7. Bicycle and Pedestrian

Introduction

A 2016 Catawba Valley Household Travel Survey indicated a mere 1.7% of the 13,000 sampled trips during that year were made by bicycling or walking, with travel by automobile accounting for the remaining 98.3%. Furthermore, taking into consideration factors such as development density, land use-mix, and street accessibility, a 2014 report by Smart Growth America, "Measuring Sprawl," cites the Hickory Metropolitan Statistical Area (MSA) as the nation's 10th most sprawled MSA. This strongly indicates that even if the desire for more non-motorized travel were prevalent, the planning area's current built environment fails to provide cyclists and pedestrians with practical alternatives to motorized travel. Moreover, bicyclists and pedestrians may feel unsafe using roads that have been designed exclusively for motorized transportation, and therefore may avoid using them altogether.

Luckily, as travel by walking and cycling is gaining in popularity, additional funds are being leveraged to finance and accelerate pertinent projects. Over time, usage of bike and pedestrian facilities is expected to grow more rapidly, particularly as the public experiences the health, safety, environmental and economic benefits that are directly and in-directly linked to bicycle and pedestrian travel (1). The following chapter will highlight the advantages of non-vehicle travel, and spotlight possible funding sources for future projects and initiatives.

The E's of Bicycle and Pedestrian Planning

Successful bicycle and pedestrian planning requires consideration of five interrelated components: Engineering, Education, Encouragement, Enforcement, and Evaluation/Planning.



This includes any on-road and off-road facilities that must be planned and designed. To create a successful, well-integrated network, design and route choices must be established and properly executed.

This consists of the resources available for all users, including cyclists, pedestrians, and motorists. Cyclists and motorists, of all experience levels, need to know how to ride safely in different networks (from off- road multiuse paths to congested urban roads) as well as how to share multimodal facilities with other pedestrians, cyclists, or motorists.

There are various ways to promote bicycling and walking. This can be as simple as providing a means for desirable, attractive destinations that people want to visit. Cyclists and pedestrians need access to programs and opportunities that focus planning efforts on specific facilities suitable for cyclists or pedestrians.

Any intentional actions that protect the safety of all users. This includes the cycling and pedestrian communities. Targeted enforcement can encourage cyclists and motorists to more safely use multimodal facilities.

Evaluation/ Planning

The periodic review of existing and planned facilities. The most successful bicycle and pedestrian communities have a system in place to assess existing programs and outline steps for future expansion. The facilities recommended as part of the GHMPO 2040 MTP should be paired with coordinated programs and policies that instruct and encourage cyclists and pedestrians in the proper use of the non-motorized transportation network (2).

The Benefits of Bicycling and Walking

In recent years, there have been an increasing number of studies indicating the benefits of pursuing active transportation choices. As a result, municipalities across the United States are implementing strategies to provide facilities and services that support bicycling and walking.

Health

Health is impacted by where we live, learn, work and play. Communities become healthier by creating and improving physical and social environments. The transportation system is a large part of the physical environment and therefore ultimately linked to the health of the community in the following ways:

Physical Activity

Obesity rates in North Carolina adults have more than doubled in the past twenty years, from 13% in 1990 to 29.1% in 2011. As of 2011, only 46.8% of North Carolina adults were performing the minimum recommended amount of weekly physical activity (3).

Increased availability of safe bicycling and pedestrian routes and connectivity to popular destinations encourages biking and walking. Bicycling facilities developed for transportation purposes also provide health benefits when utilized as an alternative to stand-alone travel. A growing number of studies show that the designs of our communities—including neighborhoods, towns, transportation systems, parks, trails and other public recreational facilities—affect people's ability to reach the recommended daily 30 minutes of moderately intense physical activity.

Active transportation is especially important for older adults, who make up a significant part of the population, as the baby boomers continue to age. Some health conditions that commonly affect older adults can be prevented or managed with exercise.

Air Pollution, Associated Respiratory, and Heart Diseases:

Increased availability of bicycling and walking facilities can help reduce traffic congestion and vehicle miles traveled (VMTs), resulting in decreased pollution.

Mobility

Increased mobility for bikers and walkers could lead to significant changes in regional commuting patterns and land-use benefits:

Regional Commuting Patterns

The total number of bicycle commuters in North Carolina is estimated at 8,723 which is 0.2% of all commuters. The total number of pedestrian commuters is 78,509 which is 1.8% of all commuters. According to U.S. Census information, within the Hickory Metropolitan Area, only a small percentage of workers bike or walk with the majority of commuters traveling by private automobile. As shown in Table 7-1, walking comprises 0.9% of all commuting modes and bicycling comprises only 0.1% of all commuting modes.

| Table 7-1 Commuting Patterns by Transportation Mode (for Workers 16 Years and Over) | | | | | | |
|---|-------------|---------|-----------|---------|----------------------------|---------|
| | United St | ates | North Ca | arolina | Greater Hickory MPO | |
| Mode | Total | Percent | Total | Percent | Total | Percent |
| Car, truck, or van | 123,370,586 | 85.9% | 3,973,409 | 91.1% | 145,407 | 94.9% |
| Public transportation (excluding taxicab) | 7,324,680 | 5.1% | 47,978 | 1.1% | 173 | 0.1% |
| Walked | 4,021,393 | 2.8% | 78,509 | 1.8% | 1,453 | 0.9% |
| Bicycle | 861,727 | 0.6% | 8,723 | 0.2% | 102 | 0.1% |
| Taxicab, motorcycle, or other means | 1,723,454 | 1.2% | 47,978 | 1.1% | 1,265 | 0.8% |
| Worked at home | 6,319,332 | 4.4% | 204,995 | 4.7% | 4,887 | 3.2% |
| Total | 143,621,171 | 100% | 4,361,591 | 100% | 153,287 | 100% |

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates.

The high number of vehicle miles traveled (VMTs) per household is a symptom of a larger problem facing the Western Piedmont region. A 2014 report by Smart Growth America cites the Hickory MSA amongst the most sprawled regions in the country. This puts into context the immense need to strive for more condensed development patterns that better connect concentrated population densities to all forms of transportation.

Mobility and Land-Use Benefits

Transportation systems have great influence in shaping the built environment: they determine an area's character, change a neighborhood's quality-of-life, and influence property values. In addition, how land-use develops over time can determine the type of transportation options available. The integration of transportation and land-use allows people a greater number of choices for getting from point A to point B. When popular destinations are placed closer to one another, there is a greater number of ways people can access them, including by bicycling and walking. Several strategies exist that can assist in re-shaping the built environment, such as incorporating compact street design, embracing transit-oriented development, managing parking, and emphasizing sustainable transportation planning which emphasizes bicycling and walking (6).

| Table 7-2 Annual Transportation Costs – Amount | | | | | |
|---|------------|-----------------|--|--|--|
| Costs | Population | Percent of Pop. | | | |
| <\$12,500 | 820 | 0.20% | | | |
| \$12,500 to \$13,500 | 38,270 | 10.90% | | | |
| \$13,500 to \$14,300 | 53,984 | 15.40% | | | |
| \$14,300 to \$15,400 | 144,662 | 41.20% | | | |
| \$15,400+ | 113,799 | 32.40% | | | |
| Total | 351,535 | 100% | | | |

Source: Center for Neighborhood Technology, 2014.

| Table 7-3 | | | | | |
|-----------|------------|-----------------|--|--|--|
| | | | | | |
| Percent | Population | Percent of Pop. | | | |
| <40% | 0 | 0% | | | |
| 40 to 45% | 0 | 0% | | | |
| 45 to 50% | 20,701 | 5.90% | | | |
| 50 to 60% | 199,534 | 56.80% | | | |
| 60 + % | 131,300 | 37.40% | | | |
| Total | 351,535 | 100% | | | |

Source: Center for Neighborhood Technology, 2014.

Compact growth also leads to lower household and transportation expenses. As shown in Table 7-3, 94.2% of households in the region spend 50% or more on housing and transportation costs (7). According to Smart Growth America, if bicycle and pedestrian-supportive compact development patterns were implemented in the region, "shorter distances to travel and a wider range of low-cost travel options mean individuals and families in these places spend a smaller portion of their household budget on transportation."

Environmental

Current and past air quality issues in the Western Piedmont region are a result of having high-levels of ground-level ozone (O3) and particulate matter (PM 2.5) in the atmosphere (refer to Figures 7-1 and 7-2) (8). Ozone (O3) is a gas created by chemical reaction when solar radiation interacts with nitrogen oxides (NOx) and volatile organic compounds (VOC) in the atmosphere (8). Nitrogen oxide (NOx) is formed when fuel is burned at high temperatures by both on-road (cars, trucks, buses) and non-road vehicles (boats and construction equipment, for example) as well as from industrial sources such as turbines, power plants, cement kilns, and industrial boilers (9). Volatile organic

compounds (VOC) can enter the atmosphere through various sources from either vehicle engine operation or fuel evaporation (10).

Transportation Emissions

Globally, between 2005 and 2030, transportation-related carbon dioxide (CO2) emissions are expected to increase by 57% (11). Also, according to the Environmental Protection Agency (EPA), in 2012 alone "greenhouse gas emissions from transportation accounted for about 28% of total U.S. greenhouse gas emissions, making it the second largest contributor of U.S. greenhouse gas emissions after the Electricity sector" (12). These emissions have also been steadily increasing by about 18% since 1990 (13). According to the latest EPA data, carbon dioxide (CO2) is the main emission from the transportation sector. Carbon dioxide (CO2) is followed by other greenhouse gases, fluorinated gases used in refrigeration, cooling systems, and lubricants.



Source: Western Piedmont Council of Governments, 2016.



Source: Western Piedmont Council of Governments, 2016.

We know that carbon emissions are a major cause of climate change, and that transportation is a major contributor to carbon emissions through the burning of petroleum-based fuels. So how is the transportation sector reducing carbon emissions? Over the past decade, many communities throughout America have adopted policies to encourage Americans to reduce carbon emissions by driving less. Although they are not viable options for every trip, walking and bicycling burn no fuel.

Increased use of these modes as an alternative to driving could lead to a reduction in carbon emission levels (14).

Other environmental benefits include a reduction in noise levels within neighborhoods and less discharge of automobile-related fluids into lakes and streams. Trails and greenways also benefit the environment by safeguarding ecologically sensitive areas, protecting large areas of plants that clean the air of pollutants, and creating a buffer zone for water-bodies.

Economic

In regards to economic benefits, bicycle and pedestrian-friendly infrastructure result in increased property values, downtown revitalization, and tourism:

Property Values

The Carolina Thread Trail is a regional network of multi-use greenways, trails and blueways that reaches 15 counties, including Catawba County, and stretches from North Carolina into South Carolina. An economic impact study published in March 2007 by Econsult Corporation and Greenways Incorporated found that expansion of green space and trails from the Carolina Thread

Trail increases nearby property value. The study found that the trail, situated near an estimated 305,000 housing units would result in each unit benefitting approximately \$3,580 from the (15). Over 50% of all housing units will appreciate around \$4,500 for a total of \$1.7 billion total dollar gain in the affected area (16). This increase in property values will result in approximate \$17 million more in collected property taxes for municipalities that are part of the trail system (15).

Downtown Revitalization

Trails and bikeways are also economic boons to redeveloping downtowns. Leadville, CO, for example, reported a 16% increase in sales tax revenue with the opening of a major bikeway in their downtown. According to a study conducted in Brown County, WI, properties adjacent to a bike trail sold faster and for 9% more than similar properties located outside the trail's proximity (16).

<u>Tourism</u>

Econsult Corporation's study conducted on the potential impacts of the Carolina Thread Trail found that the trail could bring local governments between \$42 million and \$84 million annually in tourism and tourism-related activities(15).

Research from several universities across the country, the National Bicycle Tour Directors Association, Local Government Commission, and numerous state Departments of Transportation confirm that bicyclists riding through towns positively contribute to the local economy. Biking and walking allows people to take in their surroundings as they travel, which gives them a chance to observe businesses up close. At each leg along their journey, bicyclists stop to make purchases and find entertainment (movies and concerts). In addition, bicyclists will also dine at restaurants, visit coffee shops and bakeries, patronize local bicycle shops, and rent lodging facilities (16).

Environmental Justice and Title VI

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color and national origin in programs and activities receiving federal financial assistance -- including transportation. The Environmental Justice (EJ) Orders add that "Federal agencies shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Compliance with provisions of Title VI and the EJ Orders extend to all transportation investment and planning processes and need to be considered in metropolitan and statewide planning.

Environmental Justice addresses the effects of all programs, policies, and activities on minority and low-income populations. Environmental Justice seeks to:

- Avoid or minimize high and adverse human health, environmental, social and/or economic effects on minority and low-income populations;
- Ensure full and fair participation of all potentially affected communities in the transportation decision-making process; and
- Prevent denial of, reduction in or significant delay in the receipt of benefits by minority and low-income populations.

In the context of Environmental Justice, disproportionate and adverse effects are defined as unfavorable effects that minority and low-income populations predominately experience. They are typically more severe or greater in magnitude than the adverse effects suffered by non-minority or non low-income populations. The GHMPO will work through compliance goals and planning process goals to conduct population identification, process documentation and benefit/burden assessments in order to identify and avoid disproportionately high and adverse effects on minority and low-income populations.

Safety

In a recent survey distributed by the GHMPO, respondents were asked how safe they feel when utilizing current bicycle and pedestrian facilities in Hickory. Out of 235 respondents, 124 felt unsafe. When asked how they would rate the current bicycle and pedestrian facilities in Hickory, 206 of the 239 respondents felt that the facilities are less than adequate.

One major goal of bicycle and pedestrian transportation planning by the GHMPO is to create safe and effective conditions for biking and walking. Additional bicycle and pedestrian infrastructure, such as bike lanes, buffers, and signage, could provide bicyclists and walkers with a safer environment for commuting. Between the years 2007 to 2014, there were 131 bicycle crashes reported in Alexander, Burke, Caldwell, and Catawba Counties. Four of these bicycle crashes were fatal. Between the same years, there were 455 pedestrian crashes reported in the same four counties. Forty-five of these pedestrian crashes were fatal according to NCDOT's Safety Division. A full listing of crashes can be found in tables, 7-4 and 7-5, and Map 7-1 shows the crash locations. Future roadway planning should include bicycle and pedestrian into the design to create less dangerous conditions for bicyclists and pedestrians. For example, slight decreases in automobile speeds could severely affect the condition of a bicyclist or pedestrian involved in a crash with an automobile. More safety goals to consider are below:

- Improve bike and pedestrian safety by eliminating road conditions that present hazards.
- Incentivizing improved pedestrian and bicycle infrastructure and mixed-use development in and around multimodal transit hubs to promote car-free travel
- Designing and retrofitting of roads to allow for safe, harmonious passage of vehicles, bicycles, and pedestrians, including individuals who use assisted mobility devices
- As part of the development review process, support bike and pedestrian-friendly amenities and connectivity to local greenways and routes.
- Encourage dialogue among engineers, planners, regional bike advocates and local governments
- Promote NCDOT's "Complete Streets" policy at the local and regional level
- Encourage and promote public outreach events

| Table 7-4 2007 to 2014 Bicycle Crashes | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|-------|
| County | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
| Alexander | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Burke | 6 | 4 | 6 | 6 | 3 | 1 | 2 | 2 | 30 |
| Caldwell | 6 | 4 | 0 | 4 | 1 | 6 | 1 | 1 | 23 |
| Catawba | 12 | 8 | 13 | 14 | 12 | 5 | 9 | 4 | 77 |

Source: NCDOT Safety Division

| Table 7-5 | | | | | | | | |
|-----------|-----------------------------|---|--|---|--|--|--|--|
| | | 107 10 20. | 14 Pedest | rian Crash | les | | | |
| 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
| 3 | 2 | 4 | 3 | 0 | 3 | 1 | 2 | 18 |
| 16 | 10 | 11 | 7 | 7 | 11 | 13 | 14 | 89 |
| 15 | 17 | 10 | 11 | 18 | 11 | 7 | 11 | 100 |
| 26 | 17 | 35 | 33 | 30 | 33 | 31 | 43 | 248 |
| | 2007 3 16 15 26 | 2007 2008 3 2 16 10 15 17 26 17 | 2007 to 202200720082009324161011151710261735 | Table 7-5 2007 to 2014 Pedest2007200820092010324316101171517101126173533 | Table 7-5 Table 7-5 2007 to 2014 Pedestrian Crash 2007 2008 2009 2010 2011 3 2 4 3 0 16 10 11 7 7 15 17 100 11 18 26 17 35 33 30 | Table 7-52007 to 2014 Pedestrian Crashes2007200820092010201120123243031610117711151710111811261735333033 | Table 7-52007 to 2014 Pedestrian Crashes20072008200920102011201220133243031161011771113151710111811726173533303331 | Table 7-52007 to 2014 Pedestrian Crasses2007200820092010201220132014324303121610117711133141517101118117112617353330333143 |

Source: NCDOT Safety Division



State and Regional Policies

| Policy | Policy Description |
|--|--|
| Greenway Accommodations | In 2015, NCDOT approved guidelines for the accommodation of future greenways under bridges. The guidelines include a decision-making approach and cost-sharing recommendations. |
| Complete Streets | This policy requires planners and designers to include other modes of transportation, including bicycle and pedestrian, in all transportation projects in municipal areas under certain circumstances. |
| Bicycle Policy | This policy details guidelines for the planning, design, construction, maintenance and operation of bicycle facilities and accommodations. |
| Pedestrian Policy Guidelines | These policies allow NCDOT to work with local governments to add sidewalks in coordination with highway improvement projects. State funds are available on a sliding scale to match funds provided by the local government, which will be responsible for maintaining the sidewalk. |
| Administrative Action to Include Greenway Plans | In 1994, the NCDOT adopted administrative guidelines to consider greenways and greenway crossings during the highway planning process. This policy was incorporated so that critical corridors, which have been adopted by localities for future greenways, will not be severed by highway construction. |
| Bridge Policy | NCDOT's Bridge Policy establishes design elements for new and reconstructed bridges on the state road system. It includes requirements for sidewalks and bicycle facilities on bridges, including minimum handrail heights and sidewalk widths. |

Source: NCDOT Laws & Policies

Types of Bicycle and Pedestrian Facilities 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 (Figure 7-3).

Paved Shoulder

A paved shoulder refers to the part of the highway that is adjacent to the regularly traveled portion of the highway and is on the same level as the highway. Ideally, wide paved shoulders should be included in the construction of new highways and the upgrade of existing highways where there is a significant level of current/potential bicycle travel. A wide paved shoulder refers to additional pavement width of at least 4' that has been added to an existing roadway in order to more safely accommodate bicycles (Figure 7-3).

Shared Lane

A shared lane refers to a lane of the traveled way that is open to both bicycle and motor vehicle travel where there are improvements in roadway width, signing, or marking for bicycling purposes. Shared Lanes often include improvements such as Shared Lane Markings (Sharrows) or are designated as Bicycle Boulevards which must be indicated under the field Proposed Signing and Marking. Where intended explicitly for purposes of serving as a bicycling facility, wide outside lanes should also be included in this category (Figure 7-3).

Shared Use Path

A Shared Use Path refers to a facility, which should be designed to meet ADA Standards, which may be used by bicyclists, pedestrians, and other non-motorized users. They are separated from the roadway by an open space or a physical barrier or within an independent-right-of-way. Also known as a Multi-Use Trail or Greenway (Figure 7-3).

<u>Sidewalk</u>

A sidewalk refers to the portion of a street or highway right of way, beyond the curb or edge of roadway pavement, which is intended for use by pedestrians (Figure 7-3).



Figure 7-3 – Bicycle and Pedestrian Facilities

Top Left: Shared Used Path in Hickory **Top Right:** Wide Paved Shoulder in Outer Banks **Bottom Left:** Bicycle Lane in Downtown Morganton **Middle Right:** Sidewalk in Long View **Bottom Right:** Shared Lane in Asheville, North Carolina

Current System Overview

The current GHMPO bicycle and pedestrian network consists of three signed routes, over sevenmiles of bicycling pavement markings, almost 2.5 million feet of sidewalk, and around seventeenmiles of greenway. Each GHMPO County's network is discussed in this section, listed in Table 7-6, and shown on Maps 7-2 (Alexander County), 7-3 (Burke County), 7-4 (Caldwell County), 7-5 (Catawba County).

Alexander County

- Approximately 20-miles of North Carolina bicycle route NC 2 (Mountains-to-Sea) runs through the county.
- Contains an estimated 32,549 linear feet of sidewalk within Taylorsville's municipal limits.
- Does not have a greenway system within the county.

Burke County

- Roughly 50-miles of two North Carolina bicycle routes exist in Burke: the Burke portion of NC 2 (Mountains-to-Sea) route is 20 miles and the NC 6 (Piedmont Spur) section is about 30 miles long.
- The City of Morganton currently has 3.75-miles of bicycle lanes and 1.5-miles of sharrows (shared lane markings) within and around its downtown.
- Contains an estimated 329,569 linear feet of sidewalk within the municipal limits of Drexel, Glen Alpine, Morganton, Rutherford College, and Valdese.
- The City of Morganton currently has 4.8-miles of greenway. The Morganton Greenway System consists of the Catawba River Greenway, Freedom Trail Greenway, and Green Street Greenway that contains five points for bicyclists to access the facilities. Currently the system connects Freedom Park and Freedom High School with the Catawba River Soccer Park up to Catawba Meadows Park to the north. The City estimated that approximately 18,000 people use the Catawba River Greenway trail each month.

Caldwell County

- Around 26-miles of North Carolina bicycle route NC 2 (Mountains-to-Sea) runs through the county.
- Contains an estimated 178,797 linear feet of sidewalk within the municipal limits of Granite Falls, Lenoir, Hudson, and Sawmills.
- The City of Lenoir currently has a 5.8-mile greenway system. The current system is in fair condition, moderately used, and provides limited connections to several recreation areas.

Catawba County

- Approximately 16 miles of the Lake Norman Bike Route runs through eastern Catawba County.
- The City of Hickory currently has 2.4-miles of bicycle lanes.
- Contains an estimated 1,911,220 linear feet of sidewalk within the municipal limits of Conover, Claremont, Hickory, Long View, Maiden, Newton, and Town of Catawba
- There are currently a total of 6.7 greenway miles in the cities of Conover, Hickory, and Newton.

| Table 7-6 Current Greater Hickory MPO System Overview | | | | | | |
|--|-----------|---------|----------|-----------|--|--|
| System Feature | Alexander | Burke | Caldwell | Catawba | | |
| Signed Bike Routes | 1 | 2 | 1 | 1 | | |
| Bike Lane Mileage | 0 | 3.75 | 0 | 2.4 | | |
| Sharrow Mileage | 0 | 1.5 | 0 | 0 | | |
| Existing Sidewalk (linear feet) | 32,549 | 329,569 | 178,797 | 1,911,220 | | |
| Total Roadway Mileage with Sidewalk | 4.4 | 52.2 | 28.2 | 148.1 | | |
| Roadway Mileage with Sidewalks on Two Sides | 3.2 | 15.1 | 7.9 | 34.5 | | |
| Roadway Mileage with Sidewalk on One Side | 1.2 | 371 | 20.3 | 113.6 | | |
| Greenway Mileage | 0 | 4.8 | 5.8 | 6.7 | | |

Source: Greater Hickory Metropolitan Planning Organization









Potential Greenway Projects

Overmountain Victory Trail

The Overmountain Victory Trail is a national historic trail that goes through Virginia, Tennessee, North Carolina, and South Carolina. The trail totals 330 miles of path used by patriot militia during the American Revolution. The Overmountain Victory system includes a Commemorative Motor Route, 87 miles of walkable pathways, and access to historic sites and museums that allow visitors a chance to relive the history of the 1780 Overmountain Men march. In North Carolina, the trail goes through Avery, Burke, Caldwell, McDowell, Polk, and Rutherford County (Figure 7-5). In Burke County, some of the public trails include Catawba River Greenway in Morganton and Paddy's Creek Trail at Lake James State Park. Some Burke historical points of interest include the Quaker Meadows-Charles McDowell House and Quaker Meadows Cemetery. Visitors can hike the Patterson School Overmountain Trail in Caldwell County and stop at either historic Fort Defiance or Fort Crider.

Figure 7-5 – The Overmountain Victory Trail (Avery County, Burke County, Caldwell County, McDowell County)



Source: National Park Service

Fonta Flora Loop Trail

The Fonta Flora Loop Trail (formerly Lake James Loop) (Figure 7-6) is a planned recreation loop located in the Lake James region of Burke County. The trail will circle Lake James making its way through Lake James State Park, land owned by Duke Energy, and some residential properties. According to the Lake James Loop Trail Master Plan, the loop will be used for hiking and mountain

biking, providing more opportunity for land activities around the lake. It trail is proposed as being easy to moderate difficulty, natural surface, and around 30-miles long. The trail will include multiple access points and connections to other Lake James trails, points of interests, and overlooks. As of January 2017, 6.6-miles of the trail has been completed.



Figure 7-6 - Fonta Flora State Trail (Lake James Section)

Source: Fonta Flora State Trail Master Plan, Lake James Section

Carolina Thread Trail

Starting in 2007, The Carolina Thread Trail (CTT) started looking at ways of combining various greenways, natural surface trails, and sidewalks for a large scale path network within the Carolinas. This regional system encompasses 15 counties including Anson, Cabarrus, Catawba, Cleveland, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, Stanly and Union counties within North Carolina and Cherokee, Chester, Lancaster and York counties in South Carolina. Once completed, the Thread Trail system will be 1,500 miles long, occupy 7,300 square miles, and ultimately provide a limitless line of multimodal travel through the involved counties. Figure 7-7 illustrates the proposed Catawba County CTT connections. As of winter 2016, nine Carolina Thread Trails have been established in Catawba County; Claremont City Park Trail, Conover City Park Trail, Gateway Park

Greenway, Heritage Trail Connector, the Hickory Greenway system, Lyle Creek Greenway, Murray's Mill/David Stewart Trail, Newton Heritage Trail, and South Side Park Trail.



Figure 7-7 - Catawba Thread Trail - Catawba County Proposed Connections

Source: Carolina Thread Trail Master Plan for Catawba County Communities

Inspiring Spaces

Hickory's Inspiring Spaces initiative is essentially an action plan to improve public space within the City. With the help of community input, several City assets were identified, for example Hickory's downtown, is just one of many destinations in the plan's target area. The Inspiring Spaces will focus on gateways, special places, parks, greenways, and streetscapes and how to connect them, this linkage system will address improvements to public infrastructure for roadway, bike and pedestrian routes, and construction of new greenways within public properties. Figure 7-8 on illustrates The Inspiring Spaces proposed greenway projects.



Figure 7-8 - Inspiring Spaces Greenways Proposed Projects

Source: Hickory Inspiring Spaces Master Plan

Scheduled Projects

EB-5750 - Main Avenue Greenway - City of Hickory

Construction of greenway with park nodes and pedestrian bridge spanning NC 127 along Main Avenue from 9th Street NW to 7th Avenue NE. The project will help in creating a connection from Downtown Hickory to Lenoir-Rhyne University.

EB-5803 - 1st Avenue Area Bicycle and Pedestrian Improvements - City of Conover

Construction of bicycle and pedestrian improvements along 1st Avenue. These improvements include re-striping the roadway, installing island pedestrian refuge medians, and adding curb bumpouts through the downtown all intended for traffic calming and increasing safety for bicycle and pedestrian traffic. This project covers a total length of 2.13 miles along 1st Avenue N/S from 10th Street NW to 7th Street PI SW, 7th Street PI SW from 1st Avenue S to Conover Blvd W (US HWY 70), and 3rd Street SE from 1st Avenue S to 5th Avenue SE.

EB-5806 - Hospital Avenue Sidewalk Harper - City of Lenoir

Construction of new sidewalk along Hospital Avenue from Harper Avenue to US 321 (Blowing Rock Boulevard). Approximately 950-feet of substandard sidewalk will be replaced and approximately 1,560- feet of sidewalk will be constructed. Due to a constrained corridor, the sidewalk will be 5 ft. wide and located at the back of curb. New curb and gutter will be installed to DOT standards. Some grading and the installation of new retention walls will be required in some areas due to the topography. Utility relocation will also be required.

EB-5807 - Morganton Downtown Greenway Connector - City of Morganton

Construction of a 10-ft multi-use path from the Catawba River Greenway (west of US 64/Sanford Drive) to an existing section of the Downtown Greenway at the intersection of College Street and NC 181 (North Green Street). This section of Greenway will directly link bicycle and pedestrian access from the Central Business District to the Catawba River Greenway and create the City's very first bicycle and pedestrian network connection link. This trail segment also creates first time greenway connections to the City's Aquatic Center, the Mountain View Recreation Center, the Morganton Housing Authority, the Burke Senior Center and numerous private business properties along NC 181.

<u>EB-5808 - Upgrade current pedestrian signals and install new pedestrian signals - City of</u> <u>Hickory</u>

Upgrade current pedestrian signals with LED countdown signal heads and audible push buttons. Install pedestrian signals and audible push buttons at remaining City owned signals that do not have them. The City of Hickory is hoping to upgrade 43 current and install 17 new pedestrian facilities to make them more accessible for all of our pedestrians. The addition of audible pedestrian facilities will make intersections safer for visually impaired citizens.

EB-5825 - West A Street Bike and Pedestrian Improvements - City of Newton

Construction of bicycle and pedestrian improvements along West A Street. These Improvements include bicycle lanes, new sidewalk, and ADA upgrades to existing sidewalk. The project will expand the existing sidewalk network by filling in missing sidewalk gaps to create a safer multi-modal connection within this area of Newton.

EB-5826 - Main Avenue Greenway - City of Hickory

Construction of pedestrian walkway and bridge over NC 127 along Main Avenue NE/NW from Lenoir Rhyne Boulevard to 9th Street NW. The project will help in creating a connection from Downtown Hickory to Lenoir-Rhyne University.

EB-5827 - Fonta Flora State Trail - Burke

<u>County</u>

This project will encompass the design, surveying, engineering, permitting, and right of way/easement acquisition and purchase for a section of the Fonta Flora State Trail that extends approximately 2.5 miles from the intersection of Laurel Ridge Court and North Powerhouse Road to the proposed Harris Whisnant trailhead at the intersection of Harris Whisnant and Cobb Roads. This section of the Fonta Flora State Trail will utilize a ten-foot wide asphalt side path for pedestrians and cyclists. The project will require extensive work to secure right of way and easements along North Powerhouse and Cobb Roads.

EB-5934 – Fonta Flora State Trail (Linville Dam) – Burke County

Design boardwalk across the Linville Dam. The project is located on Duke Energy land and will continue the side path from EB - 5827, linking together the Southeastern and Southwestern sections of the Fonta Flora State Trail.

<u>EB-5828 - Centennial Boulevard Sidewalk - City of</u> Claremont

Construction of approximately 3,000 linear feet of 5' sidewalk along Centennial Boulevard from North Oxford Street to North Lookout Street.

EB-5828 - Centennial Boulevard Sidewalk (Phase II) & Main Street Sidewalks - City of Claremont

Construction of approximately 2,592 linear feet along Centennial Boulevard (Phase II) and 864 linear feet along Main Street from where current sidewalk ends.

EB-5936 - Five Points Intersection - City of Conover

Relocate existing overhead utilities and poles away from the intersection; replace existing signals and mounting poles with new signals mounted on mast arms, and install pedestrian crossing signals for all crosswalks.

EB- 5937- Book Walk – City of Hickory

Construction of a 3,180' long, 10' wide multi-use path from existing City Walk to Ridgeview Library.

EB-5938 - Book Walk South

Construction of 3,160' long, 10' wide multi-use path from Ridgeview Library to US 70/Walmart Community Grocery Store.

EB-5939 - River Walk - City of Hickory

Construction of a 3,360' long, 14' wide multi-use path from Old Lenoir Road and 15th Avenue NW to the end of the proposed Rosales Bridge.

Planning Initiatives

Statewide Planning Efforts

In 2013, the NCDOT Board of Transportation adopted the State's first statewide master plan focused exclusively on bicycling and pedestrian planning. North Carolina's WalkBikeNC discusses strategies for improving walking and bicycling for residents and visitors. The plan identifies current walking and bicycling conditions in North Carolina and serves as a policy guide for state agencies, local governments, and private sector interests to develop a safe and efficient transportation system that accommodates walking and bicycling.

In 2008, NCDOT approached Centralina Council of Governments to develop the first regional bicycle plan in the State. Since 2008, NCDOT's Bicycle and Pedestrian Division has funded and given technical assistance to ten other regional plans, which includes the Western Piedmont Bicycle Plan. These plans focus on multi-county bicycle connections and on-road and off-road safety improvements. Table 7-7 highlights the completed regional plans and ones in progress.

| Table 7-7 | | | | | |
|--------------------------------------|-----------------------|--|--|--|--|
| Re | egional Bicycle Plans | | | | |
| Plan Title | Progress | Counties | | | |
| Albemarle Regional Bicycle Plan | Completed | Camden, Chowan, Currituck, Dare, Gate, Hyde, Pasquotank, Perquimans, Tyrrell, Washington | | | |
| Blue Ridge Bike Plan | Completed | Buncombe, Haywood, Henderson, Jackson, Madison, Swain, Transylvania | | | |
| Cape Fear Regional Bicycle Plan | In progress | Bladen (Portion), Brunswick, Columbus, New Hanover (Portion), Pender, Sampson (Portion) | | | |
| Central Park Regional Bicycle Plan | Completed | Rowan Davison Randolph Moore Montgomery Richmond | | | |
| Croatan Bike Trails Plan | Completed | Carteret, Craven, Jones, Onslow, Pamlico | | | |
| Far West Regional Bicycle Plan | In progress | Cherokee, Clay, Graham, Macon | | | |
| High Country Bike Plan | Completed | Alleghany, Ashe, Avery, Mitchell, Watauga, Wilkes, Yancey | | | |
| Isothermal Regional Bicycle Plan | In progress | Cleveland, McDowell, Polk, Rutherford | | | |
| Lake Norman Bike Plan | Completed | Catawba (Portion), Iredell (Portion), Lincoln (Portion), Mecklenburg (Portion) | | | |
| NC Lakes District Regional Bike Plan | Completed | Franklin, Granville, Person, Vance, Warren | | | |
| Western Piedmont Bicycle Plan | Completed | Alexander, Burke, Caldwell, Catawba | | | |

Source: North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation

Local Planning Efforts

The GHMPO has supported many local planning efforts throughout the years. This support varied from municipal to county to regional plans where many were developed to improve bicycling and pedestrian transportation. Table 7-8 highlights these plans from in and around the Greater Hickory Area from the last twenty years.

| Table 7-8 | | | | | |
|---|--------------|--|--|--|--|
| Local Planning Efforts | | | | | |
| Plan Title | Year Adopted | Sponsoring Local Government | | | |
| WalkRCV Pedestrian Plan | 2017 | Rutherford College and Valdese | | | |
| Fonta Flora State Trail Master Plan Lake James Section | 2016 | Burke County | | | |
| Newton Streetscape Master Plan and North Newton Master Plan | 2016 | Newton | | | |
| Western Piedmont Bicycle Plan | 2016 | Region | | | |
| Overmountain Victory Historic Trail Master Plan: Lenoir to Morganton | 2015 | Lenoir, Gamewell, Caldwell County, Burke County, National Park Service | | | |
| Walkability Strategic Action Plan | 2015 | Hickory | | | |
| Inspiring Spaces Master Plan | 2014 | Hickory | | | |
| Lenoir Comprehensive Pedestrian Plan | 2013 | Lenoir | | | |
| Granite Falls Pedestrian Plan | 2011 | Granite Falls | | | |
| Carolina Thread Trail Master Plan | 2010 | Catawba County | | | |
| Lake Norman Bicycle Route | 2010 | Catawba County | | | |
| Downtown Newton Streetscape Master Plan | 2010 | Newton | | | |
| Urban Corridor SAP | 2009 | Burke County | | | |
| Mission 2030 Master Plan | 2009 | Morganton | | | |
| Rutherford College Comprehensive Plan | 2009 | Rutherford College | | | |
| Hildebran Pedestrian Plan | 2009 | Hildebran | | | |
| Alexander County Comprehensive Plan | 2008 | Alexander County | | | |
| Conover Pedestrian Plan | 2008 | Conover | | | |
| Conover Parks Master Plan | 2008 | Conover | | | |
| Connelly Springs Sidewalk Plan | 2008 | Connelly Springs | | | |
| Hudson Land Development Plan | 2008 | Hudson | | | |
| Catawba County Parks Master Plan | 2007 | Catawba County | | | |
| Catawba County UDO | 2007 | Catawba County | | | |
| Greater Hickory Recreation/Tourism Plan | 2006 | Region | | | |
| Lake James SAP Phase II | 2005 | Burke County | | | |
| Long View Land Development Plan | 2005 | Long View | | | |
| Sidewalk, Bikeway, Greenway, and Trail Master Plan | 2005 | Hickory | | | |
| Connelly Springs Land Development Plan | 2005 | Connelly Springs | | | |
| Town of Catawba Sidewalk Plan | 2005 | Catawba | | | |
| Town of Maiden Pedestrian Plan | 2005 | Maiden | | | |
| Taylorsville Sidewalk Plan | 2004 | Taylorsville | | | |
| Conover Comprehensive Plan | 2003 | Conover | | | |
| Town of Claremont Sidewalk Plan | 2003 | Claremont | | | |

| Lake James SAP Phase I | 2002 | Burke County |
|---------------------------------------|------|---------------|
| Burke County Strategic Plan | 2002 | Burke County |
| Comprehensive Parks & Recreation Plan | 2000 | Burke County |
| Horizons: Land Development Plan | 1999 | Granite Falls |
| 2015 Comprehensive Recreation Plan | 1997 | Morganton |

Implementation

Partnership Opportunities

Partnerships between various organizations and groups are important to improve bicycling and pedestrian infrastructure, as well as spreading awareness in the region. These organizations and groups could help spread the message about the importance of bicycling and pedestrian in the community and lead to effective programs in the future. Potential partners for implementation of bicycling and pedestrian action steps could include:

- Bicycling clubs (on-road and off -road)
- Chambers of Commerce
- County departments of social services
- Downtown associations
- Economic development corporations
- Hospitals, medical centers, and their foundations
- Local bicycle shops
- Local non-profits
- Major employers
- Municipal engineering, planning, recreation, and police departments
- North Carolina Department of Commerce
- NCDOT's Division 11, 12, and 13
- NCDOT's Division of Bicycle and Pedestrian Transportation
- Public health departments
- Public school systems
- Service clubs
- Sheriff departments
- Tourism authorities
- Universities and community colleges
- Veteran groups
- Western Piedmont Council of Governments

Funding Sources

Potential funding can come from federal, state, local, and private sources and be used for a variety of activities including: programs, planning, design, implementation, and maintenance. Funding discussed in this section only reflects what is available at the time of this writing. The funding amounts available, funding cycles, and programs are subject to change.

Fixing America's Surface Transportation (FAST) Act

The FAST Act was signed by President Obama on December 4, 2015. It funds surface transportation infrastructure planning and investment with over \$305 billion over fiscal years 2016 through 2020 for various highway and motor safety, freight, and public transportation projects; and research and statistic programs. FAST is the first federal law in over a decade to provide long-term funding.

Surface Transportation Block Grant Program

The FAST Act converts the long-standing Surface Transportation Program into the Surface Transportation Block Grant Program acknowledging that this program has the most flexible eligibilities among all Federal-aid highway programs and aligning the program's name with how FHWA has historically administered it. The STBG promotes flexibility in State and local transportation decisions and provides flexible funding to best address State and local transportation needs. The GHMPO currently receives \$3.5 million dollars annually from the block grant program.

Congestion Mitigation/Air Quality

The Congestion Mitigation/Air Quality Improvement Program (CMAQ) provides funding for projects and programs in air quality non-attainment and maintenance areas for ozone, carbon monoxide, and particulate matter (PM 2.5) which reduce transportation-related emissions. These federal dollars can be used to build bicycle and pedestrian facilities, but facilities that are purely recreational are not eligible. Catawba County is currently the only county in the region eligible to receive CMAQ funding.

State Transportation Improvement Program

NCDOT's State Transportation Improvement Program (STIP) is based on the 2013 Strategic Transportation Investments (STI) bill which contains the new Strategic Mobility Formula assigning all modal projects into one of three separate categories: Statewide Mobility, Regional Impact, and Division Needs. All bicycle projects are placed into the Division Needs category and are ranked on several criteria by both the Greater Hickory MPO and the NCDOT division. The highest ranked projects are likely to be included in the STIP for eventual funding. The STIP is a federally mandated transportation planning document that details transportation improvement prioritized by stakeholders. Projects are scheduled over the coming ten years and the STIP is updated every two years.

Highway Safety Improvement Program (HSIP)

The purpose of the North Carolina Highway Safety Improvement Program (HSIP) is to provide a continuous and systematic process that identifies, reviews, and addresses specific traffic safety concerns throughout the state. This systematic process is both competitive and data-driven. A project may be evaluated based on its crash history and field study. The funds are administered by the NCDOT Transportation Mobility and Safety Unit.

NCDOT Bicycle & Pedestrian Planning Grant Initiative

The Bicycle Planning Grant Initiative began in 2004 and is an annual matching grant program for developing comprehensive bicycle and pedestrian plans to statewide municipalities (and counties with populations less than 25,000). As of 2015, approximately \$4 million has been allocated to 164 municipalities. Funded plans represent a comprehensive, rather than singular, strategy for expanding bicycle and pedestrian opportunities. Proposals are judged in geographical groups to ensure equitable distribution of funds.

State Street-Aid (Powell Bill Funds)

Annually, State Street-Aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. The general statutes require that a sum equal to ten and four-tenths percent (10.4%) of the net amount after refunds are disbursed to the qualifying municipalities. The statutes also provide that funds be disbursed to the qualified municipalities on or before October 1st and January 1st, thereby allowing sufficient time after the end of the fiscal year for verification of information and determining proper allocations and preparation of disbursements. Powell Bill funds can be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of any street or public thoroughfare within the municipal limits or for planning, construction, and maintenance of bikeways, greenways or sidewalks.

Municipal Bonds

A popular way for communities to finance bicycle and greenway projects is using municipal bonds. Several types of bond options are available such as revenue bonds, general obligation bonds, and special assessment bonds. As an example, in November of 2014, citizens of Hickory voted for \$40 million in bonds to help implement their Inspiring Spaces plan which was adopted by Hickory's City Council. The plan outlines the locations for new greenways, in addition to other roadway improvements throughout the city.

Bicycle and Pedestrian Recommendations

Bicycle Recommendations

In the summer of 2013, the Western Piedmont Council of Governments received funding from the North Carolina Department of Transportation to begin developing a regional bicycle plan for the MPO's planning area. The Western Piedmont Bicycle Plan's (WPBP) purpose is to improve bicycle transportation by providing a framework for the development of new facilities, programs, and policies that will support safe and efficient bicycling throughout the region. The development of the plan included an open, participatory process, with residents providing input through public events, stakeholder meetings, the WPBP Steering Committee, social media, and online surveys.

The WPBP identified a bicycle route network that consisted of 51 route segments. On-Road facility recommendations outlined in the plan apply only to Tier 1 routes. Table 7-9 breaks down facility recommendation for selected route segments. On-Road facility recommendations outlined in the plan are illustrated in Map 7-7.

| Table 7-9 | | | | |
|--|----------------------|--|--|--|
| Western Piedmont Bicycle Plan Bic | ycle Recommendations | | | |
| Facility Recommendation | Length (in Miles) | | | |
| 5-ft Paved Shoulder | 49 | | | |
| 4-ft Paved Shoulder | 70 | | | |
| Bicycle Lanes | 5 | | | |
| NCDOT Approved Bicycle Warning or Regulatory Signs | 7.2 | | | |
| No Recommendations | 3.5 | | | |
| Shared Lane (Sharrows) | 34.2 | | | |

Source: Western Piedmont Bicycle Plan

Pedestrian Recommendations

A pedestrian is anyone walking along a road or in a developed area. The GHMPO works with their 28 local governments to create desired conditions for their pedestrians. The most common pedestrian facility are sidewalks and if properly planned can increase pedestrian mobility, safety, and accessibility. Local government planning efforts have identified an estimation of around 1,350,000 linear feet of proposed sidewalk. Table 7-10 breaks down Alexander, Burke, Caldwell, and Catawba County's proposed sidewalk. Maps 7-8 to 7-11 show the locations of proposed sidewalk within the four counties.

| Table 7-10 Proposed Sidewalk by Counties | | | | |
|---|------------------------------|--|--|--|
| County | Estimated Distance (in Feet) | | | |
| Alexander | 103,400 | | | |
| Burke | 146,700 | | | |
| Caldwell | 84,300 | | | |
| Catawba | 1,012,400 | | | |

Source: Greater Hickory Metropolitan Planning Organization











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