CITY OF ANDERSON Downtown Bicycle and Pedestrian Connectivity Plan



PLANNING + DESIGN





This page left intentionally blank



Acknowledgements

Public Participants

Thank you to the many City of Anderson leaders and citizens who participated in this planning process through comment forms, interviews, and public meetings. Thanks also to the many individuals of the press and those engaged in social media throughout the process.

Project Partners

Anderson Area Transportation Study (ANATS)

City of Anderson

City of Anderson Recreation Department

Downtown Anderson Main Street



Project Steering Committee

The City of Anderson Recreation Department appointed an Advisory and Steering Committee for development of the City of Anderson Downtown Bicycle and Pedestrian Connectivity Plan. This committee includes representatives of the City of Anderson, Anderson University, AnMed Health, and citizen advocates and volunteers:

Randy Greer - Anderson University Bobby Beville - City of Anderson Melissa Fabry - Anderson citizen Ruth Ann Terry - City of Anderson Jim Simes - City of Anderson Adam Cromer - City of Anderson Harry Thompson - Anderson citizen John Moore - City of Anderson Andrew Cannon - Resident

Project Consultants

John Cock, Principal in Charge Blake Sanders, Project Manager Jean Crowther, Senior Planner



1 Augusta Street, Suite 301-C Greenville, SC 29601 David Glymph - AnMed Health Gary Knight - 3 Cross Tri Mike Gay - City of Anderson Maurice McKenzie - City of Anderson Beth Batson - City of Anderson Arlene Young - City of Anderson Danny Bufkin - Anderson citizen Linda McConnell - City of Anderson

Allison Bullock, Planner

Katie Lloyd, Designer



Table of Contents

1: Introduction & Vision	1-1
Plan Overview	1-1
Setting	1-2
Planning Process	1-2
Vision and Goals	1-3
The Six E's Approach	1-4
2: Existing Conditions	2-1
Introduction	2-1
Data Collection and Base Map	2-1
Planning and Policy Review	2-1
Community Identified Needs	2-5
Opportunities and Constraints	2-6
3: Recommendations	3-1
Overview	3-1
Recommended Facility Types	3-1
Recommended Priority Bikeway, Walkway, & Greenway Corridors	3-4
Priority Project Cutsheets	3-8
Other Recommendations	3-13

4: Implementation	4-1
Overview	4-1
Actions Steps for Implementation	4-1
Infrastructure Action Steps	4-4
Appendix A: Benefits of Bicycle, Pedestrian, and Greenway Investments	A-1
Appendix B: Public Input	B-1
Appendix C: Wayfinding and Signage Recommendations	C-1
Appendix D: Management and Maintenance Best Practices	D-1
Appendix E: Potential Funding Sources	E-1
Appendix F: Design Guidelines	F-1
Appendix G: Review of Existing Planning Efforts	G-1



"The City of Anderson Downtown Bicycle and Pedestrian Connectivity Plan envisions a connected network of on- and off-street bikeways, walkways, and trails that provide safe and family-friendly access between Downtown and community destinations for all ages and abilities. The Plan supports the City of Anderson's Downtown vision for becoming a destination for bicycling, walking, and trail activity for both transportation and recreation."

offee

Sweets

1: Introduction & Vision

Plan Overview

Downtown Anderson Bicycle and Pedestrian The Connectivity Plan was developed to provide a vision, goals, and recommendations for priority on-street and off-street bicycle and pedestrian facilities within Anderson's downtown and priority connections to key destinations immediately surrounding the downtown area. The Plan combines past planning efforts with new research and analysis, and includes comprehensive public input. A proposed on- and off-street bikeway, walkway, and trail network is included in this Plan, as well as recommended policies and programs to encourage usage of the bikeway, walkway, and trail network and to promote safe bicycling, walking, and driving practices and a robust culture of active living. These combined elements establish a complete, up-to-date framework for moving forward with improvements to Anderson's active transportation and recreation environment.

The City has participated in a series of significant planning efforts in the last decade, including a *Comprehensive Recreation Master Plan, Eastside Recreation Master Plan, and Recreation Center Master Plan.* The *Downtown Anderson Bicycle and Pedestrian Connectivity Plan* builds upon these plans. The focus of the current plan is integrate the recommendations of prior plans, identify implementable infrastructure projects **to improve bicycling and walking connectivity in the city center, and identify trail alignments that will serve as key corridors for both active transportation and recreation for the City.** The recommended projects will link residents, students, and visitors to parks, schools, health campuses, *Anderson University and downtown retail and employment* destinations in Anderson. Though the City's downtown area has an existing sidewalk network, the infrastructure includes significant sidewalk gaps and unsafe or uncomfortable crossings. The City currently has limited on-street bicycle facilities or offstreet greenways (shared-use paths). However, downtown Anderson boasts a traditional, connected street grid and low-volume neighborhood streets that provide a strong basis for a bicycle and walking route network. Anderson's existing trail segments – the AnMed campus trail, the East-West Connector Greenway, and the shared-use pathway through Linley Park – and abundant natural resources present an opportunity for a scenic greenway network.

These conditions provide the basis for a complete, connected, and inviting bikeway and walkway network for downtown Anderson with signature greenways extending outward and linking the broader community. When combined with Anderson's vibrant downtown, numerous destinations, and nearby parks, **this plan will provide the foundation for Anderson to become the Upstate's next bicycle- and walk-friendly community.**



Setting

Located in the Piedmont region of South Carolina, the City of Anderson has a population of 26,686 and covers an area of 14.6 square miles. The city is home to Anderson University, which has an undergraduate population of approximately 2,600. The city is situated near Interstate 85 and is served directly by U.S. Highway 76 and U.S. Highway 29. Lake Hartwell is located along the city's northern border and is an attraction for hiking, camping, fishing, boating, and biking. The nearby Blue Ridge Mountains also draw people to Anderson and the region.

Major destinations, recreation facilities, and cultural resources include several local farms and orchards, city parks, Sadlers Creek State Recreation Area, Portman Marina, Anderson Art Center, Electric City Playhouse, Rainey Fine Arts Center, golf courses, and museums and galleries.

The City of Anderson currently has 6.6 miles of greenway trails, including trails within county owned and operated recreational facilities within the City of Anderson. Local trails include park trails in Jefferson Avenue Park, Whitehall Park, and Linley Park, the East-West Connector Greenway, and the AnMed Health North Campus loop trail.

The City of Anderson Downtown Bicycle and Pedestrian Connectivity Master Plan builds upon these strengths of the existing community. Chapter 2 of the Plan provides more information about existing bicycling and walking conditions in the City of Anderson, including the principal opportunities and constraints for improving the bicycle and pedestrian environment.



Planning Process

The City of Anderson Downtown Bicycle and Pedestrian Connectivity Steering Committee guided the development of the City of Anderson Downtown Bicycle and Pedestrian Connectivity Plan. The committee is made up of citizen advocates and representatives from multiple stakeholder organizations and local groups. The committee met several times throughout the process and provided guidance on the overall vision, facility recommendations, programs, policies, and draft plan development.

Data Collection and Analysis

The staff of the City of Anderson, its associated metropolitan planning organization (ANATS), and various stakeholders provided baseline information about the existing conditions of the City of Anderson. Through aerial photography, geographic information systems (GIS) data, and on-theground field investigation, the project consultants identified opportunities and constraints for bicycle, pedestrian, and greenway facility development. Field research also included examining potential trail corridors, verifying certain road widths, studying lane configurations, and preparing a photographic inventory. A review of planning documents, polices, existing bicycle and pedestrian studies, and existing cultural and recreational programs supplemented the analysis of the physical environment.

Public Involvement

Outreach to the citizens and visitors of the City of Anderson included three public workshops, an online and hard-copy citizen comment form, and progress updates provided through the City of Anderson websites. Public workshops and information gathering were provided at the Downtown Anderson Block Party, Downtown Business Association Meeting, and various monthly community meetings. For development of this Plan, the City of Anderson Advisory and Steering Committee provided a key source of public input. Two Steering Committee meetings provided useful information about public concerns and preferences. Throughout the planning process, the project team shared information about key events and activities related to the Plan with local media.



Gathering feedback on bicycling and walking conditions in Anderson during a Steering Committee meeting

Plan Development

The recommendations of the draft Plan reflects input from the public, the Advisory and Steering Committee, City of Anderson staff, past planning efforts, and the existing conditions analysis. The Advisory and Steering Committee reviewed and commented on the initial draft, which was also made available for public review via the City of Anderson website and the final public workshop. The project consultants revised the Plan based on feedback received and presented its analysis and recommendations to local elected officials of the City of Anderson.

Vision and Goals

The Advisory and Steering Committee discussed overarching goals and described desired outcomes of the Plan. Input from the committee as well as public comments were combined into the following overall vision statement for this Plan:

"The City of Anderson Downtown Bicycle and Pedestrian Connectivity Plan envisions a **connected network of onand off-street bikeways, walkways, and trails** that provide **safe and familyfriendly access** between Downtown and community destinations for all ages and abilities. The Plan supports **the City of Anderson's Downtown vision for becoming a destination for bicycling, walking, and trail activity** for both transportation and recreation."

Specific goals for the outcome of this Plan include:

- Develop a community network of on- and off-street walkways, bikeways, and trails designed for all ages, abilities, and user groups;
- Capitalize on existing natural resources, including Cox Creek and Rocky River, recreation and historical amenities such as the Anderson Recreation Complex and Eastside Recreation Center, and the attractiveness of Downtown Anderson;



- Improve the safety and comfort of bicycling and walking routes to destinations identified by the City of Anderson, including the AnMed Health North Campus, Transit Center, Courthouse Annex, Westside Community Center, Anderson University, and Anderson Recreation Center;
- Ensure that bikeways, walkways, and trails are clean, inviting, and family-friendly;
- Establish a connected network of primary bicycling and walking routes and spur trails that link to identifiable community destinations;
- Promote bicycling, walking, and trail usage for both recreation and transportation; and
- Improve bicycle and pedestrian access between neighborhoods.

The Six E's Approach

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. 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 E's" approach as a guiding framework.



Attractive pedestrian facilities, like this wide brick sidewalk in downtown Anderson, promote a walk-friendly environment

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 walkfriendly 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. Monitoring implementation of this Plan on a regular basis and establishing policies that ensure longterm investment in the bikeway and walkway network are critical to effective evaluation. Monitoring progress of implementation will facilitate continued momentum and provide opportunities for updates and changes to process if necessary.



Education courses encourage more people to bicycle and to do so in a safe manner

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.





2: Existing Conditions

Introduction

This chapter provides an overview of the major components of the existing environment for bicycling, walking, and trail usage in the City of Anderson. The assessment of existing conditions is based on information collected primarily from previous planning efforts, existing regional geographic information systems (GIS) data, field work, aerial imagery, and input from the Project Steering Committee and stakeholders.

The existing conditions analysis includes the following three elements: Data collection and base map; Planning and policy review; and Community identified needs. The chapter concludes with an overview of strengths and challenges of the existing environment for bicycling, walking, and trail activity in Anderson.

Data Collection and Base Map

The project team gathered information about existing and proposed greenways, bikeways, and sidewalks within the City of Anderson. The team also collected geographic data related to existing and proposed recreation facilities, capital improvement projects, and community destinations, such as schools and employment centers. The culmination of this effort is a base map of existing conditions in Anderson, shown on page 2-2 and 2-3.

The base map illustrates the existing opportunities for bicycling and walking for transportation and recreation, as well as the spatial relationship of residential areas to local destinations. The map serves as a useful tool for examining key opportunities and constraints for creating safe, connected, and convenient network of bikeways, walkways, and trails.



Existing sidewalk and crosswalk

Planning and Policy Review

The bicycling and walking environment in the City of Anderson is affected by existing codes, ordinances, and long-range planning efforts. This section provides a summary of planning efforts relevant to the bicycle, pedestrian and trail network.





Data obtained from City of Anderson and Alta Planning + Design Map created May 2014 $\mathbf{\mathbf{b}}$

1 Miles

Existing Bike Lane

----- Red bus line Central Business District Lakes

Parks



Planning Review

This section provides a summary of bicycle and pedestrian planning efforts in the City of Anderson, and related planning for Anderson County. Five relevant plans, a Complete Streets Ordinance, and a series of conceptual master plans exist. The city is updating their comprehensive plan and LRTP as of this review. The five plans reviewed for this Plan are listed in **Table 2-1**. A full summary of the plans is provided in **Appendix G**.

Key Findings

The City of Anderson is included in county-wide planning efforts, including the Long Range Transportation Plan. The City has also produced a number of planning documents that focus exclusively on the city itself. Both types of documents discuss provision for multi-modal transportation options, although the extent to which this theme appears varies from plan to plan. The city and county are committed to **improving citizens' quality of life,** something which the planning documents define



Documents reviewed for the plan: Imagine Anderson 20-Year Vision Plan and Recreation Master Plan



according to a variety of definitions. **Health, economic vitality, environmental awareness, place-making, and strategic land-use planning are major themes** throughout the documents. Enhancing transportation planning can provide a confluence of these and other themes. In the City of Anderson, transportation planning is not just a means of traveling from one end of the city to another. Incorporating a Complete Streets-focused approach throughout the City's planning processes, manuals, and other documents will augment the City's other efforts towards providing an attractive place to live and visit.

- The public comment cards collected during the Long Range Transportation Plan coincide with this Plan's recommendation to prioritize a shared-use path extension. Comments collected during this process also show wide support for on-road facilities; 81% said "bike lanes along roadways" were "very important".
- The City of Anderson's current branding depicts the city as a vibrant and desirable place. Incorporating recommendations that encapsulate a Complete Streetsoriented and active living philosophy to transportation planning correlates with the city's current identity.
- The Recreation Master Plan calls for 74.4 total miles of greenway trails and street-based facilities.
- The Anderson County Vision Plan's public input process was particularly robust and included a variety of contributors' voices. The Eat Smart Move More Anderson County initiative takes a similar stance towards public participation. These documents create

Planning and policy review assessment of bicycle and pedestrian-related planning documents

Plan	Agency	Year
Long Range Transportation Plan	ANATS	2010
2008 City of Anderson Recreation Master Plan	City of Anderson	2009
Imagine Anderson Twenty Year Vision Plan	Anderson County	2008
City of Anderson Complete Streets Ordinance	City of Anderson	2009
Eat Smart Move More Anderson County Action Plan	Anderson County	2012
Destination Downtown, City of Anderson Downtown Master Plan	City of Anderson	2013

a **foundation of public dialogue and collaborative planning around issues of livability and active living** that will provide additional talking points regarding the implementation of the Downtown Bicycle & Pedestrian Plan.

Community Identified Needs

The City of Anderson's bicycling and pedestrian needs are diverse and depend on many factors including user age, trip purpose, physical ability, and level of cycling experience and confidence. Public outreach is an essential tool for identifying local community needs and desires and for developing a city-wide plan that addresses those priorities.

This section provides a summary of public input acquired through a citizen comment form that was made available at the public workshops and distributed throughout the community. The public workshops and citizen comment form provided opportunities for residents and visitors throughout the city to share their vision for the future of bicycling and walking in Anderson.

Citizen Comment Form

Key Findings

The citizen comment form for the Downtown Bicycle and Pedestrian Connectivity Master Plan contained 10 questions about respondents' perceptions of bicycling and walking, use of bicycling and walking facilities, and demographic information. A total of 58 people filled out and submitted the comment form. The bulleted list that follows presents the key findings of the survey results. For the full public input summary and comment form analysis, please see **Appendix B** of this Plan.

- When asked the question, "What type of biking facilities do you prefer?" the choice that received the greatest number of responses (35) was "Paved Greenways". The second and third most popular choices were "On-street Bike Lanes" (23 responses) and "Paved Shoulders" (22 responses).
- The destinations that survey respondents would most like to reach by walking or biking are Downtown events, parks, greenways, and restaurants.
- When asked the question, "What do you think are the biggest factors discouraging bikers and walkers?"

the most highly ranked answer was "Personal safety concerns," followed by "Lack of connected greenways, sidewalks, and bike facilities" and "Motor vehicle traffic."

- 84.5% of respondents have used a walking path or trail in Anderson before. Of these, 66.7% use paths or trails a few times a year, 23.1% use them once a month, 7.7% use them once a week, and 2.6% use Anderson trails or paths more than once a week.
- 60.3% of respondents have traveled outside of Anderson to use a trail or greenway. Of these, 77.8% travel a few times a year to use a trail or greenway elsewhere, 14.8% travel once a month, and 7.4% travel more than once a week to use a trail or greenway outside of Anderson.
- When respondents were asked, "Would you use trails more often if they were closer to you?" 87.7% answered "Yes".

of citizen comment form respondents would use trails more often if they were more accessible.

of citizen comment form respondents have traveled outside of Anderson to use a trail or greenway elsewhere.

Opportunities and Constraints

Overview

A variety of agencies, organizations, and partners have begun the work of improving the City of Anderson's bicycle, pedestrian, and greenway environment. Communitydriven political support for such improvements is evidenced through the city's commitment to becoming a regional destination in South Carolina, the education and encouragement work of the City of Anderson Recreation Department, and the City of Anderson's Complete Street policy.

In terms of infrastructure, the area's geographic characteristics, existing roadway configurations, and density of land uses significantly affect active transportation and recreation and the everyday decisions by bicyclists, pedestrians, and motorists. Steps taken to improve the City of Anderson's infrastructure include:

- SCDOT installed bicycle lanes on portions of Boulevard adjacent to Anderson University
- SCDOT installed 3.5 miles of greenway along the East West Connector, connecting Highway 81 to Highway 76/28.
- The City of Anderson installed 2500 linear feet of asphalt greenway through Linley Park, providing the first phase of a multi-phase project to connect this linear park to the City Recreation Center.
- The City of Anderson installed 1000 linear feet of asphalt greenway through Quarry Street Park, providing Phase of linear park project to connect Eastside Park to the Transit Center.



Existing park loop trail

Overall, however, there is a lack of connectivity between the City's existing bikeway, walkway, and greenway facilities. The bicycle lanes on Boulevard do not connect to other bicycle facilities or provide destination locations. Existing trail facilities at the Anderson Sports and Entertainment Center, Linley Park, and Quarry Street Park serve as loop trails but do not connect to on-street facilities or other off-street trails. Additionally, beyond the street grid of Downtown Anderson, neighborhoods have limited connectivity to one another.

Key infrastructure-related opportunities and constraints for the development of bicycle, pedestrian, and greenway facilities in Anderson are outlined on the following pages.



Opportunities

Railroad corridors: Railroad tracks provide a continuous linear corridor of undeveloped land. Abandoned rail lines offer a right of way suitable for developing rails-totrail greenways, while active rail lines may present an opportunity for a rail-with-trail greenway.

Utility and riparian corridors: Utility easement corridors, such as those afforded by gas lines, power lines, and sewer or water lines, provide a linear right of way suitable for developing greenways. Utility companies may require adherence to their own unique design guidelines for a trail within their easement corridor. In addition, riparian corridors offer similar opportunities, providing linear park-like space not suitable for vertical construction.



Existing greenway in Linley Park



Wide roadway with room for bicycle facilities

Roadway/lane widths: Some roadways in the City are wide enough to offer bicycle lanes or other bicycle facilities without the need to add additional pavement width.

Low-volume roads: The City of Anderson has numerous residential areas with low traffic volumes and low traffic speeds. This includes traditional neighborhoods near Downtown Anderson as well as less dense residential areas closer toward municipal boundaries

Cultural/Recreational facilities: Existing loop trails at destinations such as the Anderson Sports and Entertainment Center, Linley Park, and Eastside Park can be leveraged through linking to a broader citywide bicycle, pedestrian, and greenway network.



Utility easement corridor



Existing marked trail crossing in Linley Park

Constraints

Sidewalk gaps and lack of designated bicycle lanes: Numerous gaps in the sidewalk system exist, leaving some neighborhoods and destinations disconnected from other areas. In many cases, worn foot paths may be observed where there is no sidewalk, indicating use and need. Bicycle lanes are sporadic in nature and provide no connectivity to Downtown or city destinations.

Narrow sidewalks: A majority of existing sidewalks meet only minimum width requirements. Sidewalks measuring five feet or less in width that do not offer a buffer provide minimal comfort for pedestrians along corridors with moderate to high traffic volumes or traffic speeds.



A worn footpath along Murray Avenue adjacent to the Anderson County Farmers Market is a sign of pedestrian activity and demand for a sidewalk

Lack of crossing facilities: Incomplete crossing facilities are commonplace lacking high-visibility crosswalks, adequate curb ramps, refuge medians, or countdown signals.

Multi-lane roads: There are several commercial corridors with four or more travel lanes. The roadways provide access to commercial, retail, and office destinations that attract bicycle and pedestrian trips. The current roadway configurations do not provide a safe place for bicyclists traveling along or crossing these roads. Pedestrians face extended crossing distances and multiple conflict points at each intersection and few mid-block crossing opportunities. Examples of this can be seen along sections of Murray Avenue, Fant Street, Highway 81, Clemson Boulevard and McDuffie Street.



Multi-lane roadway with narrow sidewalk, no bicycle facilities, and a lack of crossing facilities



Roadway lacking wide sidewalks and bike lanes



3: Recommendations

Overview

This chapter lays out the recommended priority pedestrian and bicycle network to downtown and key destinations. The network recommendations build upon current and past planning efforts and were identified through input from the community, the Project Steering Committee, and the needs analysis. Reflecting the vision and goals of this Plan (see **Chapter 1**), the proposed improvements will make bicycling more comfortable and accessible for bicyclists of all skill levels and trip purposes and create walkable communities throughout the City.

Network improvements include infilling deficient or nonexistent sidewalks, establishing a formalized bikeway system, and creating signature off-street trails and greenways. This chapter is organized as follows:

- Recommended facility types: a description of each type of facility included within the proposed network
- Priority bikeway, walkway, and greenway connectors: an overview of the proposed pedestrian and bicycle recommendations within Anderson

Recommended Facility Types Bikeway and Walkway Network

The network recommendations of this Plan include approximately 10.38 miles of new on-street bikeways (including bike boulevards, bike lanes, etc.) and 13.72 miles of new off-street shared-use paths/greenways. Each mileage of new facility will increase the City of Anderson's bicycle and pedestrian network connectivity and help to create a comprehensive, safe, and logical network.

Shared-use paths/greenways will serve pedestrians, as well as other user groups. The proposed on-street bikeways were developed with consideration for roadway widths, traffic volumes and speeds, and connections to destinations. Brief descriptions of each facility type recommended for Anderson are provided below. For a comprehensive guide to design and implementation of these facilities, see **Appendix F: Design Guidelines**. **Sidewalk** Located within the roadway right of way, sidewalks serve pedestrian users and are a critical component of creating a walkable community. For the safety of pedestrians, as well as bicyclists, it is not recommended that adult bicyclists ride on sidewalks. In some areas, including downtown, bicycling on sidewalks is prohibited.

Shared-Lane Markings (Sharrows) Shared lane markings, or "sharrows," are placed in a linear pattern along a corridor, typically every 100-250 feet and after intersections. They make motorists more aware of the potential presence of cyclists; direct cyclists to ride in the proper direction; and remind cyclists to ride further from parked cars to avoid 'dooring' collisions.

Bicycle Boulevards Rather than a specific bicycle facility type, these routes contain combinations of facilities along quiet neighborhood streets with low motor vehicle traffic volumes and speeds. This Plan recommends bike boulevards as more comfortable bicycling alternatives to busier high-speed roadways to connect to trails, other bicycle facilities, and key destinations.

Bicycle Lanes A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists. The minimum width for a bicycle lane is four feet; five- and six-foot bicycle lanes are typical for collector and arterial roads. Bicycle lanes can be striped on existing roadways, sometimes with modifications to travel lane widths and configuration. As a general practice, any local arterial or collector that is widened should incorporate bicycle lanes (or another separated bikeway, such as a cycle track) with speed limit reduction considerations.



Cycle Tracks Cycle Tracks are exclusive on-street bike facilities that combine the user experience of a separated path with the on-street infrastructure of conventional bike lanes. Cycle tracks are constructed in the roadway right-of-way and are separated from motorized vehicular traffic by a physical barrier, such as a concrete or landscaped buffer.

Shared-use Paths/Greenways Shared-use paths are completely separated from motorized vehicular traffic. They are generally constructed within undeveloped corridors, such as within parks, open spaces, waterways, or utility corridors, though they may be located within a roadway right-of-way. Shared-use paths include bicycle paths, rail-trails or other facilities built for bicycle and pedestrian traffic.

Table 3-1 Lists the types of bikeway and walkway facilities and the mileage of those facility types for the recommended priority bikeway, walkway, and greenway connectors for the City of Anderson.

Facility Type	Proposed Mileage
Shared Lane Markings/Sharrows	0.78
Bicycle Boulevards	1.71
Bicycle Lanes	3.99
Bicycle Lane/Road Diet	2.48
Cycle Tracks	1.42
Shared-use Paths/Greenways	13.72
Total Proposed Network Mileage	24.10

Table 3-1: Proposed mileage of recommended facility types

Bicycle Parking

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

- 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.
- Partner with local landowners to prioritize bicycle parking at destinations for bicyclists. Priority destinations would include downtown, commercial areas, farmers market and grocery store locations, and key employment destinations, such as AnMed and Anderson University.
- Adopt local policies to ensure long-term investment in bicycle parking. This action step is discussed further below.

The City of Anderson would benefit from establishing bicycle parking requirements and standards within local codes and ordinances. 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. This Plan recommends that Anderson consider a land use-based approach with location-specific measures of supply such as parking spaces per square footage of retail. 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 City of Anderson, Table 3-2 does not reflect the higher bicycle parking rates from the Bicycle Parking Guide.

Table 3-2: 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		
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



Recommended Priority Bikeway, Walkway, & Greenway Corridors

The recommended bicycle and pedestrian network is illustrated in the maps on pages 3-6 and 3-7. The network represents a connected system that will allow transportation and recreation-based bicycle and pedestrian travel to key destinations in Anderson. The proposed facilities include sidewalks, shared-use paths/greenways, and several on-street bicycle facilities that serve to connect people and neighborhoods to local destinations. The network gives special attention to the bicycling and walking destinations identified as priorities through this planning process, such as downtown, Anderson University, AnMed, schools, parks, and other centers of activity.

Priority Projects

Table 5-4 lists five priority projects for this Plan, listed in no particular order, that are key links in developing Anderson's bikeway, walkway, and greenway system. It is important to note that, based on the research, analysis, and public input documented of this Plan, the entire proposed network has evidenced merit. All remaining proposed projects not listed as priority projects play an important role in completing the vision of the bicycle, pedestrian, and greenway network. These projects should be considered mid- to long-term projects and should be considered for implementation whenever a time-sensitive opportunity arises (such as a planned road widening, road resurfacing, new development, or land easement/acquisition opportunity).

Project Name	Facility Type	Length (Miles)	Cost Estimate	Implementation Strategy
Founders Heritage Trail	Shared-use Path	4.10	\$1,360,000	Private property recreation easement along sewer easement
Sun Trail	On-street Bicycle Facility	2.39	\$101,000	Lane reconfiguration, striping, and restriping along arterial roads
Fant Street Cycle Track	On-street Bicycle Facility	2.42	\$2,485,000 for cycle track/\$55,000 for bike lane connections to Fant Street	Roadway reconstruction, lane reconfiguration and restriping
Electric City Rail Trail	Rail-to-Trail Conversion/ Shared-use Path	2.70	\$1,106,000	Private property recreation easement along Duke Energy overhead power easement
Whitner Creek Greenway	Shared-use Path	2.34	\$1,268,000	Stormwater flume easement and private property owner coordination
	Total Length	13 95 miles		



3-4

Priority Project Cut Sheets

The five priority projects chosen for this plan are described in further detail on pages 3-8 to 3-12 with project cut sheets and custom photo renderings.











Founders Heritage Trail

Facility Type: Shared-use Path

Length: 4.10 miles

Cost Estimate: \$1,360,000

Implementation Strategy: Private property recreation easement along sewer easement

Description: The Founders Heritage Trail is a critical greenway, connecting Anderson University to the Anderson Area YMCA and AnMed North Campus through multiple residential neighborhoods and commercial corridors. The greenway will begin on the proposed Anderson



University Athletic Campus, paralleling Orr Street until the intersection of Cox Creek. The greenway will cross Old Williamston Road (signalized mid-block crossing) and parallel Cox Creek along a sanitary sewer easement. Special consideration should be given to the property owners and adjacent impacts along this easement. The greenway follows the easement, crossing Cox Creek nearest the intersection of Rantowles Road and Pelham Lane. This creek crossing allows access to Rantowles Road for a side path construction to the intersection of Greenville Street (Highway 81). The greenway will cross at the existing traffic signal with improved high-visibility crosswalks and parallel Greenville Street for 200 LF until the sanitary sewer easement becomes accessible. The greenway will parallel Cox Creek to Reed Road with potential spur trail access points to Wendover Way, Terrace Drive, Governors Way, and Avenue of the Oaks. At Reed Road the greenway will serve as a sidepath to the Intersection of Greenville Street (Highway 81). The greenway will use the existing traffic signal with improved high-visibility pedestrian crosswalks to access AnMed's North Campus and the Anderson Area YMCA. This greenway involves collaboration with existing land owners, although the City of Anderson retains an easement for most of the corridor along Cox Creek. Construction and maintenance access easements will be required to construct and operate a greenway facility.



Sun Trail

Facility Type: On-street Bicycle Facility
Length: 2.39 miles

Cost Estimate: \$101,000

Implementation Strategy: Lane reconfiguration and size/ striping and restriping

Description: This on-street trail segment is critical in connection Anderson University to Downtown and to Linley Park. The proposed Sun Trail network expands from the Anderson University campus core, radiating out among arterial neighborhood streets. Bike lanes are proposed along Summit Drive south (0.25 miles) to North Street, North Street (0.50 miles) from Summit Drive to Orr Street, Orr Street (0.16 miles) from North Street to Williamston Drive, and East Marshall Avenue (0.52 miles) from Fant Street to North Street to connect to Downtown Anderson. The Sun Trail connecting to Downtown Anderson does not require lane reconfiguration, with striping of bicycle facilities occurring within the outer 5'-7' of existing travel lane upon approval by SCDOT, Anderson County, or the City of Anderson (Dependent upon road ownership). To connect to Linley Park, the bike lane continues along Boulevard (0.46 miles) across Greenville Street to the intersection of North Fant Street; sharrows continue along Boulevard (0.25 miles)

from North Fant Street until Ingles; street and parking lot improvements via signage, landscape and striping provide alternative connectivity to the traffic signal at North Main Street and West North Avenue; to connect to Linley Park (Phase Two), the crosswalk is improved to connect to buffered bicycle lanes (0.25 miles) until the intersection of North Murray Avenue. The Sun Trail connecting to Linley Park will require lane reconfiguration along West North Avenue. Other on-street facilities along this corridor will not require significant reconfiguration, with striping of bicycle facilities occurring within the outer 5'-7' of existing travel lane upon approval by SCDOT, Anderson County, or the City of Anderson (Dependent upon road ownership).





Fant Street Cycle Track

Facility Type: On-street Bicycle Facility

Length: 2.42 miles

Cost Estimate: \$2,485,000 for cycle track/\$55,000 for bike lane connections to Fant Street

Implementation Strategy: Roadway reconstruction, lane reconfiguration and restriping

Description: The Fant Street Cycle Track and associated on-road bicycle connections provide direction connections



from Downtown, Anderson University, and neighboring communities to the Courthouse Annex, Transit Center, Anmed Health System Downtown Campus and the Sun Trail. South Fant Street from Cleveland Avenue to East River Street is a combination of bike lane and sharrow striping (0.65 miles). North Fant Street, at the intersection of East River Street, will be converting from a 5-lane cross section to a 3 lane cross section with a landscape separated two-way cycle track. This reconstruction in roadway includes drainage and stormwater reconstruction and other sidewalk infrastructure. The cycle track will extend from East River Street, over Greenville Street, to North Boulevard. The Fant Street cycle tract facilities require lane reconfiguration and approval by SCDOT, Anderson County, or the City of Anderson (Dependent upon road ownership). Secondary on-street bicycle connections under 0.5 miles occur along the Fant Street corridor (East Calhoun Street, East Earle Street, East River Street, East Franklin Street, Hampton Street, and Cleveland Avenue). All of these on-street facilities provide cross town connections to existing and proposed facilities. These are not included as part of this cost estimate but should be considered important to the viability of the Fant Street Corridor.

CITY OF ANDERSON - DOWNTOWN BICYCLE AND PEDESTRIAN CONNECTIVITY MASTER PLAN



Electric City Rail Trail

Facility Type: Rail-to-Trail Conversion/Shared-use Path

Length: 2.70 miles

Cost Estimate: \$1,106,000

Implementation Strategy: Private property recreation easement along Duke Energy overhead power easement

Description: The Electric City Rail-to-Trail Conversion extends from the Rocky River Conservancy, through Anderson University, the Sun Trail, across the Fant Street Cycle Tract, to Linley Park. Originally abandoned during the 1970s-1980s, the railroad corridor has remained out of service, with property ownership reverting back to private property owners or being retained by the City of Anderson, Duke Energy, or local utility companies. Though potentially more costly, every effort should be made to maintain the greenway along the historic corridor. Further study with individual property owner coordination will be required to determine the true feasibility of this entire corridor. The Electric City Rail-to-Trail will traverse the 30-foot easement, crossing over at signalized, at-grade road crossings at Gossett Street, East Orr Street, Calhoun Street, Summit Street, Greenville Street, Fant Street, and North Main Street. This corridor connects Anderson University, Rocky River Conservancy, Linley Park, and the City Recreation Center.





Whitner Creek Greenway

Facility Type: Shared-use Path

Length: 2.34 miles

Cost Estimate: \$1,268,000

Implementation Strategy: Stormwater flume easement and private property owner coordination



Description: The Whitner Creek Greenway follows Whitner Creek starting at Southwood Park near the Westside Community Center. The greenway parallels the channelized creek to Southwood Street (0.51 miles). An at-grade crossing at Southwood Street, followed by an elevated pedestrian bridge crossing Whitner Creek provides connections to the Westide Community Center and Beatrice Thompson Park. The trail continues along the concrete flume (Whitner Creek) using at-grade signalized road crossings at Market Street, Highway 24, Bleckley Street, Lee Street, and East Mauldin Street. Whitner Creek Greenway would cross the concrete flume nearest the City Recreation Center to provide direct uninterrupted access to trail users and recreation visitors. The Whitner Creek Greenway will terminate at East Mauldin Street where the Linley Park Greenway provides a continual recreational or transportation amenity. This greenway involves collaboration with existing land owners, although the City of Anderson owns most of the adjacent property to Whitner Creek, to develop a trail adjacent to Whitner Creek. Construction and maintenance access easements will be required to construct and operate a City of Anderson greenway facility.

Other Recommendations

The following pages present other recommendations of this plan that are not included in the top priority project list but still serve as important connections to downtown and to key destinations in Anderson.



Boundary Street Bike Boulevard

Facility Type: Bicycle Boulevard

Length: 1.2 miles

Cost Estimate: \$60,000

Implementing Partners: SCDOT and City of Anderson

Description: The Boundary Street Bicycle Boulevard will be part of the extension of Linley Park, connecting the existing shared-use path to Whitehall Elementary and the Anderson Sports and Entertainment Center.





Earle Street Bike Lane

Facility Type: Bike Lane Length: 0.4 miles Cost Estimate: \$40,000 **Implementing Partners:** SCDOT, City of Anderson, Downtown Anderson business merchants

Description: The Earle Street Bike Lane will provide a direct on-street bicycle connection across Main Street and Downtown, connecting to the Fant Street Cycle Track and Murray Avenue. Further destinations along this corridor include the Anderson County Farmers Market, Arts Center, and Anderson Recreation Center.

3-14



Lindale Bike Lanes

Facility Type: Bike Lane

Length: 1.8 miles

Cost Estimate: \$180,000

Implementing Partners: SCDOT, City of Anderson, local residents

Description: The Lindale Bike Lane is an extension of the Fant Street Cycle Track through residential communities connecting to Concord Elementary, the Founders Trail, and Bellview Road. The Lindale Bike Lane occurs on Lindale Road and Camfield Road, This bike lane is readily achievable by the addition of a 6" white stripe due to the expansion roadway cross section.





Marshall Bike Lanes

Facility Type: Bike Lane
Length: 1.15 miles

Cost Estimate: \$115,000



Implementing Partners: SCDOT, City of Anderson, local residents, Anderson University

Description: The Marshall Avenue Bike Lanes connect Anderson University to the Fant Street Cycle Track and could become part of the Sun Trail (Phase Two). These bicycle lanes provide direct connections from Anderson University to the Electric City Rail Trail, Fant Street cycle Track, Anderson University recreational facilities, and the Transit Center. The bike lanes will occur on Marshall Avenue, North Street, and East Summit Avenue.


McDuffie Bike Lanes

Facility Type: Bike Lane via Road Diet

Length: 1.0 miles

Cost Estimate: \$200,000

Implementing Partners: SCDOT, City of Anderson, Downtown business merchants

Description: The McDuffie Street Bike Lanes will be most economically feasible when repaving occurs by SCDOT or the City of Anderson. This road diet will provide vehicular traffic calming and on-street bicycle facilities. Additional improvements include high-visibility crosswalks and additional streetscape enhancements.





Murray Bike Lane

Facility Type: Bike Lane

Length: 3.0 miles

Cost Estimate: \$300,000



Implementing Partners: SCDOT, City of Anderson, Downtown business merchants

Description: The Murray Avenue Bike Lane is an on-street facility that accompanies the shared-use path through Linley Park. This bike lane is achievable with current conditions as the outside vehicular travel lane can currently accommodate a bike lane. The Murray Avenue Bike Lane provides on-street connections to Linley Park, Anderson Recreation Center, Anderson Arts Center, and the Anderson County Farmers Market. North of Linley Park, the Murray Avenue bike lanes are achievable via lane reconfiguration during repaving by SCDOT or the City of Anderson.



McDuffie Bike Lane and Sharrows

Facility Type: Bike Lane, Shared Lane Markings (Sharrows)

Length: 0.65 miles

Cost Estimate: \$65,000

Implementing Partners: SCDOT, City of Anderson, local residents

Description: The McDuffie Street Bike Lane and Sharrows extend into the southern residential areas around downtown. Due to road width restrictions and topography, there are locations where the bike lane transitions to sharrow conditions. These facilities connect the Anderson 5 Career Center to the Downtown bicycle and pedestrian network. Additional sidewalk improvements, not included as part of the planning estimate above, are required to achieve full pedestrian access. These facility types occur from River Street to Cleveland Street.



Existing trail at AnMed Health North Campus

ANMED HEALTH

4: Implementation

Overview

This chapter defines a structure for managing the implementation of the City of Anderson Downtown Bicycle and Pedestrian Connectivity Plan. Implementing the recommendations of this plan will require leadership and dedication to bikeway, walkway, and trail development on the part of a variety of agencies. Equally critical, and perhaps more challenging, will be meeting the need for a recurring source of revenue. Even small amounts of local funding could be very useful and beneficial when matched with outside sources. Most importantly, the partners who have led this planning effort need not accomplish the recommendations of this Plan by acting alone; success will be realized through collaboration with state and federal agencies, the private sector, and other non-profit organizations.

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

Action Steps for Implementation

The following is a recommended organizational framework for managing implementation of the bikeway, walkway, and trails network. The structure is based on successful implementation strategies from around the southeast and the country. Suggested roles for the core types of stakeholders involved in implementation are described in later sections. Actual roles may vary depending on how this Plan is implemented over time and the ongoing level of interest and involvement by specific stakeholders.

Form a Bicycle, Pedestrian, & Greenways Advisory Committee

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

Bicycle, Pedestrian, & Greenways Advisory Committee (BPGAC) members should be chosen based on representation of key partner groups, key allies in the trail development process, and community leaders who value biking, walking, and trail facilities. Members should expect to contribute time, expertise, and resources towards accomplishing the tasks that lie ahead. Board members or key staff of partner non-profits, members of the Project Steering Committee, and representatives of large landowners may be likely candidates to serve on the BPGAC. The BPGAC should be a forum for leaders to convene periodically to discuss progress, share resources and tools, and otherwise coordinate planning and development activities for the recommended network. Members of the Steering Committee for this plan could provide the basis for a future BPGAC, with additional at-large citizens appointed for broad perspective.





Figure 4-1: Bicycle, Pedestrian, & Greenways Advisory Committee structure

Advance Communications Efforts

A subgroup of the BPGAC should focus on the communications element of network development. This involves celebrating successes in new construction and otherwise raising awareness of the biking, walking, and trail system and its benefits. A key first task of this group is to work with local partners to implement the recommendations found in Chapter 3. These recommendations focus on recreational, cultural, and educational strategies for increasing awareness of the network and its benefits, and increasing overall usage. The recommendation for implementing a consistent and coordinated wayfinding system will be an important task for this committee subgroup as the network is developed.



Develop a Monitoring Program

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

Establish Stakeholders' Roles

The organizational framework described in this section is presented visually in Figure 4-1. The BPGAC, already discussed in this chapter, plays a leading role in this process with a 'convener' serving the function of staff support. Other stakeholders, such as nonprofit organizations, are identified as partners.

Role of the Advisory Committee

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

- Work with the City of Anderson's selected Bicycle, Pedestrian, and Greenways Coordinator staff position. This coordinator would be responsible for implementing this Plan and would work with local government departments and partner non-profits to seek funding. This coordinator will also manage and facilitate meetings for the BPGAC.
- Advocate for implementing the bicycle, pedestrian, and greenways program.
- Facilitate cooperation among government agencies and nonprofit partners for network development.
- Define and recommend sources of funding for network development.
- Meet quarterly with an agenda that includes: A) Implementation progress updates from each of the member organizations, B) Confirmation of specific tasks to be completed by specific members before the next meeting, and C) Discussion of new opportunities and constraints and identification of ways to address them.

- Pursue funding including the solicitation of major donors and corporate sponsors
- Build partnerships with land owners for trail development, with special attention given to owners of large or contiguous tracts of land.
- Keep local leaders informed about bicycle, pedestrian, and trail-related issues and developments through direct dialogue and personal e-mail; promote facility development among local leaders through creative approaches, such as organized tours of existing trails or proposed trail corridors.
- Rally public support for key public hearings and coordinate mass e-mail campaigns for special votes.
- Continue communication and build positive relationships with organizations such as utility companies (Duke Energy, Piedmont Natural Gas, and others), public and private schools, and others that can assist with issues related to potential bicycle and pedestrian facility right of way and trail development.

Role of Non-Profits

Non-profit organizations can serve a variety of purposes and are already leading many trail development related activities across the Upstate. Specific tasks for non-profits related to the implementation of this Plan include:

- Participate in the activities of the BPGAC
- Maintain open dialogue with the BPGAC and to promote resource- and information- sharing and reduce duplications of effort.
- Advocate, promote, and encourage the development of the bicycle, pedestrian, and trails network throughout the community.
- Educate citizens as to the benefits of biking and walking and trails and greenways.
- Play an active role in raising funds for network development in concert with the BPGAC.
- Assist in securing right of way for implementation.
- Help to organize volunteers to assist with implementation and management.
- Sponsor or cosponsor biking and walking and trail events.

Role of Transportation Agencies (SCDOT, ANATS, ACOG)

SCDOT and the Anderson Area Transportation Study (ANATS) have a key role in implementation of this Plan, including participation in the following tasks:

- The SCDOT should be prepared to provide guidance and technical support to for implementing on-street bikeway and walkway facilities, as well as related trail facilities such as shared-use paths in roadway corridors, trail-roadway crossings, and improvements that increase safety for bicyclists and pedestrians crossing bridges on state roadways.
- SCDOT should also continue to work with local planners on coordination of upcoming and future roadway projects that involve bikeway and walkway recommendations. Communication with ANATS, the City of Anderson, and the BPGAC regarding scheduled road maintenance and road construction projects is crucial to network development.
- ANATS should continue its ongoing inventory of trail, bikeway, and walkway facilities and incorporate the recommendations of this Plan into its long-range planning for such facilities. Maintaining open dialogue and information-sharing with the BPGAC and local partners is essential.
- Identify funding sources for network development.



Infrastructure Action Steps

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

Estimate Costs

Cost estimates for six priority projects of the Plan are provided in Chapter 3. Costs for developing additional network segments can be estimated using unit-level cost estimates listed in Table 4-1. The list offers a summary of the fully burdened costs of the facility types recommended in this Plan. The paved greenway estimates assume a 10 foot wide asphalt path. All costs are total installed costs that include: planning and engineering, environmental, and contingency. Land acquisition costs are not included.

Identify Funding

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



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

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

Donations from individuals or companies are another potential source of local funding. Recommended funding sources are included in Appendix E.

Complete Priority Trail Projects

By moving forward quickly on priority trail projects, stakeholders of this Plan will demonstrate their commitment to carrying out the Plan and will better sustain enthusiasm generated during the public outreach stages of the planning process. Chapter 5: Recommendations identifies priority bicycle, pedestrian, and trail projects.



Design, Construct, and Maintain Network Facilities

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

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



Increased rates of bicycling and walking in the City of Anderson will help to improve the **health and fitness of residents, transportation options, the local economy, and environmental conditions,** while also contributing to a **greater sense of community.**

Appendix A: Benefits of Bicycle, Pedestrian, and Greenway Investments

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 and recreation. Increased rates of bicycling and walking in the City of Anderson will help to **improve the health and fitness of residents, transportation options, the local economy, and environmental conditions,** while also contributing 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 they relate to 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, and have been doing so for many years. 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 Development

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.1



Trails play a central part in making communities more walkable. 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.² 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.

¹CEOs for Cities. (2010) Walking the Walk: How Walkability Raises Home Values in U.S. Cities.

² National Association of Realtors and National Association of Home Builders. (2002). Consumer's Survey on Smart Choices for Home Buyers. Greenville, SC's Swamp Rabbit Trail, a roughly 17-mile trail corridor created largely through a rail to trail conversion, has documented economic gains. The portion of the trail within Greenville County (outside of the City of Greenville jurisdiction) saw more than 350,000 users in its first year open. This level of bicycle and pedestrian traffic has been a boon for the small city of Travelers Rest. The Mayor described the Swamp Rabbit Trail as "the single most important thing that has happened to Travelers Rest in year." **Since development of the trail, property values along the corridor have increased more than threefold, 21 new businesses have opened, and several more have plans to do so.** Overall, the businesses near the County segments of the trail have reported revenue or sales increases of 30 to 85 percent since the trail's arrival.³

The Augusta, GA region has seen positive economic gains through major physical activity events. 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 region was also fortunate to host the 2010 International Mountain Bike Association (IMBA) Summit in 2010, which brought nearly \$500,000 in local economic gains.⁴

The City of Anderson already capitalizes on cultural, heritage, and historical tourism to the area, including recreational activities on Lake Hartwell and organized

> ³GSA Business. (October 18, 2012). Upstate cities investing in business growth. Retrieved from http://www.gsabusiness. com/news/45596-upstate-cities-investingin-business-growth?rss=0 and Reed, Julian. (2012). Greenville Hospital System Swamp Rabbit Trail: Year one findings.

⁴ Augusta Sports Council, phone interview (December 8, 2011) triathlon events. As the City of Anderson develops a comprehensive bicycle, pedestrian, and greenway network, its attractiveness to tourists and visitors will only grow.

Household Savings

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.⁵ Bicycling becomes an even more attractive transportation option when the unstable price of gas is factored into the equation.⁶ 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**.

Mode	Cost per Mile
Car	\$0.59
Transit	\$0.24
Bike	\$0.05
Walk	\$0.00

Transportation Costs by Mode Source: IRS, ATA, RTC

A-2

⁵ Pedestrian and Bicycle Information Center. (2010). Economic Benefits: Money Facts. Retrieved 1/20/2010 from: www. bicyclinginfo.org/why/benefits_economic.cfm

⁶ King, Neil. (2/27/08). The Wall Street Journal: Another Peek at the Plateau

Transportation Choices

More than one quarter of all trips (commute and noncommute) taken by Americans each and every day are less than one mile, equivalent to a walking trip of 15 minutes or a 6-minute bike ride; however, just 13 percent of all trips are made by walking or bicycling nationwide.⁷ By replacing short car trips with walking and bicycling trips, residents have a significant positive impact on local traffic and congestion. Traffic congestion reduces mobility, increases auto-operating costs, adds to air pollution, and causes stress in drivers. Substituting some car trips with walking or bicycling relieves congestion, benefiting all road users.

A national transportation poll found that Americans would like to see 22 percent of transportation funding invested in walking and bicycling facilities, but current budget allocation sets aside only one percent of all transportation funding to walking and bicycling. With improved accommodations, walking and bicycling can provide alternatives to driving for commuting to work, running errands, or making other short trips.

An improved bicycle and pedestrian network also provides greater and safer mobility for residents who do not have access to a motor vehicle. **Fourteen percent of Anderson households do not have access to a vehicle and 45 percent have access to only one.**⁸ American demographics show that typically around 30% of a community's population do not or cannot drive or own a car due to age (under 16), physical or mental disabilities or old age, and/or income. Bicycling and walking for transportation is an important option for these populations, especially those with more than one working family member.

> of occupied households in Anderson do not have access to a vehicle, and 45 percent have access to only one.

US Census Bureau, American Community Survey 5-Year Data 2008-2012

Daily Trip Distances



Source: Pedestrian and Bicycle Information Center, www. pedbikeinfo.org



According to a national transportation poll, Americans think differently about transportation funding than the reality of current budget allocation. (Transportation for America, design by Collective Strength, and fielded by Harris Interactive, 2007)

⁷ U.S. Department of Transportation (DOT), Bureau of Transportation Statistics (BTS) and the Federal Highway Administration (FHWA). (2002). National Household Travel Survey.

⁸ American Community Survey 5-Year Estimates 2007-2011. http:// factfinder2.census.gov/faces/ tableservices/jsf/pages/productview. xhtml?pid=ACS_11_5YR_DP04

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 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.9 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".10

Today, nearly 36 percent of American adults are obese, and 67 percent are overweight or obese. America's weight problem doesn't spare our youth either: 17 percent of children and youth are obese.¹¹ The childhood obesity rate has almost tripled since 1980 and the adolescent rate has more than quadrupled.¹²

In Anderson County, an estimated 30 percent of adults are physically inactive and 30 percent of adults are obese. **The county ranks 15th out of 46 counties in South Carolina for overall health. When considering physical environment factors that relate to health, such as access to recreational facilities and healthy foods, the rank drops to 29th in the state.**¹³ 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 helping to reduce the risk of obesity.



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.¹⁴ 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.

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.



¹⁴ Federal Highway Administration, Southern Resource Center. (1999)

Safety Benefits

Separate studies conducted by the Federal Highway Administration and the University of North Carolina Highway Safety Research Center demonstrate that installing pedestrian and bicycle facilities directly improves safety by reducing the risk and severity of pedestrianautomobile and bicycle-automobile crashes. For example, installing a sidewalk along a roadway reduces the risk of a pedestrian "walking along roadway" crash by 89 percent. The graphic below shows how pedestrian and bicycle facility improvements have a direct, positive impact on safety.



Federal Highway Administration. Desktop Reference for Crash Reduction Factors. http://safety.fhwa.dot.gov/

Well-designed pedestrian and bicycle facilities improve safety and security for all road users and also encourage more people to walk and bike, which in turn can further improve 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.¹⁵ 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.

¹⁵ Jacobsen, P. "Safety in Numbers: More Walkers and Bicyclists, Safer Walking and Bicycling". Injury Prevention, 9: 205-209. 2003.

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.^{16,17}** 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.



"Before" diagram of a suburban community. Source: The Sprawl Repair Manual.



"After" diagram of a transformed suburban community. Source: The Sprawl Repair Manual.

¹⁶ Frumkin, H. 2002. Urban Sprawl and Public Health. Public Health Reports 117: 201–17.

¹⁷ Leyden, K. 2003. "Social Capital and the Built Environment: The Importance of Walkable Neighborhoods." American Journal of Public Health 93: 1546–51.

Appendix B: Public Input

Overview

The City of Anderson's bicycling and pedestrian needs are diverse and depend on many factors including one's age, trip purpose, physical ability, and level of cycling experience and confidence. Public outreach is an essential tool for identifying local community needs and desires and for developing a city-wide plan that addresses those priorities.

This appendix provides an overview of the public input process carried out during the development of this plan. Outreach to the citizens and visitors of the City of Anderson included public workshops, steering committee meetings, progress updates provided through the City of Anderson websites, and an online and hard-copy citizen comment form. Throughout the planning process, the project team also shared information about key events and activities related to the Plan with local media. These efforts provided opportunities for residents and visitors throughout the city to share their vision for the future of bicycling and walking in Anderson.

Public Workshops

During the planning process, three public workshops were held to gather public input on the vision, goals, existing conditions, and recommendations of the plan. The Consultant team and City staff collected input and distributed information about the plan at the Downtown Anderson Block Party, Downtown Business Association Meeting, and monthly community meetings. These events were key to understanding the public's diverse interests, concerns, and perceptions regarding bicycling and walking in Anderson.

Steering Committee Meetings

For development of this Plan, the City of Anderson Advisory and Steering Committee provided a key source of public input. Two Steering Committee meetings provided useful information about public concerns and preferences. Feedback was recorded through meeting notes, comment forms, and markup of large format maps. This input was then used to identify key opportunities, constraints, and plan recommendations.



Steering Committee members and project consultants discuss existing bicycle and pedestrian conditions in Anderson

Citizen Comment Form

The citizen comment form for the Downtown Bicycle and Pedestrian Connectivity Master Plan contained 10 questions about respondents' perceptions of bicycling and walking, use of bicycling and walking facilities, and demographic information. A total of 58 people filled out and submitted the comment form. The following pages present detailed results for each question of the citizen comment form.



Public Comment Form Summary

1. Do you live or work in the City of Anderson?



2. What is your gender?





3. What is your age?



4. What type of biking facilities do you prefer? Select all that apply.



5. Have you ever used a walking path or trail in Anderson, such as the AnMed North Campus or the East West Parkway?



5a. If yes, how often?



6. Do you visit nearby destinations outside of Anderson to use a trail or greenway?



6a. If yes, how often?





7. Would you use trails more often if they were closer to you?



8. When you walk or bike what is the primary purpose of your trip? Select all that apply.



B-6

9. What do you think are the biggest factors discouraging bikers and walkers? Rank your top 3 choices 1, 2, and 3.



10. What destinations would you most like to get to by walking or biking? Rank your top 3 choices 1, 2, and 3.





Thank you for your interest in the City of Anderson's Downtown Bike Pedestrian and Greenway Plan- Downtown District. The purpose of this plan is to guide the development of trails, shared-use paths, bike lanes, bike routes, and other similar facilities as we connect Downtown to surrounding areas.

Please take a few moments to fill out this short survey. Your response will help determine plan priorities. Even if you do not walk or bike regularly, your feedback will be helpful. All responses will remain Anonymous. Thank you for your time.

1. Do you live or work in the City of Anderson?

- Live Work Both None of the Above
- 2. What is your gender?

____ Male ____ Female

3. What is your age?

under 19	40-49
20-29	50-59
30-39	60+

- 4. What type of biking and walking facilities do you prefer? Select all that apply.
 - ____ Sidewalks ____ Unpaved trails ____ On-street bike lanes Paved Greenways
- 5. Have you ever used a walking path or trail in Anderson, such as the AnMed health campus or the East West Parkway?

Yes _____

6. Do you visit nearby destinations outside of Anderson to use a trail or greenway?

____Yes ____No

Yes

Would you use trail more often if they were closer to you?

____ No

No

8. When you walk or bike what is the primary purpose of your trip? Select all that apply.

Transportation	Dog Walking
Exercise	Socializing
To enjoy nature	I don't walk or bike

- 9. What do you think are the biggest factors discouraging bikers and walkers? Rank your top 3 choices 1, 2, and 3.
 - ____ Lack of connected greenways, sidewalks, and bike facilities
 - Lack of information about existing
 - greenway, bike, and sidewalk facilities
 - ____ Unsafe street crossings
 - ____ Motor vehicle traffic
 - ____ Lack of interest
 - ____ Lack of time
 - ____ Lack of nearby destinations
 - Personal safety concerns
 - Aggressive motorist behavior
- 10. What destinations would you most like to get to by walking or biking? Rank your top 3 choices 1, 2, and 3.
 - ____ Place of work ____ Shopping ____ School ____ Parks
 - ____ College
- ____ Greenways

Entertainment

- ____ Restaurants ____ Public Transportation
- **Recreation** Center

Please add any additional comments in the space provided below.

City of Anderson citizen comment form for the Downtown Bicycle and Pedestrian Connectivity Master Plan

B-8

Appendix C: Wayfinding and Signage Recommendations

Overview

The types of bicycle and pedestrian facilities through the City of Anderson play an important role in determining what type of signage is most suitable for each of the varying contexts. The wayfinding and signage recommendations of this Plan correspond to the facility type continuum.

Signage Principles

The existence of wayfinding signage on trails and on-street routes is an important amenity to trail users and is crucial to a trail's success and popularity. Off-street trail signage increases comfort levels on trails, assists in trail navigation, warns of approaching roadway crossings, and guide users through diverse environments. Trail signage for on-street trail routes provide similar functions as off-street trail signage but have a larger audience by addressing other modes of transportation such as the automobile. On-street wayfinding not only provides direction but creates an awareness of the trail within the vehicular-based context. The safety benefits of on-street wayfinding signs equal that of their navigational benefits.

In general, wayfinding's purpose is to direct people and provide information about destinations, directions, and/or distances. When applied on a regional level, wayfinding can link communities and provide consistent visual indicators to direct bicyclists and pedestrians to their destinations along the route of their choice. Wayfinding signage increases the legibility of the trail system as well as achieving public objectives, such as promotion of community's attractions, education, mile marking, and directional guidance. At the local level, effective wayfinding systems address both recreation and transportation perspectives by considering the needs of bicyclists, pedestrians, and motorists in on-street and off-street situations. The City of Anderson's wayfinding system will effectively address both regional and local environments in order to provide an informative, functional, and comprehensive navigational signage system to enhance trail users' experience.

Wayfinding Signage Goals

- Enhance awareness for users that they are along a larger, city-wide trail network
- Improve wayfinding throughout the City of Anderson
- Improve connections to the City of Anderson's trail network from adjacent neighborhoods/communities, improve connections from the trail network to nearby amenities, cultural destinations or recreational destinations.
- Enhance education opportunities about local history, amenities, culture and ecology
- Establish wayfinding management and maintenance standards

Introduction to Sign Types

A multitude of trail wayfinding and signage types exist today but proper selection and correct use of a select few of these types can provide successful identification, branding, and navigation of a bicycle, pedestrian, and trail network. This section identifies sign types that are the most appropriate for an on and off-street network of trails, and that will serve as a basis for a comprehensive and cohesive wayfinding system for the City of Anderson.

The sign types include regulatory information, regional and cultural details, identification markers, biking/walking distances and timing, and geographical references. Each signage component works together to complete a system of comfortable bike and pedestrian routes for multiple types of trail users. Recreational and transportation users are considered when placing each sign type but trail non-users



benefit by an awareness of the proximity and abundance of the many bicycling and pedestrian routes within the City of Anderson. These routes occur both on and off-street and will therefore require different signage types and approaches specific for the various contexts and situations. Primarily, these will be categorized into On-Street and Off-Street wayfinding typologies.

On-street wayfinding mechanisms will not only benefit bicyclists and pedestrians but will provide a safety measure for other modes of transportation by creating a constant reminder of the presence of the trail users. It's through an imposed awareness of trail users and their routes that will deter accidents and increase safety for all. On-street signage within this category will vary in scale but must be capable of conveying messages to trail users and non-users from a variety of distances and speeds.

Contrary to the on-street signage types, the off-street wayfinding signs will cater to a more focused, trail-oriented audience and will be pedestrian-scaled. Primarily, these signs will not need to accommodate for the varied sight distances and high speeds that occur in an on-street trail situations. These signs will likely provide more information that is specific to the trail itself more so than on-street wayfinding which often provides trail and community destinations or information.

Both On and Off-street wayfinding signs can be further categorized by the type information that they convey. These informational categories are: Orientation, Informational, Directional, Identification, and Regulatory. Many signs have a primary purpose or message that corresponds to one of these informational categories but some signs will have additional or secondary messages that are also conveyed to the users.



- Orientation provides an overview of the geographical context (example – Trailhead Monument)
- Informational provides general or specific information about a place (example – Directional Signage)
- Directional the circulatory system of the trail (example - Directional Signage)
- Identification identify specific elements of the trail (example -Trailhead Monument)
- Regulatory describes the do's and don'ts of the trail or place along the trail (example – allowed trail uses or hours)



Informational components of a complete wayfinding signage system.

For the City of Anderson, we have crafted a palette of sign types for the full range of trail types identified in the master plan: from urban corridors to riparian corridors. The signage types cover both on-street and off-street situations and offer varying informational messages. The following sign types will be used to build a comprehensive wayfinding system for the City of Anderson.

Trailhead Monuments

Serve as the primary identification sign of a trail. The sign is often two-sided and able to be viewed from multiple viewing angles. It will usually carry the same information on both sides.

In addition to serving as a visual marker, trailhead monument signs can also be an information source for trail users. A trailhead monument sign may contain directional information to nearby destinations and maps to orient trail users, as shown on page C-4. These are typically placed at trail heads, parking lots, or major trail intersections to identify users' locations within the overall and local trail networks.

On-street Trailhead Monuments - Those falling within the on-street category would typically be located adjacent to a roadway marking the entrance to a trailhead or trailhead parking area. These are larger and more visible monuments as they are addressing pedestrians, bicyclists, and motorists traveling at various speeds. These are intended to be tastefully eye-catching but not intrusive to the contextual environment. This wayfinding type is primarily for Identification but may also provide informational or directional messages. **Off-street Trailhead Monuments -** Similar to on-street Trailhead Monuments in function but likely differ in size, intended audience, and might contain varying secondary information. In most cases, these should be located immediately adjacent to the entrance / exit of a trail and allows users to easily identify where they can enter a trail or where others will be exiting. These will be more pedestrianscaled but the graphic content should be consistent with that of an on-street trailhead monument.







Wayfinding Signage Monument Sign



3/4" Corten Flat Steel Plate with Threaded Bolt. Footing to be Approximately 5'-0"x2'-0". Footing to be Approved by Structural Engineer Prior to Construction.



Color A: CMYK C:00 M:25 Y:10 K:00 Color B: CMYK C:00 M:00 Y:00 K:00 Color C: CMYK C:80 M:17 Y:76 K:51

Note: Color samples to be submitted to Landscape Architect prior to construction.

Directional Signage

Directional signs are one of the key points of navigation for the trail users both on and off-street. Their primary function is to provide direction for the trail users both to remain on the trails but possibly to other nearby attractions or destinations.

Users can orient themselves within the trail system based on key destinations including culturally significant landmarks, shopping districts, and other recreational facilities. These signs provide geographical context, reference points, destination direction, and approximate times in which to get there. This sign type functions like an abbreviated map showing geographical highlights of the communities or environments in and around the trail user.

These signs often:

- Mark the junction of two or more bikeways or trails.
- Inform bicyclists and pedestrians of the designated routes or to access key destinations.
- Provide distances and travel times to destinations. These are optional but recommended.
- Provide clear direction for pedestrians or cyclists to continue on the desired route.
- Could be a pavement marking as well as a traditional sign.

On-street Directional Signs – These are typically larger signs but might also be incorporated into standard MUTCD sign formats. They address pedestrians, bicyclists, and motorists at varying distances and speeds.



Off-street Directional Signs – Similar to on-street directional signage in function but likely differ in size and intended audience, and might contain varying secondary information. These will likely be located at trail intersections or along the trail to alert trail users of a destination.





Wayfinding Signage

Directional Sign

Off-Street Greenways and Outside of SCDOT Right-of-Way



Wayfinding Signage Mile Marker





Color A: CMYK C:00 M:25 Y:10 K:00 Color B: CMYK C:80 M:17 Y:76 K:51

Note: Color samples to be submitted to Landscape Architect prior to construction.

Wayfinding Signage Bike Route Sign



Pavement Markings

The use of pavement markings are encouraged to be used in conjunction with any type of wayfinding signage system. With proper placement, these markings can be extremely valuable in supplementing a traditional signage system and provides an alternative method of navigation and identification for all modes of travel.

There are many instances in which pavement markings are appropriate and have a variety of benefits. The use of pavement markings in the following scenarios will greatly benefit the City of Anderson's network:

- Supplementing the traditional signage
- Reducing the volume of signs needed
- Providing wayfinding in locations where signs are hard to see
- Providing additional visual cues to motorists about the presence of cyclists on the roadway

The primary types of pavement markings proposed for the City of Anderson network include identification and directional signage. These types of signage could be executed using the standard MUTCD pavement markings such as:

- Sharrows
- Bike lane identification markings
- Bike lane directional markings
- Colored pavement markings indicating bike lanes and bike boxes



Sharrows



Bike lane identification markings



Bike lane directional markings



Colored pavement markings indicating bike lanes and bike boxes





In addition to traditional pavement markings, there is an option to incorporate a more custom pavement marking in the form of custom thermoplastics, concrete stamps, or pavement inserts of the City of Anderson's logo. The use of this type of marking could be extremely useful in areas where signage may not be clearly visible, have permitting issues, or other restrictions on traditional signage. These custom pavement markings could also reinforce the trail's identity and could be a cheaper solution than some signage. The following images are examples of thermoplastic pavement markings used in on-street situations as confidence markers.



C-10

All of these sign types for the City of Anderson will form one cohesive signage "family". It's through the combined used of consistent graphics, materials, design strategies, and placement that will result in the overall success of the wayfinding system.

The Northwest Arkansas Regional Razorback Greenway provides an excellent example of a successful wayfinding "family" that addresses both on and off-street conditions while reinforcing the overall trail identity throughout the length of the 32-mile trail system. The colors, fonts, symbology and design of each sign have been crafted to improve navigation, encourage use, and provide an identity for the trail. Sign types include regulatory information, regional and cultural details, identification markers, walk and bike timing, and geographical references. Each component works together to complete a system of comfortable spaces for multiple types of walker and cyclists. Recreation, fitness, and transportation users are considered when placing each sign type. Community Signs direct users toward the trail and indicates to non-users the proximity and ease of access to the greenway. As areas surrounding the greenway are developed, directional signs would be placed within neighborhoods and commercial centers to inform citizens and visitors of the opportunity to recreate or use the trails as an alternative to motor vehicle transportation. The complete signage "family" is illustrated above.

Wayfinding Signage Pavement Markings





Color A: CMYK C:00 M:25 Y:10 K:00 Color B: CMYK C:00 M:00 Y:00 K:00

Note: Color samples to be submitted to Landscape Architect prior to construction. C-11


Appendix D: Management and Maintenance Best Practices

Introduction

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

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

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

Management and Maintenance Program

There are many forms of trail management and maintenance assessments, checklists, plans, standards, and guidelines currently in use by counties, towns, and park systems throughout the United States. Trail-related organizations such as American Trails, the Rails-to-Trails Conservancy, the Federal Highway Administration, and the U.S. Forest Service provide excellent examples of management and maintenance best practices from across the country. This section was developed based on our previous experience and resources from the aforementioned organizations.

Systematic Approach

In developing an efficient and effective management and maintenance system, the City of Anderson should consider a detailed and systematic way of inventorying, planning, executing, and monitoring maintenance. A maintenance inventory and maintenance training for staff are first steps towards achieving this:

Maintain a Trail and Facilities Inventory

This Plan provides a baseline inventory and database of existing and proposed trail facilities and their features. Maintaining this information, whether through database software or other means, is an essential tool for efficient trail management. The inventory can be a simple Excel spreadsheet or a GIS map populated with data collected during the development of this Plan and through subsequent updates.



Consider Professional Maintenance Training

Another option in management and maintenance efficiency is training. Training opportunities should be carefully reviewed for relevance and cost-effectiveness. One example of a relevant program is the Park and Recreation Maintenance Management School sponsored by The National Recreation and Park Association (NRPA). For over 30 years the North Carolina State University Department of Parks, Recreation and Tourism Management and Continuing and Professional Education, in conjunction with NRPA, has conducted this two-year professional development program for park and recreation personnel. Another option is to hire an expert trail system manager to conduct a customized training or provide assistance on a consulting basis.

Maintenance Activities and Costs

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

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



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

Table D-1: Maintenance Tasks and Suggested Frequency

Maintenance Task	Suggested Frequency
Inspections	Seasonal - at both beginning and end of summer
Sign repair/replacement	4-6 years
Site furnishings; replace damaged components	As needed
Fencing repair	Inspect monthly for holes and damage, repair immediately
Pavement markings replacement	1-3 years
Pavement sweeping/blowing	As needed; before high use season
Pavement sealing; pothole repair	5-15 years
Lighting repair	Annually
Introduced tree and shrub plantings, trimming	1-3 years
Shrub/tree irrigation for introduced planting areas	Weekly during summer months until plants are established
Shoulder plant trimming (weeds, trees, branches)	Biannual (Fall or Spring)
Major damage response (fallen trees, washouts, flooding)	As needed
Culvert inspection	Before rainy season; after major storms
Maintaining culvert inlets	Inspect before onset of wet season
Waterbar maintenance (earthen trails)	Annually
Trash disposal	Weekly during high use; twice monthly during low use
Litter pick-up	Weekly during high use; twice monthly during low use
Graffiti removal	Weekly; as needed

Routine Management and Maintenance Costs

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

Greenway Trails

Many factors influence greenway trail costs, such as amount of use, maintenance crew-size needed, proximity to urban centers, and number of interfaces with geographical and man-made features. Annual routine maintenance costs range from nominal to as high as \$7,000 per mile. Research conducted by the Rails-to-Trails Conservancy (RTC) indicates costs are often on the lower end for managing and maintaining rail trails at approximately \$1,500 as shown in Table D-2.

On-Road Bicycle Facilities

Maintenance of the on-roadway bicycle facility system is handled by the local Public Works Departments and SCDOT Maintenance Division. Some provision should be made however for up to fifteen regular inspections per year, to include minor repair or replacement of signs, vegetation grooming and other items that an inspector could remedy in the field. Additional attention should be paid to any potholes or other pavement damage. Additional sweeping may be required where bicycle lanes and wider shoulders are provided along roads. Staff costs can be reduced by training local volunteers or bicycle advocates to conduct inspections and providing a means for citizens to report bicycle facilities needing repairs.
 Table D-2: Trail Overall Maintenance and Operations Annual

 Costs

Item	Overall	Asphalt	Non- Asphalt
Number of Trails Reporting Financials	39	18	19
Average Annual M&O Cost	\$24,239	\$19,584	\$25,237
Average Length (miles)	23	20	24
M&O Cost per Mile		\$1,458	\$1,478
Average Years Open	12	15	11
Average Annual Users	136,986	139,304	129,492
Re-grade/Re-surface Frequency		17	9

Pedestrian Facilities (On Road Sidewalk/Sidepath)

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

On locally-owned streets, local property owners are responsible for routine maintenance of sidewalks (such as clearing vegetation), and the City of Anderson's Public Works Department and/or Utilities Department are responsible for more significant repairs. Crosswalks, pedestrian signals, curb ramps, median crossing islands, and other pedestrian facilities should be maintained by the respective Public Works departments and SCDOT, depending on right-of-way ownership.



Remedial Management and Maintenance Costs

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

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

Greenway Trails

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

On-Road Bicycle Facilities

Remedial work for on-road bicycle facilities includes asphalt repaving (five feet on either side of the street), curb and gutter, sewer-grate, and manhole repair. Pothole and crack repair are considered routine. Pavement markings, such as bicycle lane lines, bicycle stencil markings, and fog lines should be re-installed when other roadway pavement



markings are improved. Since this work is done as part of the current street maintenance regime the cost is assumed to be covered.

Pedestrian Facilities

Sidewalks should be constructed with concrete, which requires replacement in 50 to 75 years. A rough cost estimate for on-linear-mile of concrete sidewalk could be provided by the City of Anderson and/or SCDOT; this would include base material, concrete, and construction work. Costs for design and right-of-way easement purchases should also be considered.

Setting Priorities

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

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

- Monitor your trail conditions closely.
- Decide what can be accomplished as basic maintenance.
- Determine what can be deferred.
- Identify what area will need major work.

This 'trail triage' is critically important if your maintenance dollars are going to be spent keeping most of the tread in the best possible condition.

- The first priority for trail work is to correct truly unsafe situations. This could mean repairing impassable washouts along a cliff, or removing blow down from a steep section of a pack stock trail.
- The second priority is to correct things causing significant trail damage--erosion, sedimentation, and off-site trampling, for instance.
- The third priority is to restore the trail to the planned design standard. This means that the ease of finding and traveling the trail matches the design specifications for the recreational setting and target user. Actions range from simply adding "reassurance markers" to fullblown reconstruction of eroded tread or failed structures.

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

Risk Management, Safety, and Security

Safety is central to all management and maintenance operations, and is the single most important greenway/ bicycle/pedestrian facility management and maintenance concern. Context-sensitive trail design, clear and implementable safety and security policies, comprehensive programs, and maintenance commitments affect the measurable, as well as the perceived, safety and security of a trail facility.

When considering risk management, it is important to keep in mind that:

State law of South Carolina, removes much of the liability from landowners who open their property for public recreation except in cases of gross negligence. Specifically, South Carolina Code of Laws Title 27, Chapter 3. Additionally, in April 2012, the South Carolina Governor signed amendments to Code of Laws 47-9-710 and 47-9-730 to improve liability protections for landowners allowing trail activity on their property (see Bill H4775). Trails and trail users are inherently safe. In a Rails-To-Trails Conservancy survey, most reported suits were the result of one individual being reckless, then trying to shift blame onto the trail. In 150 million trail visits surveyed by the Rails-To-Trails Conservancy, only eleven resulted in lawsuits.

Sound trail management and maintenance planning combined with attention to physical safety hazards, environmental design opportunities, and appropriate insurance policies will provide a safety structure that encourages trail use and enhances the trail experiences. Building trust with the community will serve to highlight and reinforce the value added by the trail system to the community, allowing the network to grow in a way that fits the needs of the community and improves overall quality of life.

Safety programs should include the following preventative measures:

- As part of regular trail inspections, evaluate and remove any obstacles or objects that could impede facility usage such as debris, overgrown vegetation, etc. and, when needed, provide alternative routing.
- Partner with local police to ensure that any incidents, such as vandalism, are tracked, including the specific location, and, if problems develop, create a safety follow-up task force to develop preventative measures for avoiding future incidents.
- Implement an emergency response protocol working with law enforcement, EMS agencies, and the fire department that includes mapping of access points, design of trails and access roads (to accommodate up to 6.5 tons), and an "address system" such as mile



markers to identify locations for all off-road greenway trails. Greenville, SC installed numbered pavement markings every one tenth of a mile on asphalt trails as a way to provide trail users with an "address" for their trail location in the event of an emergency. On-road facilities should make use of the existing street names and adjacent property addresses. Each local emergency response office/unit should have an up-to-date map of all greenway and trail facilities within the local jurisdiction.

Managing Trail User Conflicts

Though most multi-use trail experiences are pleasing and enjoyable, conflicts between trail users may occur that can have serious consequences. In these cases, the challenges usually relate to a trail user's style of activity (mode of travel, level of experience, etc.), trip focus, expectations, attitudes toward and perceptions of the environment, and level of tolerance for other activities.



Signs like this encourage pedestrians and slower users to stay to the right, allowing faster users to pass safely on the left.

Source: www.tfhrc.gov

In order to manage multiple user groups with potential conflicts, the City of Anderson should address user conflicts as they arise (if they arise), based on patterns of usage and recorded incidents. The City of Anderson should also review complaints and accident reports on an ongoing basis to determine if there is a pattern of user conflicts that needs to be enforced. Trail managers can take additional measures to address the challenges of shared use, such as:

- User involvement and outreach Build understanding and good will by finding mutually agreeable solutions, and then inform the community (through signs, maps, brochures, Internet, media campaigns, sponsorship of "user swap" activity days, joint trail building days, etc.) to actively and aggressively promote responsible behavior.
- Uniformed presence on the trail This can be in the form of police, maintenance staff, volunteer trail patrols, etc.
- Maintenance program An efficient and appropriate maintenance program that addresses signs, sight distances, vertical and lateral clearances and surface maintenance.
- Regulations and enforcement If user conflicts persist, for those not influenced by outreach and education, employees and volunteers must have the authority to enforce safe and courteous behavior, with regulations posted prominently at trailheads and other appropriate locations. Four broad areas of regulations include:
 - » Acceptable uses and right-of-way (ROW) (who must yield to whom) (ex: Motor vehicles, other than power assisted wheelchairs, are prohibited; Stay on the trail; No loitering; no vandalism; no dumping; Keep to the right except when passing; Yield to on-coming traffic when passing; Bicycles always yield to pedestrians; Give a vocal warning when passing; Pets must always be on short leashes; Travel no more than two abreast; Alcoholic beverages are not permitted on the trail; Bicyclists and pedestrians yield to maintenance vehicles)
 - » Speed limits (ex: 15 mph speed limit)
 - » Hours of use
 - » Objectives of resource protection (e.g., enhance native vegetation by preventing the spread of invasive species and minimizing disturbances to vegetation)

D-6

Monitoring progress - The ongoing effectiveness of decisions made and programs implemented - in the context of clearly understood and agreed-upon objectives - must be monitored for each trail area, with flexibility and willingness to adapt strategies for individual situations.

Managing Trail Use Through Design

The City of Anderson network of trails will be available to a variety of uses and managers should expect that the public will practice proper etiquette to control speed, direction, and position. Trail design can positively affect trail user experiences and a trail users understanding of proper etiquette within various contexts.

In areas with high user volumes, physical elements to separate users by direction or mode of travel may be desirable. For instance, a center stripe painted on the trail can separate users by direction, or an adjacent trail with a different surface material may be created for runners. In other cases, signs may suffice. Following recommended best practices for multi-use trail design (see Appendix F: Design Guidelines of this Plan) is important for minimizing potential trail user conflicts.



Signs can help to enforce desired uses and behaviors



Signs like this can reduce trail user conflict by clarifying universal trail etiquette.

Trail Etiquette Awareness

The City of Anderson should include public awareness as an integral component to any effort to manage trail user conflicts. Ensuring that the public is aware of trail policies and etiquette is essential to addressing trail user behavior. Providing this information in a clear and conspicuous manner allows users to understand both their responsibilities and their rights. Trail signage, pavement markings, and media campaigns are effective strategies for educating the public about appropriate trail use. For example, simple signs reminding cyclists to yield the rightof-way to hikers and other pedestrians should be posted at trail access points, as shown with the trail etiquette sign above.



Dog Use Management

Dog handlers and their pets enjoy trails for a number of reasons – mobility assistance, personal security for handlers, and for the pleasure and fitness of animals. However, adding unleashed or unruly dogs to the mix of walkers and cyclist may create conflicts. Techniques to help manage dog use on the trail can include signage pertaining to regulations and etiquette such as: staying within the trail corridor; leash usage; greet-before-you-meet etiquette with people and other dogs; and picking up waste. With appropriate management policies in place, dogs can be a welcome addition to the City of Anderson's trail system.

Administrative Responsibilities

Inter-agency design review

Coordination between and commitment of agencies responsible for greenway, bicycle, and pedestrian trail facilities is crucial in completing routine and remedial maintenance tasks. In addition to department managers, planners, designers, and engineers, police, fire/rescue, and field maintenance personnel should be consulted in the design and review process. Coordination should occur at a local level through carrying out the following tasks.

- Establish a coordinating committee with representatives from each of the participating agencies and stakeholders.
- Identify an entity to provide on-going oversight, coordination, and leadership for the overall network.
- Review critical public and private sector projects that might impact greenway, bicycle, and pedestrian projects as they come online.

- Pursue grants and cooperative agreements.
- Monitor management and maintenance and other advocacy functions now and over the years to come.
- Review accident and crime reports, and take the necessary up front actions on a case-by-case basis, to ensure that greenway, bicycle, and pedestrian facilities do not deteriorate due to safety concerns, crime, or from fear of criminal activity.

Management Responsibilities by Department

City of Anderson Recreation Department

Duties for the City of Anderson Recreation Department would include carrying out the recommendations from this Plan, applying for funding, maintaining trails, and conducting routine maintenance of paved trails, trail planning and design, trail construction, and overseeing the safety and operations of all trail facilities. Staff should also conduct tasks such as updating and publishing new maps, creating and updating GIS layers of all bicycle and pedestrian facilities proposing future alternative routes, working with adjacent neighborhoods to coordinate linkages, and playing a key role in education and encouragement programs. As the City of Anderson's bicycle and pedestrian network continues to expand, the City of Anderson should identify a staff position who can be solely responsible as the City's Bicycle and Pedestrian Coordinator. These duties would involve carrying out the recommendations from this plan, overseeing planning, design and construction of the network, and coordinating with neighborhoods, adjacent communities, and SCDOT. The City's Bicycle and Pedestrian Coordinator would also be responsible for coordinating education, enforcement, and encouragement programs, applying and maintaining Bicycle Friendly Community status, and proposing future alternative routes.



City of Anderson Public Works and Engineering Departments

The Public Works and/or Engineering Director of the City of Anderson should oversee the construction and remedial maintenance of all bicycle, pedestrian, and greenway facilities. One member of the local staff should handle facility development and construction (including posting wayfinding signs) among his/her other responsibilities. Staff should work with SCDOT to develop a schedule for routine maintenance and a means of identifying locations for spot maintenance improvements.

City of Anderson Police Department

All local police officers should go through training courses so that they are up to date with the most current laws governing bicyclists and pedestrians in South Carolina. Specific laws can be found here:

- Bicycle related http://www.bikelaw.com/blog/ south-carolina-bicycle-laws/
- Pedestrian related http://www.leekelaw.com/library/ south-carolina-pedestrian-laws-sc-pedestrian-accidentattorney.cfm
- Bikelaw.com (www.bikelaw.com) provides assistance for conducting bicycle-specific legal training for police officers.



A police force that is trained on existing bicycle laws and common crash types can help improve safety through enforcement and education

South Carolina Department of Transportation (SCDOT)

SCDOT should continue to design and build on-road facilities along with maintaining all pedestrian and bicycle facilities within the roadway rights-of-way that are owned by the state (with the exception of sidewalks on local streets). This includes paved shoulders, bicycle lanes, crosswalks, pedestrian signals, and sidewalks on main roadways. SCDOT should work with local jurisdictions to develop a schedule for routine maintenance and a means of identifying locations for spot maintenance improvements. Through coordination with the City of Anderson's staff, SCDOT can develop recommended on-street bikeway facilities that involve striping or restriping the existing pavement as part of the routine repaving schedule.

Volunteers

Services from volunteers or donations of material and equipment may be provided in-kind, to offset construction and maintenance costs. Formalized maintenance agreements, such as adopt-a-trail can be used to provide a regulated service agreement with volunteers. Other efforts and projects can be coordinated as-needed with senior class projects, scout projects, interested organizations, clubs, or a neighborhood's community service to provide for the basic needs of proposed networks. Utilizing volunteers reduces planning and construction costs and enhances community pride and personal connections to the local greenway, bicycle, and pedestrian networks. In particular, volunteer groups associated with a trail user group, such as the Southeast Off-road Bicycle Association (SORBA), a walking or hiking club, or a non-profit or school that will use the trail for nature education or other purposes are primary targets for ongoing assistance. Volunteers should be trained or supervised in the topic area in which they are working.



Implementation for Management/Maintenance

Trail management and maintenance can be regular, stable, and thorough with support from and partnerships with a variety of public, private, non-profit, and community organizations at the local, regional, and national levels. Through the combined resources of existing staff, new funding sources, and new community partners and volunteers, the following are implementation strategies for advancing best practices in management and maintenance within the City of Anderson:

Establish a Public Comment System

As discussed previously, a common factor that often influences public support for trail funding is the visual condition of the trails. Regular trail users are often the first to notice trail deficiencies or safety issues. Therefore, it is recommended that the City of Anderson establish a user feedback system that will give trail users an opportunity to provide comments related to trail conditions directly to the agency responsible for maintenance of that particular trail. This can be done by posting a sign or kiosk at each trailhead with the necessary contact information. Some communities, such as Greenville, SC, encourage citizens to provide bicycle, pedestrian, or trail related feedback through the City's existing "311" communication service, which allows submissions through a mobile application for smart phones, e-mail, or a phone call.

Implement a Management and Maintenance System

Based on the City of Anderson's staff and department resources, carry-out and monitor regular management and maintenance activities tailored to each section of trail. As the inventory of existing trail conditions and amenities is continuously updated, records of trail maintenance activities over time can be used for determining required budget adjustments on an annual basis. To achieve this, this Plan recommends that the City of Anderson:

- Integrate the trail inventory into the City and County GIS system, so trail maintenance maps can easily be developed for planning purposes;
- Identify the staff member charged with maintaining the inventory of existing and proposed trail facilities and amenities;
- Identify the staff member charged with fielding public comments and complaints related to trails, monitoring incidents along trail, and working with other agencies and partners to develop a response;
- Ensure that staff members handling various aspects of management and maintenance are in regular communication with one another.

Further Define Agency Roles and Responsibilities

As the trail system in the City of Anderson continues to expand, it will become even more critical that the roles and responsibilities of each agency are clearly defined. It is recommended that a point person be identified as the individual responsible for coordination between agencies and continually updating the recommended management and maintenance system. As roles and responsibilities are determined, the City of Anderson should coordinate with the recommended Bicycle, Pedestrian, and Greenways Advisory Committee.



Conclusion

While day-to-day management and maintenance activities may seem ordinary and routine, their proper execution will add years and value to the City of Anderson's bicycle, pedestrian, and greenway system. Thoughtful and thorough structure for trail management and maintenance activities should be established now. Establishing responsible team member roles and routinely working with community members will ensure the City of Anderson's network of bicycle, pedestrian, and trail facilities continues to grow and foster economic, social, and environmental benefits.



Streetscaping with wide sidewalks downtown

Bring Your

WATCH

1

Appendix E: Potential Funding Sources

Overview

This Appendix outlines sources of funding for bicycle and pedestrian projects in the City of Anderson. When considering possible funding sources for bicycle and pedestrian networks, it is important to consider that not all construction activities will be accomplished with a single funding source. Bicycle and pedestrian funding is administered at all levels of government, federal, state, local and through private sources. The following sections identify potential matching and major funding sources, and the criteria for bicycle and pedestrian projects and programs.

Federal Funding Sources

Federal funding is typically directed through state agencies to local governments either in the form of grants or direct appropriations, independent from state budgets. Federal funding typically requires a local match of 20%, although there are sometimes exceptions, such as the recent American Recovery and Reinvestment Act stimulus funds, which did not require a match.

The following is a list of possible Federal funding sources that could be used to support construction of many pedestrian and bicycle improvements. Most of these are competitive, and involve the completion of extensive applications with clear documentation of the project need, costs, and benefits. It should be noted that the FHWA encourages the construction of pedestrian and bicycle facilities as an incidental element of larger ongoing projects. Examples include providing paved shoulders on new and reconstructed roads, or building sidewalks, on-street bikeways, trails and marked crosswalks as part of new highways.

Moving Ahead for Progress in the Twenty-First Century (MAP-21)

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

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

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

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

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



	JUNING	ROGRAMMING	ESIGN/ ONSTRUCTION
		Ā	ΔŪ
FEDERAL F	UNDING		
Transportation Alternatives	Х	Х	Х
Surface Transportation Program			Х
Highway Safety Improvement Program		Х	Х
Congestion Mitigation/Air Quality		Х	Х
FTA Pilot Transit-Oriented Development Planning	Х		
Partnership for Sustainable Communities	Х	Х	Х
Rivers, Trails, and Conservation Assistance Program	Х		
Community Development Block Grants		Х	Х
Community Transformation Grants	Х	Х	
Land and Water Conservation Fund	Х		Х
National Scenic Byways Discretionary Grant Program			Х
Federal Lands Transportation Program	Х		Х
Energy Efficiency and Conservation Block Grants	Х		Х
STATE FU	INDING		
South Carolina Transportation Infrastructure Bank			Х
South Carolina Department of Transportation - Capital Projects			Х
South Carolina Department of Transportation - Maintenance Prog	ram		Х
South Carolina Parks and Recreation Development Fund			Х
Statewide Transportation Improvement Program			Х
LOCAL FU	JNDING		
Metropolitan Planning Organization	Х	Х	Х
General Fund			Х
Local Bond Measures			Х
Stormwater Utility Fees			Х
System Development Charges/Developmer Impact Fees			Х
Street User Fees			Х
In-Lieu-of Fees			Х
Utility Lease Revenue			Х
Local Improvement District			Х
Business Improvement Area or District			х



CITY OF ANDERSON - DOWNTOWN BICYCLE AND PEDESTRIAN CONNECTIVITY MASTER PLAN

		(5	_
		NIN	TION
	DN	AMA	SUC:
	INN	GR	IGN
FUNDING SOURCE	PLA	PRC	DES
Sales Tax	х		Х
Property Tax	Х		Х
Excise Tax			Х
Tax Increment Financing			Х
PRIVATE/NON-PROTITIONDING			
Bikes Belong Grant Program		Х	Х
The Robert Wood Johnson Foundation	Х	Х	
Bank of America Charitable Foundation	Х	Х	
The Walmart Foundation	Х	Х	Х
Duke Energy Foundation		Х	
American Greenways Eastman Kodak Awards	Х	Х	Х
National Trails Fund		Х	Х
The Conservation Alliance	Х	Х	
National Fish and Wildlife Foundation	Х	Х	Х
The Trust for Public Land	х	х	
Community Action for a Renewed Environment (CARE)	Х	Х	Х
Local Trail Sponsors			х
Corporate Donations	Х	Х	Х
Volunteer Work	х	Х	Х
Public-Private Partnerships	Х	Х	Х
Private Individual Donations	Х	Х	Х
Fundraising/Campaign Drives	Х	Х	Х
Land Trust Acquisition and Donation			Х
Adopt a Trail Program			Х



Transportation Alternatives

Transportation Alternatives (TA) is a new funding source under MAP-21 that consolidates three formerly separate programs under SAFETEA-LU: Transportation Enhancements (TE), Safe Routes to School (SR2S), and the Recreational Trails Program (RTP). These funds may be used for a variety of pedestrian, bicycle, and streetscape projects including sidewalks, bikeways, multi-use paths, and rail-trails. TA funds may also be used for selected education and encouragement programming such as Safe Routes to School, despite the fact that TA does not provide a guaranteed set-aside for this activity as SAFETEA-LU did. South Carolina's Governor Nikki Haley did not optout of the Recreational Trails Program funds, ensuring that dedicated funds for recreational trails continue to be provided as a subset of TA. MAP-21 provides \$85 million nationally for the RTP.

Complete eligibilities for TA include:

1. Transportation Alternatives as defined by Section 1103 (a)(29). This category includes the construction, planning, and design of a range of bicycle and pedestrian infrastructure including "on-road and off-road trail facilities for pedestrians, bicyclists, and other active forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety-related infrastructure, and transportation projects to achieve compliance with the Americans with Disabilities Act of 1990." Infrastructure projects and systems that provide "Safe Routes for Non-Drivers" is a new eligible activity.

For the complete list of eligible activities, visit: http://www. fhwa.dot.gov/environment/transportation_enhancements/ legislation/map21.cfm



2. Recreational Trails. TA funds may be used to develop and maintain recreational trails and trail-related facilities for both active and motorized recreational trail uses. Examples of trail uses include hiking, bicycling, in-line skating, equestrian use, and other active and motorized uses. These funds are available for both paved and unpaved trails, but may not be used to improve roads for general passenger vehicle use or to provide shoulders or sidewalks along roads.

Recreational Trails Program funds 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 or easements of 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)

Under MAP-21, dedicated funding for the RTP continues at FY 2009 levels - roughly \$85 million annually. South Carolina will receive \$1,211,220 in RTP funds per year through FY 2014 (http://www.fhwa.dot.gov/environment/ recreational_trails/funding/apportionments_obligations/ recfunds_2009.cfm).

3. Safe Routes to School. The purpose of the Safe Routes to Schools eligibility is to promote safe, healthy alternatives to riding the bus or being driven to school. All projects must be within two miles of primary or middle schools (K-8).

Eligible projects may include:

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.

- 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).
- 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.

4. Planning, designing, or constructing roadways within the right-of-way of former Interstate routes or divided highways. At the time of writing, detailed guidance from the Federal Highway Administration on this new eligible activity was not available.

Average annual funds available through TA over the life of MAP-21 equal \$814 million nationally, which is based on a 2% set-aside of total MAP-21 authorizations. Projected apportionments for South Carolina total \$606,647,974 for FY 2013 and \$611,847,012 for FY 2014 (http://www.fhwa.dot. gov/MAP21/funding.cfm). State DOTs may elect to transfer up to 50% of TA funds to other highway programs, so the amount listed above represents the maximum potential funding.

TA funds are typically allocated through the planning districts. The City of Anderson is part of the Anderson Area Transportation Study (ANATS) and therefore TA funding for the City would come from them. TA funds require a 20 percent local match and must be administered by either SCDOT or a qualified Local Public Agency (LPA).

Surface Transportation Program (Guideshare)

The Surface Transportation Program (STP) provides states with flexible funds which may be used for a variety of highway, road, bridge, and transit projects. A wide variety of bicycle and pedestrian improvements are eligible, including on-street bicycle facilities, off-street trails, sidewalks, crosswalks, bicycle and pedestrian signals, parking, and other ancillary facilities. Modification of sidewalks to comply with the requirements of the Americans with Disabilities Act (ADA) is also an eligible activity. Unlike most highway projects, STP-funded bicycle and pedestrian facilities may be located on local and collector roads which are not part of the Federal-aid Highway System. Fifty percent of each state's STP funds are sub-allocated geographically by population. These funds are funneled through SCDOT to the MPOs in the state. The remaining 50% may be spent in any area of the state. In South Carolina, STP is known as Guideshare.

Highway Safety Improvement Program

MAP-21 doubles the amount of funding available through the Highway Safety Improvement Program (HSIP) relative to SAFETEA-LU. HSIP provides \$2.4 billion nationally for projects and programs that help communities achieve significant reductions in traffic fatalities and serious injuries on all public roads, bikeways, and walkways. MAP-21 preserves the Railway-Highway Crossings Program within HSIP but discontinues the High-Risk Rural roads set-aside unless safety statistics demonstrate that fatalities are increasing on these roads HSIP is a data-driven funding program and eligible projects must be identified through analysis of crash experience, crash potential, crash rate, or other similar metrics..Infrastructure and non-infrastructure



projects are eligible for HSIP funds. Bicycle and pedestrian safety improvements, enforcement activities, traffic calming projects, and crossing treatments for active transportation users in school zones are examples of eligible projects. All HSIP projects must be consistent with the state's Strategic Highway Safety Plan.

Last updated in 2007, the SCDOT SHSP is located here: http://www.scdot.org/inside/pdfs/Multimodal/Road_Map. pdf

Congestion Mitigation/Air Quality Program

The Congestion Mitigation/Air Quality Improvement Program (CMAQ) provides funding for projects and programs in air quality nonattainment and maintenance areas for ozone, carbon monoxide, and particulate matter which reduce transportation related emissions. States with no nonattainment areas may use their CMAQ funds for any CMAQ or STP eligible project. These federal dollars can be used to build bicycle and pedestrian facilities that reduce travel by automobile. Purely recreational facilities generally are not eligible.

New Freedom Initiative

MAP-21 continues a formula grant program that provides capital and operating costs to provide transportation services and facility improvements that exceed those required by the Americans with Disabilities Act. Examples of pedestrian/accessibility projects funded in other communities through the New Freedom Initiative include installing Accessible Pedestrian Signals (APS), enhancing transit stops to improve accessibility, and establishing a mobility coordinator position.

More information: http://www.hhs.gov/newfreedom/

Pilot Transit-Oriented Development Planning

MAP-21 establishes a new pilot program to promote planning for Transit-Oriented Development. At the time of writing the details of this program are not fully clear, although the bill text states that the Secretary of Transportation may make grants available for the planning of projects that seek to "facilitate multimodal connectivity and accessibility," and "increase access to transit hubs for pedestrian and bicycle traffic."

Partnership for Sustainable Communities

Founded in 2009, the Partnership for Sustainable Communities is a joint project of the Environmental Protection Agency (EPA), the U.S. Department of Housing and Urban Development (HUD), and the U.S. Department of Transportation (USDOT). The partnership aims to "improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide." The Partnership is based on five Livability Principles, one of which explicitly addresses the need for bicycle and pedestrian infrastructure ("Provide more transportation choices: Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health").

The Partnership is not a formal agency with a regular annual grant program. Nevertheless, it is an important effort that has already led to some new grant opportunities (including the TIGER grants). The City of Anderson should track Partnership communications and be prepared to respond proactively to announcements of new grant programs.

More information: http://www.epa.gov/smartgrowth/ partnership/



Rivers, Trails, and Conservation Assistance Program

The Rivers, Trails, and Conservation Assistance Program (RTCA) is a National Parks Service (NPS) program providing technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program provides only for planning assistance-there are no implementation monies available. Projects are prioritized for assistance based on criteria including conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments. This program may benefit trail development in the City of Anderson indirectly through technical assistance, particularly for community organizations, but should not be considered a future capital funding source.

More information: http://www.nps.gov/pwro/rtca/who-weare.htm

Community Development Block Grants

TheCommunityDevelopmentBlockGrants(CDBG)program provides money for streetscape revitalization, which may be largely comprised of pedestrian improvements. Federal CDBG grantees may "use Community Development Block Grants funds for activities that include (but are not limited to): acquiring real property; reconstructing or rehabilitating housing and other property; building public facilities and improvements, such as streets, sidewalks, community and senior citizen centers and recreational facilities; paying for planning and administrative expenses, such as costs related to developing a consolidated plan and managing Community Development Block Grants funds; provide public services for youths, seniors, or the disabled; and initiatives such as neighborhood watch programs."

Trails and greenway projects that enhance accessibility are the best fit for this funding source. CDBG funds could also be used to write an ADA Transition Plans.

More information: www.hud.gov/cdbg

Community Transformation Grants

Community Transformation Grants administered through the Center for Disease Control support community-level efforts to reduce chronic diseases such as heart disease, cancer, stroke, and diabetes. Active transportation infrastructure and programs that promote healthy lifestyles are a good fit for this program, particularly if the benefits of such improvements accrue to population groups experiencing the greatest burden of chronic disease.

More info: http://www.cdc.gov/communitytransformation/

Land and Water Conservation Fund (LWCF)

The Land and Water Conservation Fund (LWCF) provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. Funds can be used for right-of-way acquisition and construction. The program is administered by the South Carolina Department of Parks, Recreation & Tourism as a grant program. Any Trails and Greenways Plan projects located in future parks could benefit from planning and land acquisition funding through the LWCF. Trail corridor acquisition can be funded with LWCF grants as well.

More information: http://www.tn.gov/environment/ recreation/grants.shtml



National Scenic Byways Discretionary Grant Program

The National Scenic Byways Discretionary Grants program provides merit-based funding for byway-related projects each year, utilizing one or more of eight specific activities for roads designated as National Scenic Byways, All-American Roads, State scenic byways, or Indian tribe scenic byways. The activities are described in 23 USC 162(c). This is a discretionary program; all projects are selected by the US Secretary of Transportation.

Eligible projects include construction along a scenic byway of a facility for pedestrians and bicyclists and improvements to a scenic byway that will enhance access to an area for the purpose of recreation. Construction includes the development of the environmental documents, design, engineering, purchase of right-of-way, land, or property, as well as supervising, inspecting, and actual construction.

For more information: http://www.bywaysonline.org/ grants/

Federal Lands Transportation Program (FLTP)

The FLTP funds projects that improve access within federal lands (including national forests, national parks, national wildlife refuges, national recreation areas, and other Federal public lands) on federally owned and maintained transportation facilities. \$300 million per fiscal year has been allocated to the program for 2013 and 2014.

For more information: http://www.fhwa.dot.gov/map21/fltp. cfm

Energy Efficiency and Conservation Block Grants

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

For more information: http://www1.eere.energy.gov/wip/ eecbg.html

Additional Federal Funding

The landscape of federal funding opportunities for bicycle and pedestrian programs and projects is always changing. A number of Federal agencies, including the Bureau of Land Management, the Department of Health and Human Services, the Department of Energy, and the Environmental Protection Agency have offered grant programs amenable to bicycle and pedestrian planning and implementation, and may do so again in the future.

For up-to-date information about grant programs through all federal agencies, see: http://www.grants.gov/

State Funding Sources

The following is a list of possible State funding sources that could be used to support construction of many pedestrian and bicycle improvements in the City of Anderson.

South Carolina 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. SCTIB funded development of the Palmetto Parkway in Aiken County, which included development of a roughly five mile multi-use trail within the parkway's right of way.

More information: http://www.scdot.org/inside/SIB_board. aspx

South Carolina Department of Transportation – Capital Projects

The City of Anderson should work closely with SCDOT to include bicycle and pedestrian improvements as part of major projects. The two groups should cooperate on a regular basis to identify opportunities for implementation of the City of Anderson Downtown Bicycle and Pedestrian Connectivity Plan.

South Carolina Department of Transportation – Maintenance Program

The South Carolina Department of Transportation carries out a number of road resurfacing maintenance projects annually. There may be opportunities for road restriping to be completed as part of regular roadway maintenance. This will require coordination between the City of Anderson, the SCDOT District Traffic Engineer and the local maintenance office to ensure that the pavement marking design is appropriate and safe for cyclists and drivers.

South Carolina Parks and Recreation Development Fund

The PARD grant program is a state funded non-competitive reimbursable grant program for eligible local governments or special purposes district entities within each county which provide recreational opportunities.

- Monthly grant cycle
- Non-competitive program available to eligible local governmental entities within each county area for development of new public recreation facilities or enhancement/renovations to existing facilities.
- Projects need endorsement of majority weighted vote factor of County Legislative Delegation Members.

- This is an 80-20 match program
- Application Deadline is the 10th of each month

More information: http://www.scprt.com/our-partners/ grants/pard.aspx.

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. The STIP must fulfill federal planning requirements for a staged, multiyear, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on Federal planning requirements and the specific State plans.

More information: http://www.scdot.org/inside/stip.aspx



Local Government Funding Sources

Local funding sources that would support bike facility project construction will most likely be limited but should be explored to support the City of Anderson's active transportation projects.

Metropolitan Planning Organization

Metropolitan Planning Organizations (MPOs) are federally required regional transportation planning organizations. MPOs are responsible for planning and prioritizing all federally funded transportation improvements within an urbanized area.

The Anderson Area Transportation Study (ANATS) is the Metropolitan Planning Organization (MPO) for the City of Anderson and surrounding urban areas (http://www. centralmidlands.org). MPOs are a partnership between local and state government that makes decisions about transportation planning in urbanized areas and meets planning requirements established by federally authorizing legislation for transportation funding. ANATS works cooperatively with SCDOT to develop transportation plans, travel models, transit plans, and bicycle and pedestrian plans. The two bodies also coordinate on funding issues for transportation improvements, project planning issues, and other issues such as environmental and air quality concerns. Locally, ANATS works with local governments to coordinate land use and transportation planning.

MPOs maintain a long-range transportation plan (LRTP) and develop a transportation improvement program (TIP) to develop a fiscally constrained program based on the long-range transportation plan and designed to serve the region's goals while using spending, regulating, operating, management, and financial tools. This Plan recommends that the City of Anderson and its partners work closely with ANATS to ensure trails and greenways projects are listed in the TIP. Typically, projects on this list require a 20% local match.

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 Bond Measures

Local bond measures, or levies, are usually general obligation bonds for specific projects. Bond measures are typically limited by time based on the debt load of the local government or the project under focus. Funding from bond measures can be used for engineering, design and construction of trails, greenways, and pedestrian and bicycle facilities. A bond issued in Denver, Colorado funded \$5 million for trail development and also funded the City's bike planner for several years. In 2012, voters in Austin, Texas approved a \$143 million bond to fund a variety of mobility and active transportation projects

More information: http://www.scdot.org/inside/SIB_board. aspx.

Stormwater Utility Fees

Stormwater charges are typically based on an estimate of the amount of impervious surface on a user's property. Impervious surfaces (such as rooftops and paved areas) increase both the amount and rate of stormwater runoff compared to natural conditions. Such surfaces cause runoff that directly or indirectly discharges into public storm drainage facilities and creates a need for stormwater



management services. Thus, users with more impervious surface are charged more for stormwater service than users with less impervious surface.

The rates, fees, and charges collected for stormwater management services may not exceed the costs incurred to provide these services. The costs that may be recovered through the stormwater rates, fees, and charges includes any costs necessary to assure that all aspects of stormwater quality and quantity are managed in accordance with federal and state laws, regulations, and rules. Open space may be purchased with stormwater fees, if the property in question is used to mitigate floodwater or filter pollutants.

System Development Charges/ Developer Impact Fees

System Development Charges (SDCs), also known as Developer Impact Fees, represent another potential local funding source. SDCs are 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- or off-site pedestrian improvements that will encourage residents to walk (or use transit, if available) rather than drive. In-lieu parking fees may be used to help construct new or improved pedestrian facilities. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical in avoiding a potential lawsuit.

Street User Fees

Many cities administer street user fees through residents' monthly water or other utility bills. The revenue generated by the fee can be used for operations and maintenance of the street system, and priorities would be established by the Public Works Department. Revenue from this fund can be used to maintain on-street bicycle and pedestrian facilities, including routine sweeping of bicycle lanes and other designated bicycle routes.

In Lieu of Fees

Developers often dedicate open space or greenways in exchange for waiving fees associated with park and open space allocation requirements in respect to proposed development. These types of requirements are presented within local municipal codes and ordinances.

Utility Lease Revenue

A method to generate revenues from land leased to utilities for locating utility infrastructure on municipally owned parcels. This can improve capital budgets and support financial interest in property that would not otherwise create revenue for the government.

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. Based on South Carolina's Municipal Improvements Act of 1999, LIDs can include a Municipal Improvement District (MID), a County Public Works Improvement District (CPWID) or a Residential Improvement District (RID).

Several cities have successfully used LID funds to make improvements on residential streets and for large scale arterial projects. LIDs 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 or District (BIA or BID)

Trail development and 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, including as wider sidewalks, landscaping and ADA compliance.

Sales Tax

Local governments that choose to exercise a local option sales tax use the tax revenues to provide funding for a wide variety of projects and activities. The City of Anderson's 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. Any increase in the sales tax, even if applying to a single county, must gain approval of the state legislature. In 2004, Charleston County voters approved a ½ cent sales tax for the purpose of financing transportation and greenbelt projects. Voters approved a second referendum in 2006.

More Information: http://roads.charlestoncounty.org/ about.php

Property Tax

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

Excise Taxes

Excise taxes are taxes on specific goods and services. These taxes require special legislation and the use of the funds generated through the tax are limited to specific uses. Examples include lodging, food, and beverage taxes that generate funds for promotion of tourism, and the gas tax that generates revenues for transportation-related activities.

Tax Increment Financing (TIF)

Tax Increment Financing 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 trail) is constructed, surrounding property values generally increase and encourage surrounding development or redevelopment. The increased tax revenues are then dedicated to support the debt created by the original public improvement project.



Private/Nonprofit Funding Sources

Many communities have solicited greenway funding assistance from private foundations and other conservationminded benefactors. The following are several examples of private funding opportunities available.

Foothills Community Foundation

Foothills Community Foundation is an independent public charity that stewards philanthropic resources from institutional and individual donors to community based organizations.

Throughout its history, the Foundation has served as a tax efficient and cost effective means for individuals, businesses and charitable organizations to provide the financial resources critical to improving the lives of our citizens. Our mission is "To retain and nurture the charitable wealth in the South Carolina counties of Anderson, Oconee and Pickens."

The Foundation awards grants under its key initiatives: Civic, Arts and Culture, Education, Health Improvement, and Youth and Recreation. Awards are made on a competitive basis to eligible grant recipients, including individuals and non-profits. The Foundation partners with organizations and individuals to encourage greater access and participation in recreational activities, support health improvement efforts in our schools, hospitals, communities and free medical clinics.

To Benefit Anderson

To Benefit Anderson is an independently organized nonprofit organization that utilizes anonymous donations on a yearly basis to complete one individual project as decided upon by the Board of Directors. Since its inception, TBA has completed numerous art installation and plaza renovations, with a yearly capital cost of \$100,000. TBA initially started the fundraising drive to accept 100 donations of \$1,000 but has since increased opportunities of giving levels. Currently the TBA is involved in design development and fundraising for a City of Anderson Dog Park.

To Benefit Anderson accepts project initiatives and ideas through its Board of Directors as previous projects are completed.

Bikes Belong Grant Program

The Bikes Belong Coalition of bicycle suppliers and retailers has awarded \$2.5 million and leveraged an additional \$650 million since its inception in 1999. The program funds corridor improvements, mountain bike trails, BMX parks, trails, and park access. It is funded by the Bikes Belong Employee Pro Purchase Program.

More information: http://www.peopleforbikes.org/pages/ community-grants

The Robert Wood Johnson Foundation

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

- To assure that all Americans have access to basic health care at a reasonable cost
- To improve care and support for people with chronic health conditions
- To promote healthy communities and lifestyles
- To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs

More information: http://www.rwjf.org/applications/



Bank of America Charitable Foundation, Inc.

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

More information: http://www.bankofamerica.com/ foundation

The Walmart Foundation

The Walmart Foundation offers a Local, State, and National Giving Program. The Local Giving Program awards grants of \$250 to \$5,000 through local Walmart and Sam's Club Stores. Application opportunities are announced annually in February with a final deadline for applications in December. The State Giving Program provides grants of \$25,000 to \$250,000 to 501c3 nonprofits working within one of five focus areas: Hunger Relief & Nutrition, Education, Environmental Sustainability, Women's Economic Empowerment, or Workforce Development. The program has two application cycles per year: January through March and June through August. The Walmart Foundation's National Giving Program awards grants of \$250,000 and more, but does not accept unsolicited applications.

More information: http://foundation.walmart.com/ apply-for-grants

Duke Energy Foundation

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

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

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

More information: http://www.duke-energy.com/ community/foundation.asp

The Kodak American Greenways Program

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

More information: http://www.conservationfund.org

National Trails Fund

American Hiking Society created the National Trails Fund in 1998, the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. 73 million people enjoy foot trails annually, yet many of our favorite trails need major repairs due to a \$200 million backlog of badly needed maintenance. National Trails Fund grants help give local organizations the resources they need to secure access, volunteers, tools



and materials to protect America's cherished public trails. To date, American Hiking has granted more than \$240,000 to 56 different trail projects across the U.S. for land acquisition, constituency building campaigns, and traditional trail work projects. Awards range from \$500 to \$10,000 per project.

Projects the American Hiking Society will consider include:

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

More information: http://www.americanhiking.org/ alliance/fund.html

The Conservation Alliance

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to protect wild and natural areas. One hundred percent of its member companies' dues go directly to diverse, local community groups across the nation-groups like Southern Utah Wilderness Alliance, Alliance for the Wild Rockies, The Greater Yellowstone Coalition, the South Yuba River Citizens' League, RESTORE: The North Woods and the Sinkyone Wilderness Council (a Native Americanowned/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 active transportation 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. The Alliance does not look for mainstream education or scientific research projects, but rather for active campaigns. All projects should be quantifiable, with specific goals, objectives and action plans and should include a measure for evaluating success. The project should have a good chance for closure or significant measurable results over a fairly short term (one to two years). Funding emphasis may not be on general operating expenses or staff payroll.

More 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.

More information: http://www.nfwf.org/AM/Template. cfm?Section=Grants

E-16

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 wellbeing. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities. Also, TPL is the leading organization helping agencies and communities identify and create funds for conservation from federal, state, local, and philanthropic sources.

Since 1996, TPL has helped states and communities craft and pass over 382 successful ballot measures, generating \$34 billion in new conservation-related funding.

More information: http://www.tpl.org/what-we-do/ services/conservation-finance/

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 \$90,000 and \$275,000.

More information: http://www.epa.gov/care/

Local Trail Sponsors

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

Corporate Donations

Corporate donations are often received in the form of liquid investments (i.e. cash, stock, bonds) and in the form of land. 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. Municipalities typically create funds to facilitate and simplify a transaction from a corporation's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented. Such donations can improve capital budgets and/or projects.

Other Sources

Volunteer Work and Public-Private Partnerships

Individual volunteers from the community can be brought together with groups of volunteers from church groups, civic groups, scout troops and environmental groups to work on greenway development on special community workdays. Volunteers can also be used for fundraising, maintenance, and programming needs. 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.

Private Individual Donations

Private individual donations can come in the form of liquid investments (i.e. cash, stock, bonds) or land. Municipalities typically create funds to facilitate and simplify a transaction from an individual's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented. Such donations can improve capital budgets and/or projects.

Fundraising / Campaign Drives

Organizations and individuals can participate in a fundraiser or a campaign drive. It is essential to market the purpose of a fundraiser to rally support and financial backing. Oftentimes fundraising satisfies the need for public awareness, public education, and financial support.

Land Trust Acquisition and Donation

Land trusts are held by a third party other than the primary holder and the beneficiaries. This land is oftentimes held in a corporation for facilitating the transfer between two parties. For conservation purposes, land is often held in a land trust and received through a land trust. A land trust typically has a specific purpose such as conservation and is used so land will be preserved as the primary holder had originally intended.

Adopt a Trail Program

A challenge grant program with local businesses may be a good source of local funding, where corporations 'adopt' a trail and help maintain the facility. Foundation grants, volunteer work, and donations of in-kind services, equipment, labor or materials are other sources of support that can play a supporting role in gathering resources to design and build new bicycle and pedestrian facilities.

Residents and other community members are excellent resources for garnering support and enthusiasm for a trail, and the City of Anderson should work with volunteers to substantially reduce implementation and maintenance costs. Local schools, community groups, or a group of dedicated neighbors may use the project as a goal for the year, possibly working with a local designer or engineer. Work parties can be formed to help clear the right-of-way for a new trail or maintain existing facilities where needed.





Appendix F: Bicycle and Pedestrian Facility Design Guidelines

Contents

Overview	F-3
National Standards	F-3
Local Standards	F-4
Design Needs of Pedestrians	F-5
Sidewalks	F-7
Zones in the Sidewalk Corridor	F-8
Sidewalk Widths	F-9
Sidewalk Obstructions and Driveway Ramps	F-10
Pedestrians at Intersections	F-11
Marked Crosswalks	F-12
Median Refuge Islands	F-13
Minimizing Curb Radii	F-14
Curb Extensions	F-15
Advance Stop Bar	F-16
ADA Compliant Curb Ramps	F-17
Crossing Beacons and Signals	F-18
Pedestrians at Signalized Crossings	F-19
Active Warning Beacons	F-20
Hybrid Beacon for Midblock Crossing	F-21
Design Needs of Bicyclists	F-22
On-Street Bicycle Facilities	F-25
Signed Shared Roadway	F-26
Marked Shared Roadway	F-27
Bicycle Boulevard	F-28



Bike Lanes	F-29
Cycle Tracks	F-30
Bike Lanes at Intersections	F-31
Bike Lanes at Right Turn Only Lanes	F-32
Colored Bike Lanes in Conflict Areas	F-33
Intersection Crossing Markings	F-34
Bike Lanes at High Speed Interchanges	F-35
Bikeway Signing	F-36
Wayfinding Sign Types	F-37
Wayfinding Sign Placement	F-38
Retrofitting Existing Streets to add Bikeways	F-39
Roadway Widening	F-40
Lane Narrowing	F-41
Lane Reconfiguration	F-42
Parking Reduction	F-43
Shared-use Paths and Off-Street Facilities	F-44
General Design Practices	F-45
Shared-use Paths in River and Utility Corridors	F-46
Shared-use Paths in Abandoned Rail Corridors	F-47
Local Neighborhood Accessways	F-48
Shared-use Paths Along Roadways	F-49
Path/Roadway Crossings	F-50
Marked/Unsignalized Crossings	F-51
Signalized/Controlled Crossings	F-52



Overview

This technical handbook is intended to assist Kershaw County in the selection and design of 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.

National Standards

The Federal Highway Administration's **Manual on 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 bicyclerelated 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 about 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**, updated in June 2012 provides guidance on dimensions, use, and layout of specific bicycle facilities. The standards and guidelines presented by AASHTO provide basic information, such as minimum sidewalk widths, bicycle lane dimensions, detailed striping requirements and recommended signage and pavement markings.

The National Association of City Transportation Officials' (NACTO) 2012 **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.

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.

Meeting the requirements of the Americans with Disabilities Act (ADA) is an important part of any bicycle and pedestrian facility project. The United States Access Board's proposed **Public Rights-of-Way Accessibility Guidelines**4 (PROWAG) and the **2010 ADA Standards for Accessible Design**5 (2010 Standards) contain standards and guidance for the construction of accessible facilities. This includes requirements for sidewalk curb ramps, slope requirements, and pedestrian railings along stairs.



Some of these treatments are not directly referenced in the current versions of the AASHTO Guide or the MUTCD, although many of the elements of these treatments are found within these documents. 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.

Local Standards

The South Carolina Department of Transportation (SCDOT) offers additional local guidance regarding the design of nonmotorized transportation facilities. The primary source of state level guidance is the SCDOT Highway Design Manual, which provides department criteria and practices for roadway construction. This guidance includes information on sidewalks and on-street bike lanes. Engineering level guidance can be found in the SCDOT Standard Drawings. These documents contain typical striping and construction plans for bike lanes and curb ramps.

SCDOT developed Traffic Calming Guidelines to assist local governments in addressing cut-through and speeding traffic on SCDOT's minor collector and local routes. The guidelines discuss eligibility criteria and the project request process.

Additional guidance can be found in SCDOT Engineering Directive Memorandums (EDM) and Traffic Engineering Guidelines (TGs) covering specific topics. The EDMs and TGs most relevant to the content in this guide are summarized here.

SCDOT EDM 22: Considerations for Bicycle Facilities

addresses shared roadways and bike lanes/paved shoulders and provides guidance on design requirements for new projects. 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 attached. Other design considerations for bicycle accommodations are also discussed.

SCDOT EDM 53: Installation of Rumble Strips provides guidance on the installation of rumble strips on SCDOT's state highway system. They are used to alert drivers of land departures by providing an audible and vibratory warning. On bicycle touring routes with a high percentage of road departure crashes, rumble strips may be considered for use. In these cases the Traffic Safety Office shall coordinate with the Office of the Pedestrian and Bicycle Engineer and applicable shareholders for input on designated bike routes where paved shoulders are less than 4 feet in width.

TG-8: Warning Sign for "Share the Road with Bicyclists" provides guidelines on conditions warranting the use of the "Share the Road with Bicyclists" warning sign.

TG-18: Engineering Guidelines For Way Finding Signs details requirements for highway signs.

TG-24: Use of Shared Lane Marking Symbols defines the appropriate locations where this type of marking should be considered for use on the South Carolina Highway System and the process by which municipalities request installation.

TG-26: Pedestrian Hybrid Beacon Guideline clarifies the warrants, engineering study requirements, timing and design of pedestrian hybrid beacon installations.

Access and Roadside Management Standards (ARMS) defines construction and design standards for driveways and entrances onto SCDOT highways. The standards provide details on driveway spacing, placement of driveways near interchanges, requirements in school access areas, street intersections and other roadway design considerations.



Design Needs of Pedestrians Types of Pedestrians

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

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

The table below summarizes common physical and cognitive impairments, how they affect personal mobility, and recommendations for improved pedestrian-friendly design.

	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
	a AASUTO Cuida fay the Diamaing Design and Operation of

Pedestrian Characteristics by Age

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 of 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 inter- sections, channelized right turn lanes) and complex intersections.	Longer pedestrian signal cycles, clear sight distanc- es, highly visible pedestrian signals and markings.
Vision Impairment	Limited perception of path ahead and obstacles; reliance on memory; reliance on non-visual indica- tors (e.g. sound and texture).	Accessible text (larger print and raised text), ac- cessible pedestrian signals (APS), guide strips and detectable warning surfaces, safety barriers, and lighting.
Cognitive Impairment	Varies greatly. Can affect ability to perceive, recog- nize, understand, interpret, and respond to informa- tion.	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

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.



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

USDOJ. (2010). ADA Standards for Accessible Design. United States Access Board. (2011). Proposed Accessibility Guidelines for Pedestrian Facilities in the Public-Right-of-Way (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 space. Colored, patterned, or stamped concrete can add distinctive visual appeal.

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 - 5 feet	4 - 6 feet	N/A	6 - 11 feet
Commercial Areas	Varies	4 - 6 feet	6 - 12 feet	2.5 - 10 feet	11 - 28 feet
Arterials and Collectors	Varies	2 - 6 feet	4 - 8 feet	2.5 - 5 feet	8 -19 feet
	Areas that have si	quificant	Six feet enables two	nedestrians	
	accumulations of snow during the		(including wheelchair users) to		

winter may prefer a wider furnishing zone for snow storage.

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.

Additional References and Guidelines

SCDOT. (2003). Highway Design Manual. USDOJ. (2010). ADA Standards for Accessible Design. United States Access Board. (2011). Proposed Accessibility Guidelines for Pedestrian Facilities in the Public-Right-of-Way. 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. Colored or patterned concrete can add distinctive visual appeal.

Sidewalk Obstructions and Driveway Ramps

Description

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

Guidance

Reducing the number of accesses reduces the need for special provisions. This strategy should be pursued first.

Obstructions should be placed between the sidewalk and the roadway to create a buffer for increased pedestrian comfort.



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 curbtight sidewalks, dipping the entire sidewalk at the driveway approaches keeps the cross-slope at a constant grade. However, this may be uncomfortable for pedestrians and could create drainage problems behind the sidewalk.

Additional References and Guidelines

USDOJ. (2010). ADA Standards for Accessible Design. United States Access Board. (2011). Proposed Accessibility Guidelines for Pedestrian Facilities in the Public-Right-of-Way AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

SCDOT. (2008). Access and Roadside Management Standards.

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 space. Surfaces must be firm, stable, and slip resistant.

Pedestrians at Intersections

Attributes of pedestrian-friendly intersection design include:

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

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

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

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

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

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

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















Marked Crosswalks

Description

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

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

Guidance

At signalized intersections, all crosswalks should be marked. At unsignalized intersections, crosswalks may be marked under the following conditions:

- At a complex intersection, to orient pedestrians in finding their way across.
- At an offset intersection, to show pedestrians the shortest route across traffic with the least exposure to vehicular traffic and traffic conflicts.
- At an intersection with visibility constraints, to position pedestrians where they can best be seen by oncoming traffic.
- At an intersection within a school zone on a walking route.



Discussion

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

Additional References and Guidelines

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

Median Refuge Islands

Description

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

Guidance

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



Discussion

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

On multi-lane roadways, consider configuration with **Active Warning Beacons** for improved yielding compliance.

Additional References and Guidelines

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

Materials and Maintenance

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

Minimizing Curb Radii

Description

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

Guidance

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



Discussion

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

Additional References and Guidelines

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

AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.

Materials and Maintenance

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

Curb Extensions

Description

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

Guidance

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



Discussion

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

Additional References and Guidelines

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

AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.

Materials and Maintenance

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

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 15-50 feet or more 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 on Uniform Traffic Control Devices.

Materials and Maintenance

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

ADA Compliant Curb Ramps

Description

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

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

Guidance

- The landing at the top of a ramp shall be at least 4 feet long and at least the same width as the ramp itself.
- The ramp shall slope no more than 1:12, with a maximum cross slope of 2.0%.
- If the ramp runs directly into a crosswalk, the landing at the bottom will be in the roadway.
- If the ramp lands on a dropped landing within the sidewalk or corner area where someone in a wheelchair may have to change direction, the landing must be a minimum of 5'-0" long and at least as wide as the ramp, although a width of 5'-0" is preferred.

Diagonal ramps shall include

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.

Crosswalk spacing not to scale. For illustration purposes only.

Discussion

The edge of an ADA compliant curb ramp may 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 should 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. (2011). Proposed Accessibility

Guidelines for Pedestrian Facilities in the Public-Right-of-Way. USDOJ. (2010). ADA Standards for Accessible Design.

Materials and Maintenance

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

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 and bicyclists.

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

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

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









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



Discussion

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

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

Additional References and Guidelines

United States Access Board. (2011). Proposed Accessibility Guidelines for Pedestrian Facilities in the Public-Right-of-Way. AASHTO. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Materials and Maintenance

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

Active Warning Beacons

Description

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

Types of active warning beacons include conventional circular yellow flashing beacons, in-roadway warning lights, or Rectangular Rapid Flash Beacons (RRFB).

Guidance

- Warning beacons shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic signals.
- Warning beacons shall initiate operation based on pedestrian or bicyclist actuation and shall cease operation at a predetermined time after actuation or, with passive detection, after the pedestrian or bicyclist clears the crosswalk.



Discussion

Rectangular rapid flash beacons have the 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. (2012). Urban Bikeway Design Guide. FHWA. (2009). Manual on Uniform Traffic Control Devices. FHWA. (2008). MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11)

Materials and Maintenance

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

Hybrid Beacon for Midblock Crossing

Description

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

Guidance

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

- If installed within a signal system, signal engineers should evaluate the need for the hybrid signal to be coordinated with other signals.
- Parking and other sight obstructions should be prohibited for at least 100 feet in advance of and at least 20 feet beyond the marked crosswalk to provide adequate sight distance.



Discussion

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

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

Additional References and Guidelines

FHWA. (2009). Manual on Uniform Traffic Control Devices. NACTO. (2012). Urban Bikeway Design Guide. SCDOT. (2011). Traffic Engineering Guideline 26

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.

Design Needs of Bicyclists

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

Bicycle as a Design Vehicle

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

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



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



Bicycle as	Design	Vehicle -	Typical	Dimensions
-------------------	--------	-----------	---------	------------

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

Design Speed Expectations

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

2	e 11	
Bicycle Type	Feature	Typical Dimensions
Upright Adult	Physical width	ysical width 2 ft 6 in
Bicyclist	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	Physical length	8 ft
Bicyclist	Eye height	3 ft 10 in
Tandem Bicyclist	Physical length	8 ft
Bicyclist with	Physical length	10 ft
child trailer	Physical width	2 ft 8 in

Bicycle as Design Vehicle - Typical Dimensions

Bicycle as Design Vehicle - Design Speed Expectations

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

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

Types of Bicyclists

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

The bicycle planning and engineering professions currently use several systems to classify the population, which can assist in understanding the characteristics and infrastructure preferences of different bicyclists. The most conventional framework classifies the "design cyclist" as Advanced, Basic, or Child1. A more detailed understanding of the US population as a whole is illustrated in the figure below. Developed by planners in Portland, OR2 and supported by data collected nationally since 2005, this classification provides the following alternative categories to address varying attitudes towards bicycling in the US:

- Strong and Fearless (approximately 1% of population) Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections -- even if shared with vehicles -- over separate bicycle facilities such as shared use paths.
- Enthused and Confident (5-10% of population) - This user group encompasses bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or shared use paths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreationalists, racers and utilitarian bicyclists.
- Interested but Concerned (approximately 60% of population) This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or trails under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These people may become "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.



Typical Distribution of Bicyclist Types

Selecting Roadway Design Treatments to Accommodate Bicycles. (1994). Publication No. FHWA-RD-92-073 Four Types of Cyclists. (2009). Roger Geller, City of Portland Bureau of Transportation.

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

2

On-Street Bicycle Facilities

Shared Roadways

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

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

Bicycle Boulevards

Bicycle boulevards are a special class of shared roadway 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.

Bike Lanes

Bike lanes use signage and striping to delineate the right-of-way assigned to bicyclists and motorists. Bike lanes encourage predictable movements by both bicyclists and motorists. Bike Lanes can increase safety and promote proper riding by discouraging bicyclists from riding on the sidewalk, reducing the incidence of wrong way riding, and reminding motorists that bicyclists have a right to the road.

Cycle Tracks

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





Bicycle Boulevard





F-25

Signed Shared Roadway

Description

Signed Shared Roadways are facilities shared with motor vehicles. They are typically used on roads with low speeds and traffic volumes, however can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.

Guidance

Lane width varies depending on roadway configuration.

Bicycle Route signage (D11-1) should be applied at intervals frequent enough to keep bicyclists informed of changes in route direction and to remind motorists of the presence of bicyclists. Commonly, this includes placement at:

- Beginning or end of Bicycle Route.
- At major changes in direction or at intersections with other bicycle routes.

MUTCD D11-1

BIKE ROUT

At intervals along bicycle routes not to exceed ½ mile.

Discussion

Signed Shared Roadways serve either to provide continuity with other bicycle facilities (usually bike lanes) or to designate preferred routes through high-demand corridors.

This configuration differs from a **Bicycle Boulevard** due to a lack of traffic calming, wayfinding, pavement markings and other enhancements designed to provide a higher level of comfort for a broad spectrum of users.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. SCDOT. (2005). Traffic Engineering Guideline 8 SCDOT. (2011). Traffic Engineering Guideline 24

Materials and Maintenance

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

Marked Shared Roadway

Description

A marked shared roadway is a general purpose travel lane marked with shared lane markings (SLM) used to encourage bicycle travel and proper positioning within the lane.

In constrained conditions, the SLMs are placed in the middle of the lane to discourage unsafe passing by motor vehicles. On a wide outside lane, the SLMs can be used to promote bicycle travel to the right of motor vehicles.

In all conditions, SLMs should be placed outside of the

Guidance

- In constrained conditions, preferred placement is in the center of the travel lane to minimize wear and promote single file travel.
- Minimum placement of SLM marking centerline is 11 feet from edge of curb where on-street parking is present, 4 feet from edge of curb with no parking. If parking lane is wider than 7.5 feet, the SLM should be moved further out accordingly.



Discussion

Bike Lanes should be considered on roadways with outside travel lanes wider than 15 feet, or where other lane narrowing or removal strategies may provide adequate road space. SLMs shall not be used on **shoulders**, in designated **Bike Lanes,** or to designate bicycle detection at signalized intersections. (MUTCD 9C.07)

This configuration differs from a Bicycle Boulevard due to a lack of traffic calming, wayfinding, and other enhancements designed to provide a higher level of comfort for a broad spectrum of users.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. NACTO. (2012). Urban Bikeway Design Guide. SCDOT. (2011). Traffic Engineering Guideline 24

Materials and Maintenance

Placing SLMs between vehicle tire tracks will increase the life of the markings and minimize the long-term cost of the treatment.

Bicycle Boulevard

Description

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

Guidance

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



Discussion

Bicycle boulevard retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments for bicyclists, these intersections can become major barriers along the bicycle boulevard and compromise safety.

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

Additional References and Guidelines

NACTO. (2012). Urban Bikeway Design Guide. SCDOT. (2011). Traffic Engineering Guideline 24. Ewing, Reid and Brown, Steven. (2009). U.S. Traffic Calming Manual. SCDOT. (2006). Traffic Calming Guidelines.

Materials and Maintenance

Vegetation should be regularly trimmed to maintain visibility and attractiveness.

Bike Lanes

Description

Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane.

Many bicyclists, particularly less experienced riders, are more comfortable riding on a busy street if it has a striped and signed bikeway than if they are expected to share a lane with vehicles.

Guidance

- 4 foot minimum when no curb and gutter is present.
- 5 foot minimum when adjacent to curb and gutter or 3 feet more than the gutter pan width if the gutter pan is wider than 2 feet.
- 14.5 foot preferred from curb face to edge of bike lane. (12 foot minimum).
- 7 foot maximum width for use adjacent to arterials with high travel speeds. Greater widths may encourage motor vehicle use of bike lane.



Discussion

Wider bicycle lanes are desirable in certain situations such as on higher speed arterials (45 mph+) where use of a wider bicycle lane would increase separation between passing vehicles and bicyclists. Appropriate signing and stenciling is important with wide bicycle lanes to ensure motorists do not mistake the lane for a vehicle lane or parking lane.

Additional References and Guidelines

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

Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

Cycle Tracks

Description

A cycle track is an exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. A cycle track is physically separated from motor traffic and distinct from the sidewalk. Cycle tracks have different forms but all share common elements—they provide space that is intended to be exclusively or primarily used by bicycles, and are separated from motor vehicle travel lanes, parking lanes, and sidewalks.

Raised cycle tracks may be at the level of the adjacent sidewalk or set at an intermediate level between the roadway and sidewalk to separate the cycle track from the pedestrian area.

Guidance

Cycle tracks should ideally be placed along streets with long blocks and few driveways or mid-block access points for motor vehicles.

One-Way Cycle Tracks

7 foot recommended minimum to allow passing. 5 foot minimum width in constrained locations.

Two-Way Cycle Tracks

- Cycle tracks located on one-way streets have fewer potential conflict areas than those on two-way streets.
- 12 foot recommended minimum for two-way facility.
 8 foot minimum in constrained locations



Discussion

Special consideration should be given at transit stops to manage bicycle and pedestrian interactions. Driveways and minor street crossings are unique challenges to cycle track design. Parking should be prohibited within 30 feet of the intersection to improve visibility. Color, yield markings and "Yield to Bikes" signage should be used to identify the conflict area and make it clear that the cycle track has priority over entering and exiting traffic. If configured as a raised cycle track, the crossing should be raised so that the sidewalk and cycle track maintain their elevation through the crossing.

Additional References and Guidelines

NACTO. (2012). Urban Bikeway Design Guide.

Materials and Maintenance

In cities with winter climates, barrier separated and raised cycle tracks may require special equipment for snow removal.

Bike Lanes 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.











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 rightmost through lane or, where right-of-way is insufficient, to use a **shared bike lane/turn lane**.

The design (right) illustrates a bike lane pocket, with signage indicating that motorists should yield to bicyclists through the conflict area.

Guidance

At auxiliary right turn only lanes (add lane):

- Continue existing bike lane width; standard width of 5 to 6 feet or 4 feet in constrained locations.
- Use signage to indicate that motorists should yield to bicyclists through the conflict area.
- Consider using colored conflict areas to promote visibility of the mixing zone.

Where a through lane becomes a right turn only lane:

- Do not define a dotted line merging path for bicyclists.
- Drop the bicycle lane in advance of the merge area.
- Use shared lane markings to indicate shared use of the lane in the merging zone.

Colored pavement may be used in the weaving area to increase visibility and awareness of potential conflict



Discussion

For other potential approaches to providing accommodations for bicyclists at intersections with turn lanes, see Colored Bike Lanes and Intersection Crossing Markings.

Additional References and Guidelines

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

Materials and Maintenance

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

Colored Bike Lanes in Conflict Areas

Description

Colored pavement within a bicycle lane increases the visibility of the facility and reinforces priority of bicyclists in conflict areas.

Guidance

- Green colored pavement was given interim approval by the Federal Highways Administration in March 2011. See interim approval for specific color standards.
- The colored surface should be skid resistant and retro-reflective.
- A "Yield to Bikes" sign should be used at intersections or driveway crossings to reinforce that bicyclists have the right-of-way in colored bike lane areas.

Normal white dotted edge lines should define colored space



Discussion

Evaluations performed in Portland, OR, St. Petersburg, FL and Austin, TX found that significantly more motorists yielded to bicyclists and slowed or stopped before entering the conflict area after the application of the colored pavement when compared with an uncolored treatment.

Additional References and Guidelines

FHWA. (2011). Interim Approval (IA-14) has been granted. Requests to use green colored pavement need to comply with the provisions of Paragraphs 14 through 22 of Section 1A.10 NACTO. (2012). Urban Bikeway Design Guide.

Materials and Maintenance

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

Intersection Crossing Markings

Description

Bicycle pavement markings through intersections indicate the intended path of bicyclists through an intersection or across a driveway or ramp. They guide bicyclists on a safe and direct path through the intersection and provide a clear boundary between the paths of through bicyclists and either through or crossing motor vehicles in the adjacent lane.

Guidance

- See MUTCD Section 3B.08: "dotted line extensions"
- Crossing striping shall be at least six inches wide when adjacent to motor vehicle travel lanes. Dotted lines should be two-foot lines spaced two to six feet apart.
- Chevrons, shared lane markings, or colored bike lanes in conflict areas may be used to increase visibility within conflict areas or across entire intersections. Elephant's Feet markings are common in Europe and Canada.



Discussion

Additional markings such as chevrons, shared lane markings, or **colored bike lanes in conflict areas** are strategies currently in use in the United States and Canada. Cities considering the implementation of markings through intersections should standardize future designs to avoid confusion.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. (3A.06) NACTO. (2012). Urban Bikeway Design Guide.

Materials and Maintenance

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

Bike Lanes at High Speed Interchanges

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.

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.



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

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. Bicycle and Pedestrian Transportation. Lesson 15: Bicycle Lanes

Materials and Maintenance

Locate crossing 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 misconceptions 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

Description

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

Confirmation Signs

- Indicate to bicyclists that they are on a designated bikeway. Make motorists aware of the bicycle route.
- Can include destinations and distance/time. Do not include arrows.

Turn Signs -

- Indicate where a bikeway turns from one street onto another street. Can be used with pavement markings.
- Include destinations and arrows.

Decisions Signs

- Mark the junction of two or more bikeways.
- Inform bicyclists of the designated bike route to access key destinations.
- Destinations and arrows, distances and travel times are optional but recommended.



Discussion

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

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. NACTO. (2012). Urban Bikeway Design Guide. SCDOT. (2008). Traffic Engineering Guideline 18

Materials and Maintenance

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

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

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices. NACTO. (2012). Urban Bikeway Design Guide. SCDOT. (2008). Traffic Engineering Guideline 18

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.



Lane Narrowing







Roadway Widening

Description

Bike lanes can be accommodated on streets with excess right-of-way through shoulder widening. Although roadway widening incurs higher expenses compared with re-striping projects, bike lanes can be added to streets currently lacking curbs, gutters and sidewalks without the high costs of major infrastructure reconstruction.

Guidance

- Guidance on **Bicycle Lanes** applies to this treatment.
- 4 foot minimum width when no curb and gutter is present.
- 6 foot width preferred.



Discussion

Roadway widening is most appropriate on roads lacking curbs, gutters and sidewalks.

If it is not possible to meet minimum bicycle lane dimensions, a reduced width paved shoulder can still improve conditions for bicyclists on constrained roadways. In these situations, a minimum of 3 feet of operating space should be provided.

Additional References and Guidelines

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

Materials and Maintenance

The extended bicycle area should not contain any rough joints where bicyclists ride. Saw or grind a clean cut at the edge of the travel lane, or feather with a fine mix in a non-ridable area of the roadway.

Lane Narrowing

Description

Lane narrowing utilizes roadway space that exceeds minimum standards to provide the needed space for bike lanes. Many roadways have existing travel lanes that are wider than those prescribed in local and national roadway design standards, or which are not marked. Most standards allow for the use of 11 foot and sometimes 10 foot wide travel lanes to create space for bike lanes.

Guidance

Vehicle lane width:

- Before: 10-15 feet
- After: 10-11 feet

Bicycle lane width:

Guidance on **Bicycle Lanes** applies to this treatment.



Discussion

Special consideration should be given to the amount of heavy vehicle traffic and horizontal curvature before the decision is made to narrow travel lanes. Center turn lanes can also be narrowed in some situations to free up pavement space for bike lanes.

AASHTO supports reduced width lanes in *A Policy on Geometric Design of Highways and Streets: "On interrupted*flow operation conditions at low speeds (45 mph or less), narrow lane widths are normally adequate and have some advantages."

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.

Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower grates and utility covers so they are flush with the pavement.

Lane Reconfiguration

Description

The removal of a single travel lane will generally provide sufficient space for bike lanes on both sides of a street. Streets with excess vehicle capacity provide opportunities for bike lane retrofit projects.

Guidance

Vehicle lane width:

 Width depends on project. No narrowing may be needed if a lane is removed.

Bicycle lane width:

 Guidance on **Bicycle Lanes** applies to this treatment.



Discussion

Depending on a street's existing configuration, traffic operations, user needs and safety concerns, various lane reduction configurations may apply. For instance, a four-lane street (with two travel lanes in each direction) could be modified to provide one travel lane in each direction, a center turn lane, and bike lanes. Prior to implementing this measure, a traffic analysis should identify potential impacts.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2010). Evaluation of Lane Reduction "Road Diet" Measures on Crashes. Publication Number: FHWA-HRT-10-053

Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement.
Parking Reduction

Description

Bike lanes can replace one or more on-street parking lanes on streets where excess parking exists and/or the importance of bike lanes outweighs parking needs. For example, parking may be needed on only one side of a street. Eliminating or reducing on-street parking also improves sight distance for bicyclists in bike lanes and for motorists on approaching side streets and driveways.

Guidance

Vehicle lane width:

 Parking lane width depends on project. No travel lane narrowing may be required depending on the width of the parking lanes.

Bicycle lane width:

 Guidance on **Bicycle Lanes** applies to this treatment.



Discussion

Removing or reducing on-street parking to install bike lanes requires comprehensive outreach to the affected businesses and residents. Prior to reallocating on-street parking for other uses, a parking study should be performed to gauge demand and to evaluate impacts to people with disabilities.

Additional References and Guidelines

AASHTO. (2012). Guide for the Development of Bicycle Facilities. AASHTO. (2004). A Policy on Geometric Design of Highways and Streets.

Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement

Shared-use Paths and Off-Street Facilities

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

Key features of shared-use paths include:

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









Local Neighborhood Accessways



General Design Practices

Description

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

Guidance

Width

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

Lateral Clearance

A 2 foot or greater shoulder on both sides of the trail should be provided. An additional foot of lateral clearance (total of 3') is required 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 trail where it is easily accessible to and from the street system, preferably at a controlled intersection or at the beginning of a dead-end street.



Discussion

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

Additional References and Guidelines

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

Materials and Maintenance

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

Shared-use Paths in River and Utility Corridors

Description

Utility and waterway corridors often offer excellent shared-use path development and bikeway gap closure opportunities. Utility corridors typically include powerline and sewer corridors, while waterway corridors include canals, drainage ditches, rivers, and beaches. These corridors offer excellent transportation and recreation opportunities for bicyclists of all ages and skills.

Guidance

Shared-use paths in utility corridors should meet or exceed **general design practices.** If additional width allows, wider paths, and landscaping are desirable.

Access Points

Any access point to the trail should be well-defined with appropriate signage designating the pathway as a bicycle facility and prohibiting motor vehicles.

Path Closure

Public access to the trail may be prohibited during the following events:

- Canal/flood control channel or other utility maintenance activities
- Inclement weather or the prediction of storm conditions



Discussion

Similar to railroads, public access to flood control channels or canals is undesirable by all parties. Hazardous materials, deep water or swift current, steep, slippery slopes, and debris all constitute risks for public access. Appropriate fencing may be required to keep path users within the designated travel way. Creative design of fencing is encouraged to make the path facility feel welcoming to the user.

Additional References and Guidelines

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

Materials and Maintenance

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

Shared-use Paths in Abandoned Rail Corridors

Description

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

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

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

Guidance

Shared-use paths in abandoned rail corridors should meet or exceed **general design practices. I**f 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 Shared-use Paths in Active Rail Corridors.



Discussion

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

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

Additional References and Guidelines

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

Materials and Maintenance

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

Local Neighborhood Accessways

Description

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

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

Guidance

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



Discussion

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

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

Additional References and Guidelines

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

Materials and Maintenance

Asphalt 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 improve the experience of path users.

Shared-use Paths Along Roadways

Description

A shared-use path along a roadway, also known as a sidepath, 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 trail should not be used as a reason to not provide adequate shoulder or bicycle lane width on the roadway, as the on-street bicycle facility will generally be superior to the sidepath for experienced bicyclists and those who are cycling for transportation purposes.

Additional References and Guidelines

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

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 improve the experience of path users.

Path/Roadway Crossings

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

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

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





Marked/Unsignalized Crossings

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.

Guidance

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



Discussion

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

Additional References and Guidelines

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

Materials and Maintenance

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

Signalized/Controlled Crossings

Description

Signalized crossings provide the most protection for crossing path 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 path 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.

Guidance

Hybrid beacons (illustrated here) may be installed without meeting traffic signal control warrants if roadway speed and volumes are excessive for comfortable path crossings.

Full traffic signal installations must meet MUTCD pedestrian, school or modified warrants. 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



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 on Uniform Traffic Control Devices. NACTO. (2012). Urban Bikeway Design Guide. SCDOT. (2011). Traffic Engineering Guideline 26

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.

Appendix G: Review of Existing Planning Efforts

Introduction

This section provides a summary of bicycle and pedestrian planning efforts in the City of Anderson, and related planning for Anderson County. Five relevant plans, a Complete Streets Ordinance, and a series of conceptual master plans exist. The city is updating their comprehensive plan and LRTP as of this review. The documents reviewed for this Plan are listed in **Table G-1**.

Table G-1: Planning and policy review assessment of bicycle and pedestrian-related planning documents

Plan	Agency	Year
Imagine Anderson Twenty Year Vision Plan	Anderson County	2008
2008 City of Anderson Recreation Master Plan	City of Anderson	2009
City of Anderson Complete Streets Ordinance	City of Anderson	2009
Long Range Transportation Plan	ANATS	2010
Eat Smart Move More Anderson County Action Plan	Anderson County	2012
Bellview and Lindale Master Plan	City of Anderson	2012
McDuffie Street Corridor Design	City of Anderson	2012
Destination Downtown, City of Anderson Downtown Master Plan	City of Anderson	2013
Anderson University Master Plan	Anderson University	2013

Summary of Planning Efforts

Imagine Anderson Twenty Year Vision Plan

Year: 2008

Description: Imagine Anderson was created by county residents and led by the Anderson Area Chamber of Commerce and its steering committee. Participants identified five major goals as a result individual interviews, focus group sessions, town hall meetings, and mail-in and online input forms. The five goals are: growth management, education, economic development, health and human services, and leisure and recreation. The Implementation

Leadership Team will use the prioritized objectives resulting from this process to inform work leading to Anderson County's bicentennial in 2026.

Citizens called for a "modern, vibrant downtown Anderson with attention to density issues, transportation and parking" and a variety of other qualities. **Citizen planners and community partners called for a preservation of green space and new quality-of-life additions, including bicycle and pedestrian facilities.**

The vision plan discussed ways to stimulate the local economy including **creating higher paying jobs and attracting young professionals** to the area. **Health and wellness recommendations** included a focus on preventative health measures.

Recommendations:

- Work to develop the vibrancy of Anderson, including thoughtful transportation considerations
- Create a greenway plan to encourage walkable communities and to create urban-to-rural trails that can connect cities
- Reevaluate transportation between towns and educational centers. Proactively plan for future transportation needs



2008 City of Anderson Recreation Master Plan: Greenway Section

Year: 2009

Description: The 2008 City of Anderson Recreation Master Plan consisted, in part, of randomly sampling the city's population regarding recreational practices and needs. **Cycling received the third-highest response rate** when residents were asked about their participation in individual sports for active recreation. As such, cycling was included in the plan's consideration of park and greenway analysis and design.

The City of Anderson, SC currently contains 6.6 miles of existing greenway trails. As of the plan, the city did not include any street-based trails. During the plan's creation, the team divided the urban area into three parts to ensure that connections were established throughout each area. Trails should link destination points throughout Anderson. The Plan exists as a map only, without additional supporting analysis or strategies for implementation.

Recommendations:

- 33 miles of proposed greenway trails
- 34.8 miles of proposed street-based trails
- The Plan would increase the area's total trail system to 74.4 miles.

City of Anderson Complete Streets Ordinance

Year: 2009

Description: With the development of a Complete Streets Ordinance, the City of Anderson has evidenced their commitment to providing a variety of multimodal transportation options for visitors and residents. The document states that providing for biking and walking, "should be an integral part of planning, design, construction and operating activities, and will be included in everyday operations of our transportation system". The ordinance recognizes the need for changes to the existing transportation system and takes preliminary steps towards endorsing and enforcing policies that will help accomplish these goals. The Ordinance proposes a number of possible methods to achieve these goals including capital improvements, re-channelization projects, major maintenance, and changes to "manuals, rules, regulations and programs as deemed appropriate and if feasible". The Ordinance demonstrates the City's objective in providing accommodation to "pedestrians, bicyclists, transit riders, and persons of all abilities".

Recommendations:

- City staff will enforce existing policies to incorporate biking and walking within transportation planning and programming. Such activities will promote safety.
- All new City transportation improvement projects will provide accommodation for multiple modes of transportation.
- The City will use the Ordinance in strategic planning and in guiding documents such as "plans, manuals, rules, regulations and programs as deemed appropriate and if feasible".



Long Range Transportation Plan

Year: 2010

Description: Anderson County's LRTP addresses transportation planning throughout the City of Anderson, the City of Belton, and parts of Anderson County. The LRTP produced models to understand Anderson County's transportation opportunities and challenges up to the year 2035. By combining regional growth trends, socioeconomic data, school enrollment data, and employment data with traffic planning tools such as average daily traffic and existing or committed projects, ANATS can understand future transportation throughout the region. As such, the plan searches for improvements to the current transportation system, including provision for bicycle and pedestrian traffic.

Public comments illustrate a demand for nonmotorized options.81% of comment card respondents said "providing bike trails and greenways" throughout the study area is "very important". 76% felt that "commuting using a bike or walking" is "very important". ANATS acknowledges that the current street network does not consistently allow for the integration of alternative forms of transportation. The document states that these provisions (via on- or offstreet facilities) are an important goal for the ANATS Policy Committee, Anderson County, and the City of Anderson.

Recommendations:

- Promotion of an Anderson Area Bicycle/Pedestrian
 Plan
- Consensus seeking among key stakeholders related to implementing bike and pedestrian projects
- An annual list of recommended bicycle and pedestrian priorities
- North Anderson Multi-Use Path Extension to extend the bicycle and pedestrian facilities under construction along the East West Connector
- Intersection improvements for 39 locations

81%

of Anderson survey respondents feel that providing trails and greenways is very important. 76% feel that commuting using a bike or walking is very important.

Anderson County 2010 Long Range Transportation Plan

Eat Smart Move More Anderson County Action Plan

Year: 2012

Description: Eat Smart Move More is based on strategies for implementation in four domains: "School, After School, Child Care"; "At Work"; "At the Doctor"; and "In the Community". Community groups and institutions throughout Anderson County contribute to encouraging healthy eating and movement as part of "the everyday culture where we live, work, learn, pray and play".

Recommendations:

- Progress towards the initiative's action plans by drawing from a formalized leadership and workgroup structure. Establish and maintain on-going communication between these partners
- Develop a mass media awareness campaign concerning the themes of "obesity, eating smarter and moving more"
- Develop and implement a staffing plan
- Establish a budget and create a fund development plan



Destination Downtown, City of Anderson Downtown Master Plan

Year: 2013

Description: The newest Destination Downtown planning document provides updates on improvement projects within the City of Anderson's Downtown area. Several of the initiatives discussed in the planning document began in previous years. A number of planning initiatives work to improve downtown transportation while invigorating the area and improving a sense of place. Many projects also look for private investment to help leverage available funds. Streetscape projects such as Market St to John St (2004); Main St from Earle St to Federal St/Share St (2005-2006); Benson St, Whitner St, Murray Ave, Townsend St (2013). The 2013 Caton Alley project created a public gathering space that provides public seating, brick pavers, landscaping, and a fountain.

A number of downtown amenities enable place-making, recreation, and economic vitality throughout downtown Anderson. Wayfinding signage has developed overtime to incorporate more locations and types of signage including directional kiosks. Sidewalk trail markers show walking and jogging routes to downtown destinations and offer a fun way to interact with the city's landmarks. The former Belk hotel and mixed use development site was transformed into a greenspace and park development that offers space for performances and recreation.

Recommendations:

Destination Downtown reports on the previous year's efforts to enhance downtown Anderson. As such, the summaries are meant to inform the public and decision makers, instead of presenting recommendations for future efforts.



Other Relevant Planning Efforts

Bellview and Lindale Master Plan

Completed in 2012, this Master Plan is a conceptual design of Bellview Road and Lindale Road. The plan proposes bike lanes of 4 ft and 5 ft width achieved through lane narrowing on Lindale Road, Camfield Road, Millgate Road, and Harden Street. A road diet is proposed along Bellview Road between Concord and E. Greenville Street.

McDuffie Street Corridor Design

Completed in 2012, the McDuffie Street Corridor Design proposes a series of walking paths, connector trails, pedestrian-only streets, and an on-street bike facility.

Anderson University Master Plan

Completed in 2013, the Anderson University Master Plan provides conceptual design for the Athletic Campus and Academic Campus. The plans focus on building expansion and additions with minimal recommendations related to pedestrian and bicyclist circulation and access.

City of Anderson Comprehensive Plan 2014 Update

As of this document, the City of Anderson is currently updating the Comprehensive Plan. More information is forthcoming.

Parks & Recreation Conceptual Plans

The Parks & Recreation Department has produced a series of conceptual plans. These conceptual plans provide a basis for growth and development of recreation amenities and services.

Rocky River Nature Park: adjacent to the Anderson University Soccer Complex, this park includes a hierarchy of proposed trails and greenways.

Key Findings

The City of Anderson is included in county-wide planning efforts, including the Long Range Transportation Plan. The City has also produced a number of planning documents that focus exclusively on the city itself. Both types of documents discuss provision for multi-modal transportation options, although the extent to which this theme appears varies from plan to plan. The city and county are committed to improving citizens' quality of life, something which the planning documents define according to a variety of definitions. Health, economic vitality, environmental awareness, place-making, and strategic land-use planning are major themes throughout the documents. Enhancing transportation planning can provide a confluence of these and other themes. In the City of Anderson, transportation planning is not just a means of traveling from one end of the city to another. Incorporating a Complete Streets-focused approach throughout the City's planning processes, manuals, and other documents will augment the City's other efforts towards providing an attractive place to live and visit.

- The public comment cards collected during the Long Range Transportation Plan coincide with the Plan's recommendation to prioritize a multi-use path extension. Comments collected during this process also show wide support for on-road facilities; 81% said "bike lanes along roadways" were "very important".
- The City of Anderson's current branding depicts the city as a vibrant and desirable place. Incorporating recommendations that encapsulate a Complete Streetsoriented and active living philosophy to transportation planning correlates with the city's current identity.
- The Recreation Master Plan calls for 74.4 total miles of greenway trails and street-based facilities.

The Anderson County Vision Plan's public input process was particularly robust and included a variety of contributors' voices. The Eat Smart Move More Anderson County initiative takes a similar stance towards public participation. These documents create a foundation of public dialogue and collaborative planning around issues of livability and active living that will help the City interact with the public during the ongoing Downtown Bicycle & Pedestrian Plan efforts.



Existing loop trail at the Civic Center of Anderson