



2015 Bicycle, Pedestrian, Trails & Greenways Plan Update

November 2015



Acknowledgements

The development of the 2015 Bicycle, Pedestrian, and Trails and Greenways Master Plan Update has been a multi-year process that included the hard work and resources of many different people and organizations. The Greensboro Department of Transportation and the staff of the Greensboro MPO express sincere gratitude and appreciation to all those who have assisted with the plan’s development and adoption.

MPO and City of Greensboro Staff responsible for the development of the 2015 BiPed Plan Update:

MPO Staff:

- Tyler Meyer, AICP Transportation Planning Manager
- Tram Truong, GISP Transportation Planner
- Daniel Amstutz Transportation Planner

GDOT Engineering Staff:

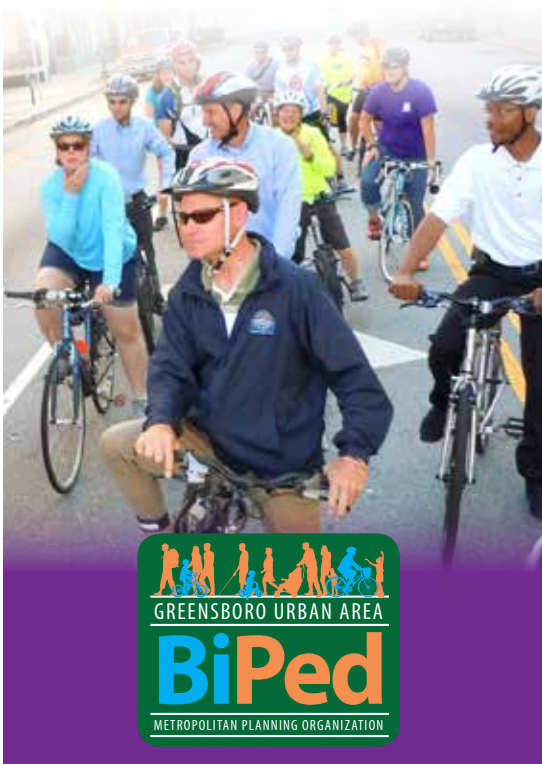
- Chris Spencer, PE Engineering Division Manager
- Deniece Conway, PE Transportation Engineer

Greensboro Parks & Recreation Staff:

- Madeleine Carey Trails and Greenways Planner

The MPO would like to extend its gratitude to the attendees of the BiPed Update Advisory Committee:

- Alex Ashton, *Guilford County Parks (formerly)*
- Bill Bruce, *Town of Oak Ridge*
- Madeleine Carey, *Greensboro Parks & Recreation*
- Aaron Daniel
- John Dewey, *Fleet Feet Sports*
- Mark Gatehouse
- Tony Jarrett, *Allen Tate Realtors*
- Kristen Jeffers
- Walter Jenkins, *Piedmont Authority for Regional Transportation*
- Mark Kirstner, *Piedmont Authority for Regional Transportation*
- Janet Mayer, *Guilford County Health Department*
- Laura Peoples, *Bicycling in Greensboro*
- Chris Pieck, *Trek Bicycle Store*
- Kelly Pryzwansky, *Northern Guilford PTA*
- Dabney Sanders, *Downtown Greenway*
- Scott Schneider, *Greensboro Police Department*
- Leigha Shepler, *Safe Kids Guilford County*
- Jeff Sovich, *Greensboro Planning Department*



Although most pictures were provided by the City of Greensboro, the following people, resources, and organizations are credited with pictures that were used in the BiPed Plan Update:

Downtown Greenway	Oaks & Spokes Raleigh
United Health Foundation	Walter Jenkins
Institute for Transportation Research and Education	Smart Growth America
Alta Planning + Design	NC Division of Public Health
National Association of City Transportation Officials	NC Department of Transportation
UCLA Transportation	Safety Town Greensboro
San Francisco Streetsblog – Bryan Goebel	UNC Highway Safety Research Center
Federal Highway Administration	Safe Kids Guilford
WalkBikeNC Plan	National Center for Safe Routes to School
AASHTO Guide for the Development of Bicycle Facilities, 4th Edition	Friends of the Mountains-to-Sea Trail – Ian Fraher
APBP Bicycle Parking Guidelines, 2nd Edition	Robert Seth
Town of Oak Ridge	Joe Wheby
2009 Manual on Uniform Traffic Control Devices	Lynn Donovan
	Peter Vahan

MPO Staff extends special thanks to:

Johnn James, <i>GDOT Intern</i>	Jennifer Delcourt, <i>Active Routes to School</i>
Megan Grigg, <i>GDOT Intern</i>	Craig McKinney, <i>GDOT Planning Staff</i>
Ben Millard, <i>GDOT Intern</i>	Lydia McIntyre, <i>GDOT Planning Staff</i>
Masha Block, <i>GDOT Intern</i>	NCDOT Division 7
Bryce Gardner, <i>GDOT Intern</i>	Jesse Day, <i>Piedmont Triad Regional Council</i>
Lee Brannock, <i>GDOT Intern</i>	Mary Brookshire, <i>City of Greensboro Graphic Services</i>
Annie Martinie, <i>Danville Regional Foundation, VA</i>	



Table of Contents

Acknowledgements

Maps and Figures

Chapter 1: Introduction

Purpose & Vision	1-1
Plan Themes & Goals	1-3
Background & Development of the Plan	1-12
Overview of Plan Elements	1-19

Chapter 2: Bicycle Chapter

Introduction	2-1
Background, Trends, and Types of Cyclists	2-1
Bicycling and the BiPed Plan	2-3
Infrastructure	2-7
Bicycle Accommodations	2-7
Non-motorized Counting Programs and Data Collection	2-54
Maintenance	2-61
Safety	2-67
Existing Conditions	2-67
Recommendations and Implementation	2-79
Policies and Programs	2-87
Complete Street Policies	2-87
Policies Related to Land Use, Development, and Design	2-89
Programs to Encourage Bicycling and Promote Cycling Safety	2-90
Local Government Policies Relating to the Cycling Environment	2-97
Summary	2-101
Infrastructure	2-101
Safety	2-113
Policies and Programs	2-114



Chapter 3: Pedestrian Plan

Introduction	3-1
Infrastructure	3-2
Pedestrian Accommodations	3-2
Usage and Volume	3-35
Maintenance	3-41
Safety	3-45
Existing Conditions	3-45
Recommendations and Implementation	3-59
Policies and Programs	3-71
Complete Street Policies	3-71
Policies Related to Land Use, and Design	3-73
Education, Encouragement, and Enforcement Programs	3-74
Various Local Government Policies and Programs Relating to Pedestrian Environment	3-79
Summary	3-82
Infrastructure	3-82
Safety	3-90
Policies and Programs	3-91

Chapter 4: Trails and Greenways Plan

Introduction	4-1
Infrastructure	4-3
Trails & Greenways Accommodations	4-3
Usage and Volume	4-15
Maintenance	4-18
Safety	4-23
Existing Conditions	4-23
Recommendations	4-28
Implementation	4-28
Policies and Programs	4-29
Policies for Design and Developments Adjacent to Greenways	4-29
Programs and Partnerships to Assist with Maintenance of Trails and Greenways	4-31
Promotional and Encouragement Programs	4-32
Mapping and Wayfinding Programs	4-33



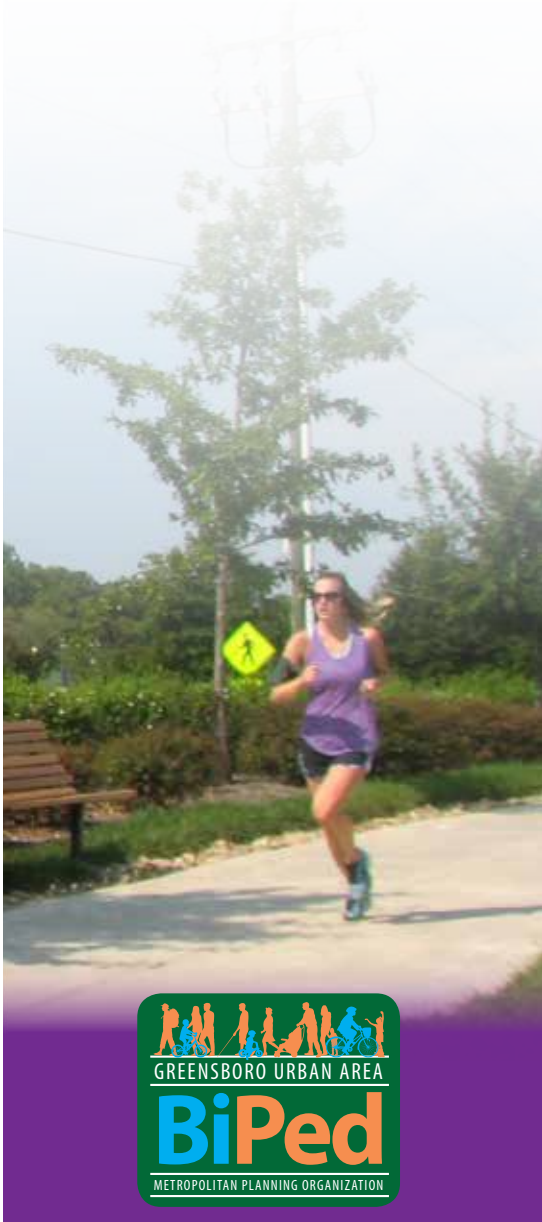
Summary	4-35
Infrastructure	4-35
Safety	4-39
Policies and Programs	4-40



This page is intentionally left blank.

Maps, Tables and Figures

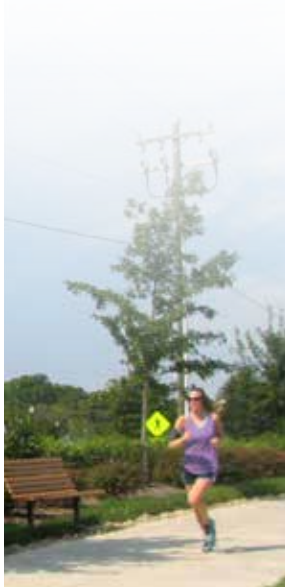
NUMBER	TITLE	PAGE
Chapter 2: Bicycle Chapter		
Map 2-1	Existing Bicycle Facilities in the Greensboro MPO	2-17
Map 2-2	New Statewide Bicycle Route System in MPO	2-20
Map 2-3A	BLOS in the Greensboro Urban Area	2-24
Map 2-3B	BLOS in City of Greensboro	2-25
Map 2-4	City of Greensboro Bicycle Parking Facilities Including UNCG Facilities	2-31
Map 2-5A	Highest-Noted Roads for Bicycle Improvements by the BPAC	2-34
Map 2-5B	Highest-Noted Roads for Bicycle Improvements from the 2014 Public Survey	2-35
Map 2-6	Urban Bicycle Facility Recommendations by Facility Type	2-38
Map 2-7	Urban Bicycle Facility Recommendations by Phasing	2-39
Map 2-8	Conceptual Recommendations Based On Review Status	2-41
Map 2-9	Paved Shoulder Recommendations and Top Priorities	2-44
Map 2-10	All Short-Term Bicycle Recommendations	2-50
Map 2-11	City of Greensboro Manual Count Locations	2-56
Map 2-12	City of Greensboro Miovision Count Locations	2-58
Map 2-13A	Bicycle Crashes in the Greensboro MPO Area	2-70
Map 2-13B	Bicycle Crashes Inside the City Of Greensboro	2-71
Map 2-14	Bicycle Crash Analysis – Intersection & Corridor	2-73
Map 2-15	Bicycle Crash Analysis – Hot Spot	2-74
Map 2-16	Bicycle Crash Severity by Land Use	2-76
Map 2-17	Bike Facility Recommendations by Type in the Greensboro MPO	2-105
Map 2-18	Bike Facility Recommendations by Phasing in the Greensboro MPO	2-106
Table 2.1	Four Types of Cyclists and Their Attributes	2-3
Table 2.2	Bicycle Facilities in the Greensboro MPO	2-5
Table 2.3	Comparison of BLOS between 2013 and 2006	2-23
Table 2.4	Resurfacing Amounts Per Year in the City of Greensboro	2-63
Table 2.5	Bicycle Crash Intersection Analysis	2-69
Table 2.6	Bicycle Crash Corridor Analysis	2-72
Table 2.7	Bicycle Crash Hot Spot Analysis	2-72
Table 2.8	Bicycle Crash Proximity to Facilities	2-75
Table 2.9	Bicycle Crash Severity by Land Use	2-75
Table 2.10	Urban Bicycle Facility Recommendations by Facility Type	2-107



NUMBER	TITLE	PAGE
Fig. 2.1	BLOS in the Greensboro MPO by Category in 2006 & 2013	2-23
Fig. 2.2	Percentage of Bicycle Crashes on BLOS Streets by Category	2-27
Fig. 2.3	Breakdown of Streets into PCR Categories for Comparison from 2008-2012	2-62
Fig. 2.4	Bicycle Crash Rate per 100,000 People in the Greensboro MPO	2-68
Fig. 2.5	Bicycle Crash Severity in the Greensboro MPO	2-68
Fig. 2.6	Average Bicycle Crash Rate per 100,000 People from 2007-2012	2-69
Fig. 2.7	Average Bicycle Fatality Rate per 100,000 People from 2007-2012	2-69
Fig. 2.8	Bicycle Crashes by Time of Day in the Greensboro MPO from 2007-2012	2-77
Fig. 2.9	Bicycle Crashes by Day of the Week in the Greensboro MPO from 2007-2012	2-77
Fig. 2.10	Bicycle Crashes by Month in the Greensboro MPO from 2007-2012	2-77
Fig. 2.11	Bicycle Crash Reasons in the Greensboro MPO	2-78
Fig. 2.12	Bicycle Crash Reasons for Children (Under 16) in the Greensboro MPO	2-78
Fig. 2.13	Bicyclist and Motorist Age Groups in Bicycle Crashes	2-78
Fig. 2.14	Bicyclist and Motorist Ethnicities in Bicycle Crashes	2-79
Fig. 2.15	Bicyclist and Motorist Gender in Bicycle Crashes	2-79
Fig. 2.16	BIKESAFE Crash Type Matrix	2-80

Chapter 3: Pedestrian Chapter

Map 3-1A	Existing Sidewalk in the MPO Area	3-11
Map 3-1B	Existing Sidewalk inside the City of Greensboro	3-12
Map 3-1C	Sidewalk Completed Since 2006	3-13
Map 3-2	Existing Curb Ramps in the City of Greensboro	3-16
Map 3-3	Existing Pedestrian Signals in the City of Greensboro	3-17
Map 3-4	Land Use Diversity Index	3-20
Map 3-5A	Sidewalk Prioritization in the City of Greensboro	3-23
Map 3-5B	Sidewalk Priorities in Oak Ridge	3-24
Map 3-5C	Sidewalk Project Alternative Recommendations in Pleasant Garden	3-25
Map 3-6	Intersection Improvement Recommendations in the City of Greensboro	3-29
Map 3-7	Sidewalk Project Implementation in the City of Greensboro	3-32
Map 3-8	Pedestrian Signal Implementation in the City Greensboro	3-33
Map 3-9	Pedestrian Manual Count Locations	3-36
Map 3-10	Pedestrian MioVision Count Locations	3-38
Map 3-11A	2007-2012 Pedestrian Crashes in the Greensboro MPO Area	3-48
Map 3-11B	2007-2012 Pedestrian Crashes in the City of Greensboro	3-49
Map 3-12A	Pedestrian Crash Analysis – Intersection & Corridor	3-52
Map 3-12B	Pedestrian Crash Analysis – Hot Spot	3-53
Map 3-13	Pedestrian Crash Severity by Land Use	3-55
Map 3-14	Completed and Planned Sidewalk in the City of Greensboro	3-63



NUMBER	TITLE	PAGE
Map 3-15	Sidewalk Projects Expected Implementation Schedule	3-84
Table 3.1	Sidewalk Projects and Status Since 2006	3-10
Table 3.2	Sidewalk Conditions - Survey Conducted in 2012	3-14
Table 3.3	Major Intersections with Pedestrian Signals	3-18
Table 3.4	Pedestrian Signal and Curb Ramp Installation Criteria	3-27
Table 3.5	Pedestrian Crash Intersection Analysis	3-50
Table 3.6	Pedestrian Crash Corridor Analysis	3-51
Table 3.7	Pedestrian Crash Hot Spot Analysis	3-51
Table 3.8	Pedestrian Crash Proximity to Facilities	3-54
Table 3.9	Pedestrian Crash Severity by Land Use	3-54
Table 3.10	Potential Engineering Countermeasures for Pedestrian Crash Types	3-61
Table 3.11	Future Sidewalk Projects & Status	3-85
Fig. 3.1	Existing Sidewalk Pavement Condition	3-14
Fig. 3.2	Sidewalk Prioritization Flow Chart	3-22
Fig. 3.3	Pedestrian Crash Rate per 100,000 Population in the Greensboro MPO Area	3-46
Fig. 3.4	Pedestrian Crash Severity in the Greensboro MPO Area from 2007-2012	3-46
Fig. 3.5A	Average Pedestrian Crash Rate per 100,000 People from 2007-2012	3-47
Fig. 3.5B	Average Pedestrian Fatality Rate per 100,000 People from 2007-2012	3-47
Fig. 3.6	Pedestrian Crashes by Time of Day in the Greensboro MPO from 2007-2012	3-56
Fig. 3.7	Pedestrian Crashes by Day of the Week in the Greensboro MPO 2007-2012	3-56
Fig. 3.8	Pedestrian Crashes by Month in the Greensboro MPO from 2007-2012	3-56
Fig. 3.9	Common Pedestrian Crash Types	3-57
Fig. 3.10	Pedestrian Crash Reasons in the Greensboro MPO	3-57
Fig. 3.11	Pedestrian and Driver Age Groups in Pedestrian Crashes	3-58
Fig. 3.12	Pedestrian and Driver Ethnicities in Pedestrian Crashes	3-58
Fig. 3.13	Pedestrian and Driver Gender in Pedestrian Crashes	3-58
Fig. 3.14	PEDSAFE Crash Type Matrix	3-60
Chapter 4: Trails and Greenways Chapter		
Map 4-1	Existing Trails and Greenways	4-4
Map 4-2	Greenway & Trail Priorities	4-10
Map 4-3	TrafX Counter Locations	4-16
Map 4-4	Specific Greenways to be Designated as Transportation Corridors	4-22
Map 4-5	Crashes on Trails and Greenways	4-24
Map 4-6	Existing Rescue Marker Locations	4-26
Map 4-7	Greensboro Adopt-a-Trail Map	4-30
Map 4-8	Greenway & Trail Top Priorities	4-36

NUMBER	TITLE	PAGE
Table 4.1	Greensboro General Schedule of Routine Maintenance	4-19
Table 4.2	Trail & Greenway Top Priorities	4-37



1 Introduction



In an urban context, street design must meet the needs of people walking, driving, cycling, and taking transit, all in a constrained space.”

~Urban Street Design Guide – NACTO

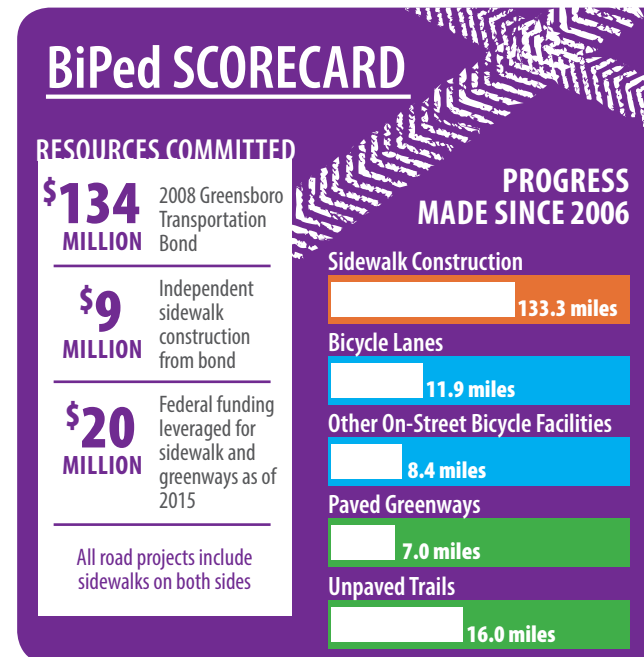


PURPOSE OF THE PLAN

The first **Greensboro Urban Area Bicycle, Pedestrian, and Greenway Master Plan (BiPed)** was adopted in 2006. Covering the entire Greensboro MPO area including the City of Greensboro, the Towns of Oak Ridge, Pleasant Garden, Sedalia, Stokesdale, Summerfield, and much of unincorporated Guilford County, the purpose of the plan included promoting development of integrated bicycle, pedestrian, and greenway networks; improving transportation safety; promoting public health and wellness and access to outdoor landscapes; and promoting a range of community goals for land use, enhanced livability, and economic competitiveness. Nine years since its adoption by the MPO, new bicycle, pedestrian, and trail and greenway infrastructure has been installed and is providing greater access to non-motorized transportation modes. There have also been changes in demographics and socioeconomic factors, facility designs, and technologies for counting bicyclists and pedestrians.

Due to this changing landscape it was necessary to revise and update the BiPed Plan. The **2015 BiPed Plan Update** was undertaken to make the plan current and to ensure its continuing relevance to the MPO, area local governments, NCDOT, and the community as a planning and implementation document for the years ahead. The purpose of the 2015 Biped Plan Update includes:

- Reviewing facility improvements since 2006;
- Providing a comprehensive inventory of existing bicycle, pedestrian, trail, and greenway facilities;
- Identifying current facility improvement needs and priorities; and
- Providing guidance for innovations in infrastructure, safety, programs, and policies to help improve walking and biking conditions throughout the region.



VISION AND GOALS

Purpose

Vision and Goals

> Mobility

Safety

Health

Economy

Environment

Background & Development

Overview

The **2015 BiPed Plan Update** provides a more detailed description of the bicycle and pedestrian modal elements in the **2040 Metropolitan Transportation Plan (2040 MTP)**. The 2040 MTP is a broad document encompassing all the transportation modes in the Greensboro MPO, including automobile, transit, rail, and bicycle and pedestrian. The vision of 2040 MTP is:

"To develop and maintain a safe, efficient, and environmentally compatible transportation system that provides convenient choices for accessing destinations throughout the Greensboro Metropolitan Area and the Triad, including well-integrated, connected public transportation, pedestrian, and bicycle networks."

This vision reflects the need for a balanced transportation system and emphasizes the importance of enhancing and integrating pedestrian and bicycle networks in the Greensboro Metropolitan Area. Considering the broad and encompassing nature of this vision, the BiPed Plan Update has been developed in accordance with the same vision as the 2040 MTP. From this vision five themes can be drawn out: **Mobility, Safety, Health, Economy, and Environment**. Each theme has goals as part of the BiPed Plan Update implementation.





Goal: Improve mobility strategically with greater investment in walking, biking, and trails/greenways infrastructure; improve transportation equity and choice; increase connectivity to attractive destinations, between existing facilities, and between transportation modes; reduce traffic congestion; improve access to outdoor and recreational amenities; and improve coordination between land use and transportation planning.

WALKING, BIKING, AND PUBLIC TRANSIT

Non-motorized transportation has a strong connection to public transit. Everyone who uses public transportation is a pedestrian at some point in the journey, as those who use public transit commonly access a station or stop by walking or bicycling. In fact, a study by the American Public Transportation Association (APTA) found that nearly 60% of transit users walk to and from transit.¹ In addition, when they leave a transit station or vehicle, they need to have safe pedestrian or bicycling facilities in order to reach their final destination. Biking and walking infrastructure is necessary to solve the “last mile problem” (or the “first mile problem”) to connect transit stops and stations to commercial, employment, and residential centers that are just beyond the limits of fixed-route transit. Combining bicycling or walking with transit also allows users to travel much farther distances than by using one mode alone. For example, a study by the Mineta Transportation Institute found that the most common reasons for traveling with a bicycle on transit in the cities of Philadelphia and San Francisco were that it is faster, the trip is otherwise too long to do by bicycle, bicyclists avoid riding in the dark or poor weather, and they need their bicycle to reach their final destination.² The City of Greensboro has been working diligently to install sidewalks

along transit corridors to provide better accessibility to transit routes and increase transit ridership.

ADA accessibility is a very important factor in pedestrian facilities, allowing individuals with mobility impairments to be able to navigate sidewalks comfortably and to reach transit stops and stations independently. Greenways similarly must be built to accessible standards to allow for transportation and recreation by any person who wishes to do so. Investing in walking and biking infrastructure improves transportation equity and choice for all people, no matter what mobility limitations they may have.

THE EFFECT OF LAND USE ON MOBILITY

Land use has a significant impact on the way people travel. Large lots that are single-use with significant land space devoted to parking and connected to each other only by fast-moving roadways without bicycle or pedestrian facilities creates an environment where the only logical travel choice is to use an automobile. Development that is compact and integrates multiple uses and provides access for multiple modes of transportation leads to a much greater variety of travel choices. The Victoria Transport Policy Institute notes that “integrated smart growth programs that result in community design similar to what developed prior to 1950 can reduce vehicle ownership and travel 20-40%, and significantly increase walking, cycling and public transit.”³ In order to get these results, however, land use policies and ordinances must support



Public transit users typically walk or bicycle to a stop or station, and also need to walk or bicycle to their final destination after dismounting from the transit vehicle.

¹Advocacy Advance. “First Mile, Last Mile: How Federal Transit funds can improve access to transit for people who walk and bike.” August 2014. Pg. 3. Accessed September 4, 2015 at <http://www.bikewalkalliance.org/blog/378-first-mile-last-mile-a-look-into-biking-and-walking-in-federal-transit-administration-programs>.

²Flamm, B. and Rivasplata, C. “Perceptions of Bicycle-Friendly Policy Impacts on Accessibility to Transit Services: The First and Last Mile Bridge.” January 2014. Mineta Transportation Institute. Pg. 30. Accessed September 4, 2015 at <http://transweb.sjsu.edu/PDFs/research/1104-bicycle-policy-transit-accessibility-first-last-mile.pdf>. Flamm, B. and Rivasplata, C. “Perceptions of Bicycle-Friendly Policy Impacts on Accessibility to Transit Services: The First and Last Mile Bridge.” January 2014. Mineta Transportation Institute. Pg. 30. Accessed September 4, 2015 at <http://transweb.sjsu.edu/PDFs/research/1104-bicycle-policy-transit-accessibility-first-last-mile.pdf>.

³Litman, T. and Steele, R. “Land Use Impacts on Transport: How Lane Use Factors Affect Travel Behavior.” August 2015. Victoria Transport Policy Institute. Pg. 3. Accessed September 4, 2015 at <http://vtpi.org/landtravel.pdf>.

this type of development. The form and orientation of structures also makes an impact on the how people choose to access a destination – either encouraging or discouraging walking or bicycling trips to be made.

Purpose

Vision and Goals

> Mobility

Safety

Health

Economy

Environment

In the Greensboro Urban Area, overemphasis on automobile mobility and lower density development with disconnected street networks has led to land use patterns that make walking and bicycling inconvenient and inefficient. The City of Greensboro in particular has been working to address pedestrian mobility by building sidewalks along major roadways. In general, walking and bicycling can still sometimes be inefficient modes of travel due to more than five decades of automobile-centered land use patterns. Future land use policy must address these deficiencies to ensure that walking and bicycling is the easy choice to make for visitors and residents alike.

Background & Development

Overview





Goal: Improve safety and convenience for all roadway users through strategic, consistent, and connected pedestrian and bicycle facility improvements, education, and enforcement strategies.

Together with providing alternative choices for all users and increasing bicycle and pedestrian facilities, enhancing safety for bicyclists and pedestrians is a critical goal of the BiPed Plan Update.

From 2007 to 2012 in the Greensboro Urban Area, there were 848 pedestrian-motorist and 288 bicycle-motorist crashes. Of these numbers, 29 pedestrians and 3 bicyclists resulted in fatality.⁴ Although the bike crash rate per 100,000 people in the Greensboro MPO is lower than the national and NC rate, the pedestrian crash rate in the MPO is higher than the national and NC rate. **Figure 1.1** and **Figure 1.2** display the pedestrian crash rates and bicycle fatality rates compared to the Greensboro MPO across several different geographic areas.

Motorist failing to yield (22%), bicyclist failing to yield (19%), and motorist overtaking bicyclist (14%) were the top reasons for bicycle crashes in the

MPO area. Although motorist overtaking bicyclist was not the top reason for bicycle crashes, it had the highest possibility of resulting in fatality and disabling injury for bicyclists. Pedestrian failing to yield (17%), off-roadway (14%) and backing vehicle (11%) were the top reasons for pedestrian crashes in the MPO area.

Reducing crash numbers is one of the important goals of the plan. The MPO has implemented many programs and projects to enhance safety for bicyclists and pedestrians, such as partnering with NCDOT on Watch For Me NC, a statewide bicycle and pedestrian campaign to educate the public and increase awareness on bicycle and pedestrian safety. In the plan, the MPO emphasizes the 5Es of Engineering, Education, Enforcement, Encouragement, and Evaluation to implement strategies and recommendations to enhance safety for bicyclists and pedestrians.

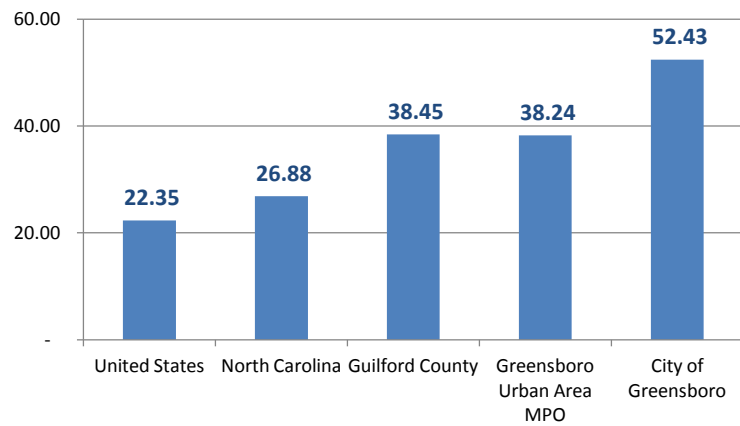


FIGURE 1.1
Average Pedestrian Crash Rate per 100,000 People from 2007-2012

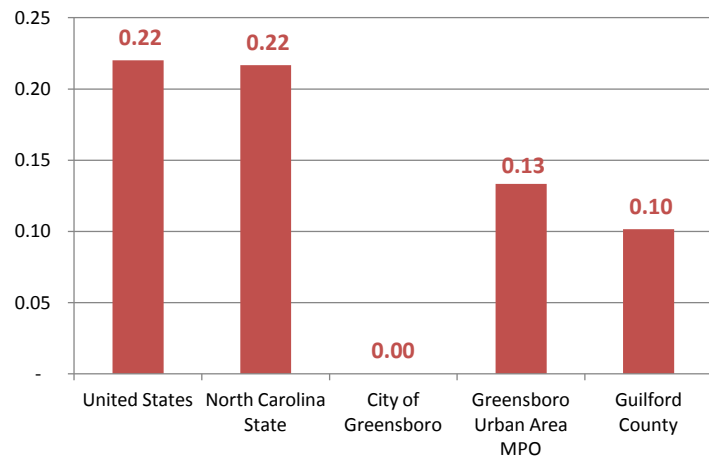


FIGURE 1.2
Average Bicycle Fatality Rate per 100,000 People from 2007-2012

⁴NCDOT, Division of Bicycle and Pedestrian Transportation, data from 2007 to 2012.



Goal: Contribute to public health by providing active living and built environments with safe, inviting, connected, accessible facilities along with programs that encourage walking and bicycling.

Purpose

Vision and Goals

Mobility

Safety

> Health

Economy

Environment

Background & Development

Overview

Health is a major theme of the 2015 BiPed Plan Update and was a major impetus for the development of the original 2006 BiPed Plan. Overweight and obesity rates in Guilford County have risen dramatically in the last three decades, and physical activity rates have declined during the same period. Today, more than two-thirds of adults are overweight or obese⁵ and nearly 60 percent do not get the recommended amount of physical activity.⁶ Among young people, 31% of children ages 10-17 in North Carolina are overweight or obese, less than a third of adolescents get enough physical activity and only 4% walk or ride their bikes to school.⁷ These youth are at a greater risk of being overweight as adults and developing serious health conditions, including heart disease, stroke, cancer and type 2 diabetes. In addition, minority adults and children suffer from higher rates of chronic disease and obesity compared to their non-minority counterparts.⁸ Health experts now warn that this generation could be the first to live shorter lives than their parents.

Making healthy choices and being physically active is not just a personal decision. Research has shown that community design and the built environment has a strong influence on our health. The Centers for Disease Control and Prevention (CDC) identified improved bike and pedestrian infrastructure as a key strategy to prevent obesity. Residents of neighborhoods with sidewalks

or access to trails are nearly 50 percent more likely to get the recommended levels of physical activity.⁹ **Figure 1.3** describes the impacts of various infrastructure improvements on transportation choices. Communities designed in a way that supports physical activity and provides access to healthy food—wide sidewalks, safe bike lanes, attractive stairways, accessible recreation areas—make the healthy choice the easy choice.

Healthy community design is also more attractive to businesses, developers and new residents. In fact, active living research shows that home values increase in communities that provide access to physical activity and local shops and restaurants do better business. Healthy places also create economic value by attracting both younger and older workers and appealing to a skilled workforce and innovative companies.

Even the smallest increase in physical activity is proven to be more beneficial than inactivity, so much so that it enhances longevity across both genders and different age groups. A study conducted in 2012 examined the behavior of residents in car-centric areas and those in urban mixed-use communities. Those living in urban livable communities (livable communities possess the factors that increase a community’s quality of life including the built and natural environments) were 160 percent more physically active than those in communities that rely on automobiles. Furthermore, the study found that males of average height weighed 10 lbs less and females weighed 6 lbs less than their counterparts in car-centric communities.¹⁰

⁵Guilford County Department of Health & Human Services. “2014 State of the County Health Report.” 2014. <http://www.myguilford.com/wp-content/uploads/2015/04/FINALSOTCH3-16-15.pdf>. Accessed July 21, 2015.

⁶North Carolina Department of Health and Human Services, State Center for Health Statistics. “2013 BRFSS Survey Results: Exercise – Physical Activity Categories (CDC calculated variable).” 2014. http://www.schs.state.nc.us/data/brfss/2013/nc/nccr/_PACAT1.html. Accessed July 21, 2015.

⁷North Carolina Child Health Assessment and Monitoring Program (CHAMP). North Carolina Department of Health and Human Services, Division of Public Health, State Center for Health Statistics. 2011. Accessed September 3, 2015 at: <http://www.schs.state.nc.us/schs/champ/2011/topics.html>.

⁸Office of Minority Health and Health Disparities and the State Center for Health Statistics. “Racial and Ethnic Health Disparities in North Carolina: Report Card 2010.” North Carolina Department of Health and Human Services. 2010. Accessed September 3, 2015 at http://www.schs.state.nc.us/SCHS/pdf/MinRptCard_WEB_062210.pdf.

⁹Active Living Research. “Active Transportation: Making the Link from Transportation to Physical Activity and Obesity.” 2009. Robert Wood Johnson Foundation.

¹⁰Shreeve, Elizabeth. “Open Spaces and Active Transportation.” January 31, 2014. Urban Land Magazine. Accessed September 3, 2015 at <http://urbanland.uli.org/planning-design/open-spaces-and-active-transportation/>.



Creating the infrastructure to support healthy living in Greensboro makes social, economic, physical and cultural sense. The 2015 BiPed Plan Update identifies programs and projects that will support increased physical activity, access to healthy food and a higher quality of life for all Greensboro residents.

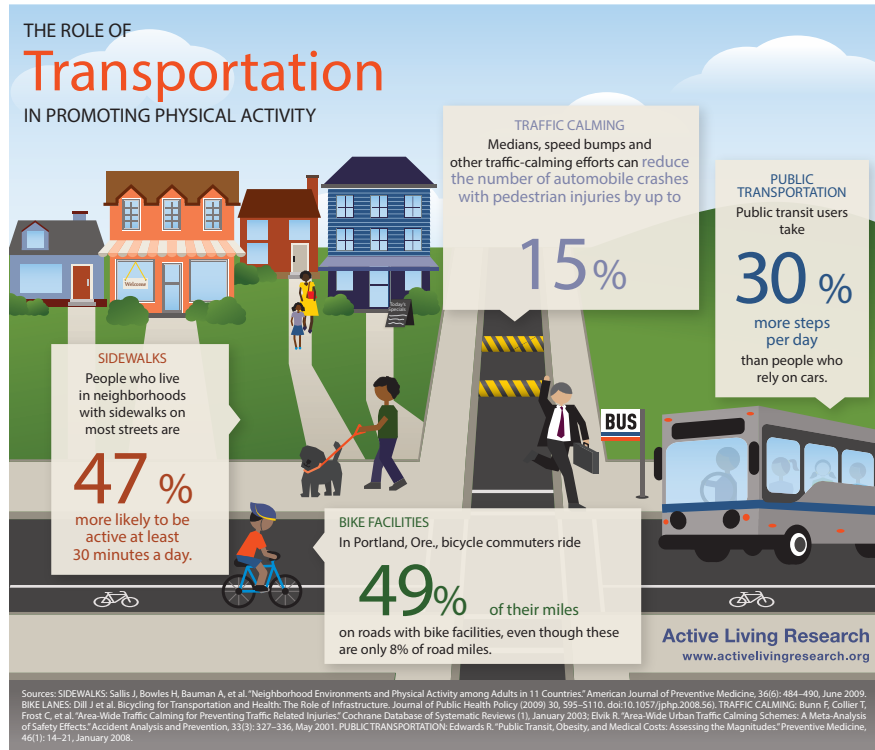


FIGURE 1.3
Transportation Infrastructure Impacts Transportation Choice and Safety¹¹

¹¹Wilson, Amanda. "Infographic: The Role of Transportation in Promoting Physical Activity." Active Living Research; Move! A Blog About Active Living. July 2012. Accessed September 14, 2015 at <http://activelivingresearch.org/blog/2012/07/infographic-role-transportation-promoting-physical-activity>.

Vision and Goals

Purpose



ECONOMY

Goal: Maximize the economic competitiveness and return on investment of the municipalities within the Greensboro MPO by creating more attractive walkable and bikeable communities and jobs, increasing livability, reducing residents' transportation costs, and managing growth through additional MPO, public, and private funding.

Mobility

Safety

Health

> Economy

Environment

Background & Development

Overview

Active transportation infrastructure, including greenways, trails, pedestrian pathways and bicycle paths, has repeatedly been proven to contribute to local economies across the United States through job creation, tourism, commercial businesses and increases in real estate value. **Figure 1.4** shows that bicycle and pedestrian infrastructure improvements produce more direct, indirect and

induced jobs than road infrastructure projects. The economic impact of upfront construction includes direct jobs created from the engineering and construction process and indirect jobs initiated through product and service industries required in the construction phase such as cement manufacturing, trucking, etc. The economic impact of ongoing use produces induced jobs due to demand from local residents and tourists such as retail positions and food services specialists. Investments in active transportation can partly mitigate high unemployment rates through the power to create jobs.¹²

Numerous studies on active transportation infrastructure illustrate a substantial return on investment. Active transportation facilitates business development and tourism, allowing funds to circulate within the local economy when people spend at local businesses

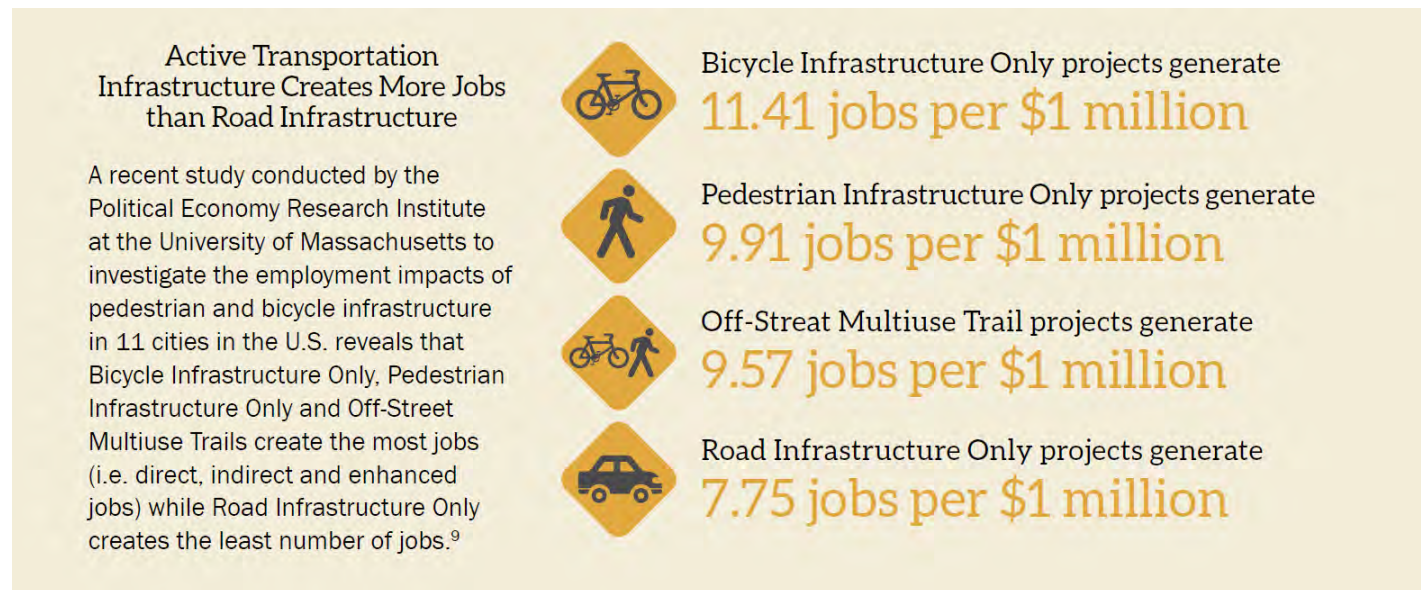


FIGURE 1.4
Job Impacts of Active Transportation Infrastructure¹³

¹²Garrett-Peltier, Heidi. "Pedestrian and Bicycle Infrastructure: A National Study of Employment Impacts." June 2011, Political Economy Research Institute. University of Massachusetts, Amherst. Accessed September 3, 2015 at http://www.peri.umass.edu/fileadmin/pdf/published_study/PERI_ABikes_October2011.pdf.

¹³National Recreation and Park Association. "Active Transportation and Parks and Recreation." No date. National Recreation and Park Association. Pg 3. Accessed September 3, 2015 at http://www.nrpa.org/uploadedFiles/nrpa.org/Publications_and_Research/Research/ActiveTransportation_Final.HIGH.pdf.

while walking or bicycling.¹⁴ In addition, according to the American Institute of Architects (AIA), investments in a community's walkability typically increase land value by 70 to 300 percent. Furthermore, studies of 15 major metropolitan markets cited by the AIA revealed that neighborhoods with an above-average walk score command a premium ranging from about \$4,000 to \$34,000 in real estate transactions.¹⁵

There are also economic gains to be had from increasing the number of walking and bicycling commuters. Commuters who opt to bike and walk to and from work or school reduce road congestion; additional dedicated pathways that remove bicyclists and pedestrians from shared roads lower automobile crashes; and the those who switch to biking and walking receive personal cost savings from utilizing cheaper alternative transportation modes.¹⁶ According to the American Automobile Association (AAA), the average annual cost to own and operate a car is \$8,698.¹⁷ In contrast, the average annual operating cost of a bicycle is \$308,¹⁸ or about 3.5% of the cost of owning and operating an automobile.

Finally, investing in non-motorized transportation helps to manage regional growth by scaling communities for more compact, pedestrian- and bicycle-oriented travel. Compact development not only makes bicycling and walking more attractive and feasible, but it also reduces costs of utility infrastructure like roadways and water systems; reduces maintenance costs; and reduces the costs associated with urban decline, including the reuse of vacant properties and brownfields.¹⁹

¹⁴Ibid, pg. 4.

¹⁵The American Institute of Architects. "Local Leaders: Healthier Communities Through Design." December 2012. The American Institute of Architects. Pg. 6. Accessed September 3, 2015 at <http://www.aia.org/aiaucmp/groups/aia/documents/pdf/aia096790.pdf>.

¹⁶North Carolina Department of Transportation. "WalkBikeNC: North Carolina Statewide Pedestrian and Bicycle Plan." 2013. Plan Appendix, Pg. 9.5-3.

¹⁷American Automobile Association. "Annual Cost to Own and Operate a Vehicle Falls to \$8,698, Finds AAA." April 28, 2015. Accessed September 3, 2015 at <http://newsroom.aaa.com/2015/04/annual-cost-operate-vehicle-falls-8698-finds-aaa/>.

¹⁸Sierra Club. "Pedaling to Prosperity: Bicycling Will Save Americans \$4.6 Billion in 2012." May 2012. Accessed September 3, 2015 at http://vault.sierraclub.org/pressroom/downloads/BikeMonth_Factsheet_0512.pdf.

¹⁹Smart Growth America. "Smart growth benefits municipal budgets." 2015. Accessed September 3, 2015 at <http://www.smartgrowthamerica.org/issues/economic-prosperity/municipal-budgets/>.



Purpose

ENVIRONMENT

Goal: Advance environmental stewardship by reducing automobile dependence, decreasing fuel consumption, improving air quality, conserving resources, and preserving natural resources through a network of trails and greenways throughout the Greensboro MPO.

Vision and Goals

Mobility

Safety

Health

Economy

> Environment

Background & Development

Overview

Increasing pedestrian and bicycle facilities but still advancing environmental stewardship through preserving resources and reducing impact on the environment is one of the goals in the BiPed Plan Update. According to Green Commuter, a publication of the Clean Air Council and WorldWatch Institute, 31% of carbon dioxide, 81% of carbon monoxide, and 59% of nitrogen oxides released in the US are motor vehicle emissions.²⁰ World Watch Magazine notes that a bicycle commuter who rides four miles to work, five days a week, avoids 2,000 miles of driving and about 2,000 lbs of carbon dioxide each year.²¹ In addition, the National Association of Realtors and Transportation for America have found that 89% of Americans believe that transportation investments should support the goal of reducing energy use.²² **Figure 1.5** shows that non-motorized transportation such as bicycling produces significantly less emissions than automobiles. Therefore, reducing automobile use not only mitigates fuel consumption, but also uses lowers vehicle emissions resulting in cleaner air, healthier communities and the preservation of valuable natural resources.

The transportation sector accounts for 71 percent of all petroleum use in the US. Providing environments for safe and efficient walking and biking can encourage people to replace some driving trips with active transportation modes; and hence, decrease fuel

consumption. In particular, fuel consumption and air pollution can be reduced drastically by replacing short driving trips with walking and biking. Sixty percent of the pollution created by automobile emissions happens in the first few minutes of operation, before pollution control devices can work effectively. Since “cold starts” create high levels of emissions, shorter car trips are more polluting on a per-mile basis than longer trips.²³ Approximately 25% of all driving trips are less than one mile, 40% of daily trips are within two miles or less, and approximately 50% of trips are three miles or less. Replacing a percentage of short trips made by motor vehicle with walking and biking would reduce local fuel consumption and the environment costs associated with it.²⁴

Trails and greenways can benefit community conservation. Trails assist with preserving important natural landscapes, providing necessary links between fragmented habitats and providing tremendous opportunities for protecting plant and animal species. Greenways protect and preserve our natural resources by preserving vital habitat corridors and promoting plant and animal diversity. They cleanse and replenish the air, buffer the negative effects of development while mitigating noise, water, thermal, and air pollution.²⁵ The natural buffer zones that occur along greenways protect streams, rivers and lakes, preventing soil erosion and filtering pollution caused by agriculture and roadway runoff. In addition, motor oil and other contaminants that leak into the roadway end up in road runoff, polluting waterways and groundwater. Integrating trails and greenways into developed areas can improve water quality through retaining and treating sources of water pollution.



²⁰North Carolina Department of Transportation. “WalkBikeNC: North Carolina Statewide Pedestrian and Bicycle Plan.” 2013. Pg 2-37

²¹Pedestrian and Bicycle Information center. http://www.pedbikeinfo.org/data/factsheet_environmental.cfm Accessed 09/11/2015

²²North Carolina Department of Transportation. “WalkBikeNC: North Carolina Statewide Pedestrian and Bicycle Plan.” 2013. Pg 2-37

²³Pedestrian and Bicycle Information center. http://www.pedbikeinfo.org/data/factsheet_environmental.cfm Accessed 09/11/2015.

²⁴North Carolina Department of Transportation. “WalkBikeNC: North Carolina Statewide Pedestrian and Bicycle Plan.” 2013. Appendix 9.6 – Pg 11

²⁵North Carolina Department of Transportation. “WalkBikeNC: North Carolina Statewide Pedestrian and Bicycle Plan.” 2013. Appendix 9.6 – Pg 12

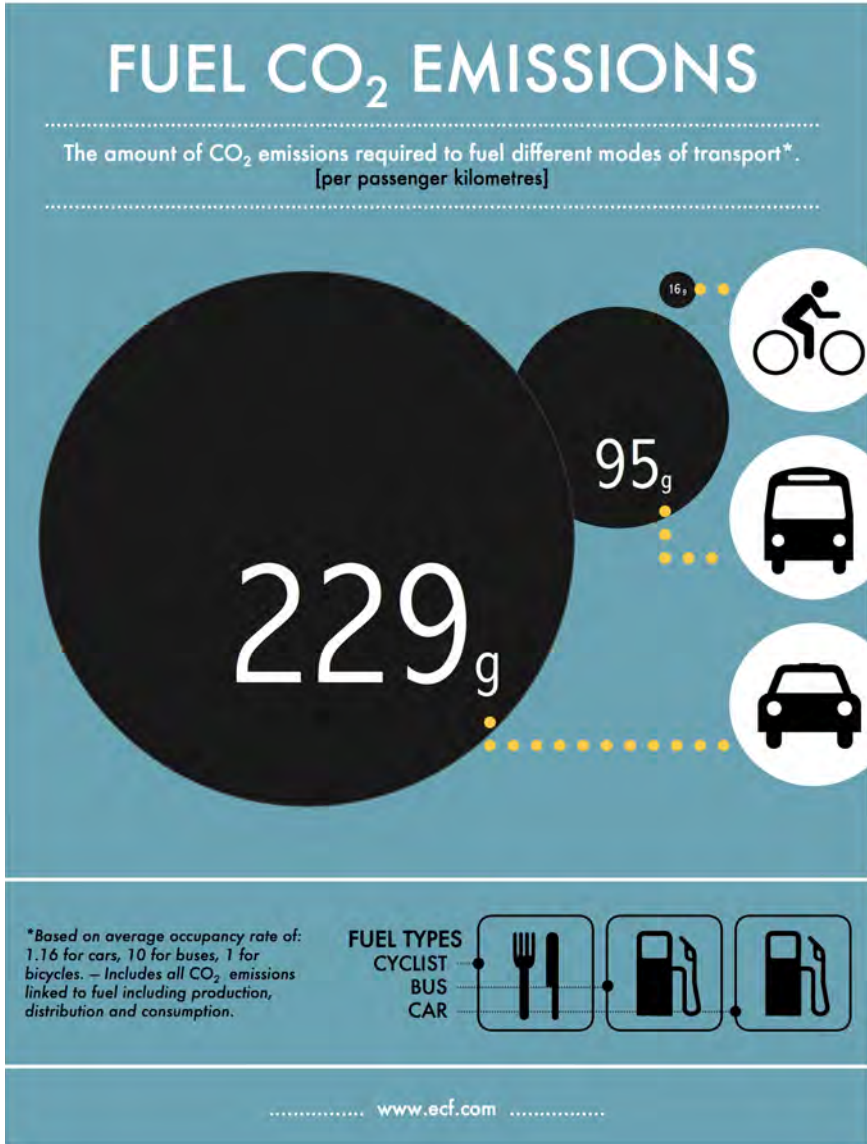


FIGURE 1.5
CO₂ Emissions per Kilometer of Cars and Buses versus Bicycling²⁶

²⁶European Cyclists' Federation. "New Study Investigates Potential of Cycling to Reduce Emissions." ECF Press Release, December 12, 2011. Accessed September 24, 2015 at http://www.ecf.com/press_release/5056/.

BIPED PLAN UPDATE BACKGROUND AND DEVELOPMENT

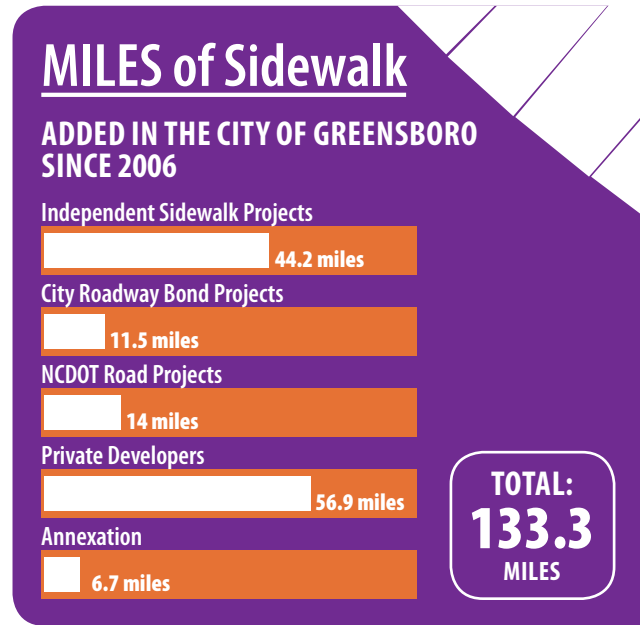
History of Non-Motorized Transportation in the Greensboro Urban Area

Although walking was the primary mode of transportation in Greensboro's earliest years, and Greensboro developed as a walking city through much of the nineteenth century, this started to change in the 1920's as automobile use dramatically increased. Development patterns favored the dispersion of housing and employment, and development density declined. By the late 1940's the community was heading towards a focus on automotive mobility with progressively less emphasis on the provision of walking-related and other non-motorized infrastructure. With the extensive development of lower density neighborhoods and disconnected street networks sidewalks became an increasingly rare investment in Greensboro neighborhoods from the 1940s through the rest of the century. This era of pedestrian neglect created an infrastructure backlog that the City is now working to correct.

Leading up to the 2000 Transportation Bond, the City heard clearly from the community that sidewalk construction and other pedestrian improvements were a high priority. Under the direction of the City Council, the 2000 Transportation Bond package was developed to incorporate sidewalks into roadway system enhancements, as well as to support the retrofitting of existing roadways with sidewalks and the continuing development of a greenway system. The approval by Greensboro voters of the 2000 Transportation Bond represented a new commitment to create a more walkable Greensboro. This commitment was extended through the approval of the 2008 Transportation Bond. The \$134 million 2008 Transportation Bond included \$9 million dedicated to independent sidewalk construction, and every road improvement project includes sidewalks on both sides—a policy which leads to millions of additional dollars for sidewalk construction. The City has implemented notable improvements in cooperation with the MPO and the NCDOT, partly through using bond funds to leverage

federal funds for priority projects. Almost \$20 million in federal funds has been leveraged by local funds for sidewalk and greenway construction and repair since 2006. The top priorities, taken from BiPed, have been to complete sidewalks along busy corridors and transit routes, to expand key greenway connections, and to install bicycle improvements with resurfacings and roadway widenings.

- Purpose
- Vision and Goals
- Background & Development
- Overview



Sidewalks built privately as required by municipal development and subdivision ordinances have also made a very significant impact on walkability in the Greensboro MPO. Since 2003 the City of Greensboro has had strong ordinances requiring sidewalk installation in the right-of-way or easements adjacent to developing property. This allows for faster sidewalk construction within the city and stretches the resources of the independent sidewalk construction program by making it possible to link up existing sections of sidewalk instead of having to build the entire sidewalk section along a street. Developer sidewalk contribution is also an important factor for the towns. Greensboro DOT analysis has found that since 2006 56.9 miles of sidewalk were added through the development process with another 6.7 by way of annexation.

Bicycle transportation has also received significant attention by the MPO in the past decade, particularly after the development of the first BiPed Plan. 20.3 centerline miles of on-road bicycle facilities and markings have been created in the City of Greensboro, and 36.7 miles of local signed bicycle routes have been designated. Off-road greenway paths such as the Atlantic & Yadkin Greenway also provide additional route options for bicycle and pedestrian transportation and give novice bicycle riders a more comfortable facility for commuting.

Improving walkability and bicycling in Guilford County and the five MPO area towns continues to gain traction since the 2006 BiPed Plan adoption. Oak Ridge completed a Comprehensive Pedestrian Improvement Plan in 2013 and Pleasant Garden completed a Comprehensive Bicycle and Pedestrian Transportation Plan in 2015. The Town of Sedalia is working on completing a bicycle and pedestrian plan as of this writing. The Town of Summerfield is preparing to design a section of the A&Y Greenway through their town. In general, the towns have comprehensive plans encouraging walkable downtown cores and ordinances requiring sidewalk construction with new development.

NCDOT owns and maintains all the roadways within unincorporated Guilford County and the towns, as well as some roadways in Greensboro. The BiPed Plan and local town bicycle and pedestrian plans allow for the municipalities to communicate their needs to NCDOT when it comes time to improve roadways within their jurisdiction. NCDOT also adopted a Complete Streets Policy in 2012, although its implementation is not truly complete, in that the Department requires commitment of local financial participation in sidewalk installation costs set at 20% for the towns and 50% for the City and County. Also, NCDOT sometimes declines to accommodate pedestrian and bicyclists on or below bridges for various reasons.

FACILITY TYPE	MILES ADDED SINCE 2006
Sidewalks – Within the City of Greensboro	133.3
Sidewalks – Outside City of Greensboro	36.3
Bicycle Lanes	11.9
Other On-Street Bicycle Facilities	8.4
Paved Greenways	7
Unpaved Trails	16

TABLE 1.1
Mileage of Biking and Walking Facilities Constructed Since 2006

Accomplishments Since 2006

The development of the 2006 BiPed Plan was a turning point in the Greensboro Urban Area for non-motorized transportation. Construction of new biking and walking facilities has progressed in all areas of the region. Specific facilities and the added mileage since 2006 are included.

The MPO recognizes the growing demand for bicycle and pedestrian facilities that is being experienced by cities across the United States, and these accomplishments prove that considerable progress has been made within the MPO to accommodate non-motorized transportation. It is no small feat that over 130 miles of sidewalk have been built in the City of Greensboro since 2006, bringing the total sidewalk mileage in the city from 373 to 503 in only nine years. The MPO has been a strong partner of the City in this regard, allocating almost \$20 million in federal funds for non-motorized transportation projects within the City, the majority of which are sidewalk projects. The City has been using the \$9 million in sidewalk construction funds from the 2008 Transportation Bond, among other sources, to match these federal funds. Progress on greenways and on-road bicycle facilities has also been gaining momentum with the construction and planning of several high-profile projects, including the Downtown Greenway, A&Y Greenway, and N. Buffalo Creek Greenway; and bicycle facilities on Spring Garden St, Meadowview Rd, Cornwallis Ave, and Phillips Ave. The 2015 BiPed Plan Update highlights these

significant accomplishments and provides direction on the next steps needed to continue the good work spurred by the original plan.

Purpose

Vision and Goals

Background & Development

Overview



BiPed Plan Update Development Process

There were several stages to the development of the BiPed Plan Update, including significant technical analysis by MPO staff, coordination with member agencies and staff, public involvement through surveys and public meetings, and a BiPed Update Advisory Committee made up of a diverse group of municipal staff, public health professionals, non-profit organizations, advocates, and interested residents.

TECHNICAL ANALYSIS

An important reason for updating the BiPed Plan was the need to incorporate updated technical data and analyses, and review the recommendations based on existing conditions. Updated data include bicycle and pedestrian crash locations, priority greenway projects, and roadway pavement conditions. Crash data assists in the evaluation of improvements that increase safety. Priority greenway projects show the way for future projects that are on the horizon that must be planned for. Roadway pavement conditions assist in determining on-street bicycle level of service conditions. The bicycle and pedestrian technical analysis used to develop recommendations is explained in detail in each individual modal chapter.

The technical analysis also involves updating the list of bicycle, pedestrian and greenway facilities that since BiPed (2006) adoption are now completed, under construction, under design, or in the planning stage. Compiling this information in one place makes it easier for staff and the public to indentify future priorities.

MPO MEMBER AGENCY COORDINATION AND STAFF WORK

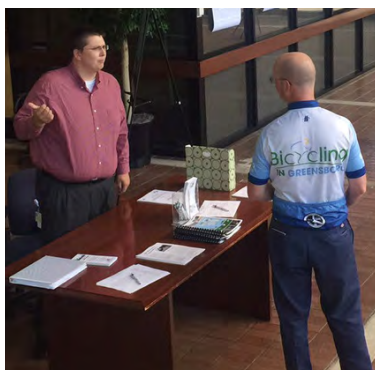
MPO staff updated the plan in-house with support from member agency staff including special help from Greensboro Parks & Recreation on greenway and trail planning. Content from the 2006 BiPed Plan was used as a reference but the majority of the content in the 2015 Update is newly created considering important changes in bicycle and pedestrian planning and roadway conditions since 2006. The 2006 recommendations were used as a base to develop

the infrastructure priorities of this plan, although significant additional analysis was completed that brings these recommendations a step further to set up the implementation of high-priority projects.

MPO staff coordinated with MPO Towns on their particular recommendations, incorporating recently developed bicycle and/or pedestrian plans for Pleasant Garden and Oak Ridge. These recommendations mainly include greenway and trail projects that were identified in the 2006 BiPed Plan, but sidewalks and bicycle facilities, where known, were also added to the plan.

PUBLIC INVOLVEMENT

There was a considerable amount of opportunity for public involvement in developing the BiPed Plan. Over the summer of 2014, a public survey was opened to collect information on the most important elements of the BiPed Plan Update to focus on and where new or improved facilities were needed. More than 150 people responded to this survey. In addition, MPO staff presented the BiPed Plan Update as part of Bike Month events in May 2014, to the Greensboro Community Sustainability Council in July 2014, and to the Greensboro Regional Realtors Association in April 2015. Findings and preliminary recommendations were presented for public review at a meeting also focusing on the Long Range Transportation Plan in February 2015. The presentations included reviews of accomplishments in bicycle and pedestrian infrastructure, projects, and programs since 2006, descriptions of ongoing outreach, and new analysis and potential recommendations for the update.



More than 30 people attended the public open house to review the BiPed Plan Update on August 18, 2015.

To incorporate more detailed input from an interdisciplinary group of stakeholders, the MPO created a BiPed Update Advisory Committee to advise staff on specific perspectives important to the Plan. The Committee's members reside within the MPO region and are associated with relevant interest areas and perspectives such as mountain biking,

public health, bicycling, running, and transit. Many of the BPAC members were also affiliated with organizations that are relevant to the planning process such as the Greensboro Planning Department, Greensboro Police Department, Guilford County Public Health Department, Bicycling in Greensboro (BIG), the Greensboro Fat Tire Society, Greensboro Velo Club, Safe Kids Guilford, Guilford PTA, and the Downtown Greenway. This group met ten times during the development of the plan, from November 2013 to August 2015.

The draft 2015 BiPed Plan Update went out for public review from August 14, 2015 to September 14, 2015. A public open house was held on August 18 at the City Hall in downtown Greensboro for the public and other stakeholders to review the draft plan, speak to staff, and make comments. More than 30 people attended this meeting. In addition, a public survey to collect input was opened during this time, and 46 responses to the survey were received from the public. Including emailed and organizational comments, the MPO received 51 comments on the draft plan. City and county staff and other key stakeholders were also consulted to ensure that the draft plan was comprehensive and accurate. Appendix C (online attachment) includes a summary of public comments and responses from the MPO to those comments.

The BiPed Plan Update was presented to the MPO's Transportation Advisory Committee for adoption in November 2015. The Plan is in effect MPO wide at this point. The Plan will subsequently be presented to Guilford County, the City of Greensboro, and the Towns of Oak Ridge, Pleasant Garden, Sedalia, Stokesdale, and Summerfield for their use. These individual jurisdictions may elect to adopt the plan directly as a way of signifying their interest and commitment in plan implementation.

Relationships to other Plans

2040 METROPOLITAN TRANSPORTATION PLAN (MTP)

Purpose

Vision and Goals

Background & Development

Overview

The 2040 Metropolitan Transportation Plan (MTP) addresses surface transportation, including highways, railways, public transportation, aviation, bicycling, and pedestrians. The plan provides an assessment of future area transportation needs, issues, and recommendations. The BiPed Plan Update elaborates on one of the elements in the MTP and provides recommendations and priorities for

sidewalk, bicycle, trail, and greenway facilities when developing the MTP programs and projects. The MTP, with fiscal constraints, includes the projects expected to be funded given current funding estimates in the twenty five year period in MTP. In sum, while BiPed recommendations include an extensive list of pedestrian, bicycle, trail and greenway project needs, the projects in the MTP provide a snapshot of what currently appears to be a more realistic subset of BiPed projects that can be expected to be funded in the next twenty five years.

The Vision of the MTP plan reflects the need for a balanced transportation system and well-integrated transportation networks. Walking and biking are key to MPO objectives to create an integrated, intermodal transportation system that provide traveler with a real travel choice. The MPO and member governments are working to correct infrastructure deficiencies and expand the system. Recommendations in MTP to support and expand bicycle and pedestrian facilities include:

- Implement recommendations of Greensboro Urban Area Bicycle, Pedestrian, and Greenway Master Plan Update (BiPed Plan Update)
- Continue expansion and infill of the sidewalk network,



focusing on high priority links, ADA compliance ramps, and removal of obstructions

- Implement an adequately funded annual sidewalk maintenance program to ensure accessibility
- Increase local resurfacing investment to a level commensurate with the infrastructure needs
- Include sidewalks and bicycle facilities in all new roadway projects except controlled-access facilities
- Improve pedestrian crossing conditions through expanded pedestrian signals and high-visibility crosswalks at high volume locations

2016 – 2025 METROPOLITAN TRANSPORTATION IMPROVEMENT PROGRAM

After being listed in the MTP, the next step for any BiPed projects to receive federal funds and move towards implementation is to be included in the Metropolitan Transportation Improvement Program (MTIP). The 2016-2025 Metropolitan Transportation Improvement Program (MTIP) lists transportation investments within the Greensboro

Urban Area scheduled for federal or state funding in the next ten years. The document includes the highway program, the non-highway program (including transit, rail, bicycle, pedestrian, and aviation), and the Statewide program (umbrella projects which may be used to make investments across the entire state as needed -- not to be confused with Statewide Needs Projects listed in the highway program). Biped projects funded with federal funds are listed in the MTIP.

The FY 2016-2025 MTIP includes substantial investment in the MPO area transportation system. Total funding over the period is \$896,591,000, according to an MPO analysis. **Figure 1.6** displays the project category breakout of the 2016-2025 MTIP. In



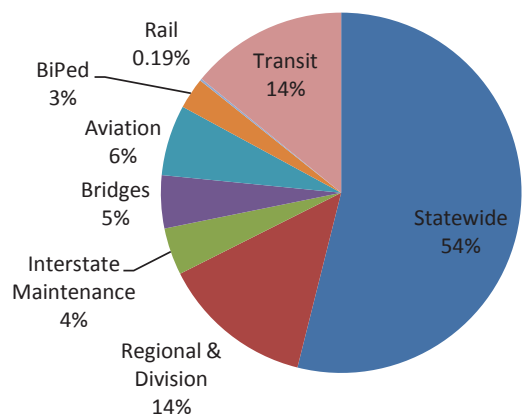


FIGURE 1.6
2016-2025 MTIP Project Category Breakout 2

Figure 1.6, the Statewide, Regional, and Division categories represent roadway projects only. Bicycle and pedestrian projects are shown as a stand alone category, although under the STI such projects are classified in the Division Category. That being said, bicycle and pedestrian projects consume 3% of the programmed funding.

LOCAL GOVERNMENT PLANS

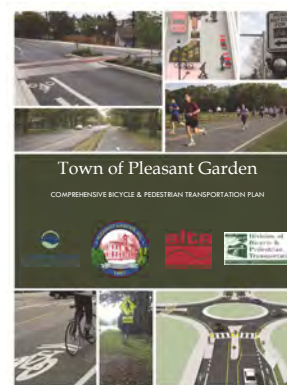
The BiPed Plan is a resource for local governments when updating plans and implementing projects. Local governments can use BiPed recommendations to inform local land use plans, intersection improvements, and corridor studies. Recommendations of local government plans are also included in the BiPed Plan.

Some local governments have stand-alone bicycle and pedestrian plans including the Town of Oak Ridge's Comprehensive Pedestrian Transportation Plan (2013) and Town of Pleasant Garden's Comprehensive Bicycle and Pedestrian Transportation Plan (2015).

Other jurisdictions have incorporated bicycle and pedestrian elements into their Comprehensive and Area Plans, including



the City of Greensboro's Connections 2025 Comprehensive Plan (2003), Summerfield's Comprehensive Plan (2010), and the Downtown Area Consolidated Plan (2010, developed through a collaboration of the City of Greensboro, Guilford County, Action Greensboro, and Downtown Greensboro Incorporated).



NORTH CAROLINA STATEWIDE TRANSPORTATION PLAN (2040 PLAN) AND WALK BIKE NC PLAN (2013)

The 2040 Plan addresses how North Carolina's transportation system should develop over the next thirty years to meet the needs of its users. The plan reviews the current conditions for each mode of transportation. Bicycle and pedestrian performance is reported to be at Level of Service (LOS) D. According to the



plan, the greatest priority for pedestrian and bicycle improvement is addressing walking and biking safety needs. Based on NCDOT estimates, a total of \$1.29 billion is needed to invest in pedestrian and bicycle improvements to increase the LOS to A.

Purpose

Vision and Goals

Background & Development

Overview

The North Carolina Statewide Pedestrian and Bicycle Plan (WalkBike NC) outlines a strategy for improving pedestrian and bicycle transportation in North Carolina. The vision and goals of the plan were developed based on input from the Joint



Steering Committee and Advisory Committee, the 2011 Bicycle and Pedestrian Safety Summit report, and public outreach. The vision states “North Carolina is a place that incorporates walking and bicycling into daily life, promoting safe access to destinations, physical activity opportunities for improved health, increased mobility for better transportation efficiency, retention and attraction of economic development, and resource conservation for better environmental stewardship of our state.” Five vision themes were framed to provide detailed current conditions, strategies and actions to achieve the goals of Mobility, Safety, Health, Economy, and Environment. The BiPed Plan Update was developed to concur and be consistent with the vision and goals in the 2040 Plan and the WalkBike NC Plan. The BiPed Plan Update also includes recommendations from WalkBike NC, in particular the newly revised State Bicycle Routes.



OVERVIEW OF PLAN ELEMENTS

The 2015 BiPed Plan Update consists of four chapters. The last section of each of the modal chapters includes a Summary of recommendations and implementation steps from that chapter. In addition, each summary item is tagged with a symbol that identifies what theme the recommendation addresses: mobility, safety, health, economy, or environment. Recommendations may address more than one of these themes.

CHAPTER 1: *Introduction to BiPed and the Greensboro Urban Area*

This chapter introduces the BiPed Plan Update and explains its contents, purpose, goals, and how it was developed. The chapter gives background information on non-motorized transportation planning in the Greensboro Urban Area and describes how BiPed relates to other local plans and planning concepts.

CHAPTER 2: *Bicycle Chapter*

This section provides an overview of the Bicycle Network including a crash analysis, bicycle facility types and applications, bicycle needs, recommendations, and priorities, and a list of bicycle facility improvements.

CHAPTER 3: *Pedestrian Chapter*

This section provides an overview of the Pedestrian Network including pedestrian facility types and applications, crash analysis, and pedestrian facility recommendations and priorities.

CHAPTER 4: *Greenways and Trails Chapter*

This section provides an overview of the Greenways and Trails Network including an explanation of greenway and trail facility types and their applications, Greenway system needs analysis, and future greenway recommendations and priorities.



This page is intentionally left blank.