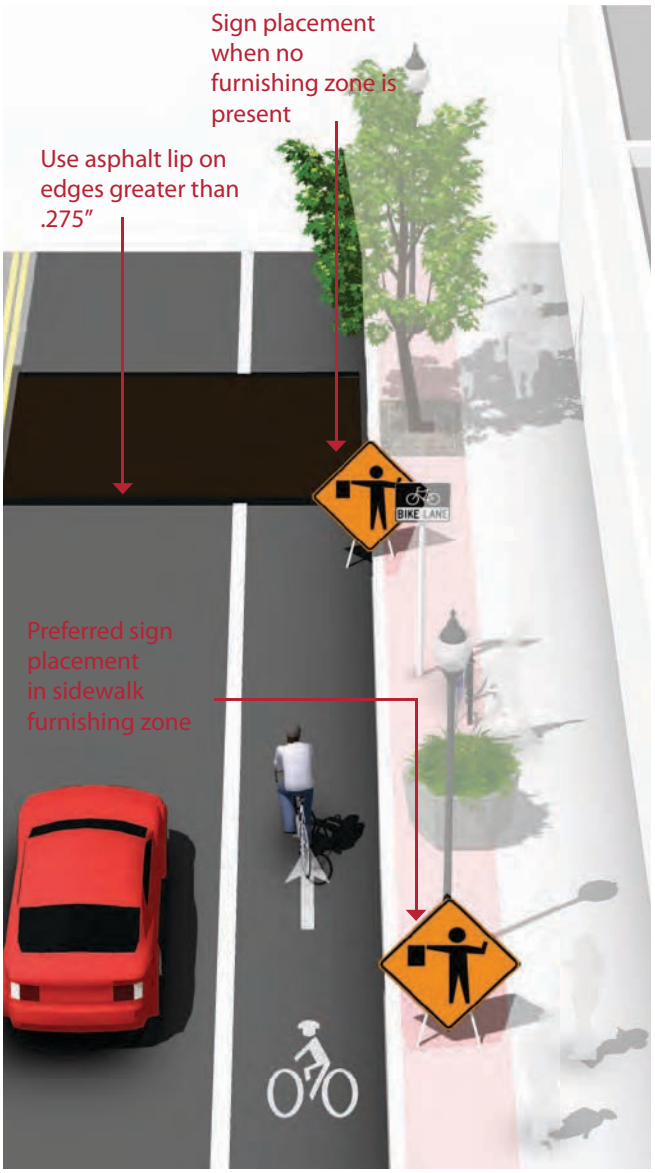
APBP. (2010). Bicycle Parking Guide 2nd Edition.

Materials and Maintenance

Regularly inspect the functioning of moving parts and enclosures. Change keys and access codes periodically to prevent access to unapproved users.

Street Construction and Repair

Bicycle Access Through Construction Areas



Description

Wherever bicycles are allowed, measures should be taken to provide for the continuity of a bicyclist's trip through a work zone area. Bicyclists should not be led into conflicts with work site vehicles, equipment, moving vehicles, open trenches, or temporary construction signage.

Efforts should be made to re-create a bike lane (if one exists) to the left of the construction zone. If this is impossible, then a standard-width travel lane should be considered.

Guidance

Construction Signage

- Place in a location that does not obstruct the path of bicyclists or pedestrians.
- Detour and closure signs related to bicycle travel may be included on all bikeways where construction activities occur. Signage should also be provided on all other roadways.

Bicycle Travel around Steel Grates

- Require temporary asphalt (cold mix) around plates to create a smooth transition.
- Use steel plates only as a temporary measure during construction, not for extended periods.
- Use warning signs where steel plates are in use.
- Require both temporary and final repaving to provide a smooth surface without abrupt edges.

Discussion

Plates used to cover trenches tend to not be flush with pavement and have a 1"-2" vertical transition on the edges. This can puncture a hole in a bicycle tire and cause a bicyclist to lose control. Although it is common to use steel plates during non-construction hours, these plates can be dangerously slippery, particularly when wet.

Contractors performing work should be made aware of the needs of bicyclists and be properly trained in how to safely route bicyclists through or around work zones.

Additional References and Guidelines

FHWA. (2009). Manual of Uniform Traffic Control Devices.
FHWA. (2006). Federal Highway Administration University Course on Bicycle and Pedestrian Transportation. Lesson 21: Bicycle and Pedestrian Accommodation in Work Zones

Materials and Maintenance

Debris should be swept to maintain a reasonably clean riding surface in the outer 5 - 6 ft of roadway.

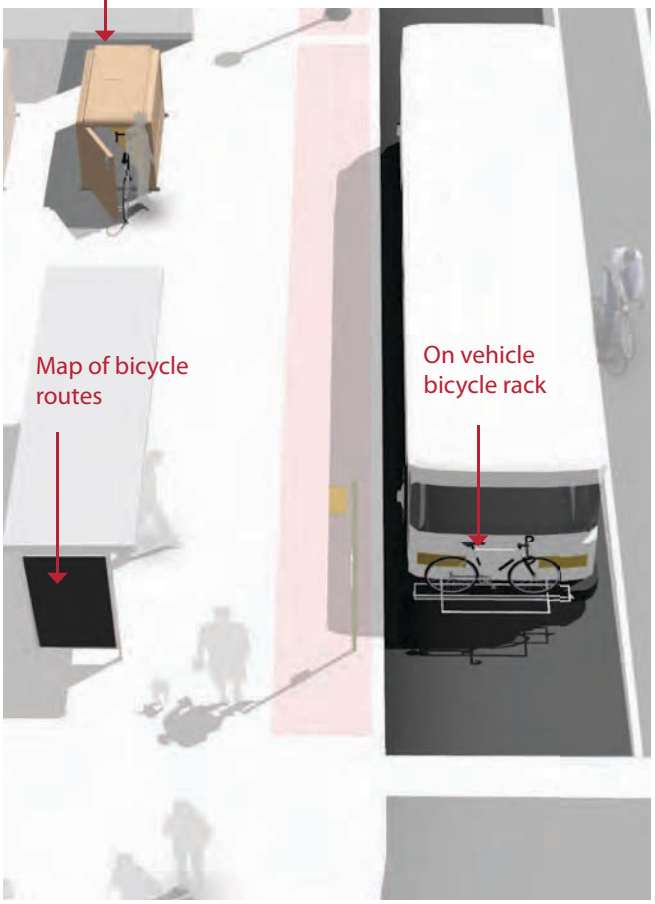
Support Facilities

Bicycle Access to Transit

Description

Safe and easy access transit stations and secure bicycle parking facilities is necessary to encourage commuters to access transit via bicycle. Bicycling to transit reduces the need to provide expensive and space consuming car parking spaces.

Many people who ride to a transit stop will want to bring their bicycle with them on the transit portion of their trip, so buses and other transit vehicles should be equipped accordingly.



Guidance

Access

- Provide direct and convenient access to transit stations and stops from the bicycle and pedestrian networks.
- Provide maps at major stops and stations showing nearby bicycle routes.
- Provide wayfinding signage and pavement markings from the bicycle network to transit stations.
- Ensure that connecting bikeways offer proper **bicycle actuation and detection**.

Bicycle Parking

- The route from bicycle parking locations to station/stop platforms should be well-lit and visible.
- Signing should note the location of bicycle parking, rules for use, and instructions as needed.
- Provide safe and secure long term parking such as **bicycle lockers** at transit hubs. Parking should be easy to use and well maintained.

Discussion

Providing bicycle routes to transit helps combine the long-distance coverage of bus travel with the door-to-door service of bicycle riding. Transit use can overcome large obstacles to bicycling, including distance, hills, riding on busy streets, night riding, inclement weather, and breakdowns. High-visibility crosswalks and mid-block crossings are often appropriate treatments to provide safer bicycle and pedestrian access to bus stops, particularly at high-usage transit stops. If a bus stop is located mid-block, adequate crossing treatments should be provided, based on the level of traffic on the roadway. All transit riders will need to cross the street to access or leave the bus stop.

Additional References and Guidelines

APBP. (2010). Bicycle Parking Guide 2nd Edition.
FHWA. (2006). Federal Highway Administration University Course on Bicycle and Pedestrian Transportation. Lesson 18: Bicycle and Pedestrian Connections to Transit

Materials and Maintenance

Regularly inspect the functioning of long-term parking moving parts and enclosures. Change keys and access codes periodically to prevent access to unapproved users.

Bikeway 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. The following recommendations provide a menu of options to consider to enhance a maintenance regimen.

Recommended Walkway and Bikeway Maintenance Activities

Maintenance Activity	Frequency
Inspections	Seasonal – at beginning and end of Summer
Pavement sweeping/ blowing	As needed, with higher frequency in the early Spring and Fall
Pavement sealing	5 - 15 years
Pothole repair	1 week – 1 month after report
Culvert and drainage grate inspection	Before Winter and after major storms
Pavement markings replacement	As needed
Signage replacement	As needed
Shoulder plant trimming (weeds, trees, brambles)	Twice a year; middle of growing season and early Fall
Tree and shrub plantings, trimming	1 – 3 years
Major damage response (washouts, fallen trees, flooding)	As soon as possible

This Section Includes:

- Sweeping
- Roadway Surface
- Pavement Overlays
- Drainage Grates
- Gutter to Pavement Transition
- Maintenance Management Plan

Bikeway Maintenance

Sweeping

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 .

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.

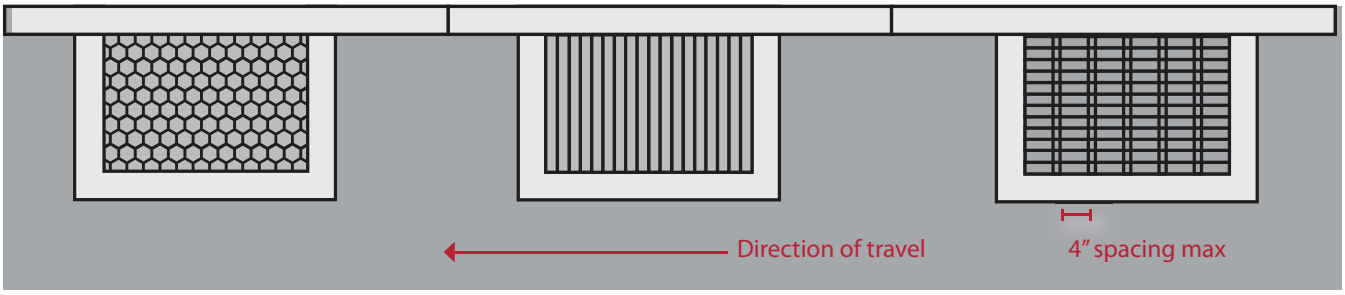
Drainage Grates

Guidance

- Where practical, drainage inlets should be placed outside of the bicycle facility. Where this is not practical, hydraulically efficient, bicycle-safe grates should be utilized and should be placed or adjusted to be flush with the adjacent pavement surface. On bridges, a minimum of 4 feet from the edge of the travel lane should be clear of drainage inlets.
- Create a program to inventory all existing drainage grates, and replace hazardous grates as necessary.

Description

Drainage grates are typically located in the gutter area near the curb of a roadway. Drainage grates typically have slots through which water drains into the municipal storm sewer system. Many older grates were designed with linear parallel bars spread wide enough for a tire to become caught so that if a bicyclist were to ride on them, the front tire could become caught in the slot. This would cause the bicyclist to tumble over the handlebars and sustain potentially serious injuries.



Bikeway Maintenance

Roadway Surface

Guidance

- Maintain a smooth surface on all bikeways that is free of potholes
- Ensure that on new roadway construction, the finished surface on bikeways does not vary more than ¼".
- Maintain pavement so ridge buildup does not occur at the gutter-to-pavement transition or adjacent to railway crossings.
- Inspect the pavement 2 to 4 months after trenching construction activities are completed to ensure that excessive settlement has not occurred.
- If chip sealing is to be performed, use the smallest possible chip on bike lanes and shoulders. Sweep loose chip regularly following application.
- During chip seal maintenance projects, if the pavement condition of the bike lane is satisfactory, it may be appropriate to chip seal the travel lanes only.

Description

Bicycles are much more sensitive to subtle changes in roadway surface than are motor vehicles. Various materials are used to pave roadways, and some are smoother than others. Compaction is also an important issue after trenches and other construction holes are filled. Uneven settlement after trenching can affect the roadway surface nearest the curb where bicycles travel. Sometimes compaction is not achieved to a satisfactory level, and an uneven pavement surface can result due to settling over the course of days or weeks. When resurfacing streets, use the smallest chip size and ensure that the surface is as smooth as possible to improve safety and comfort for bicyclists.

Pavement Overlays

Guidance

- Extend the overlay over the entire roadway surface to avoid leaving an abrupt edge.
- If the shoulder or bike lane pavement is of good quality, it may be appropriate to end the overlay at the shoulder or bike lane stripe provided no abrupt ridge remains.
- Ensure that inlet grates, manhole and valve covers are within ¼ inch of the finished pavement surface and are made or treated with slip resistant materials.
- Pave gravel driveways to property line to prevent gravel from being tracked onto shoulders or bike lanes.

Description

Pavement overlays represent good opportunities to improve conditions for bicyclists if done carefully. A ridge should not be left in the area where bicyclists ride (this occurs where an overlay extends part-way into a shoulder bikeway or bike lane). Overlay projects also offer opportunities to widen a roadway, or to re-stripe a roadway with bike lanes.

Bikeway Maintenance

Gutter to Pavement Transition

Guidance

- Ensure that gutter-to-pavement transitions have no more than a ¼" vertical transition.
- Examine pavement transitions during every roadway project for new construction, maintenance activities, and construction project activities that occur in streets.
- Inspect the pavement 2 to 4 months after trenching construction activities are completed to ensure that excessive settlement has not occurred.
- Provide at least 3 feet of pavement outside of the gutter seam.

Description

On streets with concrete curbs and gutters, 1 to 2 feet of the curbside area is typically devoted to the gutter pan, where water collects and drains into catch basins. On many streets, the bikeway is situated near the transition between the gutter pan and the pavement edge. This transition can be susceptible to erosion, creating potholes and a rough surface for travel.

The pavement on many streets is not flush with the gutter, creating a vertical transition between these segments. This area can buckle over time, creating a hazardous condition for bicyclists.

Maintenance Management Plan

Guidance

- Provide fire and police departments with map of system, along with access points to gates/bollards
- Enforce speed limits and other rules of the road
- Enforce all trespassing laws for people attempting to enter adjacent private properties

Description

Bikeway users need accommodation during construction and maintenance activities when bikeways may be closed or unavailable. Users must be warned of bikeway closures and given adequate detour information to bypass the closed section. Users should be warned through the use of standard signing approaching each affected section (e.g., "Bike Lane Closed," "Trail Closed"), including information on alternate routes and dates of closure. Alternate routes should provide reasonable directness, equivalent traffic characteristics, and be signed.

Greenways and Off-Street Facilities

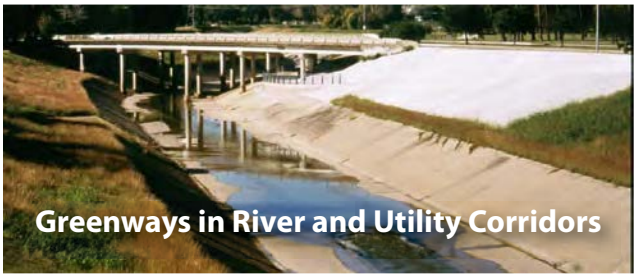
A greenway (also known as a multi-use path) allows for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where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

Key features of greenways include:

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

This Section Includes:

- General Design Practices
- Greenways in River and Utility Corridors
- Greenways in Abandoned Rail Corridors
- Greenways in Existing Active Rail Corridors
- Trailheads
- Local Neighborhood Accessways
- Shared Use Paths Along Roadways



Greenways and Off-Street Facilities

General Design Practices

Description

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

Guidance

Width

- 8 feet is the minimum allowed for a two-way 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.

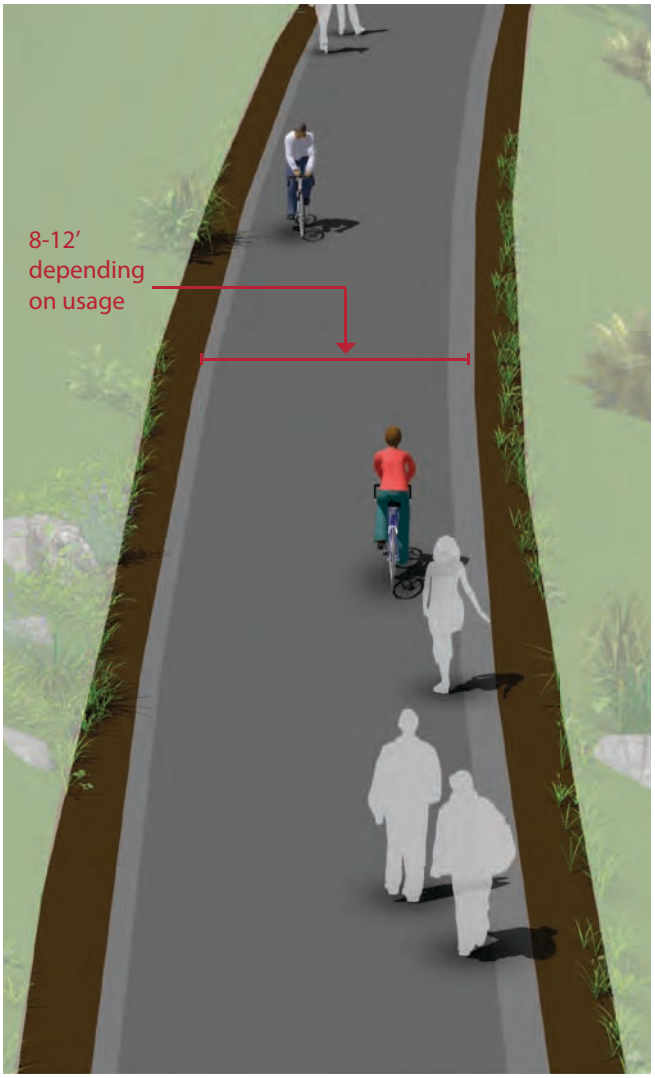
Overhead Clearance

- 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 recommend 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. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of 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.

Greenways and Off-Street Facilities

Greenways in River and Utility Corridors

Guidance

Greenways 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 greenway may be prohibited during the following events:

- Canal/Flood control channel or other utility maintenance activities
- Inclement weather or the prediction of storm conditions

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.

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. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of 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.

Greenways in Abandoned Rail Corridors

Guidance

Greenways in abandoned rail corridors should meet or exceed **general design practices**. If additional width allows, wider paths, and landscaping are desirable.

In full conversions of abandoned rail corridors, the sub-base, superstructure, drainage, bridges, and crossings are already established. Design becomes a matter of working with the existing infrastructure to meet the needs of a rail-trail.

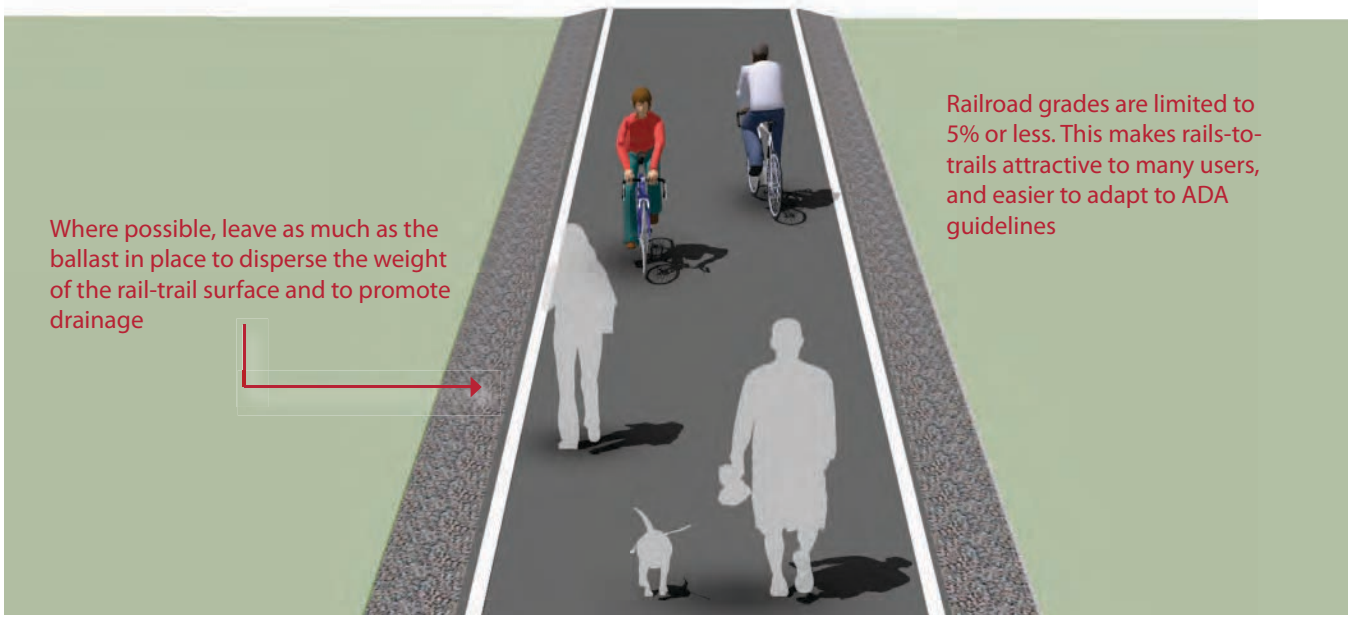
If converting a rail bed adjacent to an active rail line, see **Greenways in Existing Active Rail Corridors**.

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 following generally flat terrain that typically does not exceed 2 percent grade.

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 greenway or linear park until it is again needed for rail use. Municipalities should acquire abandoned rail rights-of-way whenever possible to preserve the opportunity for greenway development.



Discussion

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

Rail-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. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of Uniform Traffic Control Devices.
Flink, C. (1993). Greenways: A Guide To Planning Design And Development.

Materials and Maintenance

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Greenways and Off-Street Facilities

Greenways in Existing Active Rail Corridors

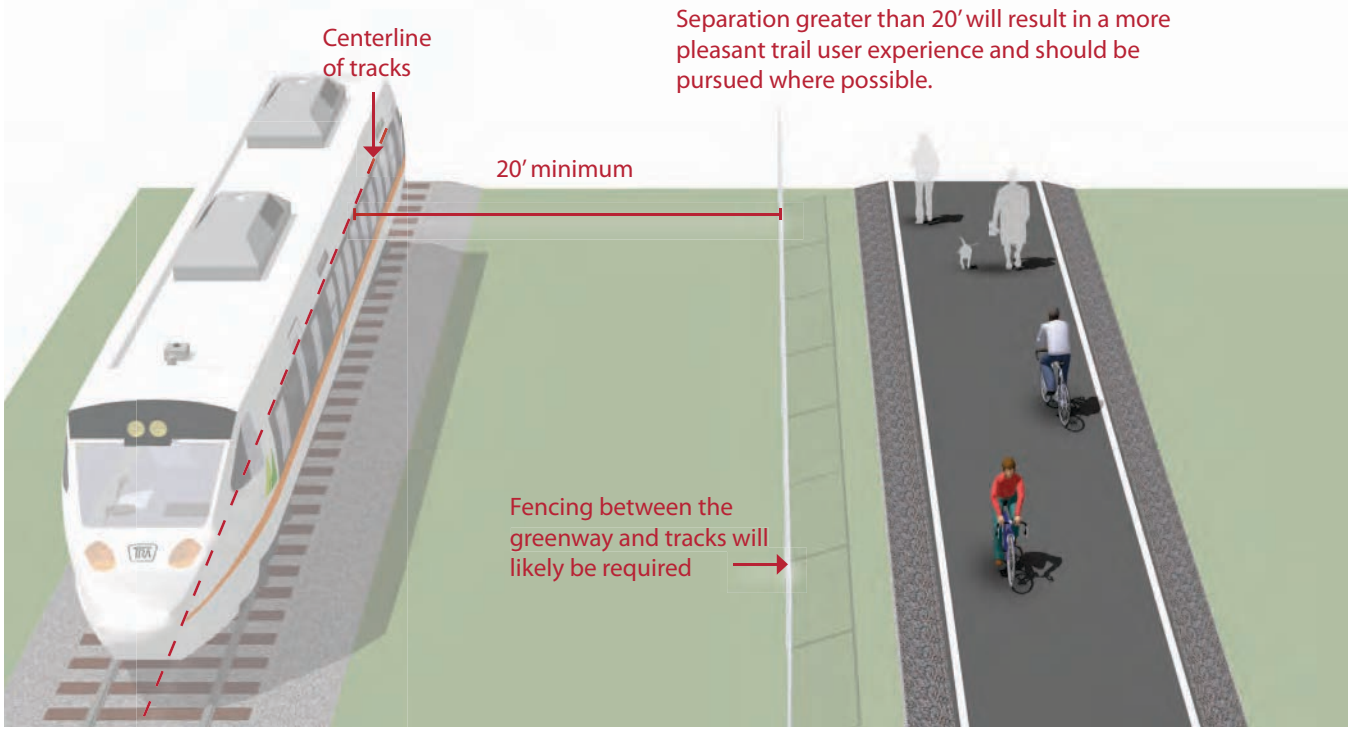
Guidance

Greenways in active rail corridors should meet or exceed **general design practices**. If additional width allows, wider paths, and landscaping are desirable.

If required, fencing should be a minimum of 5 feet in height with higher fencing usual next to sensitive areas such as switching yards. Setbacks from the active rail line will vary depending on the speed and frequency of trains, and available right-of-way.

Description

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



Discussion

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

Additional References and Guidelines

AASHTO. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of Uniform Traffic Control Devices.
FHWA. (2002). Rails-with-Trails: Lessons Learned.

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.

Greenways and Off-Street Facilities

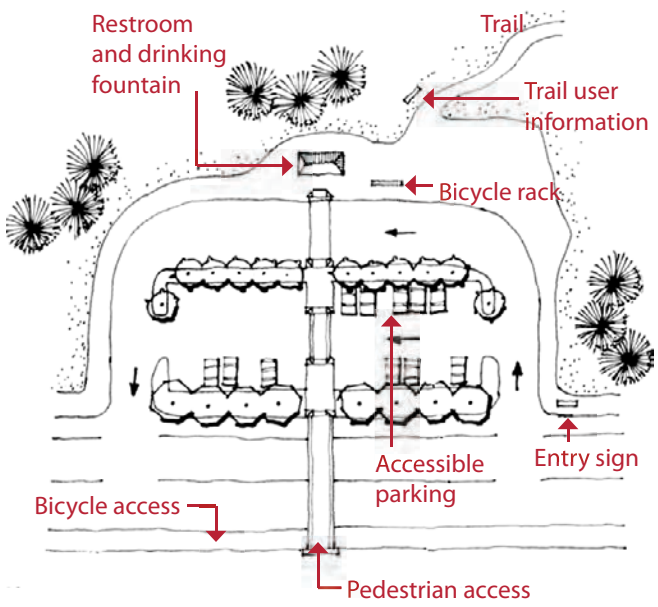
Trailheads

Guidance

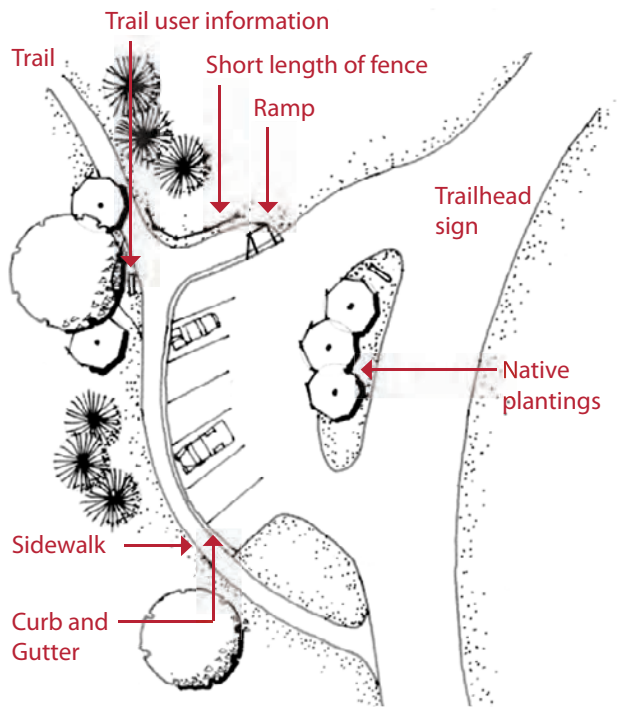
- Major trailheads should include automobile and bicycle parking, trail information (maps, user guidelines, wildlife information, etc.), garbage receptacles and restrooms.
- Minor trailheads can provide a subset of these amenities.

Description

Good access to a path system is a key element for its success. Trailheads serve the local and regional population arriving to the path system by car, transit, bicycle or other modes. Trailheads provide essential access to the shared-use path system and include amenities like parking for vehicles and bicycles, restrooms (at major trailheads), and posted maps.



Major Trailhead



Minor Trailhead

Discussion

Trailheads with a small motor vehicle parking area should additionally include bicycle parking and accessible parking.

Neighborhood access should be achieved from all local streets crossing the path. No parking needs to be provided, and in some situations "No Parking" signs will be desirable to minimize impact on the neighborhood. See **Local Neighborhood Accessways** for neighborhood connection guidance.

Additional References and Guidelines

AASHTO. (1999). Guide for the Development of Bicycle Facilities.

Materials and Maintenance

Trailhead signage and lighting will require regular maintenance. Major trailheads will require regularg servicing.

Greenways and Off-Street Facilities

Local Neighborhood Accessways

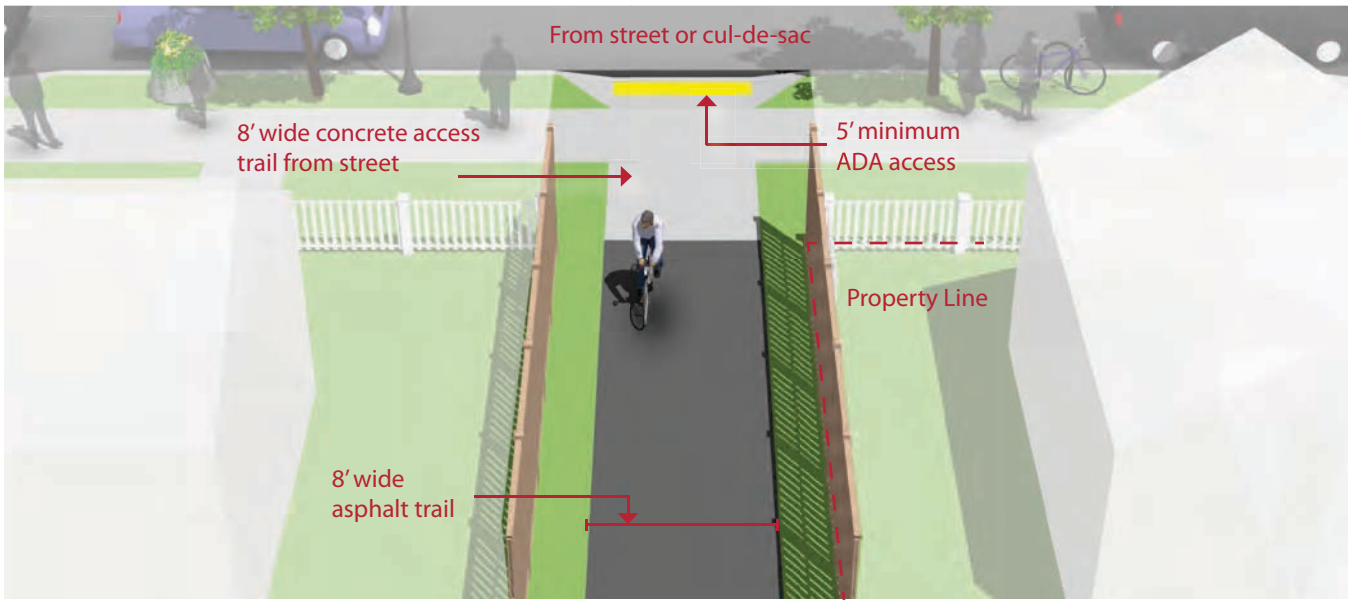
Guidance

- 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.
- Accessways should slightly meander whenever possible.

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 greenway 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.



Discussion

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

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

Additional References and Guidelines

AASHTO. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of 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.

Greenways and Off-Street Facilities

Shared Use Paths Along Roadways

Description

A shared 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.

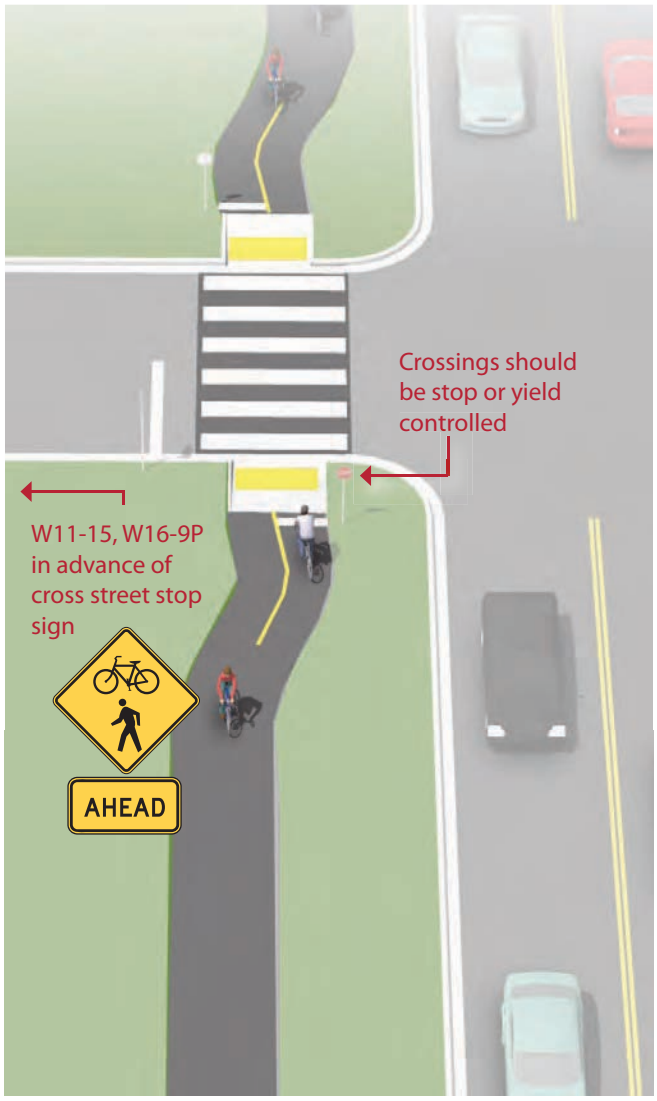
Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the path.

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of shared-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. (1999). Guide for the Development of Bicycle Facilities.
NACTO. (2011). Urban Bikeway Design Guide. See entry on Raised Cycle Tracks.

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.

Greenway/Roadway Crossings

At-grade roadway crossings can create potential conflicts between greenway 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 greenway crossings can be properly designed to provide a reasonable degree of safety and can meet existing traffic and safety standards. Greenways 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 greenway 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 greenway crossings. A median stripe on the path approach will help to organize and warn path users. Crosswalk striping is typically a matter of local and State preference, and may be accompanied by pavement treatments to help warn and slow motorists. In areas where motorists do not typically yield to crosswalk users, additional measures may be required to increase compliance.

This section includes:

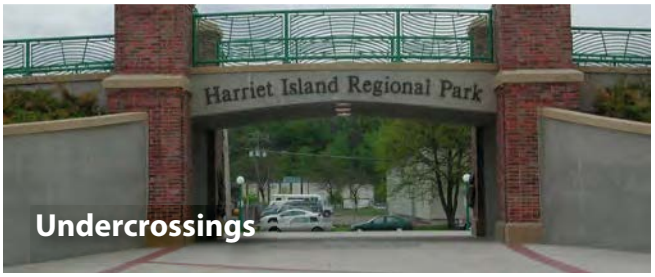
- Marked/Unsignalized Crossings
- Active Warning Beacons
- Route Users to Existing Signalized Intersections
- Signalized/Controlled Crossings
- Undercrossings
- Overcrossings

Marked/Unsignalized Crossings

Active Warning Beacons

Route Users to Existing Signals

Signalized/Controlled Crossings



Undercrossings

Overcrossings

Greenway/Roadway Crossings

Marked/Unsignalized Crossings

Guidance

Maximum traffic volumes

- ≤9,000-12,000 Average Daily Traffic (ADT) volume
- Up to 15,000 ADT on two-lane roads, preferably with a median
- Up to 12,000 ADT on four-lane roads with median

Maximum travel speed

- 35 MPH

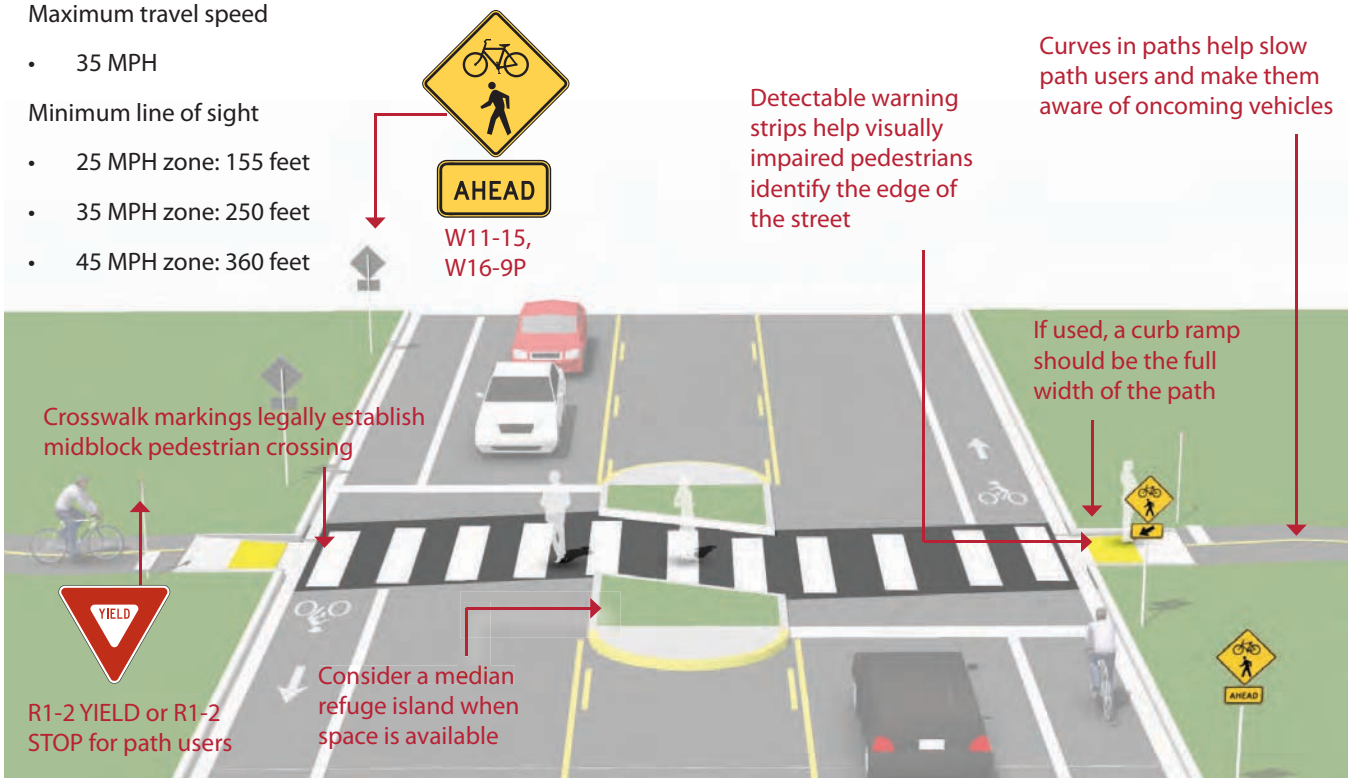
Minimum line of sight

- 25 MPH zone: 155 feet
- 35 MPH zone: 250 feet
- 45 MPH zone: 360 feet

Description

A marked/unsignalized 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.



Discussion

Unsignalized crossings of multi-lane arterials over 15,000 ADT may be possible with features such as sufficient crossing gaps (more than 60 per hour), median refuges, and/or active warning devices like rectangular rapid flash beacons or in-pavement flashers, and excellent sight distance. For more information see the discussion of **active warning beacons**.

On roadways with low to moderate traffic volumes (<12,000 ADT) and a need to control traffic speeds, a raised crosswalk may be the most appropriate crossing design to improve pedestrian visibility and safety.

Additional References and Guidelines

AASHTO. (1999). Guide for the Development of Bicycle Facilities.
FHWA. (2009). Manual of Uniform Traffic Control Devices.

Materials and Maintenance

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

Greenway/Roadway Crossings

Active Warning Beacons

Guidance

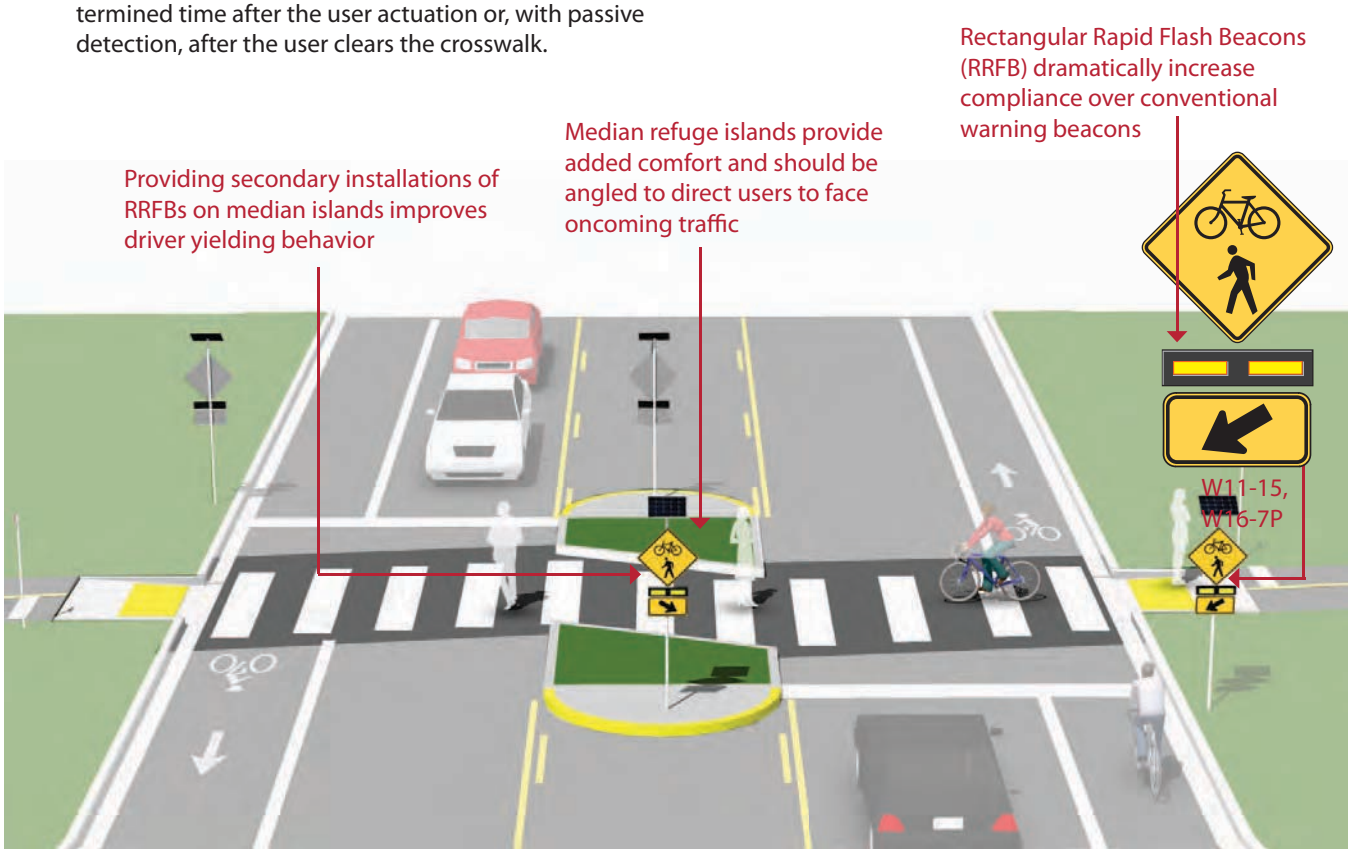
Guidance for **Marked/Unsignalized Crossings** applies.

- 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.

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.



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. (2011). Urban Bikeway Design Guide.
FHWA. (2009). Manual of Uniform Traffic Control Devices.
FHWA. (2008). MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11)

Materials and Maintenance

Locate markings out of wheel tread when possible to minimize wear and maintenance costs. Signing and striping need to be maintained to help users understand any unfamiliar traffic control.

Greenway/Roadway Crossings

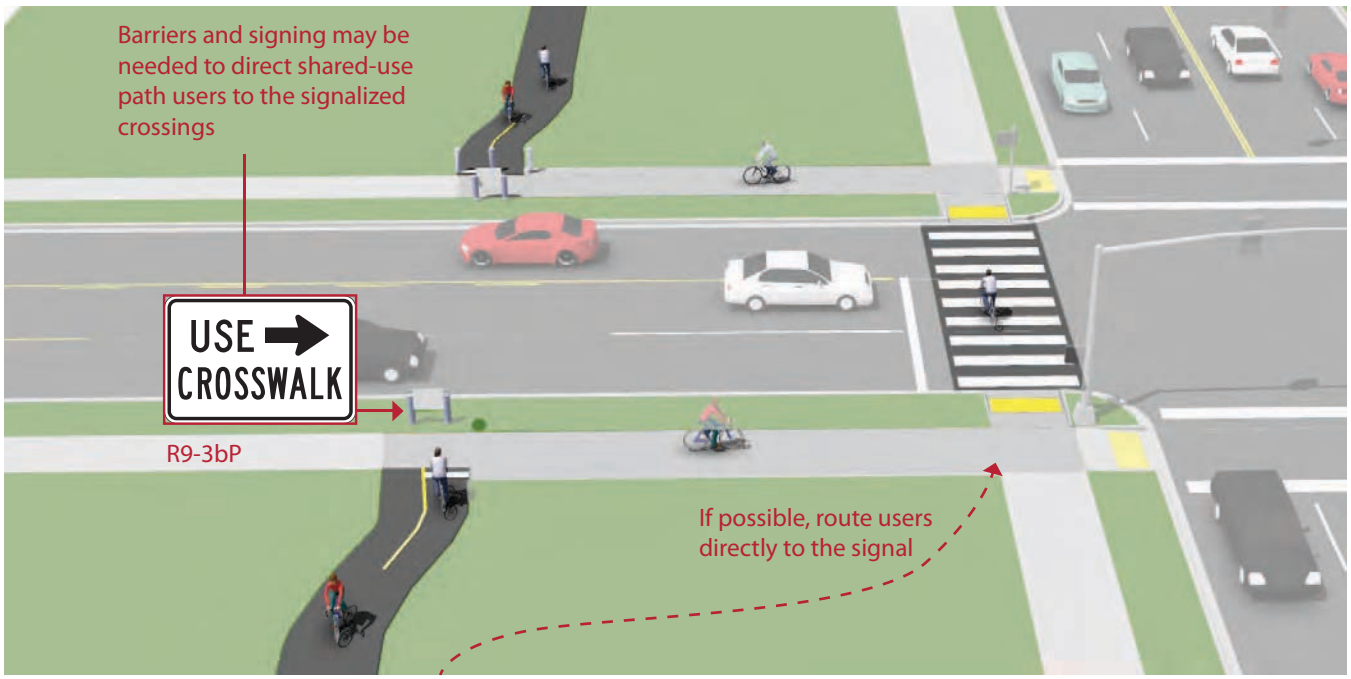
Route Users to Signalized Crossings

Guidance

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

Description

Greenway 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 greenway users to the signalized crossing. If no pedestrian crossing exists at the signal, modifications should be made.



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. (1999). Guide for the Development of Bicycle Facilities.
AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Materials and Maintenance

If a sidewalk is used for crossing access, it should be kept clear of snow and debris and the surface should be level for wheeled users.

Greenway/Roadway Crossings

Signalized/Controlled Crossings

Guidance

Traffic signal installations must meet MUTCD pedestrian, school or modified warrants.

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

Additional guidance for signalized crossings:

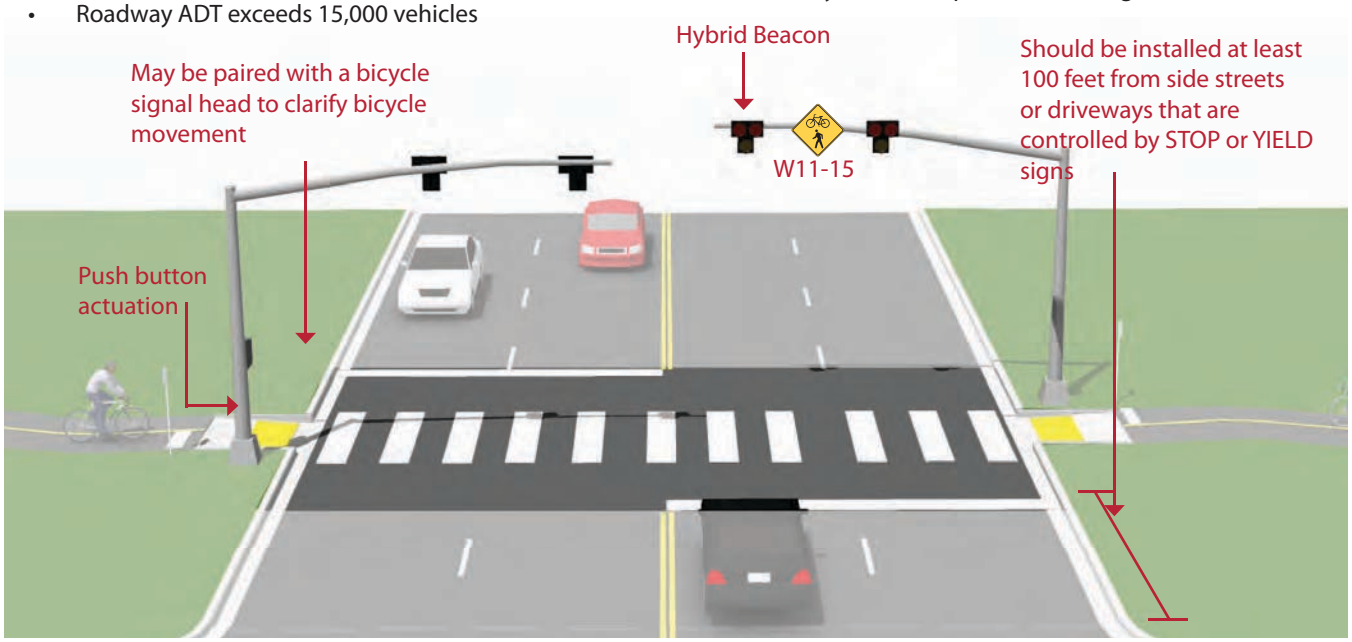
- Located more than 300 feet from an existing signalized intersection
- Roadway travel speeds of 40 MPH and above
- Roadway ADT exceeds 15,000 vehicles

Description

Signalized crossings provide the most protection for crossing greenway users through the use of a red-signal indication to stop conflicting motor vehicle traffic. The two types of path signalization are full traffic signal control and hybrid signals.

A full traffic signal installation treats the greenway crossing as a conventional 4-way intersection and provides standard red-yellow-green traffic signal heads for all legs of the intersection.

Hybrid beacon installation (shown below) faces only cross motor vehicle traffic, stays dark when inactive, and uses a unique 'wig-wag' signal phase to indicate activation. Vehicles have the option to proceed after stopping during the final flashing red phase, which can reduce motor vehicle delay when compared to a full signal installation.



Discussion

Shared-use path signals are normally activated by push buttons but may also be triggered by embedded loop, 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 of Uniform Traffic Control Devices.
NACTO. (2011). Urban Bikeway Design Guide.

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.

Greenway/Roadway Crossings

Undercrossings

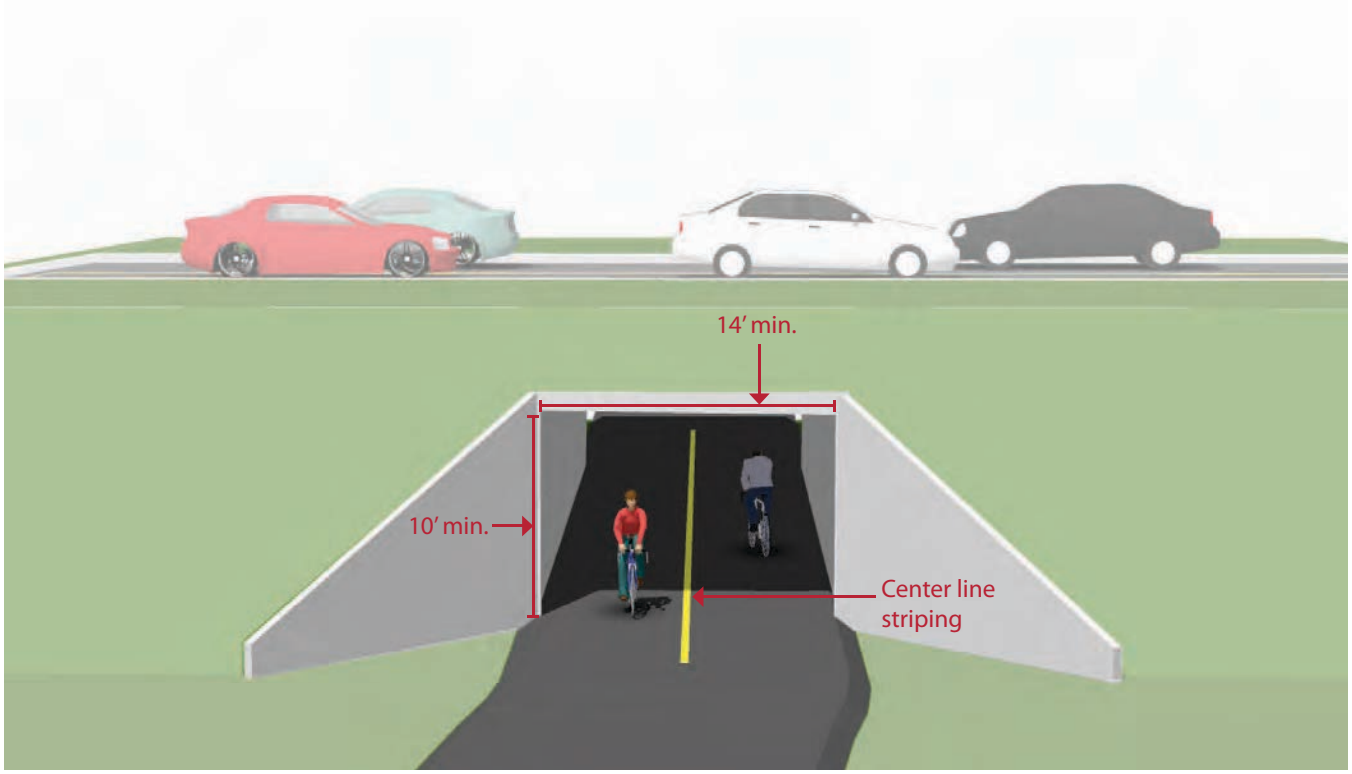
Guidance

- 14 foot minimum width, greater widths preferred for lengths over 60 feet.
- 10 foot minimum height.
- The undercrossing should have a centerline stripe even if the rest of the path does not have one.
- Lighting should be considered during the design process for any undercrossing with high anticipated use or in culverts and tunnels.

Description

Bicycle/pedestrian undercrossings provide critical non-motorized system links by joining areas separated by barriers such as railroads and highway corridors. In most cases, these structures are built in response to user demand for safe crossings where they previously did not exist.

Grade-separated crossings are advisable where existing bicycle/pedestrian crossings do not exist, where ADT exceeds 25,000 vehicles and where 85th percentile speeds exceed 45 miles per hour.



Discussion

Safety is a major concern with undercrossings. Shared-use path users may be temporarily out of sight from public view and may experience poor visibility themselves. To mitigate safety concerns, an undercrossing should be designed to be spacious, well-lit, equipped with emergency cell phones at each end and completely visible for its entire length from end to end.

Additional References and Guidelines

AASHTO. (1999). Guide for the Development of Bicycle Facilities.
AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Materials and Maintenance

14 foot width allows for maintenance vehicle access.

Potential problems include conflicts with utilities, drainage, flood control and vandalism.

Greenway/Roadway Crossings

Overcrossings

Guidance

8 foot minimum width, 14 feet preferred. If overcrossing has any scenic vistas additional width should be provided to allow for stopping. A separate 5 foot pedestrian area may be provided for facilities with high bicycle and pedestrian use.

10 foot headroom on overcrossing; clearance below will vary depending on feature being crossed.

Roadway:	17 feet
Freeway:	18.5 feet
Heavy Rail Line:	23 feet

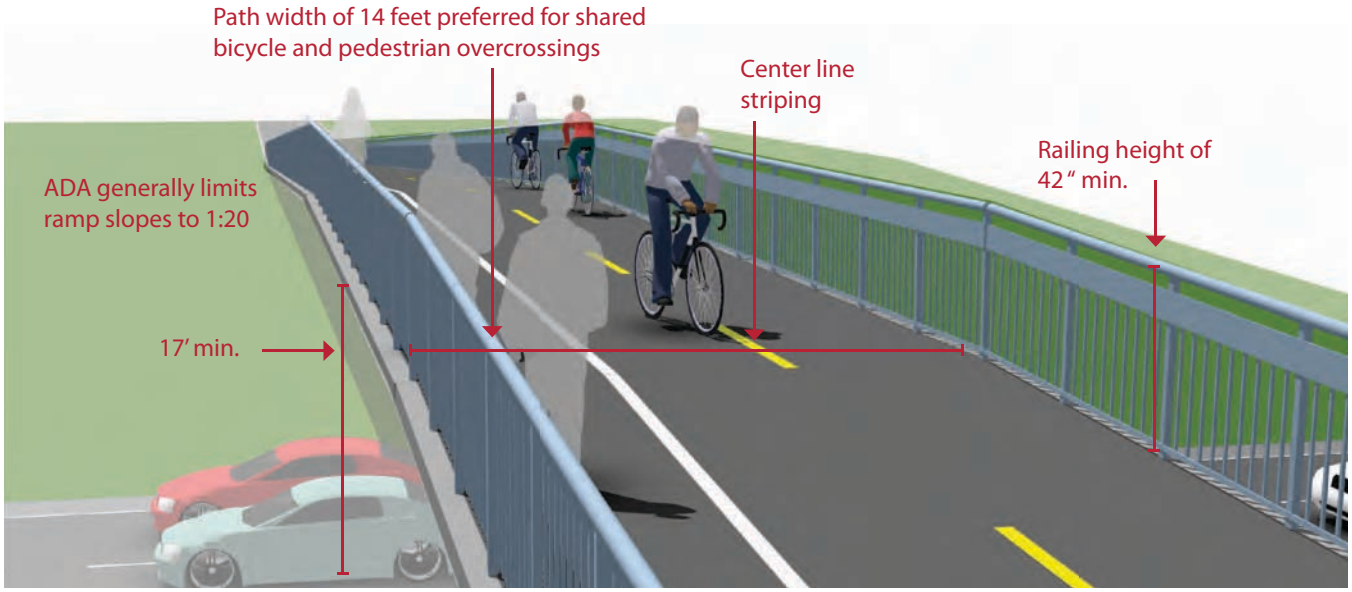
The overcrossing should have a centerline stripe even if the rest of the path does not have one.

Description

Bicycle/pedestrian overcrossings provide critical non-motorized system links by joining areas separated by barriers such as deep canyons, waterways or major transportation corridors. In most cases, these structures are built in response to user demand for safe crossings where they previously did not exist.

Grade-separated crossings may be needed where existing bicycle/pedestrian crossings do not exist, where ADT exceeds 25,000 vehicles, and where 85th percentile speeds exceed 45 miles per hour.

Overcrossings require a minimum of 17 feet of vertical clearance to the roadway below versus a minimum elevation differential of around 12 feet for an undercrossing. This results in potentially greater elevation differences and much longer ramps for bicycles and pedestrians to negotiate.



Discussion

Overcrossings for bicycles and pedestrians typically fall under the Americans with Disabilities Act (ADA), which strictly limits ramp slopes to 5% (1:20) with landings at 400 foot intervals, or 8.33% (1:12) with landings every 30 feet.

Overcrossings pose potential concerns about visual impact and functional appeal, as well as space requirements necessary to meet ADA guidelines for slope.

Additional References and Guidelines

AASHTO. (1999). Guide for the Development of Bicycle Facilities.
AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Materials and Maintenance

Potential issues with vandalism.

Overcrossings can be more difficult to clear of snow than undercrossings.

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Appendix F

Potential Funding Sources

Introduction

Bicycle and pedestrian funding is administered at all levels of government. This chapter begins with explaining the current state of federally-administered funding and the anticipated new transportation bill, which influences State, regional and local funding and is followed by a description of funding sources that may be pursued to implement facilities and programs in this Plan.

Federally-Administered Funding

SAFETEA-LU, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, is the primary federal funding source for bicycle and pedestrian projects. SAFETEA-LU is the fourth iteration of the transportation vision established by the Intermodal Surface Transportation Efficiency Act (1991). Also known as the federal transportation bill, Congress passed the $286.5 billion SAFETEA-LU bill in 2005. SAFETEA-LU expired in 2009, and since that time Congress has approved extending funds through 2012. When the next multi-year federal transportation bill is reauthorized, funding available for bicycle and pedestrian projects is likely to change. Historically, these modes have received larger allocations with each new multi-year transportation bill.[1]

State Departments of Transportation and regional planning agencies administer SAFETEA-LU funding. Most, but not all of these funding programs emphasize transportation modes and purposes that reduce auto trips and provide inter-modal connections. SAFETEA-LU programs require a local match of between zero percent and 20 percent. SAFETEA-LU funds primarily capital improvements and safety and education programs that relate to the surface transportation system.

1 Information related to the federal transportation bill is current at the time of writing.

To be eligible for Federal transportation funds, States are required to develop a State Transportation Improvement Program (STIP) and update it at least every four years. A STIP is a multi-year capital improvement program of transportation projects that coordinates transportation-related capital improvements planned by metropolitan planning organizations and the state. Bicycle and pedestrian projects are eligible for inclusion.

The following programs are administered by the Federal government.

TIGER Discretionary Grants

The TIGER, or Transportation Investment Generating Economic Recovery, grants are administered by the United States Department of Transportation (USDOT). The program offers federal funding for local surface transportation initiatives. The TIGER grants are awarded based on primary and secondary criteria. The primary criteria consist of a) long-term outcomes, such as livability and sustainability, and b) job creation and economic stimulus. Innovation and partnership are also evaluated, but are given less weight than other criteria.

The TIGER IV grant, announced in January 2012, includes about $500 million. Some of those funds are set aside for rural grants, and other funds set aside for TIFIA (Transportation Infrastructure Finance and Innovation ACT) assistance. The pre-application process closed on February 20, 2012. Future funding cycles of the TIGER grant program are currently unknown.

Transportation, Community and System Preservation (TCSP) Program

The Transportation, Community and System Preservation (TCSP) Program provides federal funding for transit oriented development, traffic calming and other projects that improve the efficiency of the transportation system, reduce

the impact on the environment, and provide efficient access to jobs, services and trade centers. The program provides communities with the resources to explore the integration of their transportation system with community preservation and environmental activities. TCSP Program funds require a 20 percent match. SAFETEA-LU authorized an extension of TCSP Program funds through FY 2012.

Online resource: http://www.fhwa.dot.gov/tcsp/

Rivers, Trails and Conservation Assistance Program

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

Online resource: http://www.nps.gov/ncrc/programs/rtca/contactus/cu_apply.html

Community Challenge Planning Grants

The program provides grants (~$30M) to enable communities to foster reform and reduce barriers to achieving affordable, economically vital, and sustainable communities. Such efforts may include amending or replacing local master plans, zoning codes, and building codes, with the goal of promoting sustainability at the local or neighborhood level. This Program's funds can be used for regulations to support community-wide complete streets. The program is administered by the United States Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD).

Further Information: http://www.hud.gov/sustainability

Sustainable Communities Regional Planning Grant

The Regional Planning Grant program is sponsored by the United States Department of Transportation (USDOT), Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) and encourages grantees to support regional planning efforts that integrate housing, land-use, economic and workforce development, transportation, and infrastructure developments in a manner that empowers regions to consider how all of these factors work together to bring economic competitiveness and revitalization to a community. The program places a priority on partnerships, including the collaboration of arts and culture, philanthropy, and innovative ideas to the regional planning process.

Funds can be used to support the preparation of Regional Plans for sustainable development, to support efforts to modify existing regional plans so that they are in accordance with the Partnership for Sustainable Communities' six Livability Principles, and to prepare more detailed execution plans for an adopted regional plan for sustainable development. The program funded projects in 2010 and 2011. Available funding for 2012 is currently uncertain.

Further Information: http://www.hud.gov/sustainability

New Freedom Program

The New Freedom formula grant program is a USDOT program that aims to provide additional tools to overcome existing barriers facing Americans with disabilities seeking integration into the work force and full participation in society. Lack of adequate transportation is a primary barrier to work for individuals with disabilities. The 2000 Census showed that only 60 percent of people between the ages of 16 and 64 with disabilities are employed. The New Freedom formula grant program seeks to reduce barriers to transportation services and expand the transportation mobility options available to people with disabilities beyond the requirements of the Americans with Disabilities Act (ADA) of 1990.

Funds may be used for capital and operating expenses for new public transportation services and new public transportation alternatives beyond those required by the American with

Disabilities Act of 1990 (ADA), that are designed to assist individuals with disabilities.

Additional Information: http://www.fta.dot.gov/funding/grants/grants_financing_3549.html

Clean Water Act Grants

The Clean Water Act Grants program is a United States Environmental Protection Agency (USEPA) program. Under Section 319, states, territories and tribes receive grant money that supports a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects and monitoring to assess the success of specific nonpoint source implementation projects. Green infrastructure aspects of complete streets are eligible for grant funding.

Additional Information: http://www.epa.gov/owow_keep/NPS/cwact.html

State and Regional-Administered Funding

The States of South Carolina and Georgia use both federal sources and their own budget to fund the following bicycle and pedestrian projects and programs.

Safe Routes to School (SRTS)

The purpose of the Safe Routes to Schools program is to provide children a safe, healthy alternative to riding the bus or being driven to school. The SRTS Grants were established in 2005, as part of the SAFETEA-LU bill, to address pedestrian and bicycle mobility and safety near schools. In South Carolina, SCDOT is responsible for administration of SRTS funding. Agencies providing a funding match will be given preference. In Georgia, GDOT administers funding for SRTS infrastructural projects while Georgia SRTS manages funding for non-infrastructural programs. Application for these funds is open to any public agency in both States.

Eligible projects may include two elements:

- Engineering Improvements. These physical improvements are designed to reduce potential bicycle and pedestrian conflicts with motor vehicles. Physical improvements may also reduce motor vehicle traffic volumes around schools, establish safer and more accessible crossings, or construct walkways, trails or bikeways. Eligible improvements include sidewalk improvements, traffic calming/speed reduction, pedestrian and bicycle crossing improvements, on-street bicycle facilities, off-street bicycle and pedestrian facilities, and secure bicycle parking facilities.
- Enforcement Efforts. These programs aim to ensure that traffic laws near schools are obeyed. Law enforcement activities apply to cyclists, pedestrians and motor vehicles alike. Projects may include development of a crossing guard program, enforcement equipment, photo enforcement, and pedestrian sting operations.

In South Carolina, SRTS also provides funding for education and encouragement efforts. These programs are designed to teach children safe bicycling and walking skills while educating them about the health benefits, and environmental impacts. Projects and programs may include creation, distribution and implementation of educational materials; safety based field trips; interactive bicycle/pedestrian safety video games; and promotional events and activities (e.g., assemblies, bicycle rodeos, walking school buses).

The Federal Safe Routes to School Program has been extended through FY 2011, and may be included in the future federal transportation bill. The timeframe for the next SRTS funding cycle has not been established as SRTS is pending federal reauthorization.

Online resource: http://scsaferoutes.org/index.php and http://www.saferoutesga.org/

Recreational Trails Program

The Recreational Trails Program (RTP) of SAFETEA-LU allocates funds to states to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. Examples of trail uses include hiking, bicycling, in-line skating, equestrian use, and other non-motorized and motorized uses. The RTP funds are administered in South Carolina by the South Carolina Department of Parks, Recreation, and Tourism and in Georgia by the Georgia Department of Natural Resources. In FY2011,

South Carolina received an apportionment of $1.32 million and Georgia received $1.82 million[2]. A minimum 20 percent local match (in-kind is eligible) is required and grants are awarded annually. State and local agencies are permitted to apply for funds. RTP projects must be ADA-compliant and may be used for:

- Maintenance and restoration of existing trails
- Purchase and lease of trail construction and maintenance equipment
- Construction of new trails, including unpaved trails
- Acquisition of easements or property for trails
- State-administrative costs related to this program (limited to seven percent of a State's funds)
- Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a State's funds).

In South Carolina, applicants must submit a Letter of Intent in order to be eligible to apply for a grant. The LOI is due in December, applications are due in March and grants are awarded in July of each year. The minimum grant amount is $10,000 with a maximum amount of $100,000.

In Georgia the application and all supporting materials must be postmarked by November 30. The minimum grant amount is $25,000 with a maximum amount of $100,000.

Applicants can be municipal, state, or federal government, or for- or non-profit organizations. Both Georgia and South Carolina Recreational Trails Program grants must be used for construction (no more than 5% for planning or engineering in South Carolina and 10% in Georgia).

Online resource: http://www.scprt.com/our-partners/grants/trails.aspx, http://www.gastateparks.org/item/18195#pogo

2 A full list of state-by-state apportionments can be found through the FHWA website: http://www.fhwa.dot.gov/environment/recreational_trails/funding/apportionments_obligations/recfunds_2011.cfm

Highway Safety Improvement Program

The Highway Safety Improvement Program funds are allocated to States as part of SAFETEA-LU. The goal of HSIP funds is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. This program includes the Railway-Highway Crossings Program and the High Risk Rural Roads Program. As required under the Highway Safety Improvement Program (HSIP), both the South Carolina and Georgia Departments of Transportation have developed and are in the process of implementing a Strategic Highway Safety Plan (SHSP). A portion of the HSIP funds allocated to each state is set aside for construction and operational improvements on high-risk rural roads. If the state has a Strategic Highway Safety Plan, the remainder of the funds may be allocated to other programs, including projects on bicycle and pedestrian pathways or trails and education and enforcement. A local match of 10% is required.[3]

South Carolina has steadily improved its ratio of obligated HSIP funds to apportioned HSIP funds. In 2006, the state obligated 11.2% of apportioned funds and in 2010, the state obligated 77.2% of funds.[4]

In as described in the Georgia SHSP, State-wide, bicycle-related research efforts, educational campaigns, and facility improvement projects are to be carried out by *Georgia Bikes!*. *Georgia Bikes!* Is the leading, non-profit organization in the State dedicated to improving bicycling conditions and promoting ridership. Funding for SHSP pedestrian and bicycle projects is provided through SHSP section 406 funds. Revenues from the sale of *Share the Road* license plates provide additional funding for SHSP bicycle programs as well.[5]

Federal HSIP online resource: http://www.fhwa.dot.gov/safetealu/factsheets/hsip.htm

Land and Water Conservation Fund

The Land and Water Conservation Fund (LWCF) is a federally funded program, run through the

3 Additional online resources can be found at: http://www.bikeleague.org/resources/reports/

4 Source: http://safety.fhwa.dot.gov/hsip/gen_info/slorhsip/

5 http://www.gahighwaysafety.org/shsp/shsp2011.pdf

National Park Service that provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. In South Carolina, the fund is administered by the South Carolina Department of Parks, Recreation and Tourism (SC PRT). In Georgia, the fund is administered by the Georgia Department of Natural Resources. The fund has been reauthorized until 2015.

Cities, counties, and districts authorized to acquire, develop, operate, and maintain park and recreation facilities are eligible to apply. Applicants must fund the entire project, and will be reimbursed for 50 percent of costs. In South Carolina the minimum amount of project reimbursement is $100,000 and the maximum is $250,000. However, if the project is determined as having regional or statewide significance, up to $500,000 may be awarded. In Georgia, the minimum amount awarded for reimbursement is $25,000 and the maximum is $100,000. Property acquired or developed under the program must be retained in perpetuity for public recreational use.

In 2011, SC PRT announced that the grant cycle will operate on a bi-annual basis rather than an annual basis. The next funding cycle is expected to begin in the spring of 2012. The LWCF grant cycle in Georgia operates on an annual basis with applications for funding due in February.

National Park Service website: http://www.nps.gov/lwcf/

SC PRT online resource: http://www.scprt.com/our-partners/grants/lwcf.aspx

Georgia DNR online resource: http://www.gastateparks.org/item/18194

Community Development Block Grants

The CDBG program funds projects and programs that develop viable urban communities by providing decent housing and a suitable living environment and by expanding economic opportunities, principally for persons of low and moderate income. Federal Community Development Block Grant Grantees may use CDBG funds for activities that include (but are not limited to) acquiring real property; building public facilities and improvements, such as streets, sidewalks, and recreational facilities; and planning and administrative expenses, such as costs related to developing a consolidated plan and managing CDBG funds. The state makes funds available to eligible agencies (cities and counties) through a variety of different grant types. Grantees enter into a contract with the state. Eligible agencies are determined based on a formula, and are listed on the HUD website.

Online resource: http://www.hud.gov/offices/cpd/communitydevelopment/programs/index.cfm

Eligible CDBG Agencies by State: http://portal.hud.gov/hudportal/HUD?src=/states

Georgia and South Carolina Department of Transportation

ARTS municipalities and their respective State departments of transportation can benefit from a close working relationship. Through open communication and collaboration, these agencies can more efficiently identify and implement bicycle and pedestrian improvements as part of major projects. Both The South Carolina Department of Transportation and Georgia Department of Transportation carry out a number of road resurfacing projects annually that target maintenance issues. There may be opportunities for road re-stripping as part of pedestrian and bicycle improvement projects to be completed in conjunction with regular roadway maintenance. This will require coordination between the municipality, the SCDOT or GDOT District Traffic Engineer, and the local maintenance office to ensure that the pavement marking design is safe for cyclists or drivers. It is recommended that the organizations continue to liaise with one another on an ongoing basis to identify opportunities for implementation of the ARTS Bicycle and Pedestrian Master Plan.

SCDOT Guideshare Program

Since the mid-1990's the SCDOT Guideshare program has been responsible for the allocation of urban and rural federal-aid funds for MPO's and COG's in the State of South Carolina. Transportation Management Areas (TMA's), MPO's with urbanized area populations greater than 200,000, are entitled to federal Urban Attributable Funds. The ARTS MPO qualifies as a TMA and projects within the South

Carolina portion of the MPO (Aiken County) qualify for guideshare money through SCDOT.[6] The distribution of funds to State TMA's depends on what proportion of the State's population and vehicle miles of travel (VMT) the individual TMA comprises. In FY 2012 Aiken County expects to receive $8 million for roadway improvement projects within the county.[7]

Guideshare funds are primarily intended for street and highway improvements, but also may fund intersection upgrades, sidewalks and bike lanes, and safety improvements.[8]

Statewide Transportation Improvement Program

The Statewide Transportation Improvement Program (STIP) is SCDOT's short-term capital improvement program, providing project funding and scheduling information for the department and South Carolina's metropolitan planning organizations. The program provides guidance for the next six years and is updated every three years. The South Carolina Department of Transportation Commission, as well as the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) approve the STIP.

In developing this funding program, SCDOT must verify that the identified projects comply with existing transportation and comprehensive plans and SAFETEA-LU planning requirements. The STIP must fulfill federal planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on Federal planning requirements and the specific State plans. [9]

In Georgia, the STIP covers all areas of the State with the exception of those areas within Metropolitan Planning Organizations (MPO). All MPO's, including the ARTS MPO, have MPO specific Transportation Improvement Programs (TIP).

6 Source SCDOT: http://www.scdot.org/inside/planning_faq.shtml
7 ARTS TIP: http://appweb.augustaga.gov/Transporation/docs/FINALFY11-14TIP.pdf
8 Source GPATS LRTP: http://www.greenvillecounty.org/gcpc/transportation_planning/gpats/
9 Additional information is available at: http://www.scdot.org/inside/stip.shtml

ARTS Transportation Improvement Program

"The ARTS Transportation Improvement Program (TIP) is a staged, multi-year intermodal program of transportation projects consistent with the Augusta Regional Transportation Study (ARTS) area long range transportation plan. The TIP is the link between planning for trasportation needs and addressing those needs."[10]

The ARTS TIP is a four year plan, five years for the Aiken County portion of the MPO, and includes all projects in the MPO that are proposed for implementation using federal funding. The current TIP is approved for Fiscal Years 2011-2014. Proposed improvements are prioritized by the calculated need and potential benefit of the project. The ARTS Citizens Advisory Committee and the ARTS Policy Coordinating Committee give the final approval for the TIP.

ARTS Transportation Improvement Program: http://appweb.augustaga.gov/Transporation/docs/FINALFY11-14TIP.pdf

State Transportation Infrastructure Bank

The South Carolina Transportation Infrastructure Bank (SCTIB) is a statewide revolving loan fund designed in 1997 to assist major transportation projects in excess of $100 million in value. The SCTIB has since approved more than $4.5 billion in financial assistance and is arguably the largest and most active State Infrastructure Bank in the country.[11]

The Georgia Transportation Infrastructure Bank (GTIB) is a revolving infrastructure investment fund that provides loans with attractive terms to eligible state, regional, and local government entities to fund eligible transportation projects. The GTIB operates under the authority of the State Road and Tollway Authority (SRTA). Established in 2008, the initial funding for the GTIB loan program is $33.1 million and the initial funding for the GTIB Grant program is $10 million.

10 Source: http://appweb.augustaga.gov/Transporation/docs/FINALFY11-14TIP.pdf
11 Additional information is available at: http://www.chiplimehouse.net/whisper/graphics/60565Connector%20Fall%202007%2012.pdf

Locally-Administered Funding

Local funding sources are generally administered by Metropolitan Planning Organizations or other regional agencies. Counties or cities may administer some funding sources. These funding sources are supported by federal, state, or local revenue streams.

Transportation Enhancements Program

The Transportation Enhancements Program (TE) is a locally-administered source of funding that is drawn from federal gas tax revenues. TE funds can be applied to bicycle and pedestrian projects, as well as a number of other types of transportation-related projects. Bicycling activities approved for TE funds include: the development of bicycle and pedestrian facilities, including support facilities; and bicycle safety education.

General Fund

The General Fund is often used to pay for maintenance expenses and limited capital improvement projects. Projects identified for reconstruction or re-pavement as part of the Capital Improvements list should also implement recommendations for bicycle or pedestrian improvements in order to reduce additional costs.

Local Improvement Districts (LIDs)

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.

Several cities have successfully used LID funds to make improvements on residential streets and for large scale arterial projects. LID formed to finance commercial street development can be "full cost," in which the property assessments are entirely borne by the property owners.

Business Improvement Area (BIA)

Pedestrian and bicycle improvements can often be included as part of larger efforts aimed at business improvement and retail district beautification. Business Improvement Areas collect levies on businesses in order to fund area-wide improvements that benefit businesses and improve access for customers. These districts may include provisions for pedestrian and bicycle improvements, such as wider sidewalks, landscaping, and ADA compliance.

Transportation User Fees

Transportation user fees are any group of additional fees that could be used to fund maintenance and improvement projects for non-motorized uses. Properties would be assessed fees based on the traffic generation by land use or business activity as published in the Institute of Transportation Engineers (ITE) Trip Generation Manual.

The fee could be a Street Maintenance Fee, to fund maintenance of the existing roadway system to free up dollars from the state gasoline tax for capital projects.

Local Bond Measures

Counties or municipalities within the region could issue bonds to fund bicycle and/or pedestrian improvements. This would spread the cost of the improvements over the life of the bonds. Certain types of bonds would require voter approval. The debt would have to be retired, so funding for repayment on the bond and the interest would be required.

A bond issued in Denver, Colorado funded $5 million for trail development and also funded the city's bike planner for several years. The City of Albuquerque, New Mexico and Bernalillo County have a 5 percent set-aside of street bond funds for trails and bikeways. This has amounted to approximately $1.2 million for the City every two years.

Tax Increment Financing/Urban Renewal Funds

Tax Increment Financing (TIF) is a tool to use future gains in taxes to finance the current improvements that will create those gains. When a public project (e.g., shared-use path) 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. Tax Increment Financing typically occurs within designated Urban Renewal Areas (URA) that meet certain economic criteria and approved by a local governing body. To be eligible for this financing, a project (or a portion of it) must be located within the URA.

Street User/Street Utility Fees

Counties or municipalities within the region could administer street user fees through residents' monthly water or other utility bills. The revenue generated by the street user fee is used for operations and maintenance of the street system, and priorities are established by the Public Works Department. Revenue from this fund could be used to maintain on-street bicycle and pedestrian facilities, including routine sweeping of bicycle lanes and other designated bicycle routes. Additionally, this type of fee may free up more general fund money for off-street projects. Implementation of street user fees would require a public vote.

Sales Taxes

Bicycle and pedestrian projects can be funded by a portion of local sales tax revenue or from a voter-approved sales tax increase. The City of Colorado Springs implemented a TOPS tax (Trails, Open Space and Parks) to administer the ordinance passed by voters in April of 1997. The sales tax, 1/10th of one percent, generates about $6 million annually for trails, open space and parks. Additionally, Aiken County's local option sales tax (LOST) allows for a wide variety of capital improvement projects to receive funding.

Property Tax Levy

Approved property taxes can be an important source of funding for bicycle and pedestrian projects. Seattle, Washington is receiving $5 million a year for nine years for bicycle and pedestrian projects as a result of a levy (property tax) approved by voters in 2006.

Bike Tax

Bike taxes can provide funding for bicycle infrastructure projects. The City of Colorado Springs has a $4.00 per bike tax to provide funding for bikeway improvements. The tax generates nearly $100,000 annually and has been used for both on- and off-street projects. It is used primarily to provide a local match for other grants such as the Colorado State Trails Program or SAFETEA-LU grants. A bike tax is an annual fee; implementation would require a pubic vote.

Developer Impact Fees

Another potential local source of funding is developer impact fees, typically tied to trip generation rates and traffic impacts produced by a proposed project. A developer may reduce the number of trips (and hence impacts and cost) by paying for on- and off-site bikeway improvements that will encourage residents to bicycle or walk rather than drive. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical in avoiding a potential lawsuit.

Latecomer Fees

Latecomer fees are a mechanism that allows cities to recover pro-rata costs of a duly authorized public improvement from future developers, which receive benefit from the public improvement.

Other Sources

Georgia Bikes! Seed Grants for Bicycle Advocacy Projects

Georgia Bikes is a non-profit organization that strives to improve bicycling conditions and promote bicycling throughout the State of Georgia. Georgia Bikes offers 10 grants of $1,500 for the funding of innovative bicycle safety and advocacy programs and projects in Georgia. Eligible organizations must be located in Georgia; and are either a bicycle advocacy organization, a bicycle advisory committee, or an organization that actively promotes bicycle safety and road sharing in Georgia.

Online Resource: http://georgiabikes.org/index.php/resources/35/157-seed-grants-bicycle-projects

Community Action for a Renewed Environment (CARE)

CARE is a competitive grant program that offers an innovative way for a community to organize and take action to reduce toxic pollution in its

local environment. Through CARE, a community creates a partnership that implements solutions to reduce releases of toxic pollutants and minimize people's exposure to them. By providing financial and technical assistance, EPA helps CARE communities get on the path to a renewed environment. Transportation and "smart-growth" types of projects are eligible. Grants range between $75,000 and $300,000.

Online resource: http://www.epa.gov/care/

Bikes Belong Grant

Bikes Belong is an organization sponsored by bicycle manufacturers with the intent to increase bicycle riding in the United States. Bikes Belong provides grant opportunities up to $10,000 with a minimum 50 percent match to organizations and agencies seeking to support facility and advocacy efforts. Eligible projects include bike paths, trails, and bridges, mountain bike facilities, bike parks, and BMX facilities.

Online resource: http://www.bikesbelong.org/grants

Robert Wood Johnson Foundation Grants

Robert Wood Johnson Foundation Grants are awarded to promote healthy communities and lifestyles. Most grants are awarded through Calls for Proposals for the seven program areas of the RWJ Foundation. In recent years, Spartanburg and Greenville Counties in SC and Cook and Milledgeville Counties in GA have received grants from the RWJ Foundation through the Healthy Kids Healthy Communities grant program.

American Greenways Program

Administered by The Conservation Fund, the American Greenways Program provides funding for the planning and design of greenways. Applications for funds can be made by local regional or state-wide non-profit organizations and public agencies. The maximum award is $2,500, but most range from $500 to $1,500. American Greenways Program monies may be used to fund unpaved trail development.

Online resource: http://www.conservationfund.org/node/245

Volunteer and Public-Private Partnerships

Local schools or community groups may use the bikeway projects as a project for the year, possibly working with a local designer or engineer. Work parties may be formed to help clear the right-of-way where needed. A local construction company may donate or discount services. A challenge grant program with local businesses may be a good source of local funding, where corporations 'adopt' a bikeway and help construct and maintain the facility.

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 infrastructural 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://walmartstores.com/CommunityGiving/8168.aspx?p=8979

Coca-Cola Foundation Community Support Grants

The Coca-Cola Foundation awards grants for projects that promote and support water stewardship, active, healthy living, community recycling, and education. The award amount for projects varies and the application process is rolling. Programmatic, planning, and educational projects are eligible to apply. The Foundation does not support construction projects or projects that involve land acquisition. In addition, schools are not eligible to apply for Community Support funding.

Online Resource: http://www.thecoca-colacompany.com/citizenship/application_guidelines_faq.html

The 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. A wide array of activities

are eigible for funding, including infrastructural and programmatic projects.

Online resource: http://www.riteaid.com/company/community/foundation.jsf

Local Businesses

There is increasing corporate and business involvement in trail and conservation projects. Employers recognize that creating places to bike and walk is one way to build community and attract a quality work force. Bicycling and outdoor recreation businesses often support local projects and programs. Some examples include:

- In Evansville, Indiana, a boardwalk is being built with corporate donations from Indiana Power and Light Co. and the Wal-Mart Foundation.
- In Arizona, trail directional and interpretive signs are being provided by the Salt River Project — a local utility. Other corporate sponsors of the Arizona Trail are the Hughes Missile Systems, BHP Cooper, and Pace American, Inc.
- Recreational Equipment, Inc. has long been a financial supporter of local trail and conservation projects.
- The Kodak Company now supports the American Greenways Awards program of The Conservation Fund, which was started in partnership with the DuPont Company. This annual awards program provides grants of up to $2500 to local greenway projects for any activities related to greenway advocacy, planning, design or development.

Land Trusts

Many environmental land trust organizations have raised funds to purchase land where trails are built, especially rail-trails. The Palmetto Conservation Foundation is a statewide nonprofit in South Carolina with a history of establishing conservation easements and building trail networks, including the cross-state Palmetto Trail. In Georgia, the Georgia Land Trust, Inc. actively works to conserve land across Georgia and also supports trail development.

The Conservation Alliance

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to protect wild and natural areas. One hundred percent of its member companies' dues go directly to diverse, local community groups across the nation - groups like Southern Utah Wilderness Alliance, Alliance for the Wild Rockies, The Greater Yellowstone Coalition, the South Yuba River Citizens' League, RESTORE: The North Woods and the Sinkyone Wilderness Council (a Native American-owned/operated wilderness park). For these groups, who seek to protect the last great wild lands and waterways from resource extraction and commercial development, the Alliance's grants are substantial in size (about $35,000 each), and have often made the difference between success and defeat. Since its inception in 1989, The Conservation Alliance has contributed $4,775,059 to grassroots environmental groups across the nation, and its member companies are proud of the results: To date the groups funded have saved over 34 million acres of wild lands and 14 dams have been either prevented or removed-all through grassroots community efforts.

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

The Conservation Alliance Funding Criteria: The Project should be focused primarily on direct citizen action to protect and enhance our natural resources for recreation. 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.

Additional Information: http://www.conservationalliance.com/index.m.

National Fish and Wildlife Foundation (NFWF)

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

The Foundation awards matching grants under its Keystone Initiatives to achieve measurable outcomes in the conservation of fish, wildlife, plants and the habitats on which they depend. Awards are made on a competitive basis to eligible grant recipients, including federal, tribal, state, and local governments, educational institutions, and non-profit conservation organizations. Project proposals are received on a year-round, revolving basis with two decision cycles per year. Grants generally range from $50,000-$300,000 and typically require a minimum 2:1 non-federal match.

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

Additional Information: http://www.nfwf.org/AM/Template.cfm?Section=Grants

The Trust for Public Land

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land for human enjoyment and well being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities. Georgia has a state office of the Trust for Public Land, located in Atlanta.

Additional Information: http://www.tpl.org

Funding for Sidewalk Infill Programs

Recent research has shown the substantial individual and community-wide benefits of walking. An increase in people walking improves environmental health and alleviates traffic congestion by reducing dependence on the automobile.[12] Walking promotes an active lifestyle and has health and psychological benefits for individuals.[13] As the number of people who walk increase, communities can see economic benefits such as savings on health care costs and the costs of vehicular operation and infrastructure.[14] Lastly, community promotion of walking and other forms of alternative transportation increases transportation options for users of varied ages, income levels, and abilities.[15]

Many communities around the country have sidewalk networks that are fragmented, disconnected, and poorly maintained. This is due in large part to historically minimal sidewalk requirements in new development. One of the ways in which communities can promote walking is through infrastructure improvements that complete the pedestrian network – often referred to as sidewalk infill. The goal of sidewalk infill programs is to connect fragmented segments of a community's existing sidewalk network through the construction of new sidewalks as a means of improving the network's continuity and connectivity. Strategic sidewalk infill consists of inventory and analysis of the community's existing sidewalk network to identify network gaps, prioritizing gaps based on community needs and funding requirements,

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12- 15 http://www.walkinginfo.org/why/

and filling in these gaps as funding becomes available.[16] Gaps are typically prioritized based on criteria such as: surrounding density, surrounding income level, connection to transit, proximity to grade schools, proximity to parks, traffic volumes on adjacent roadways, the presence of sight line limitations, and to what extent resolution of a gap would complete the overall sidewalk network.[17]

Often the biggest hurdle for communities is coming up with ways to fund sidewalk infill projects. Typically, available funding for sidewalk construction and maintenance in operational budgets is scarce. In many communities this is because sidewalk construction and maintenance is considered the responsibility of the adjacent property owner (in the case of existing development) or the developer (in the case of new development).[18]

The most common mechanisms for funding sidewalk infill programs include assessment of adjacent property owners, developer assessments, Capital Improvement Programs (CIP), and/or the creation of Local Improvement Districts (LID).

Communities have been able to find other creative ways of funding sidewalk improvement programs as well. These include state and federal grant programs, voter approved tax increases, utilizing funds from the gasoline tax, and using funds collected from parking tolls.

This following section explains and compares the many ways in which communities have funded sidewalk infill.

Primary Municipal Mechanisms for Sidewalk Infill

The primary method for sidewalk development in new development or redevelopment is through requiring property developer to provide sidewalks that conform to the municipal code. Because the Americans With Disabilities Act (ADA) requires that non-single family development addresses accessibility needs, there is particular precedent for requiring properly-constructed sidewalk infill when a property is improved.[19] While developer requirements are an important mechanism for constructing sidewalks, this mechanism alone is generally inadequate for addressing sidewalk infill needs as there is no correlation between important gaps in the sidewalk network and the likelihood of a property redeveloping. Most communities will find that additional measures will be needed that allow for greater control over where and how sidewalk infill happens.

To that end, many communities have a mechanism in place for sidewalk infill funded through the assessment of adjacent property owners and developers. This stems from the fact that in most communities, the adjacent property owner is responsible for sidewalk provision and maintenance. Property assessments are a way to fund sidewalk infill at low or no cost to the municipality; unsurprisingly, however, they are often quite unpopular with property owners, who may oppose the project because of the cost to them. Numerous communities have programs in place that modify the property assessment process to lower the costs to property owners:

- **Chatham-Kent, CA** has a 50/50 program that splits the cost of sidewalk assessment with the property owner if that particular sidewalk link is identified as a high priority in their sidewalk infill program or if a valid petition is submitted. CitySidewalk costs and design have been standardized by the City and are installed by approved contractors at a rate of $85/meter, which helps reduce inconstancies between sections of sidewalk. More information on this program can be found through the City's website: http://www.chatham-kent.ca/NR/rdonlyres/D07AA51A-1E2A-4911-B3CE-FB064073D157/10996/15b.pdf.
- **Syracuse, NY** has a sidewalk assessment program that provides property owners financing for sidewalk installation and

16 Chapter 7 of the Greensboro, NC BiPed is a good example of how sidewalk infill projects can be prioritized: http://www.greensboro-nc.gov/index.aspx?page=2121

17 *A Streamlined Approach to Prioritize Sidewalk Investments*. http://www.ite.org/annualmeeting/compendium10/pdf/AB10H0703.pdf

18 *Sidewalks: The City's Problem, and Greenwood's Solution*. http://www.worldchanging.com/local/seattle/archives/008386.html

19 A list of ADA sidewalk design standards can be found here: http://www.fhwa.dot.gov/environment/sidewalks/chap4b.htm

maintenance. Financing is at an annual rate of 7% over a period of 10 years. More information can be found through the City's website: http://www.syracuse.ny.us/Sidewalk_Maintenance.aspx.

- **Tumwater, WA** has an 80/20 cost sharing program for the construction of sidewalks for residential infill lots where a gap in the existing sidewalk network currently exists. Sidewalk design and construction is conducted by the City with the City covering 80% of the costs. Funding for the program is allocated through the City's annual budget. More information can be found through the City's website: http://www.ci.tumwater.wa.us/sidewalkinfill.htm.

- **The Greenwood district in Seattle, WA** initiated a pilot program that implements sidewalk infill based on a low-impact sidewalk design standards manual developed by the district planner. The program offers zero-interest monthly loans to homeowners, as well as an option where the City pays for sidewalk construction up front and the homeowner pays construction costs back when they sell their house. More information can be found through the City's website: http://www.worldchanging.com/local/seattle/archives/008386.html.

Developer assessments are another way communities can implement sidewalk infill:

- **Downers Grove, IL** requires that developers and builders install sidewalks along the roadway adjacent to the properties they are developing and that sidewalks are constructed on both sides of new roads in developments. If the municipal engineer determines that new sidewalks are not necessary in a proposed development, the developer may pay a fee in lieu of constructing new sidewalks. These fees are added to the Community Investment Program and used to fund sidewalk infill construction in other areas of the village. This program is outlined in Section 20.602 of their municipal code: http://www.downers.us/public/docs/code/Chapter20.pdf.

Capital Improvement Programs are plans created by municipalities that organize, prioritize, and allocate funding for improvement projects that require significant investment. Projects included in Capital Improvement Programs usually include infrastructure improvements, building improvements, and land acquisition. CIPs are funded through a variety of means such as utilities revenue, tax revenue, bonds, and grants. Sidewalk infill programs can be included as a stand-alone program in the CIPs list to provide a means of ongoing funding and implementation.

- **Greensboro, NC** funds their priority sidewalk program through a combination of funds from the City's CIP, funds from STP and CMAQ grants (obtained through the MPO), and voter approved bonds. The City prioritizes gaps along major thoroughfares in their bike and pedestrian plan. In addition, there is a petition process to request sidewalk construction along residential streets that requires 51% approval by affected owners. Sidewalks in residential areas are completely funded by public means and no property owner assessments are made. (Peggy Holland, City of Greensboro Bicycle and Pedestrian Coordinator).

Local Improvement Districts (LIDs) and Business Improvement Districts (BIDs) are special assessment districts within a municipality, formed by property and/or business owners as a means of funding and implementing local improvement projects. Establishment of a LID/BID offers low-interest financing, funded through the sale of bonds, for district-wide improvement projects. Incremental assessments are collected over several years for the collective costs of projects in the district. Projects are typically infrastructural and can include construction and maintenance of sidewalks, street lighting, roads, and utility lines. The benefits of LIDs/BIDs are that they provide a means of funding public projects that the City can't fund, they offer project financing for property owners, they spread the costs of projects over all affected property owners, and the owner assessments directly reflect the costs of the projects. The drawbacks of LIDs/BIDs are that they take a significant amount of time to establish and the project approval process can be tedious. LIDs and BIDs are typically established independently of strategic sidewalk infill plans, but could be considered in these plans as a way of leveraging funds and support.

Some examples of cities that support the establishment of LIDs are: Nampa, Idaho (http://www.nampa.id.us/engineering/local-improvement-districts-(lids)/sidewalk.aspx), Portland, Oregon (http://www.portlandonline.com/transportation/index.cfm?c=35715), and Everett, WA (http://www.ci.everett.wa.us/default.aspx?ID=862).

Toolbox of Additional Sidewalk Infill Strategies

There are also other strategies of funding sidewalk infill programs. The following strategies rely more on obtaining funding from large, public revenue sources rather than individual assessments. Funding sidewalks from broad sources such as taxes and grants supports the idea that sidewalks are part of the public transportation network, and their implementation is the responsibility of all citizens. However, many munipalities are understandably concerned about funding sidewalks through public funds in some areas and through individual assessments in other areas, so careful consideration of the long-term implications of a policy change is recommended.[20]

There are several federally-sponsored grants that offer assistance in funding sidewalk construction or maintenance projects. Table F-1 provides an overview of these sources and links to additional information.

Another successful means of funding sidewalk construction is through voter approved tax increases. These usually come in the form of a tax increment attached to a local sales tax or utilities tax. Although the process of approval can be long and political, the primary advantage of this measure is that it only requires 51% of the voter approval to pass. Some municipalities that have had success with this funding method include:

- **Olympia, WA** residents have voted in a 2% increase on their telecom, gas, and electric tax to fund sidewalk improvements. A concerned group of citizens supported and promoted the cause, and gained support by voters. Funds generated from taxes have increased the annual budget for sidewalks by over one million dollars, providing a substantial financial base for their sidewalk infill program. More information can be found on pages 233-235 of the *Pedestrian and Bicycle Information Center Case Study Compendium*: http://katana.hsrc.unc.edu/cms/downloads/pbic_case_study_compendium.pdf.
- **San Diego Region, CA** has a local half-cent sales tax increase program called TransNet. The fund is inclusive of all areas in the SANDAG MPO and individual municipalities apply for sidewalk funds through the MPO. More information on TransNet can be found here: http://www.sandag.org/index.asp?classid=30&fuseaction=home.classhome.

Some municipalities have been able to use funds collected from state fuel taxes to fund sidewalk maintenance and construction programs:

- **Charlotte, NC** now funds its sidewalk construction and replacement program through funds collected from the fuel tax as part of the Powell Bill.[21] Their annual budget for sidewalk construction and maintenance is around $555,000. Before the Powell Bill was passed into legislation, Charlotte filled sidewalk gaps through individual property assessments. Now, they have eliminated assessments for sidewalks, which has allowed them to standardize and streamline design and construction. More information about the program can be found here: http://peds.org/wp-content/uploads/2010/09/Charlotte-Sidewalk-Maintenance.pdf.
- **Downers Grove, IL** funds their CIP partly through revenue generated from the state motor vehicle fuel tax. Additional information on their CIP can be found on the City's website: http://www.downers.us/public/docs/vlg_budget/2011/CIP.pdf.

20 Paul H.Klassen, P.E. Coastland Civil Engineering

- 21 Information on the NC Powell Bill: http://www.ncdot.org/programs/Powell_Bill/

Lastly, parking tolls have been used in some areas as a means of funding local sidewalk and streetscaping projects in Business Improvement Districts. In some cases, collections from parking tolls have been added to CIP funds specifically to construct sidewalk and streetscape improvement projects in all areas of a municipality:

- **Pasadena, CA** has used parking meters as a means of revitalizing a declining, historic business district in the city known as Old Pasadena. The streetscape improvements, funded by revenue generated from the meters, have proven successful in drawing people to the area and improving business throughout the district. A full overview of the program's history and success is located here: http://shoup.bol.ucla.edu/SmallChange.pdf.
- **Downers Grove, IL** partly funds the roadway and sidewalk improvement projects in their CIP through revenue generated from parking tolls. An overview of their CIP, including a breakdown of funding sources, can be found on the City's website:(http://www.downers.us/public/docs/vlg_budget/2011/CIP.pdf.

Sidewalk Infill Program Funding Conclusions

A well-connected sidewalk network is an essential part of a pedestrian-friendly community. Sidewalk connectivity encourages walking by improving safety, accessibility, and comfort for pedestrians. Strategic sidewalk infill programs are a means for communities to increase their sidewalk connectivity in a cost-effective manner that prioritizes filling highest-value gaps.

Securing funding for sidewalk construction can often be difficult; municipal budgets for new sidewalks are usually small in comparison to the funding allocated for other infrastructure improvements such as roads. However, many communities, like the ones listed in this section, have found creative ways to fund sidewalk improvement programs. The purpose of this information is to outline proven ways of funding sidewalk construction and maintenance as part of a strategic sidewalk infill plan. However, this section should not be taken as a comprehensive list of funding solutions for sidewalks—resourcefulness, creativity, and persistence can produce additional sources of funding not mentioned here.

Table F-1: Sidewalk Infill Grant Funding Sources

Grant Program	Funding Sources	Project Requirements	Additional Funding Info	Project Examples
Surface Transportation Program (STP) Transportation Enhancements (TE)	Federal Funds, allocated through state DOTs	Project meets all applicable required design standards and is financially feasible.	80% of costs covered by the grant with a 20% local match	Many examples of sidewalk projects using TE funds can be found on the TE website: http://www.enhancements.org/TE_news.asp
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	Federal Funds, allocated through state DOTs	An air quality report including projected cost/benefit analysis is required for the application. Project progress reports are required for reimbursement. Proposals must be consistent with the local transportation plan.	80% of costs covered by the grant with a 20% local match	Walkinginfo.org provides helpful resources on CMAQ funding and project examples: http://www.walkinginfo.org/faqs/answer.cfm?id=4274
Community Development Block Grant (CDBG)	Federal Funds, allocated through State HUD office	Municipality must conduct a study of block conditions and develop an action plan to describe how funds will be used for improvement. After funds are granted, the HUD requires an annual progress report called CAPER.	Two categories of eligible areas: Entitlement Communities (large counties and municipalities) and Non-Entitlement Communities (small counties and municipalities)	The City of Sandy Springs, GA has a detailed overview of a sidewalk project funded through CDBG dollars: www.sandyspringsga.org/City-Departments/Community-Development/Community-Development-Block-Grant
Federal Safe Routes to School Program (SRTS)	Federal Funds, allocated through State DOT	Eligible schools apply through their municipality for funds. New sidewalk construction is eligible if it is within one mile of a primary or middle school.	100% of costs covered by the grant	Multiple examples by state can be found on the National Center for Safe Routes to School's website: www.saferoutesinfo.org/funding-portal

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Appendix G

Trip Generator, Trip Attractor, and Roadway Quality Maps

Figure G-1: ARTS Live Map - Bicycle

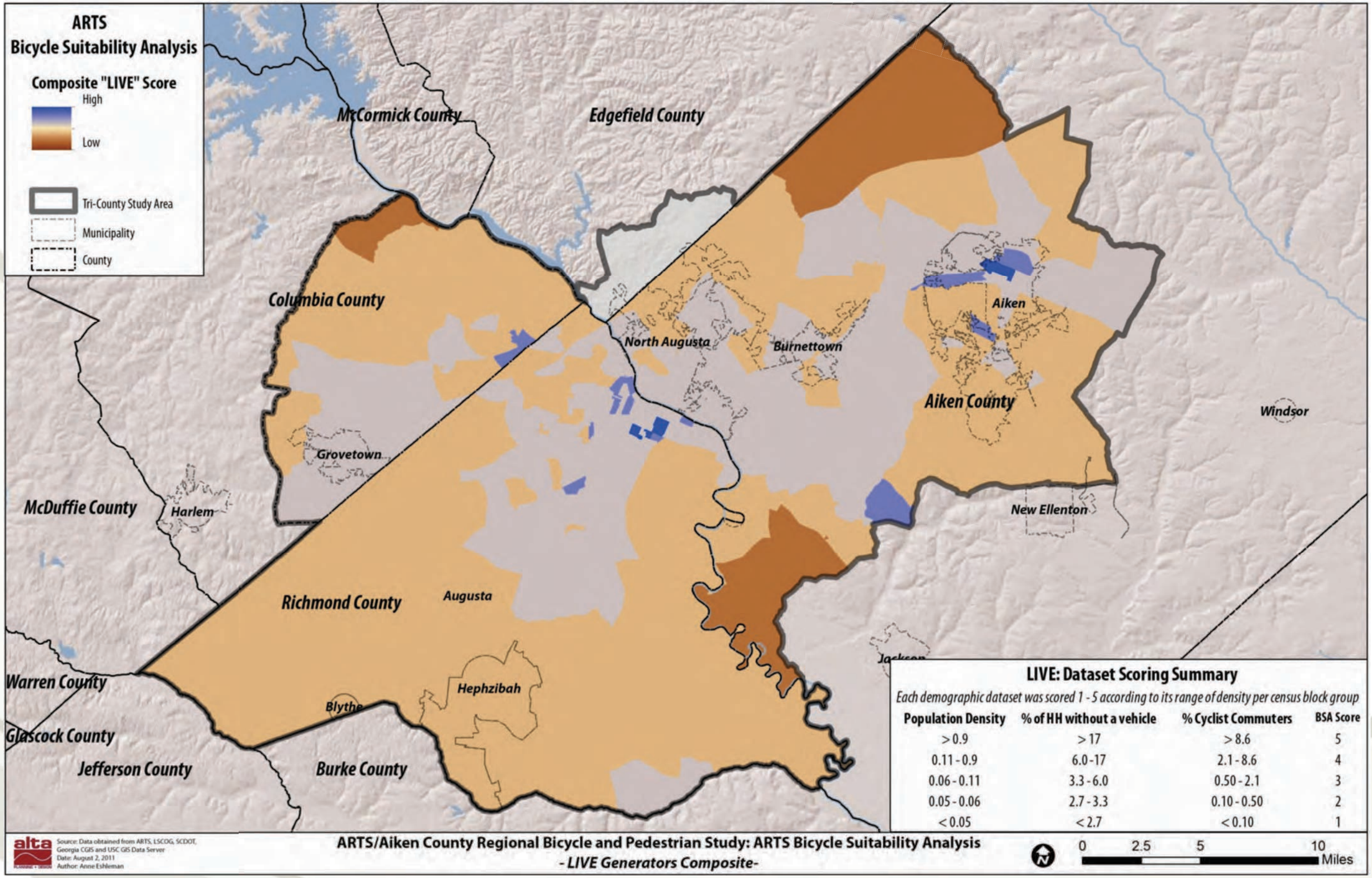


Figure G-2: ARTS Work Map- Bicycle

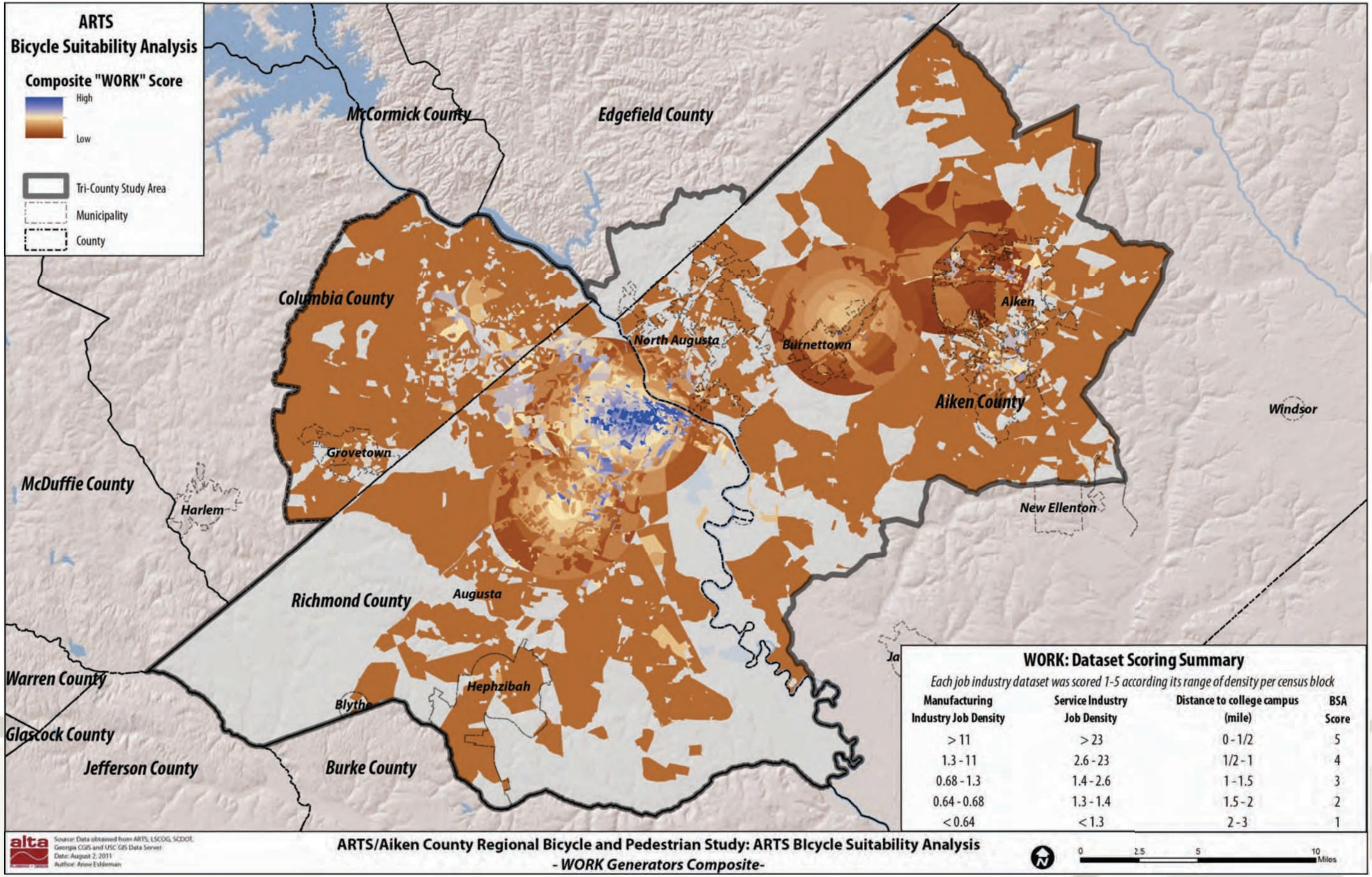


Figure G-3: ARTS Transit Map- Bicycle

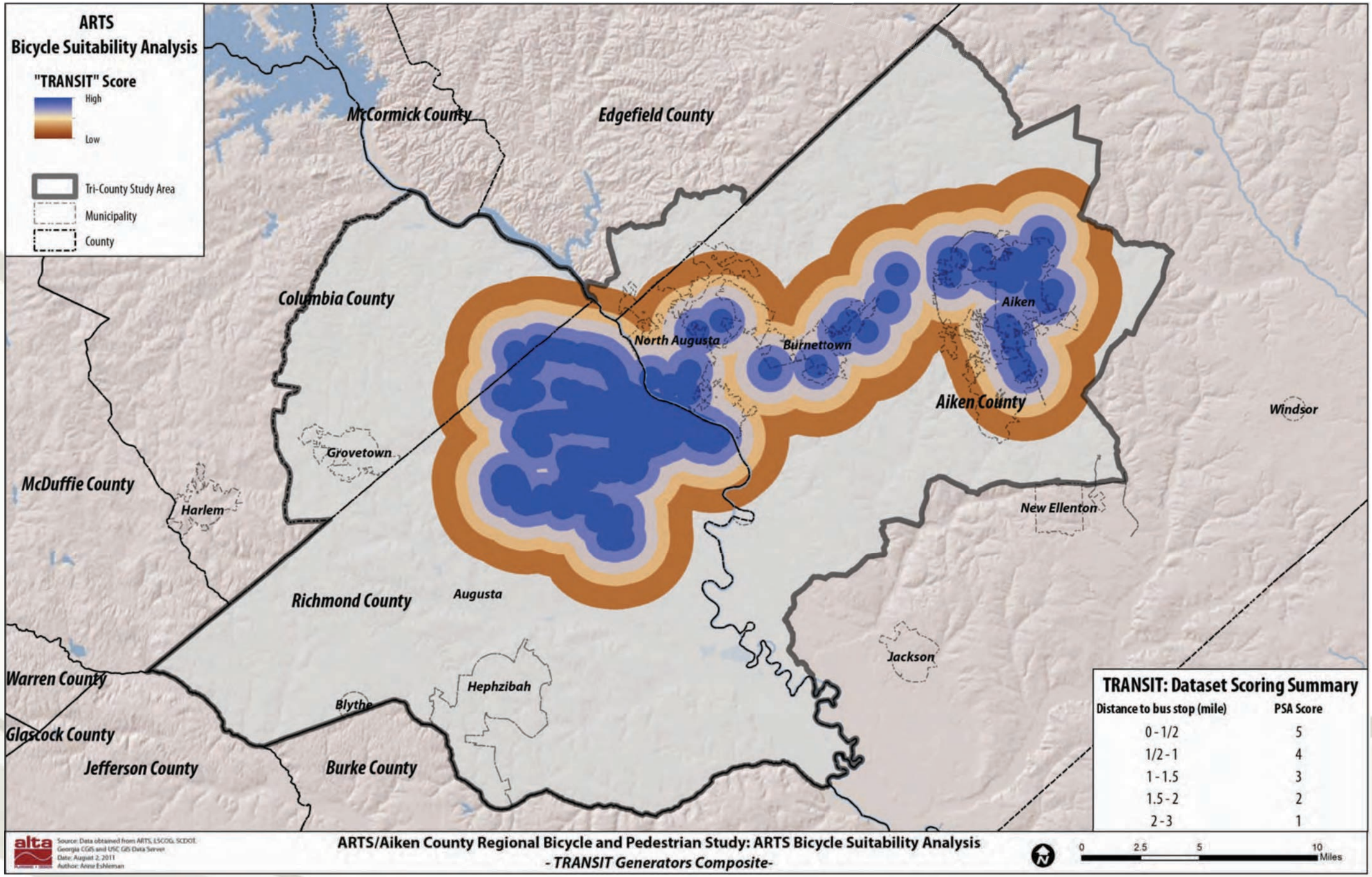


Figure G-4: ARTS Play Map- Bicycle

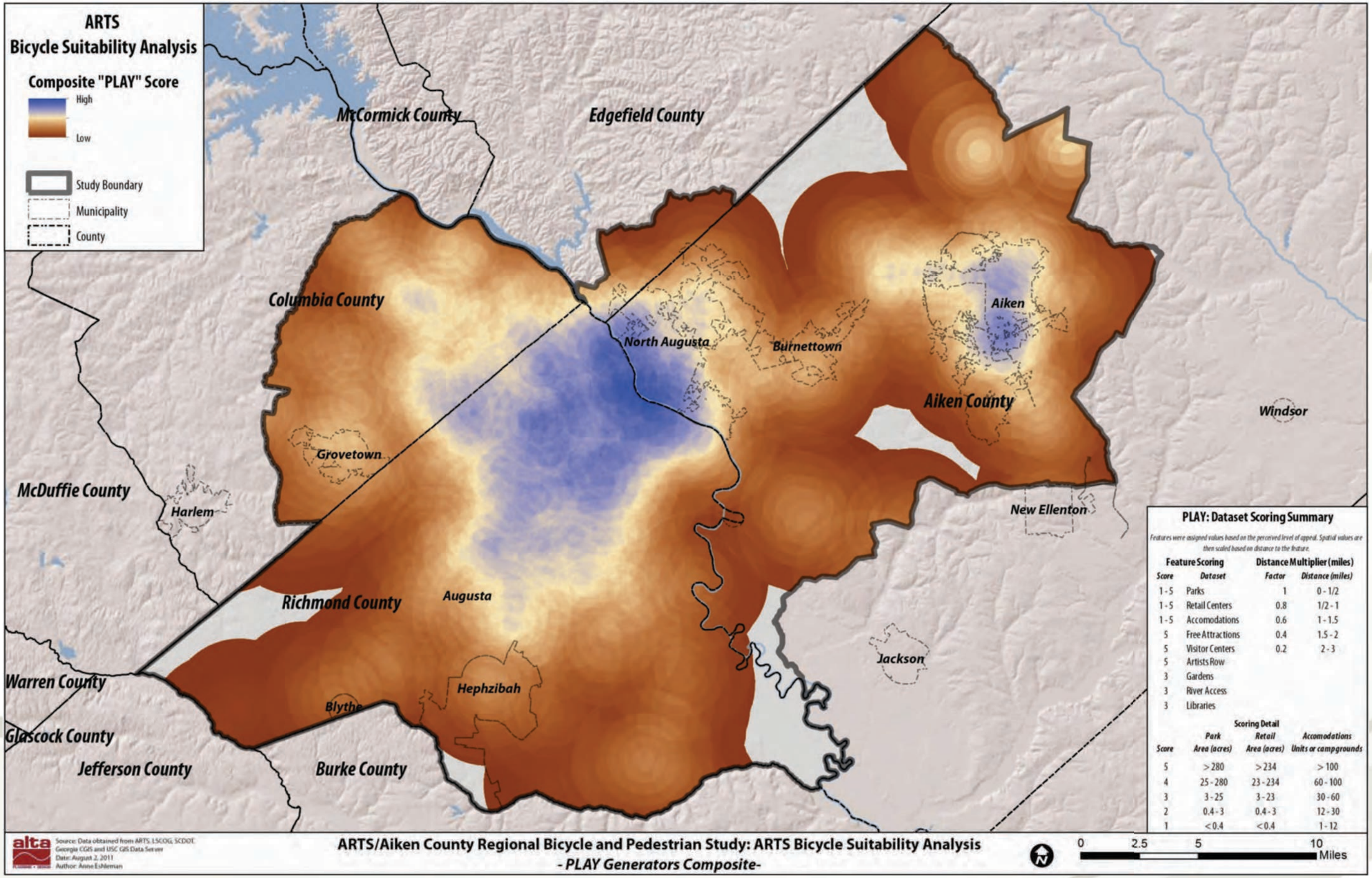


Figure G-5: ARTS Roadway Quality Map- Bicycle

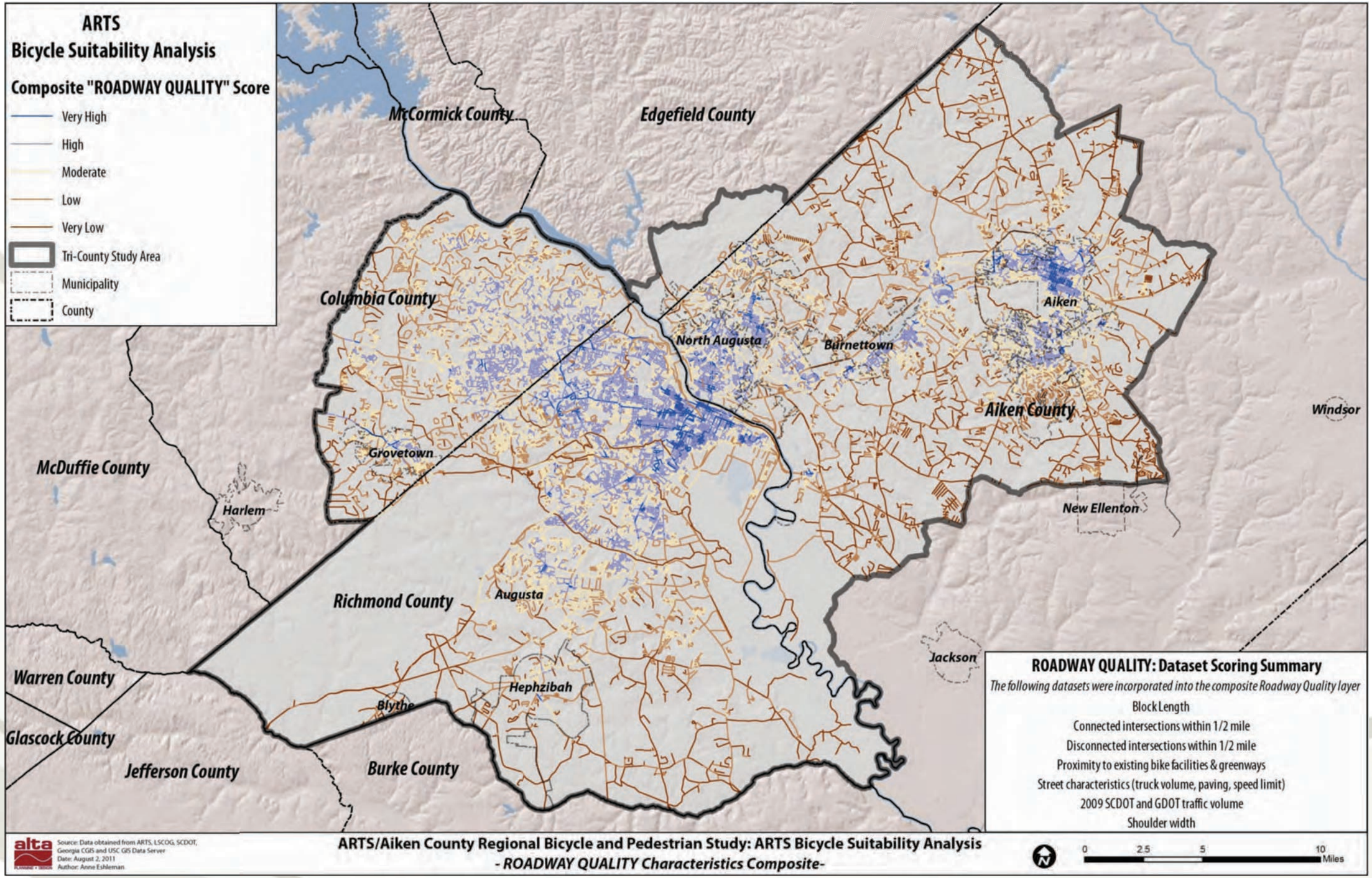


Figure G-6: ARTS Live Map - Pedestrian

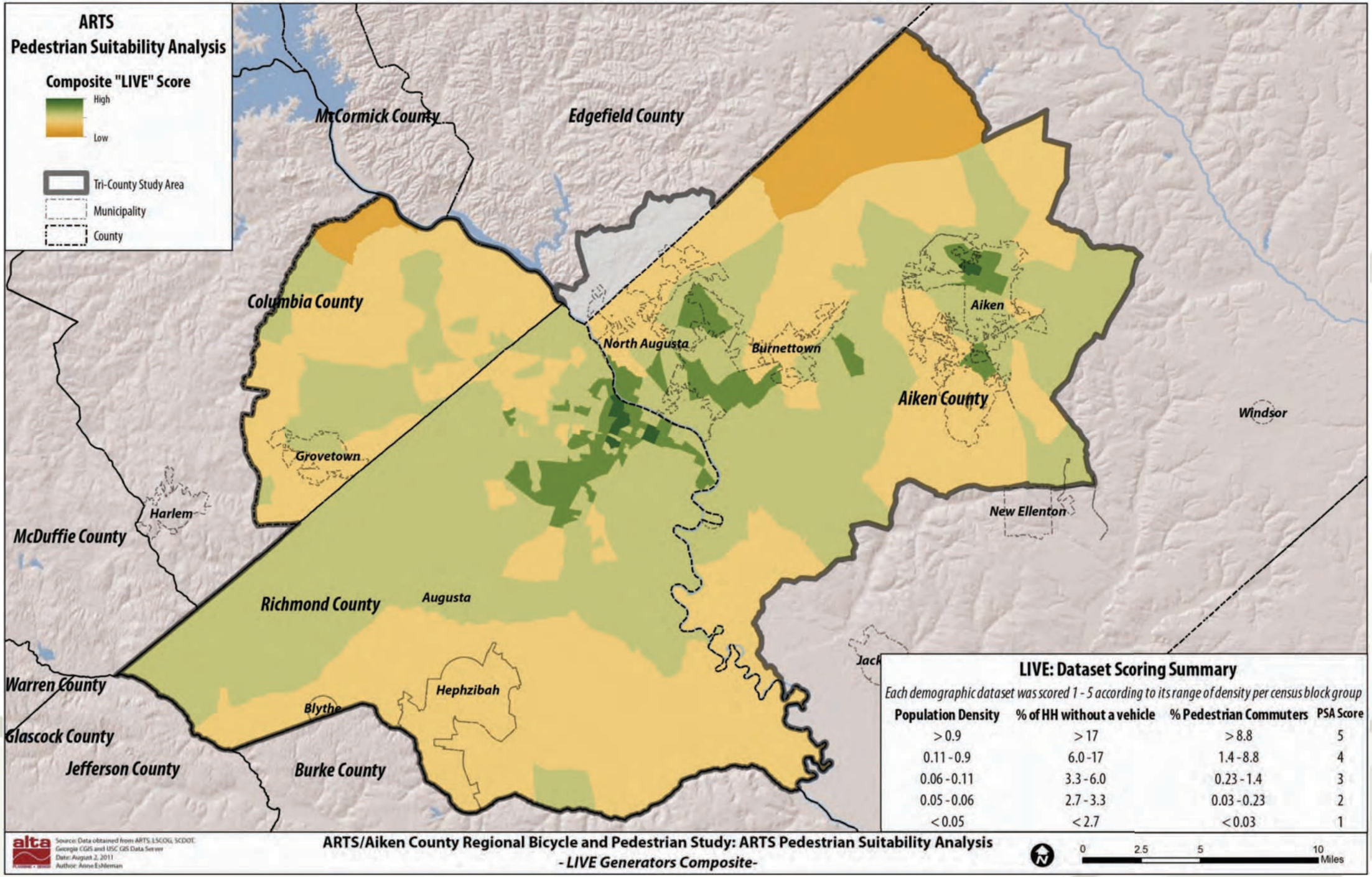


Figure G-7: ARTS Work Map - Pedestrian

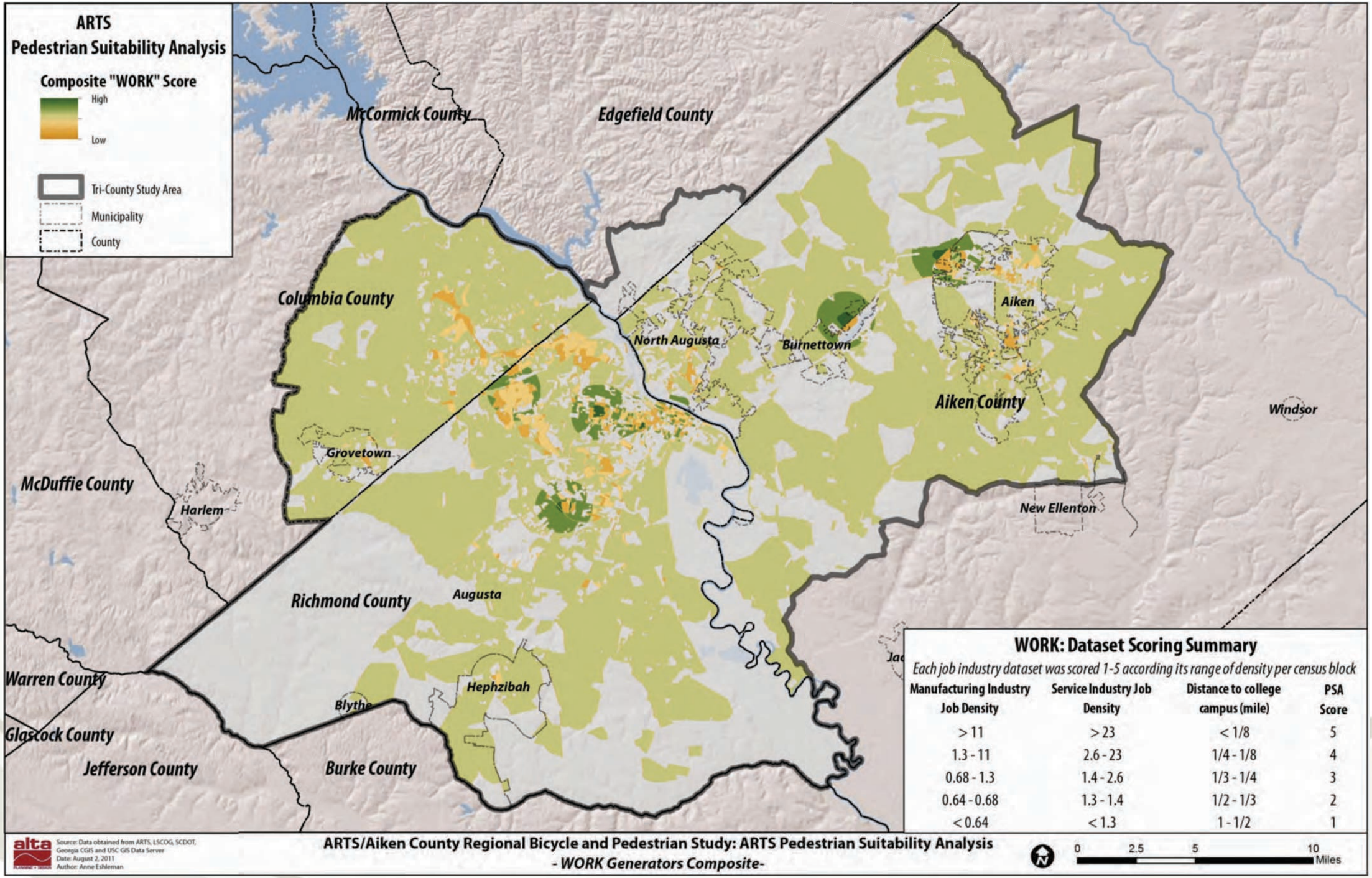


Figure G-8: ARTS Transit Map - Pedestrian

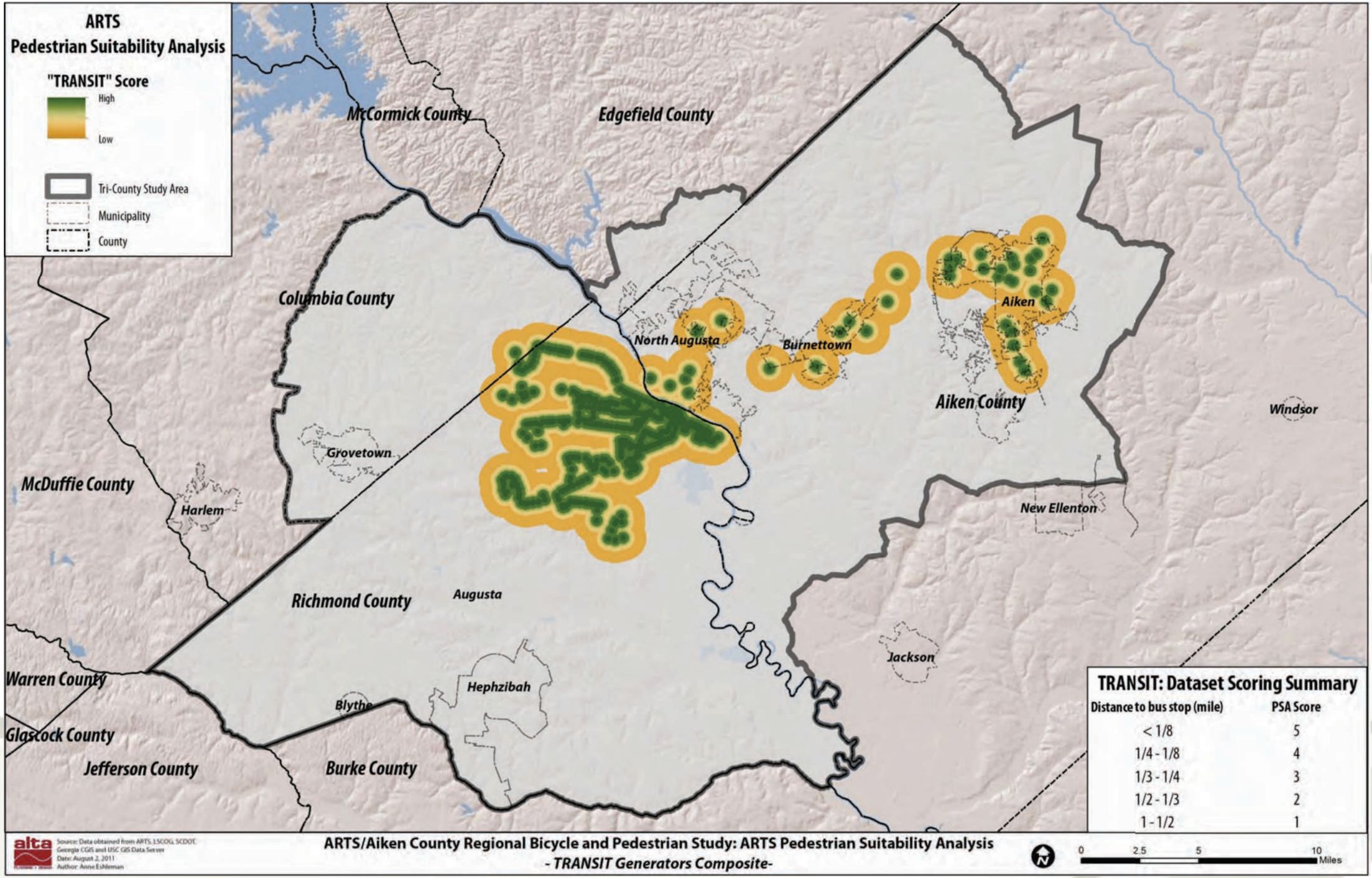


Figure G-9: ARTS Play Map – Pedestrian

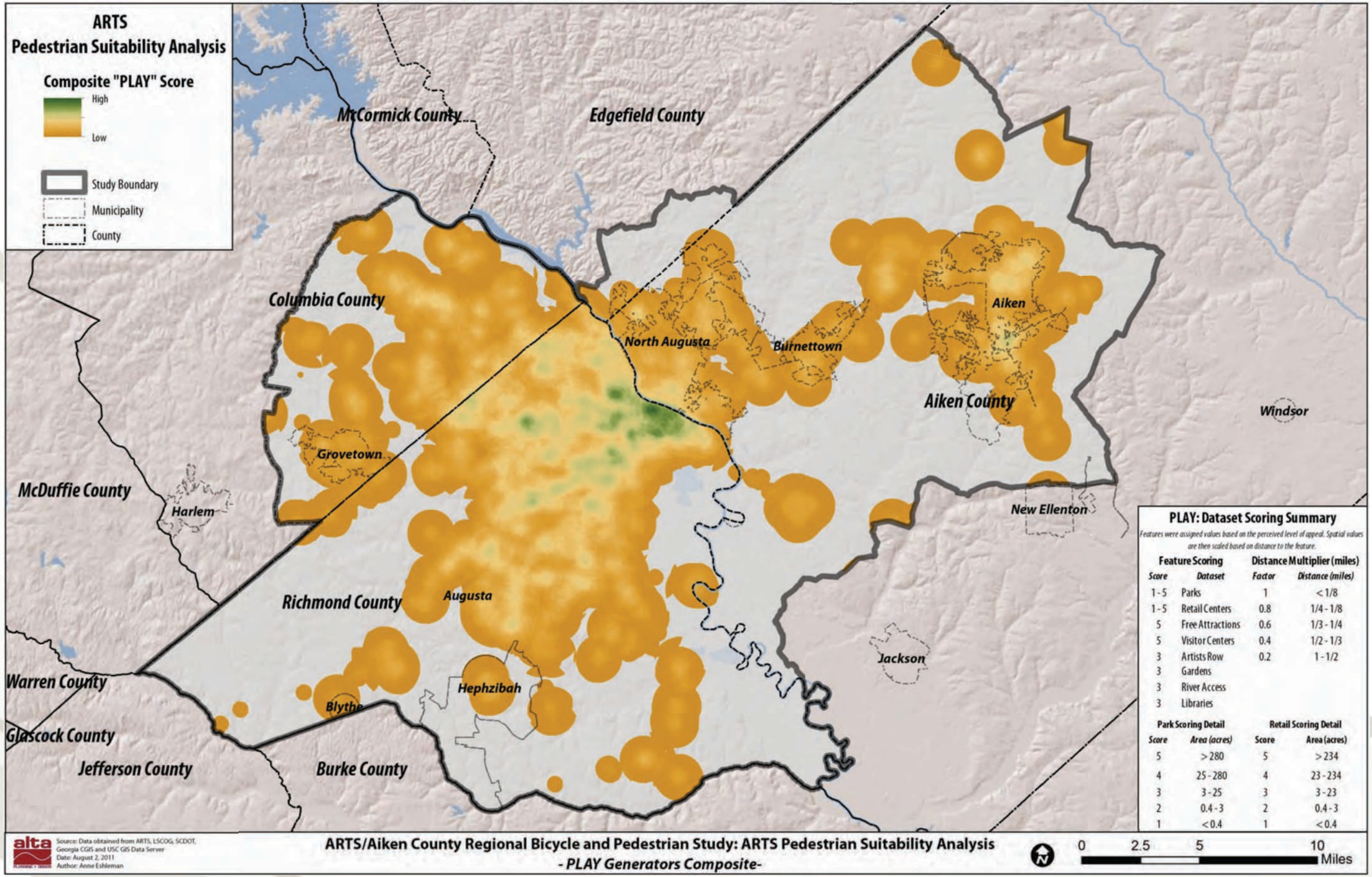
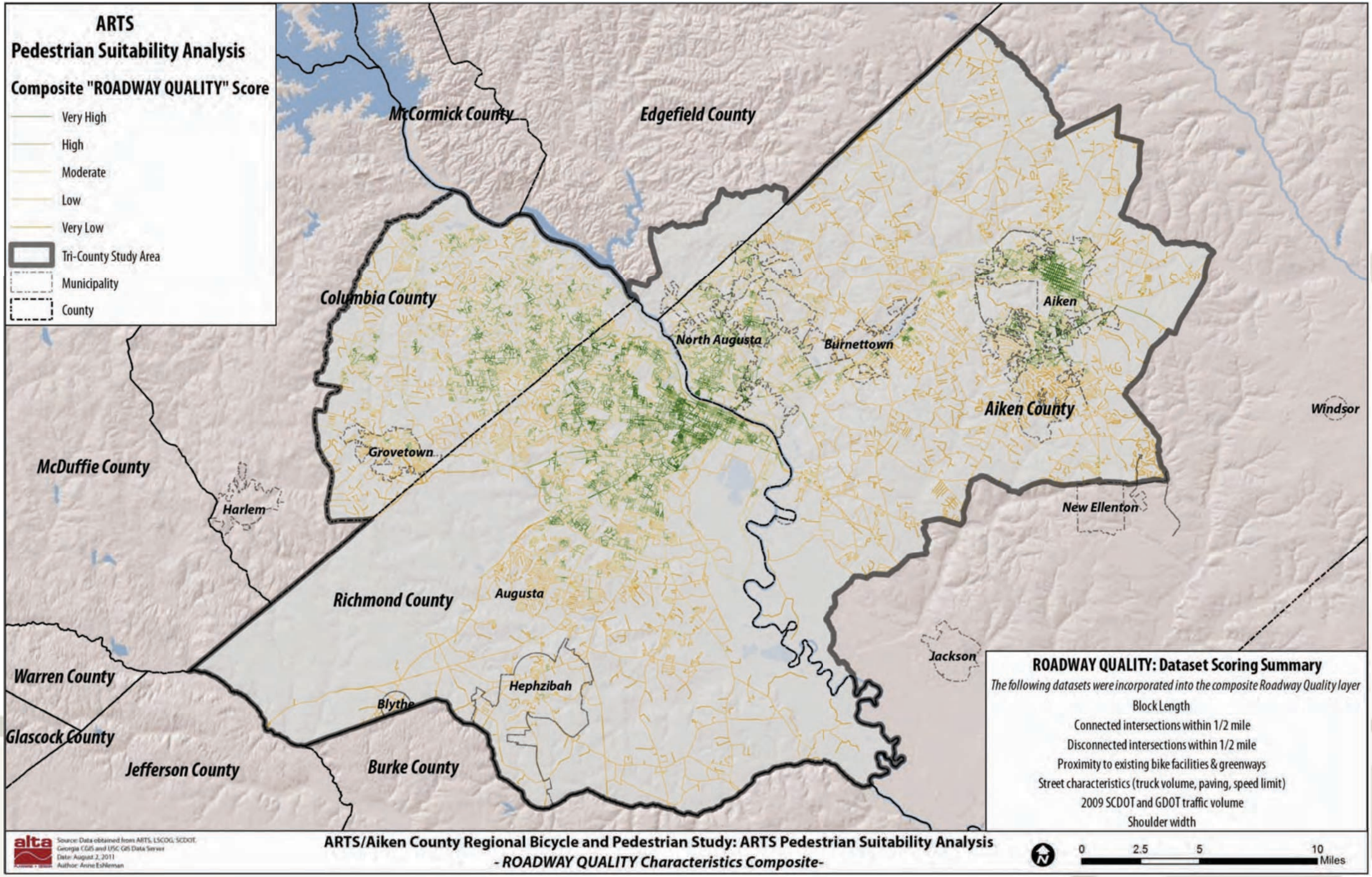


Figure G-10: ARTS Roadway Quality Map - Pedestrian



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Appendix G

Trip Generator, Trip Attractor, and Roadway Quality Maps

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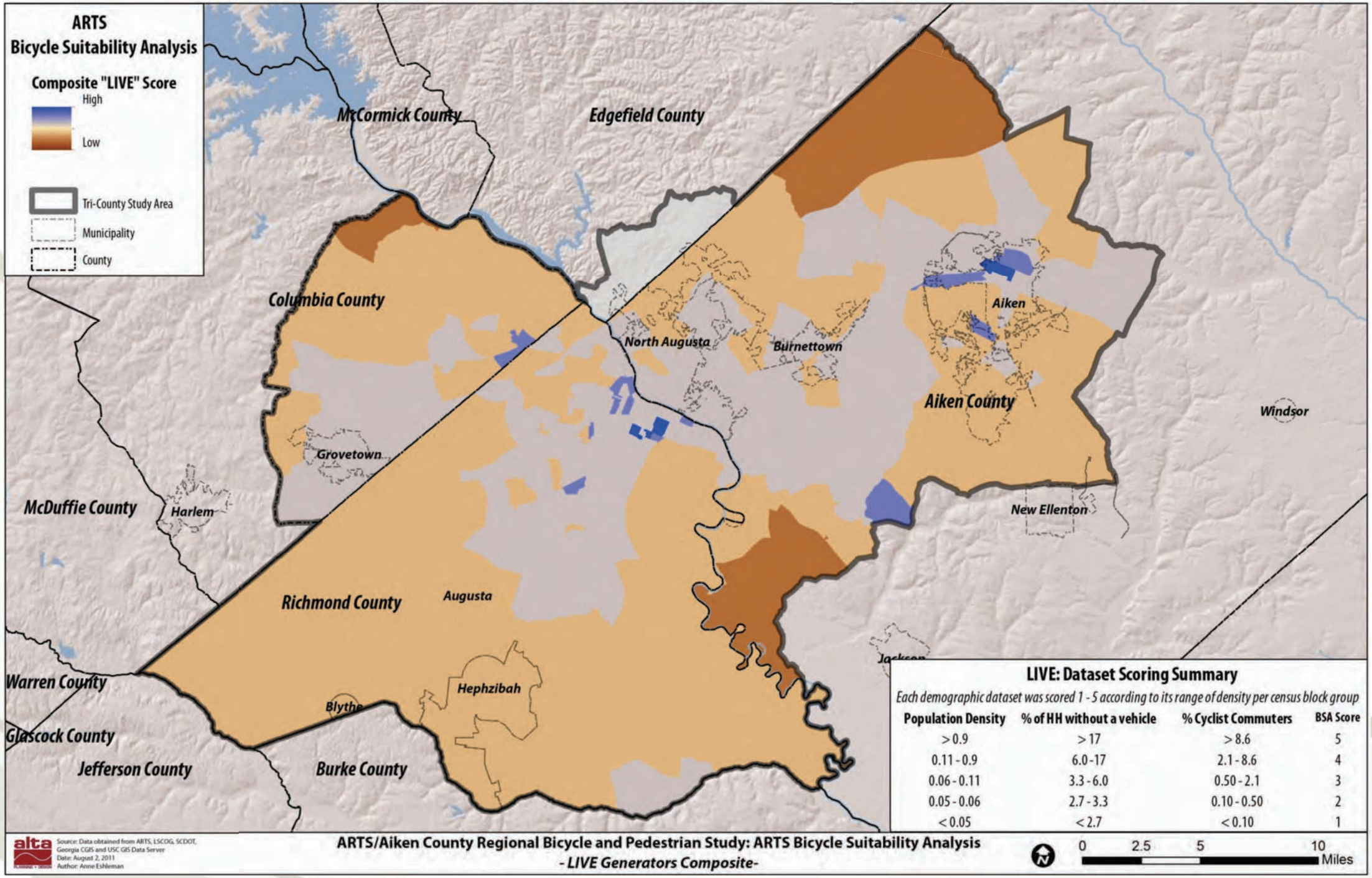

Figure G-2: ARTS Work Map- Bicycle

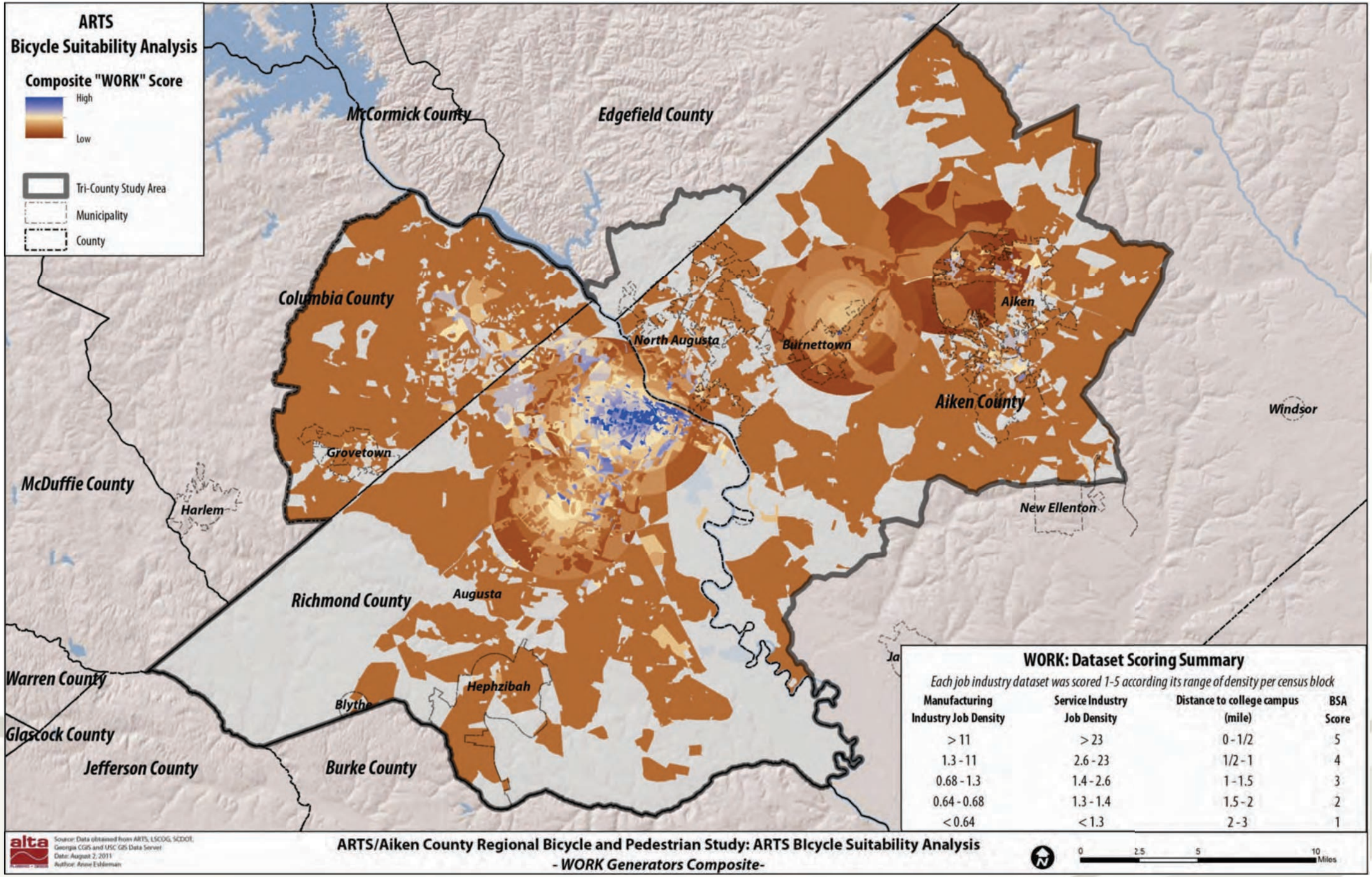

Figure G-3: ARTS Transit Map- Bicycle

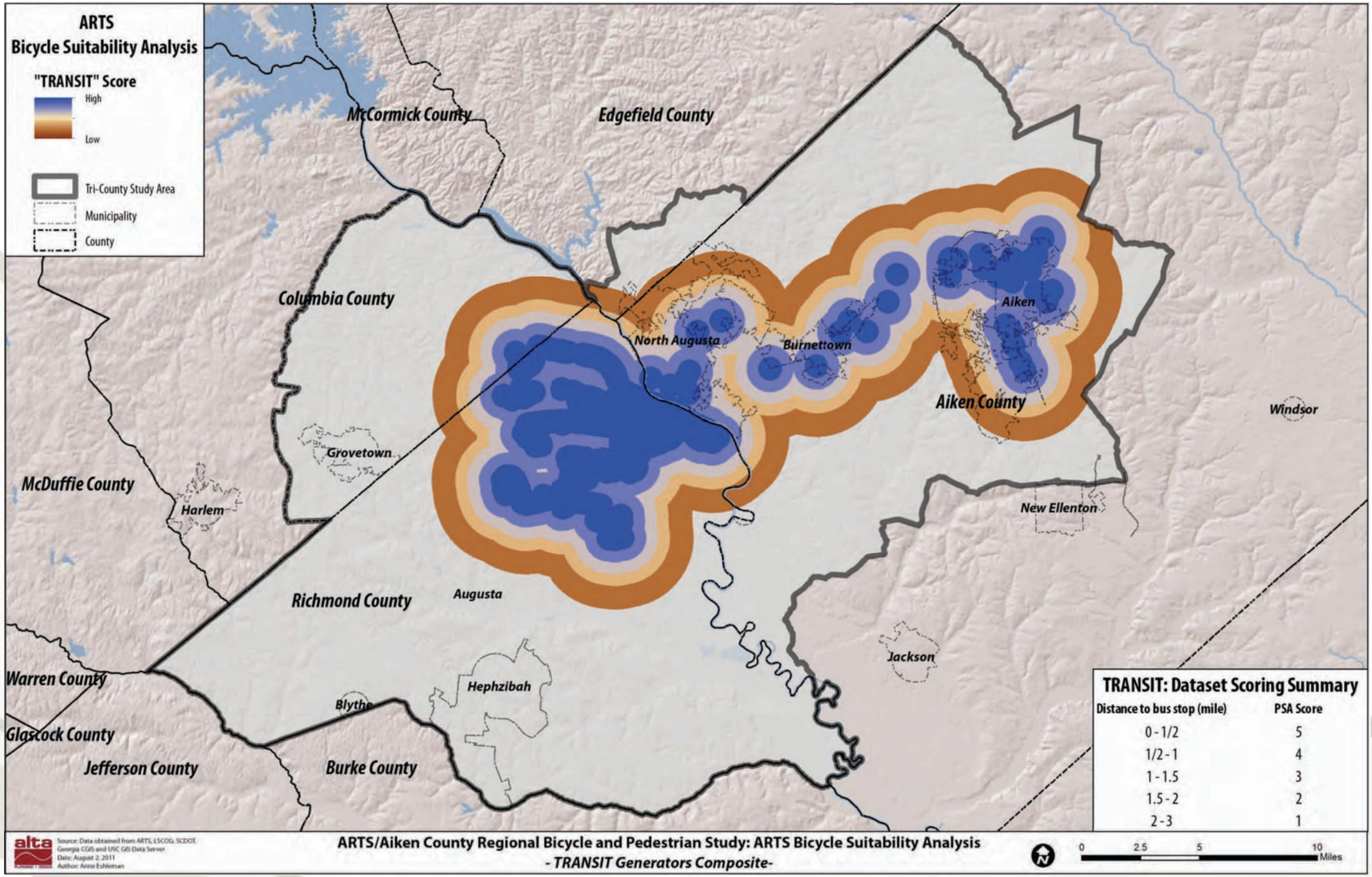

Figure G-4: ARTS Play Map- Bicycle

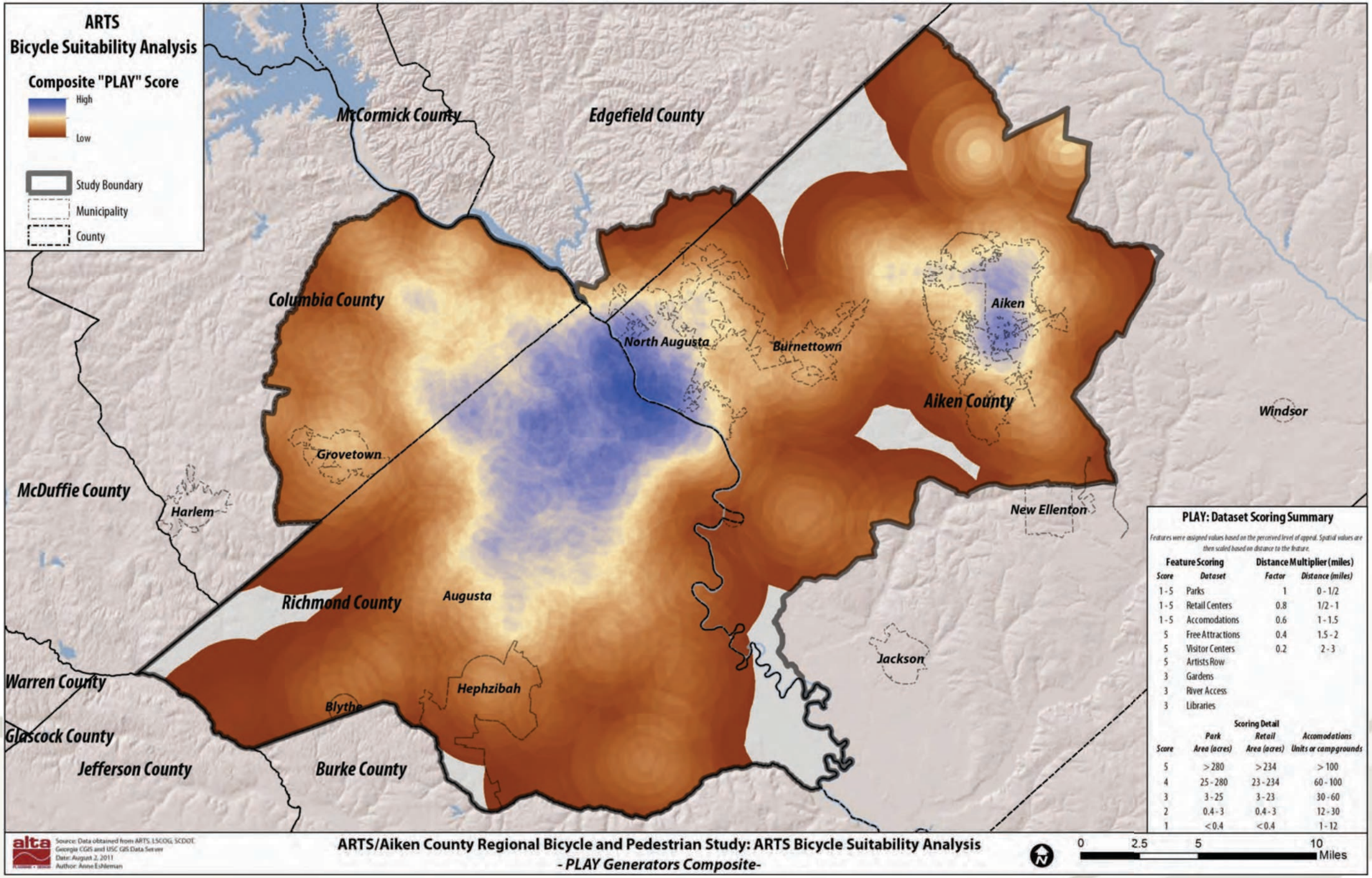

Figure G-5: ARTS Roadway Quality Map- Bicycle

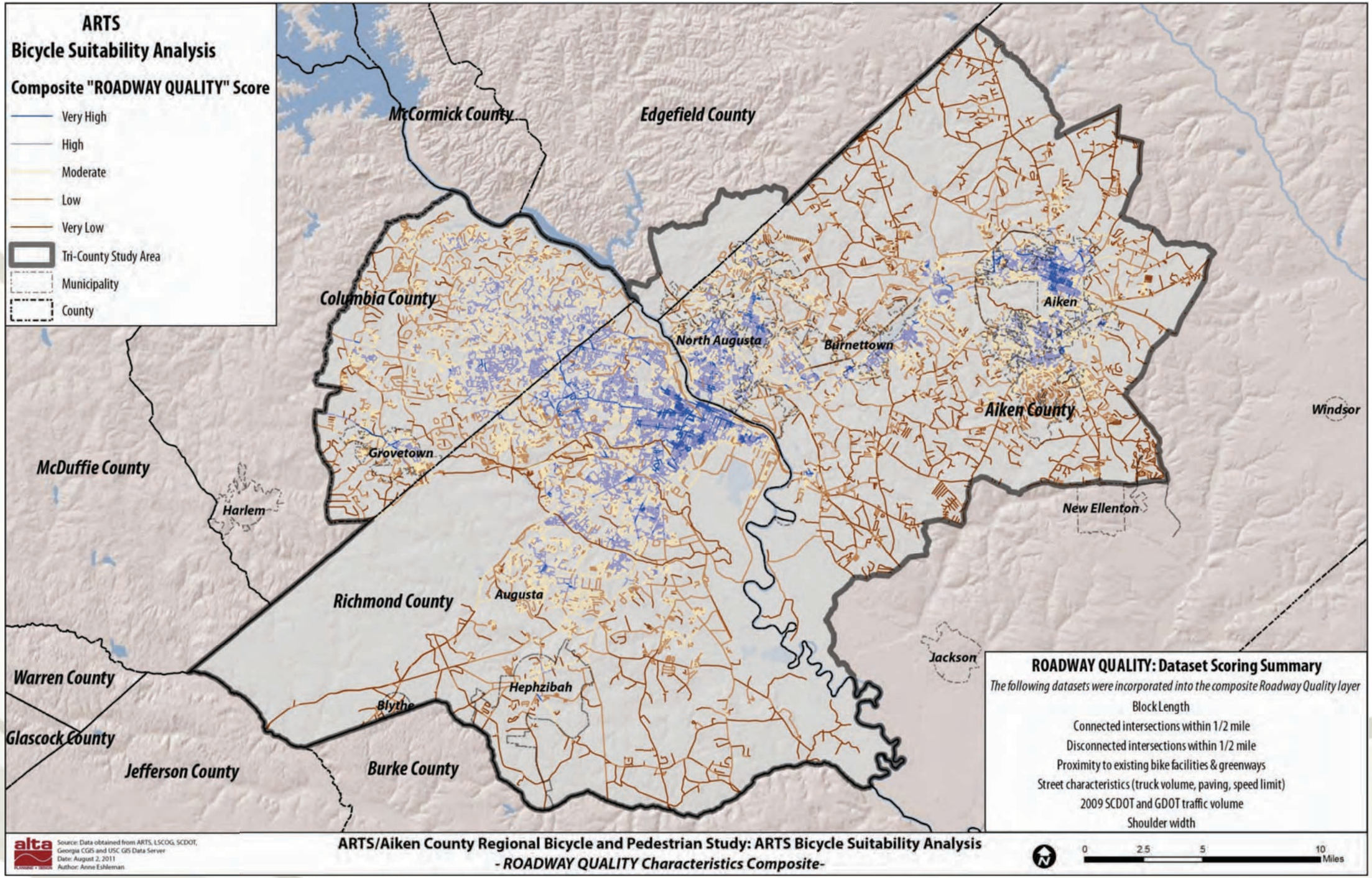

Figure G-6: ARTS Live Map - Pedestrian

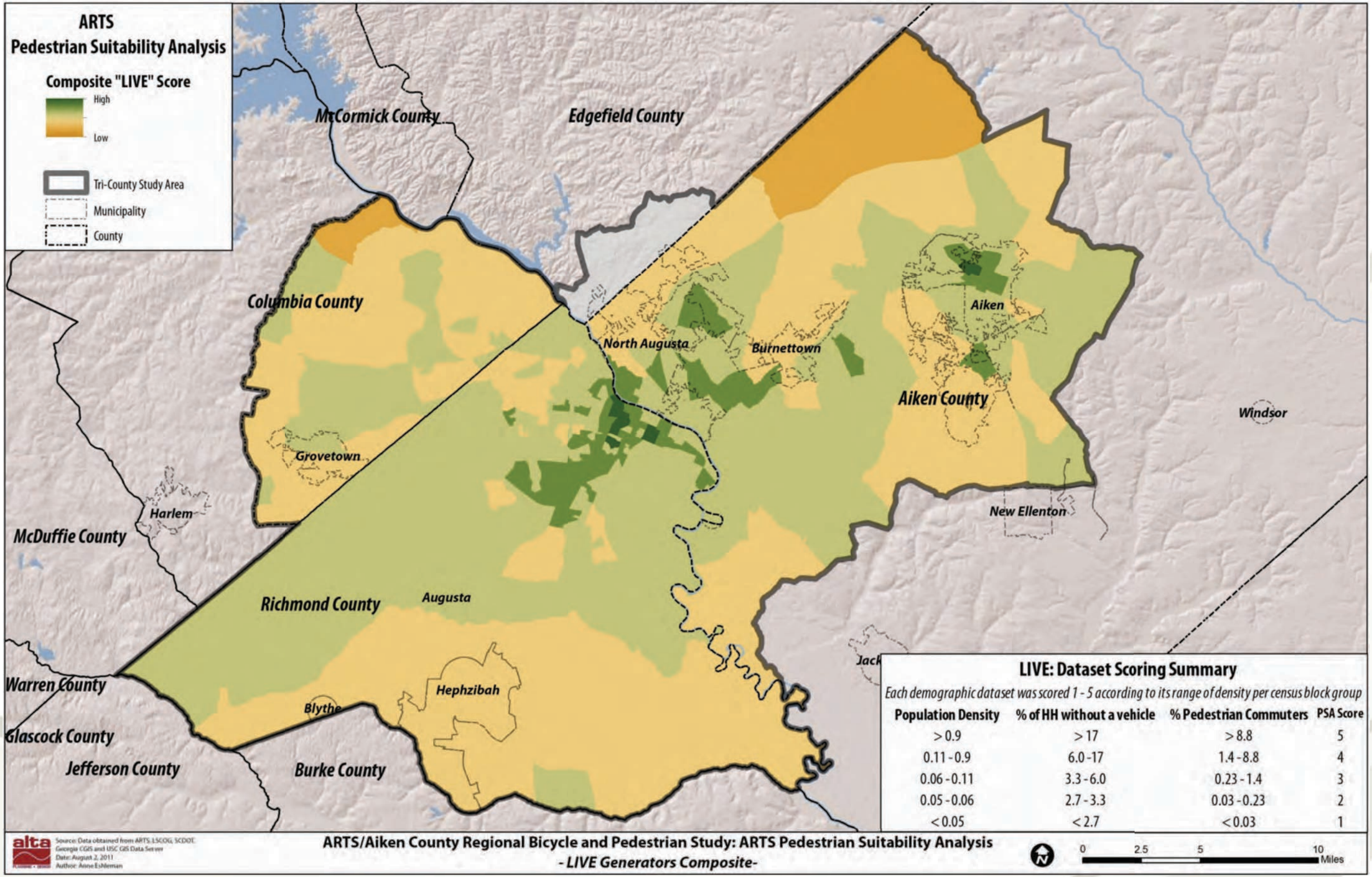

Figure G-7: ARTS Work Map - Pedestrian

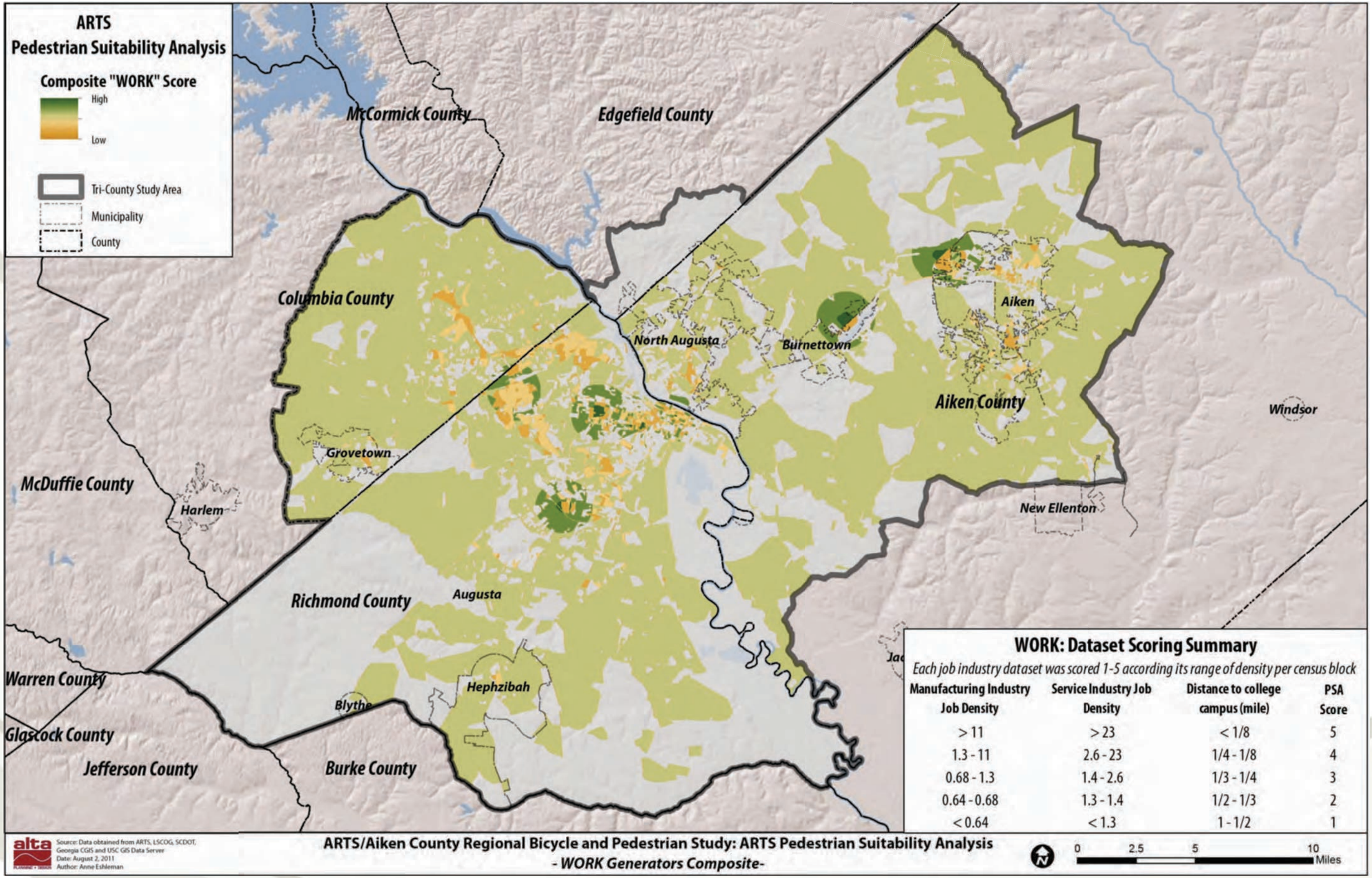

Figure G-8: ARTS Transit Map - Pedestrian

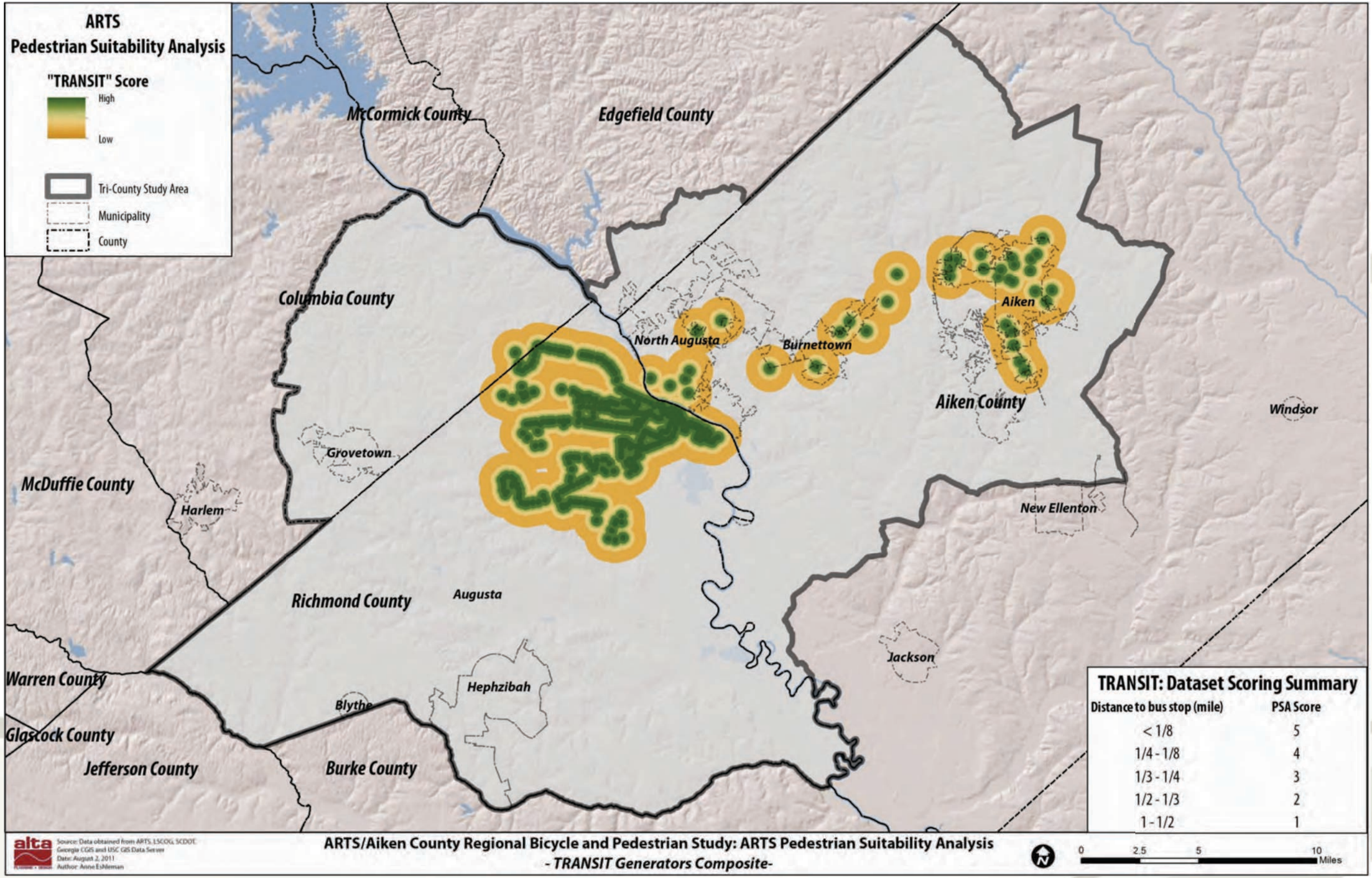

Figure G-9: ARTS Play Map – Pedestrian

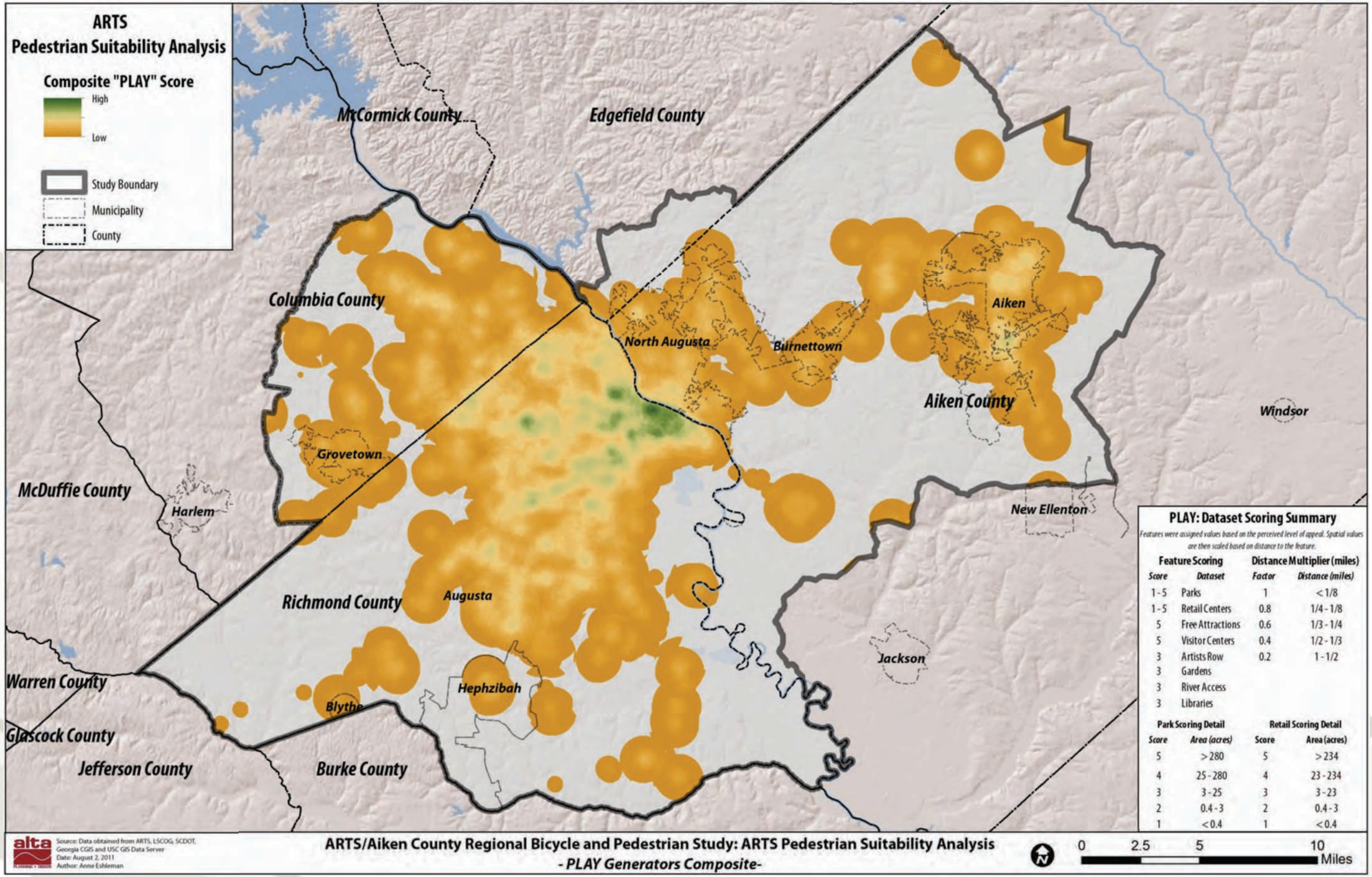
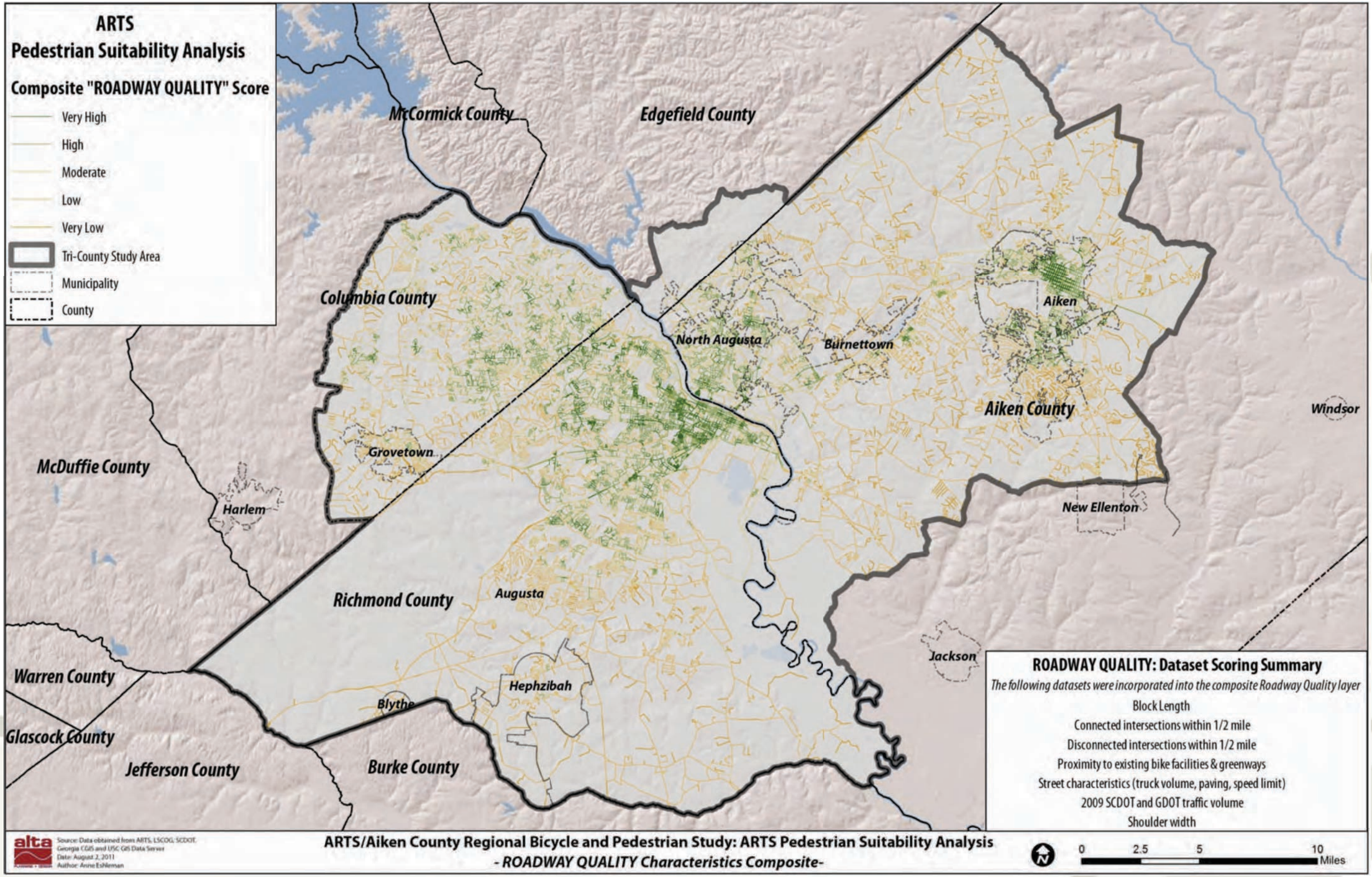
Figure G-10: ARTS Roadway Quality Map - Pedestrian