



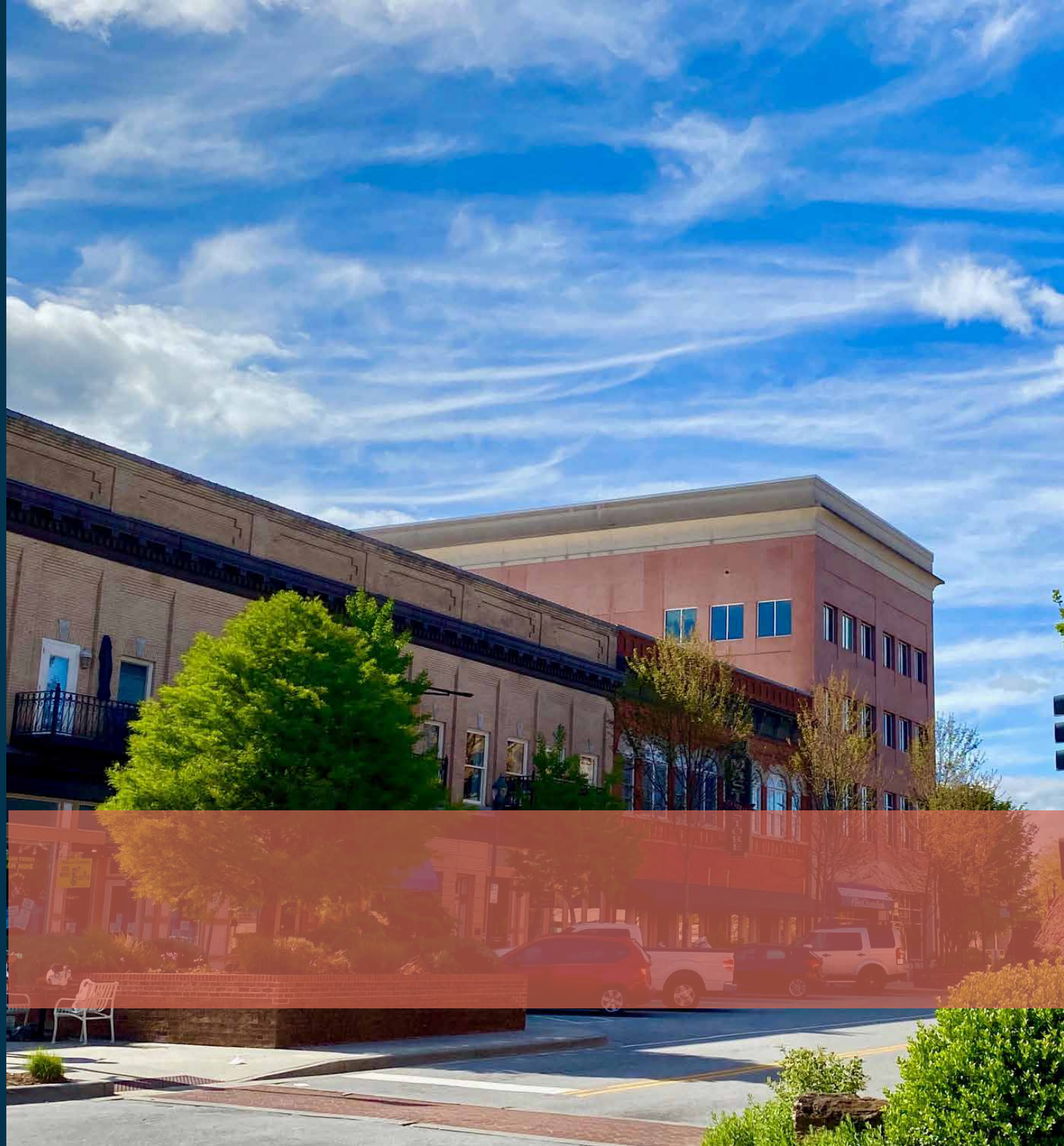
# Metropolitan Transportation Plan 2045

Our Path to the Future

**FRENCH BROAD RIVER LAND OF SKY**  
METROPOLITAN PLANNING ORGANIZATION

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# CHAPTER 1: INTRODUCTION

## INTRODUCTION

### WHAT IS AN MTP?

Benjamin Franklin said, "By failing to prepare, you are preparing to fail." This saying encapsulates the fundamental principles involved in long-range transportation planning.

A Metropolitan Planning Organization (MPO) is a federally-required transportation planning agency that provides a forum for coordination and collaboration between local governments, state agencies, federal transportation agencies, and the public, serving urbanized areas with populations over 50,000. Urbanized areas include census tracts and/or blocks that meet minimum population density requirements strongly linked to the urban core. MPOs with over 200,000 in population receive an additional designation as a Transportation Management Area (TMA), which carries additional planning requirements. With its expansion beyond the areas immediately around Asheville, the French Broad River MPO's population is enough to designated a TMA.

The French Broad River MPO has been serving the Asheville area since the 1960s and has grown with the urbanized area to include all of Henderson County, most of Buncombe and Haywood Counties, a large part of Madison County, and a small section of Transylvania County. The MPO works with member governments, public transit agencies, Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and the North Carolina Department of Transportation (NCDOT) to establish a setting for a continuous, coordinated, and collaborative regional transportation planning process.

The MPO is governed by its board, which is made up of elected officials from every member jurisdiction, appointed members from the Board of Transportation, representatives for rural and urban transit systems in the region, and non-voting members of FHWA and NCDOT. Advising the MPO Board is the Technical Coordinating Committee (TCC) which is made up of local government, NCDOT, and public transit staff. The MPO also maintains several subcommittees and working groups that advise the TCC and Board on specific matters, and engages the public as required by the MPO's Public Involvement Plan, to make sure members of the public can be heard on any matter going before the MPO Board.

The 2045 Metropolitan Transportation Plan (MTP) is the long-range transportation plan for the French Broad River MPO Planning area that focuses on the region's current and future transportation needs. As

part of the transportation planning process, MTPs are required to look to the region's future to help determine needs, establish priorities, and determine investments necessary to achieve the region's goals and objectives. The MTP is also required to be fiscally-constrained, meaning the plan is required to have reasonable financial assumptions about how much money is likely to be available for projects in the region and how those funds may be applied. The MTP is also required to have a financial plan.

The MTP serves as a comprehensive, long-range plan for transportation investments within the French Broad River MPO region through the planning horizon year of 2045. The 2045 MTP meets all federal requirements established by the USDOT and continues to advance the strategic, performance-based approach to planning and investment as outlined in the Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21) and Fixing America's Surface Transportation (FAST) Act national transportation goal areas.<sup>1</sup> The MTP is the region's blueprint for creating a network of road, bicycle and pedestrian, transit, and rail connections to better meet the needs of the growing region by prioritizing resources in one fiscally constrained, long-range plan. The region must update its long-range plan to prioritize transportation projects every five years, and the plan must find a balance between identified needs and projected transportation revenues. Planning efforts give communities the opportunity to make transportation investment decisions to further the local economy and development goals and facilitate safe and efficient movement of people and goods.

This planning effort was developed under the guidance of the MPO's Prioritization Subcommittee, which was made-up of the following local government staff and elected officials:

#### Steering Committee Member

Josh O'Conner (Chair)  
Elizabeth Teague (Vice-Chair)  
Autumn Radcliff  
Brian Burgess  
Jerry Vehaun  
Julie Mayfield  
Anthony Sutton  
John Dockendorf

#### Jurisdiction Represented

Buncombe County  
Town of Waynesville  
Henderson County  
Town of Mills River  
Town of Woodfin  
City of Asheville  
Town of Waynesville  
Village of Flat Rock

MPO staff would also like to thank the guidance and input provided by the numerous other local government staff, elected officials, NCDOT staff, and Citizens Advisory Committee members that participated. These include, but are not limited to:

### Contributing MPO Members

Steve Williams  
Troy Wilson  
Hannah Cook  
Stephen Sparks  
Daniel Sellers

Dan Baechtold  
Janna Peterson  
LeRoy Robertson  
George Webb

### Jurisdiction Represented

NCDOT Division 14  
NCDOT Division 14  
NCDOT Division 13  
NCDOT Division 13  
NCDOT Transportation Planning Division  
City of Asheville  
Henderson County  
Town of Waynesville  
Citizens Advisory Committee

### A Note on the Plan Development and the Current COVID-19 Crisis

The majority of this plan was developed prior to the COVID-19 crisis, which began in March, 2020. At the time of this writing it is unclear what will be the long-term impacts of the crisis. In the short-term, Vehicle Miles Traveled in the region have plummeted due to the shutdown of businesses and spread of the virus, resulting in a financial crisis for the North Carolina Department of Transportation (NCDOT) from decreased revenues that has caused delays and suspensions of numerous projects. Unemployment is increasing rapidly, likely hitting the Asheville Metro Area's economy especially hard. MPO staff continue to monitor the situation and its impact on the transportation network and transportation planning.

In terms of transportation, infrastructure, and the economy, it is still unknown whether this will be a short-lived crisis or a long-term paradigm shift. Streets are relatively empty of cars with most counties in the region reducing travel by up to 80% (note: every county is slowly increasing travel back towards pre-crisis baseline levels.) Some neighborhoods have seen an explosion of people walking and riding bicycles. Transit systems are having to take measures to make riders feel safe and comfortable. Thousands of still-employed workers, working remotely, may be finding that they prefer working from home to going into the office. These are dramatic shifts to individual habits that have changed our transportation system over the last two months, but it is unclear if those trends will remain post-crisis and when that will be.

In general, it is the MPO's responsibility to monitor trends and changes in the region and help determine priorities accordingly. We plan to continue to monitor how our region reacts during this crisis, how these changes impact transportation, and how we can better plan for our region's future while safely keeping our communities and the public engaged in the process.

Map 1.1: French Broad River MPO Planning Area

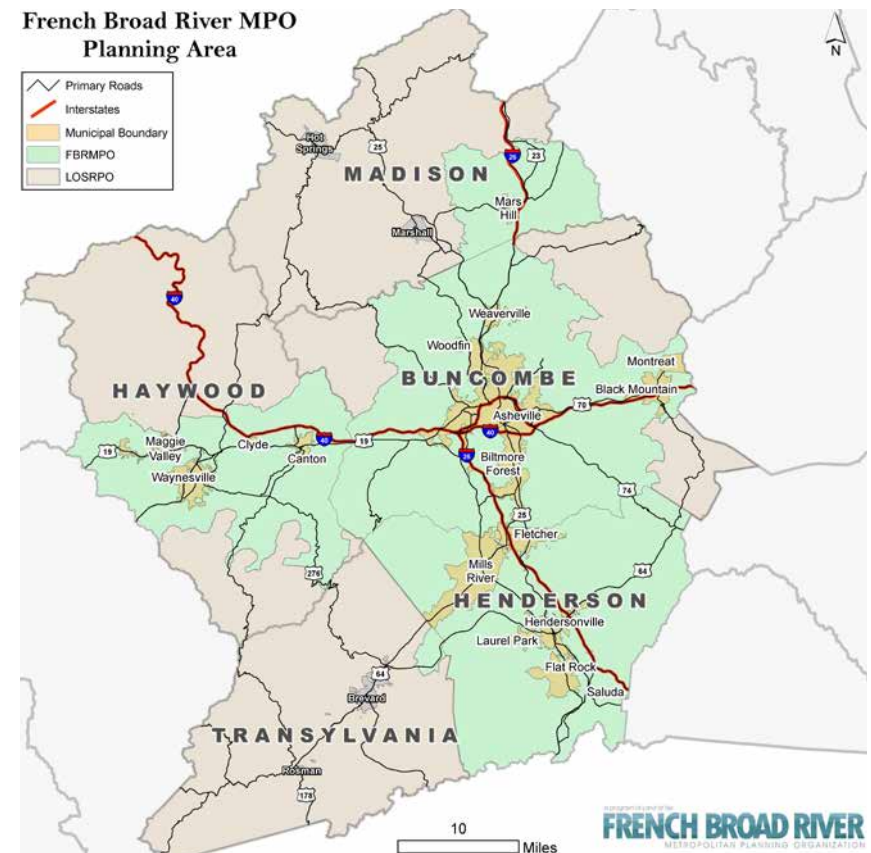
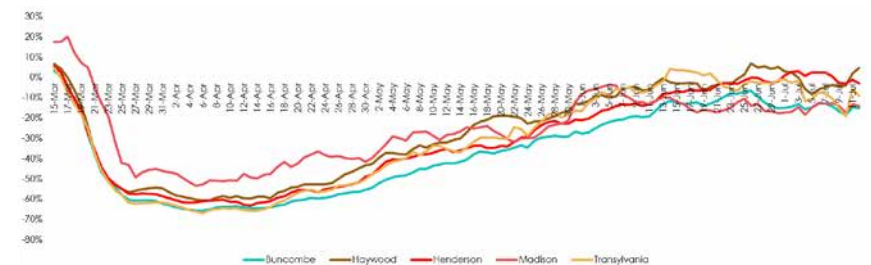


Figure 1.1: County Vehicle Miles Traveled vs. Baseline, Seven-Day Averages During COVID-19 Crisis







## CHAPTER 2: REGIONAL TRENDS

## REGIONAL TRENDS

### About Our Region

The French Broad River MPO Planning Area is centered around the Asheville Urbanized Area in Western North Carolina. The region can be loosely defined by its mountainous and scenic terrain, its growing population, and its influx of seniors and retirees, but there is so much more. The attributes that make our region unique also help to define some of the transportation challenges that are being, or are projected to be faced by transportation providers.

### DEMOGRAPHICS

In 2010, the French Broad River MPO Planning Area was made up of 396,841 residents in 167,943 households. The number of residents in the MPO Planning Area has defined it as a Transportation Management Area (TMA), a designation that gives the French Broad River MPO a broader set of responsibilities but also provides it with more resources and a larger role in the regional transportation network.

Since 2010, the region has experienced a considerable amount of growth, with the population estimated to increase to 423,111 in 2018—a growth of 26,270 residents in nine years. This growth has brought about a considerable amount of change to the region’s landscape and has impacted virtually every part of the region. Every jurisdiction with the MPO’s Planning Area has been estimated to have increased in population between 2010 and 2018, although with some areas growing more than others. The Town of Biltmore Forest in Buncombe County has only grown by an estimated 58 residents in that time period-

growth of 4% in eight years. However, Buncombe County has been estimated to have grown by an additional 20,785 residents (9% growth) while the Town of Fletcher has grown by 15% (1,108 new residents). This growth has been, at times, politically contentious, impactful to the transportation network, and unpopular in communities, but has started discussions on how to better plan for and accommodate changes to the region.

Table 2.2 shows the demographic breakdown of the 5-county region, including race and ethnicity. The table shows the 1990, 2000, 2010, and 2018 Census data, revealing that the FBRMPO region is predominantly white with slight variations in demographic composition over time. Currently there are more Hispanic or Latino individuals in the region than there have been in the last 30 years; however the percentage of white population has remained almost unchanged. This marks our region as one that lacks racial diversity, which makes intentional equity and inclusion even more important. The Environmental Justice (EJ) and Title VI section of this document delves further into implications of demographic data for marginalized communities.

One of the most predominant demographic trends in the French Broad River MPO Planning Area is the growth of its aging population. Every county in the MPO has a percentage of seniors well above the state and national averages. Seniors made up 25.8% of Henderson County's population in 2018, almost 10 percentage points higher than the national average (16.0%). While Buncombe County has the lowest percentage of seniors in the region (20.0%), that percentage still exceeds state and national averages and makes for the largest population of seniors in the region- an estimated 51,821 senior residents in the county.

The growth in the senior population is likely due to two phenomenon: (1) the country, as a whole, has an aging population; and (2) Western North Carolina has become an increasingly popular area for retirees. It should be noted that not only does every county in the region have a senior percentage higher than the country or state, but every county has seen that percentage increase over the last decade.

Having a larger senior population provides some distinct transportation challenges and opportunities. There are increasing discussions around the topic of “active aging” or “aging in-place” to try to build communities that accommodate and even promote healthy, active lifestyles that can keep individuals healthy and independent. For those having trouble

Table 2.1: Five Fastest Growing Jurisdictions

Five Fastest Growing Jurisdictions				
Jurisdiction	2010	2018	Change	Change %
Maggie Valley	1,027	1,220	193	19%
Montreat	722	836	114	16%
Fletcher	7,225	8,333	1,108	15%
Asheville	83,393	92,452	9,059	11%
Henderson County	106,887	117,417	10,530	10%



maintaining independence, that can mean more demand for public transit services for trips and a greater consideration of governmental services that provide assistance.

Similarly, individuals with a disability make up an estimated 13.1% of the five-county area's population, according to the 2014-2018 American Community Survey, also more than State (9.5%) and National (8.6%) averages.

The French Broad River MPO also has considerable pockets of poverty across the region. It should be noted that census data over the last several years shows low-income areas moving from urban centers into the urban fringes and more rural areas. Areas in Asheville and Hendersonville are becoming wealthier, which suggests either an influx of higher-income housing units, the displacement of lower-income residents, or both. In some areas outside of Asheville and Hendersonville, new low-income areas are cropping up in areas that were less populated before.

Other evidence from commuter data suggests that high housing prices may be causing workers to move to areas further outside the metropolitan boundary.

Figure 2.1: Persons 65 and Over, Percentage of Population

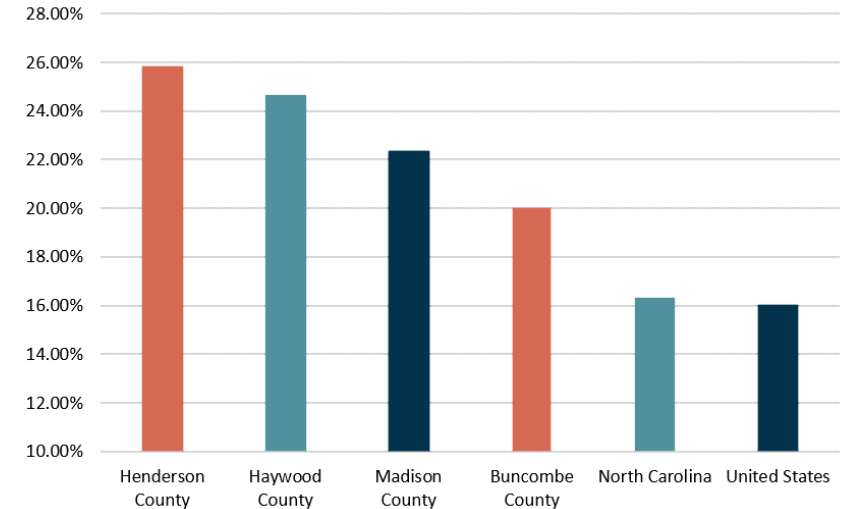
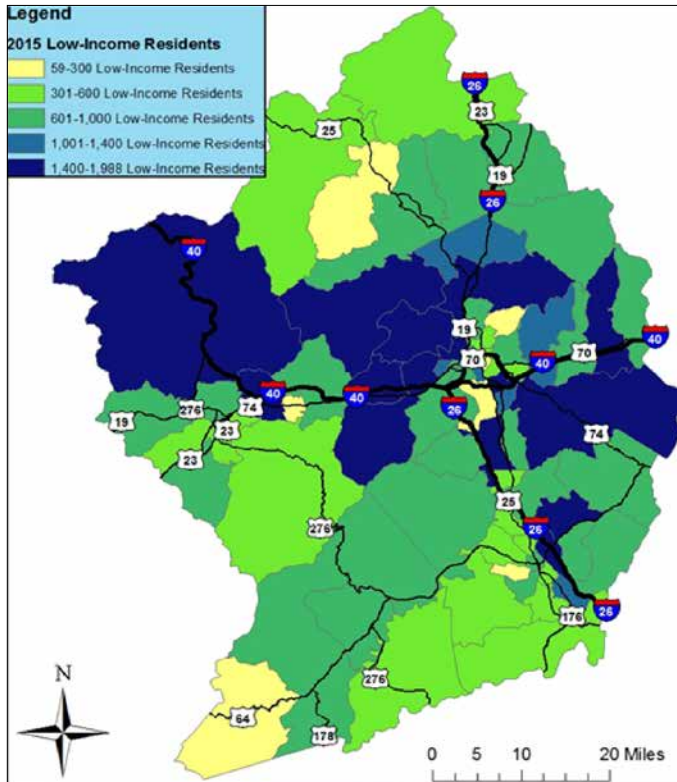


Table 2.1: Demographic Breakdown of the 5-County Region

5-County Demographic Breakdown								
	1990		2000		2010		2018	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>ALL</b>	333,251	100%	386,999	100%	396,840	100%	412,771	100%
<b>White</b>	312,013	93.6%	357,331	92.3%	352,363	88.8%	371,476	90%
<b>Black or African American</b>	18,670	5.6%	18,640	4.8%	19,185	4.8%	20,707	5%
<b>American Indian or Alaskan Native</b>	961	0.3%	1,313	0.3%	1,647	0.4%	1,488	0.4%
<b>Asian</b>	1,246	0.4%	1,811	0.5%	3,655	0.9%	4,898	1.2%
<b>Native Hawaiian or Other Pacific Islander</b>	45	0.0%	85	0%	481	0.1%	482	0.1%
<b>Some Other Race</b>	628	0.2%	4,644	1.2%	11,925	3.0%	5,672	1.4%
<b>Two or More Races</b>	--	--	3,175	0.8%	7,584	1.9%	7,940	1.9%
<b>Hispanic or Latino (of any race)</b>	2,499	1%	10,991	3%	26,430	6.7	31,863	7.7%

Map 2.1: Low-Income Populations by Census Tract 2015



### ECONOMY

The French Broad River MPO's economy is relatively unique in its makeup for a large urbanized area. The area's economy has been known for being heavily based on leisure and hospitality. There are also several sectors of the region's economy that are relatively larger than the state average. The region's economy is changing as the state of general work changes as well. Census and other data suggest that Asheville is becoming a significant hub for telecommuters- residents who do their work from home (or a café, remote working hub, etc.) for an employer in a different part of the state, country, or world. As Asheville continues to grow, the demand for more housing units with limited housing supply has increased housing prices significantly, likely playing a role in moving more workers further from urban centers.

Figure 2.2: Percentage Point Difference Between Asheville Metro vs. North Carolina Employment, by Sector

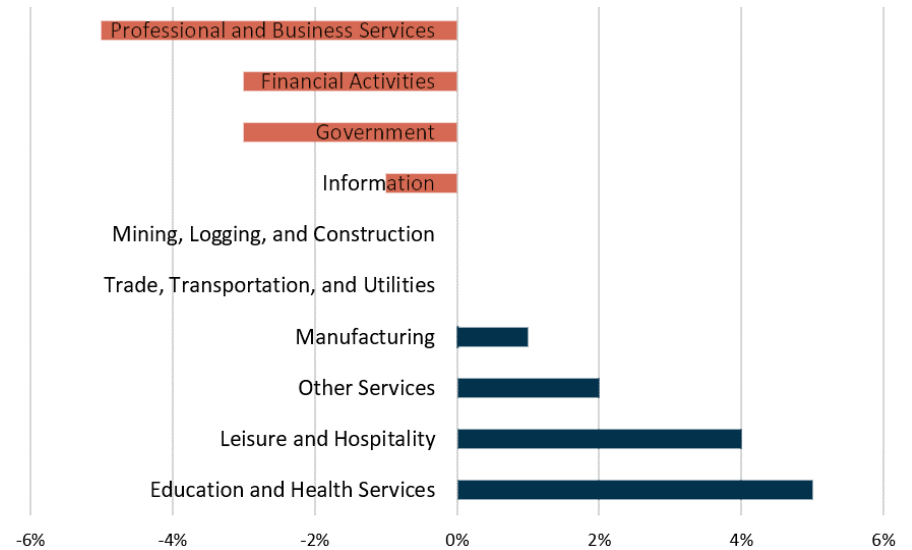
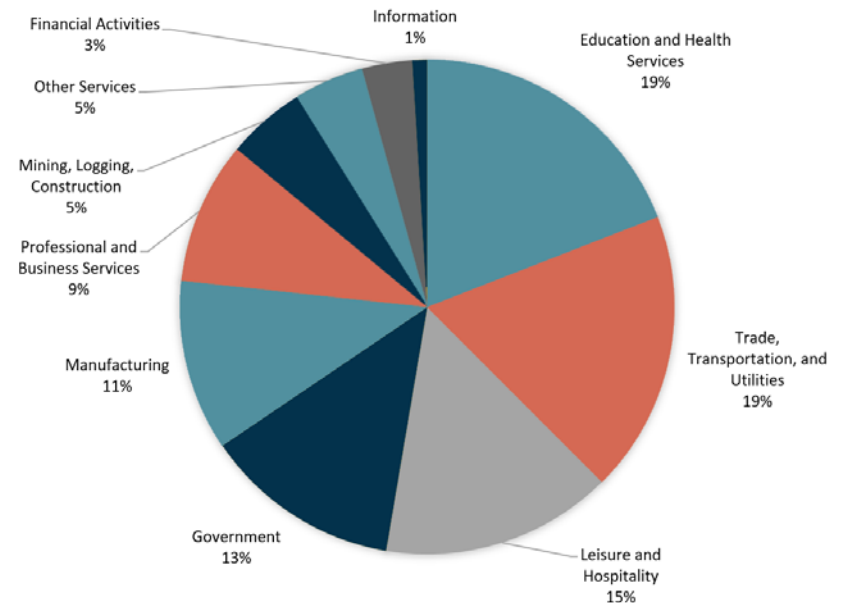


Figure 2.3: Asheville Area Non-Farm Employment, February 2020



## Regional Economy Overview

Historically, Asheville has been known as a resort town—a place for wealthy people in the east to escape hot summers, air pollution, and enjoy the outdoors. Many of Asheville's attractions to this day were built as part of some of the first waves of seasonal visitors- the Biltmore Estate, the Grove Park Inn, and the Grove Arcade. The impact from visitors has continued with hotel booms, the rise of Air BnB, the growth of outdoor recreation sectors, the establishment of new attractions, and a service industry that has been recognized across the country. While leisure and hospitality make up a larger portion of the region's employment, per US Bureau of Labor Statistics, it is not the only sector that exceeds state averages. Education and Health Services makeup 19% of the metro area's employment, five percentage points higher than the state average. Leisure and Hospitality, Manufacturing, and Other Services also make up a larger portion of the metro area's employment than the state average. On the other hand, the metro area has a lower percentage of jobs in Professional and Business Services, Financial Activities, Government, and Information than the state average—sectors that often provide higher-wage positions.

To note: this data was collected in February, 2020, before data reflecting the COVID-19 crisis. Preliminary data shows the Asheville metro area being especially hard hit in the jobs market and the Leisure and Hospitality sector taking the brunt of the early job losses. It is unknown at the time of writing how long this crisis is likely to go on for, how deep the job losses will be, and how each sector of the economy will be impacted.

## TELECOMMUTING

Another increasing economic phenomenon in the French Broad River MPO's planning area is the growth of telecommuting, or residents that live in the metro area but use the internet, email, telephone, etc. to work at a job in a different part of the state, country, or world. This is an increasingly important aspect of the region's economy to note as the data on employment by sector reflects data for employers based in the region, not employees. Data from the US Census suggests that a considerable amount of telecommuters exist in the Asheville metro area, up to 9.3% of area's workforce- the sixth highest percentage for any metropolitan area in the country. Currently there is little data to suggest what sectors the area's telecommuters are working in, but it remains an interesting and important shift in the region's economy.

The Asheville area, and the greater Appalachian region, has often been known for its low wages and poverty. Telecommuting allows residents to be employed in jobs located in metro areas that often have higher wages. While some of this data may reflect "cottage industry" workers, the vast majority is likely to be telecommuters with year-over-year increases since 2010.

The rise in telecommuting also points to changes in demands for the region's transportation network and economy. Telecommuters need quality internet service in order to do their jobs from home or other places they prefer to work, highlighting the pressing need for improved regional broadband access. Telecommuting is likely to decrease roadway demand, especially at peak-times, helping to reduce congestion. However, there is some evidence that telecommuters are more likely to need to fly to destinations more frequently, likely increasing demand at the Asheville Regional Airport and surrounding airports in Charlotte, Greenville, and Knoxville.

Table 2.3: Telecommuting in Metropolitan Areas

Telecommuting in Metropolitan Areas	
Metro Area	Percentage of Workforce "Working from Home"
Boulder, Colorado	12.3%
Bend-Redmond, Oregon	11.5%
Fort Collins, Colorado	10.3%
Santa Fe, New Mexico	9.8%
Kingston, New York	9.5%
<i>Asheville, North Carolina</i>	<i>9.3%</i>

### HOUSING PRICES & COMMUTING PATTERNS

The third major economic phenomenon impacting the Asheville region is the increase in housing prices, across all counties. In general, evidence suggests that supply has not kept up with the demand of a growing region, leading to significant increases in home and rental prices, across all price ranges. This change has caused residents to move due to their inability to afford the rising costs and appears to be pushing low-income residents further from urban centers and into the urban fringes. Areas such as Asheville and Hendersonville have traditionally been where low-income residents have been concentrated, but census data shows low-income residents moving to areas in Fairview, Leicester, and Fruitland in Buncombe and Henderson counties—areas where land and real estate prices are lower but also further from employment centers and often out of reach of some government services.

This shift in low and middle-income residents away from urban centers places more burden on transportation, both in terms of costs for the individual and increased Vehicle Miles Traveled required to access jobs and services. Some of these shifts appear to be relatively subtle—from one part of a county to another. While the shift in miles is lower, this movement can still have a major impact on the day-to-day lives of individuals. Many of the census block groups with an increasing low-income population tend to require ownership of a vehicle for all or most trips, whereas more centralized locations may have easier access to jobs and services by other means. In sum, individuals being forced out of their neighborhoods by increasing housing prices tend to move to areas where the transportation burden is greater.

Other shifts appear to be considerably greater in geographic size, suggesting that more workers in the metro area are moving outside of the metro area. Commuter data confirms this shift with an increase in commuters from Yancey, McDowell, Rutherford, and Jackson counties—areas with significantly lower real estate prices than the Asheville metro. Commutes from these counties are significantly longer and can only be done in a personal automobile as there is no transit or bike/ped infrastructure connecting those areas. In Yancey and Rutherford counties, where raw numbers of residents being employed in Buncombe County are not increasing as significantly, the share of overall county residents being employed in Buncombe is increasing (4.8% to 6.1% of Yancey County residents and 1.6% to 2.3% of Rutherford County residents), suggesting increasingly important economic ties between the a wider area than the defined metro.

Figure 2.4: Home Price Index

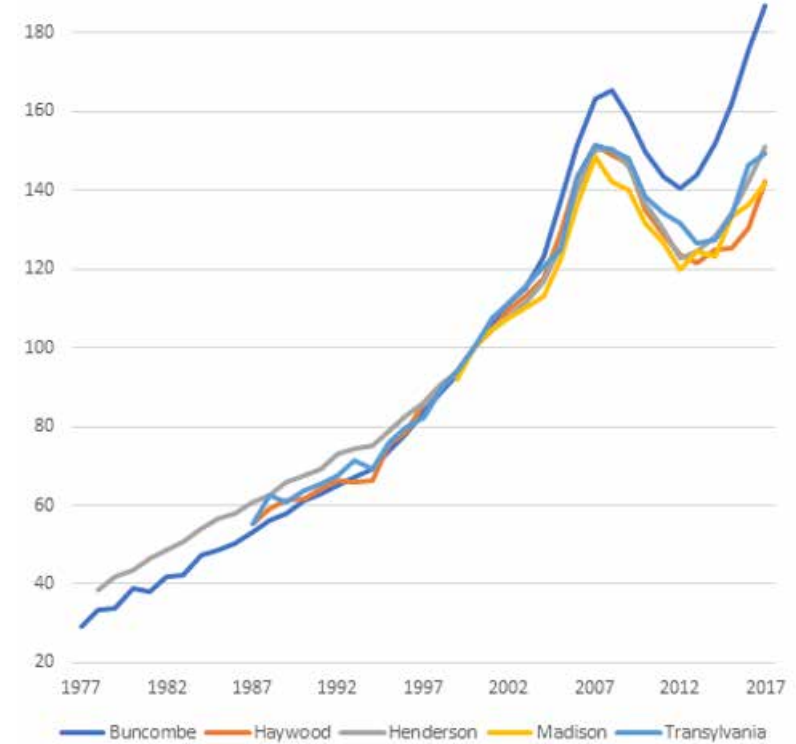
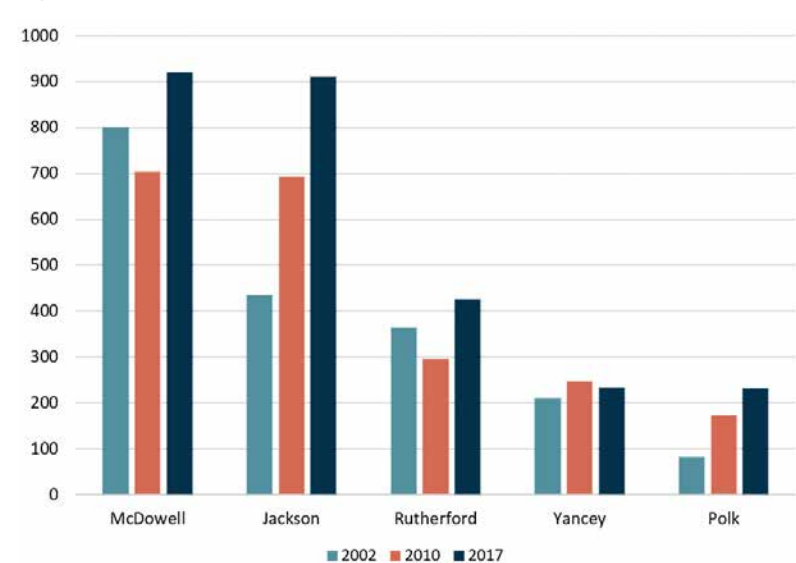


Figure 2.5: Residents Employed in Buncombe County, by County



It is also important to note that the housing market in Asheville will be affected by the COVID-19 crisis, though the manner and extent of those impacts are undetermined.

## TOPOGRAPHY

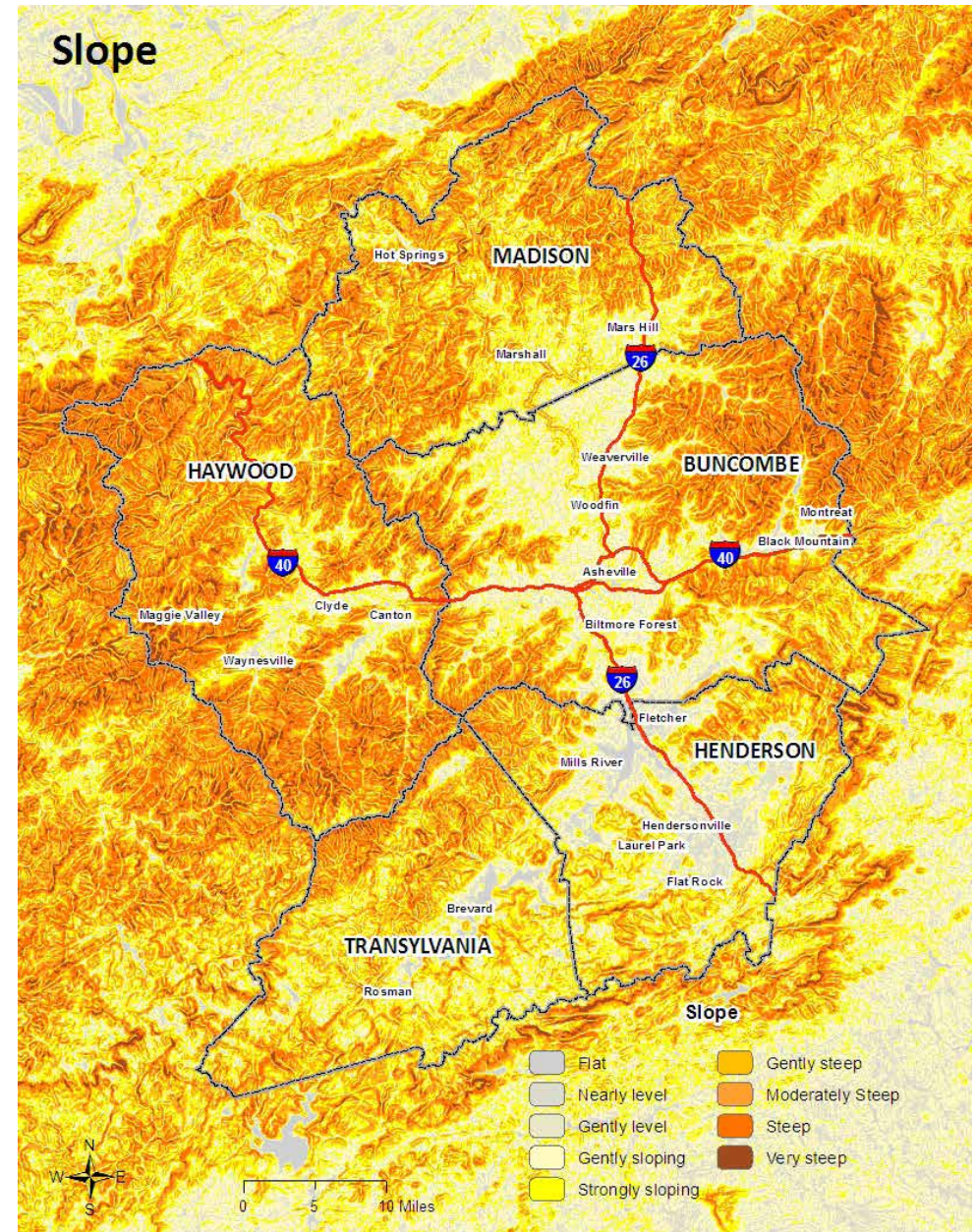
Western North Carolina's defining feature is its mountainous terrain. As part of the Southern Appalachian Mountain Range, some of the highest mountains east of the Rockies, including the tallest mountain in the Appalachian Mountain Range, Mount Mitchell, surround Asheville, Hendersonville, and Waynesville. The terrain has played a major role in dictating the terms of economic development and infrastructure.

While mountainous terrain creates challenges for development and infrastructure, this topography is the primary driver of much of the region's success. The region was first lauded for its natural beauty, clean air, and clean water—assets it still maintains. The mountains have drawn people in for over a century for their views, the abundance of flora and fauna, and the potential for adventure. The rivers of the region are known for their abundance of trout—a species that demands cold, clean water. The leisure and hospitality sector of the region, that is estimated to be accountable for 15% of the region's workforce, thrives because of these assets.

The region's population and employment centers align very closely with areas with fewer slope challenges. Development and infrastructure require buildable topography. Flat land with few constraints or environmental hazards is often hard to come by or difficult to access in the French Broad River MPO region. Thus, all of the major municipalities are based in the valleys around the mountains, even if the occasional mountain or two may sit in the middle of it.

The development of the regional transportation network has been largely constrained within these valleys as well, with only a few routes providing major connections through steeper terrain. One of the major challenges for the region's transportation network is its lack of connectivity. With a multitude of coves and cliffs, the region is pockmarked with roads that taper off where the terrain becomes too demanding. This causes the region's network to rely more heavily on the few routes that have been positioned in more favorable terrain. This terrain also results in construction and maintenance costs being considerably higher than in other parts of the state. Major roadway expansions or new location projects often demand the use of

Map 2.2: Slope



considerable earth-moving and dynamite. Some constraints are too great to be addressed through those methods.

For day-to-day operations, the slopes of the mountains also cause considerable difficulties for individuals, companies, and their vehicles. Residents who live on steep roads should expect brakes and other vehicle parts to be worn down more quickly. Many secondary roads are inaccessible to heavier vehicles and freight vehicles. Even interstate passes, especially from Old Fort, Saluda, and the Pigeon River Gorge are hazardous and challenging for trucks carrying heavier loads. More mundane challenges include increased congestion where slopes become greater. Sections of I-26 in southern Buncombe County or I-40 near the Buncombe/Haywood line can become regularly congested when slow-moving trucks struggling to deal with the incline become bottlenecks for peak-hour commuters.

Finally, the terrain causes major resiliency challenges (to be discussed further). As noted, the terrain has dictated a lack of connectivity in some places, demanding more of routes that provide connections. Some of these routes are prone to landslides, especially I-40 through the Pigeon River Gorge, and a number of crucial US, NC, and secondary routes regularly face similar challenges. Many routes are also prone to major flooding. The mountains, when faced with heavy rainfall, act as almost a funnel, accelerating stormwater into the valleys and sometimes quickly overwhelming streambeds and riverbeds, causing temporary closures and long-term issues with erosion.

The terrain of the French Broad River MPO is the reason many people are attracted to the area, to work and to visit, but this terrain comes with major challenges, especially to the transportation system.

## TRANSPORTATION DEMAND MANAGEMENT (TDM)

Transportation Demand Management (TDM) includes programs and strategies that promote the reduction and elimination of vehicular trips through a variety of methods. Some of these strategies include public transit, carpooling, vanpooling, active and multi-modal travel, teleworking, carshare and incentivizing businesses and individuals to undertake aspects of TDM. These methods, particularly when combined with one another, provide an effective way to make long-range trips more efficient.

In 2012, the French Broad River MPO and City of Asheville undertook a study to look at implementing a TDM plan for the region with a recommendation for a three to five year introductory period. This program has continued under the MPO and includes a TDM coordinator position. In order to incorporate TDM strategies such as telecommuting, commuter benefits programs, and car-pooling, collaboration between the public and private sector is important. The TDM coordinator has the opportunity to encourage businesses to develop commuting programs with their employees to reduce demand or peak-hour demand on congested roadways. As a result of the TDM study, a program called GO Mountain Commuting was developed to offer sustainable commute solutions for the region by promoting van/car pools, transit and active transportation modes. Major employers may be more likely to participate in vanpooling or flexible work hours, in order to improve employee satisfaction, while simultaneously reducing peak-time travel demand. Implementing strategies such as this do not require a high-capital investment from either the public or private side. Another TDM program, Strive Not to Drive, focuses on the month of May each year to encourage those in the region to "think beyond the car". The month includes a range of events, such as walk audits and walk to school events in order to encourage collaboration between stakeholders in the region. The intention of having these programs throughout May is to carry the momentum through the year and establish partnerships that reduces single-occupancy vehicle (SOV) trips. Between GO Mountain Commuting and STRIVE, the TDM program promotes creative solutions to managing congestion in the region with the intention of providing a more sustainable commute for all.



## GROWTH PROJECTIONS

As the previous sections indicate, the French Broad River MPO Planning Area is and has been growing for some time. As part of the 25-year planning process for the MTP, the MPO is required to make socioeconomic projections for the region. These projections play an important part in developing the region's travel demand model. The amount of population and employment growth projected and where that growth is likely to occur plays an important role in projecting future issues on the roadway network.

### The Importance of Growth Projections

Growth and socioeconomic projections play a major role in the development of the region's travel demand model. The travel demand model, in turn, plays a major role in the planning process for determining areas that may need improvement and in traffic forecasting to determine how much capacity may be needed to sufficiently handle traffic on any given roadway. Growth projections also give the region an opportunity to discuss how things are changing at a regional rather than a local level.

Travel Demand Models are based on decades of traffic engineering research to try to determine general travel patterns and behaviors. A travel demand model determines how people will travel, how many trips people will take, where jobs and people will be distributed, and what routes will be taken in order to predict the way that changes in residential, commercial, and industrial development will affect a region's transportation network so that plans can proactively address potential challenges. By analyzing household size, automobile ownership, development type and density, congestion, road conditions, transit capacity and schedules, and the distribution of destinations, among other factors, the travel demand model considers extensive variables that affect future roadway volumes and travel forecasts.

Growth and development has also been a sensitive and politically contentious topic throughout the region. As one of the fastest growing regions in the fastest growing state in the country, more and more communities have met resistance when new developments have been proposed. During this MTP planning process, there have been clear instances of community resistance: the City of Asheville declared a moratorium on new hotels; a housing development in south

Buncombe County was repeatedly scaled down to meet neighborhood concerns; and a proposed housing development in Henderson County repeatedly drew crowds of concerned residents. Often, concerns regarding the impact of these developments focus on the effects on the transportation system from increased traffic. However, heavy traffic is becoming an increasingly regional phenomenon. The impacts of developments extend well beyond their immediate context. While local governments maintain the ability to regulate land uses, coordination of growth in the region is an effective way to understand how growth affects our infrastructure.

### The Process for Growth Projections

MPO staff began internally updating the region's land use, employment, and population data in 2015. This process developed "base year" data for the region that reflected where people were living, where jobs were placed, and different types of general land uses. This process also included meetings with local governments to get information on developments that were only at the permitting process. It should also be noted these projections went beyond the MPO Planning Area to include the five-county area that makes up the French Broad River MPO and the Land of Sky RPO.

The MPO then hired a consultant for its "Land Use Study" in 2017. The consultant was primarily tasked with developing population and employment projections for the region and determining where that growth was most likely to occur. These projections also included additional socioeconomic data including individuals/household, household incomes, and types of jobs being developed.

Socioeconomic projections are distributed among Traffic Analysis Zones (TAZs), small geographic blocks that divide the region for purposes of the region's travel demand model. These TAZs are loosely based on census block groups, but do not line-up with block group boundaries in many places. Each TAZ generally attempts to cover an area with similar transportation characteristics, but it should be noted that some TAZs include large swaths of state or nationally protected lands. This means that while some TAZs may be quite large in geographic size, their capacity for population and employment growth may be limited to smaller portions of the TAZ.

The consultant developed three projections for the region, using the same general population and employment growth projections for each scenario, but differing in the distribution of growth. Each of these scenarios were loosely based on the following:

**Business as Usual** - generally developed to determine how the region would be developed over 25 years if it continued with current growth policies with no major changes in market trends.

**Efficient Growth** - developed as part of the GroWNC initiative in 2010 that emphasizes growth in areas with existing water and sewer infrastructure with increased densities in more urbanized areas

**WalkUP Scenario** - based on an analysis from the MPO's Congestion Management Process that emphasizes more growth in areas determined to have residents more likely to walk, bike, or take transit for trips

These scenarios were all vetted by the MPO's Prioritization Subcommittee, which served as the steering committee for the study and includes staff, representation from the TCC, and elected official representation from Board Members across the region.



## The Results

The Land Use Study projects that the five-county region will grow by an additional 189,173 residents in 78,842 new households over the next 25 years—a rate of growth that slightly exceeds what has been experienced in the past few decades of growth. To put that number in perspective, that is roughly the the size of an additional Henderson, Haywood, and Madison county to the region. The study also projects that the region will consist of wealthier residents and a shift in employment towards more service and retail jobs.

In terms of scenarios, the MPO Board selected the WalkUP Scenario to be the Preferred Growth Scenario for the region. This scenario concentrated more growth in more urbanized areas than the other scenarios and less growth in rural and suburban areas. Overall, the scenario puts the fastest rates of growth in Asheville, Woodfin,

Hendersonville, and Waynesville, and considerably more growth in Buncombe, Haywood, and Henderson counties than Madison and Transylvania counties. The projections did not show any jurisdictions declining in population but did have considerably lower rates of growth in Montreat, Laurel Park, and Hot Springs.

This growth scenario is projected to help reduce the overall vehicle miles traveled (VMT) of the region and increase the utilization of public transit and trips made by walking and biking. However, the increased concentration of development in more urbanized areas is likely to shift congestion hotspots to some shorter, more urban arterials as well as freeways, and away from the longer, more suburban corridors. In other words, the scenario envisions a region with more people living more closely to jobs and services, but inter-regional travel as increasingly important for access to jobs and other trip purposes.

Table 2.4: Household Population

Household Population					
County/City	Year 2015 Base	2045 Preferred Growth Scenario	County/City	Year 2015 Base	2045 Preferred Growth Scenario
<b>BUNCOMBE</b>	<b>247,277</b>	<b>352,887</b>	<b>HAYWOOD</b>	<b>59,812</b>	<b>84,917</b>
Asheville	85,127	141,264	Canton	4,070	5,718
Biltmore Forest	1,511	2,286	Clyde	1,250	1,838
Black Mountain	8,031	10,438	Maggie Valley	1,194	1,540
Montreat	787	975	Waynesville	9,364	15,481
Weaverville	3,544	4,560	Other Haywood	43,933	60,340
Woodfin	4,824	7,318	<b>MADISON</b>	<b>19,754</b>	<b>26,146</b>
Other Buncombe	143,454	186,046	Hot Springs	547	689
<b>HENDERSON</b>	<b>110,993</b>	<b>153,454</b>	Mars Hill	1,187	1,730
Flat Rock	3,280	4,414	Marshall	802	1,466
Fletcher	7,000	9,794	Other Madison	17,218	22,260
Hendersonville	13,202	22,162	<b>TRANSYLVANIA</b>	<b>32,676</b>	<b>42,282</b>
Laurel Park	2,200	3,116	Brevard	7,250	10,581
Mills River	7,152	9,188	Rosman	494	848
Other Henderson	78,159	104,780	Other Transylvania	24,933	30,853
			<b>Grand Total</b>	<b>470,513</b>	<b>659,686</b>



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## CHAPTER 3: **PLANNING FOR MOBILITY**

## PLANNING FOR MOBILITY

The French Broad River MPO is changing and is expected to continue to change with new developments to help accommodate more residents, visitors, and jobs. This section outlines the federal planning factors in order to help prepare for these changes and give a general overview of present and future challenges while also providing recommendations for what the MPO and its partners could undertake to better plan for identified challenges and address needs.

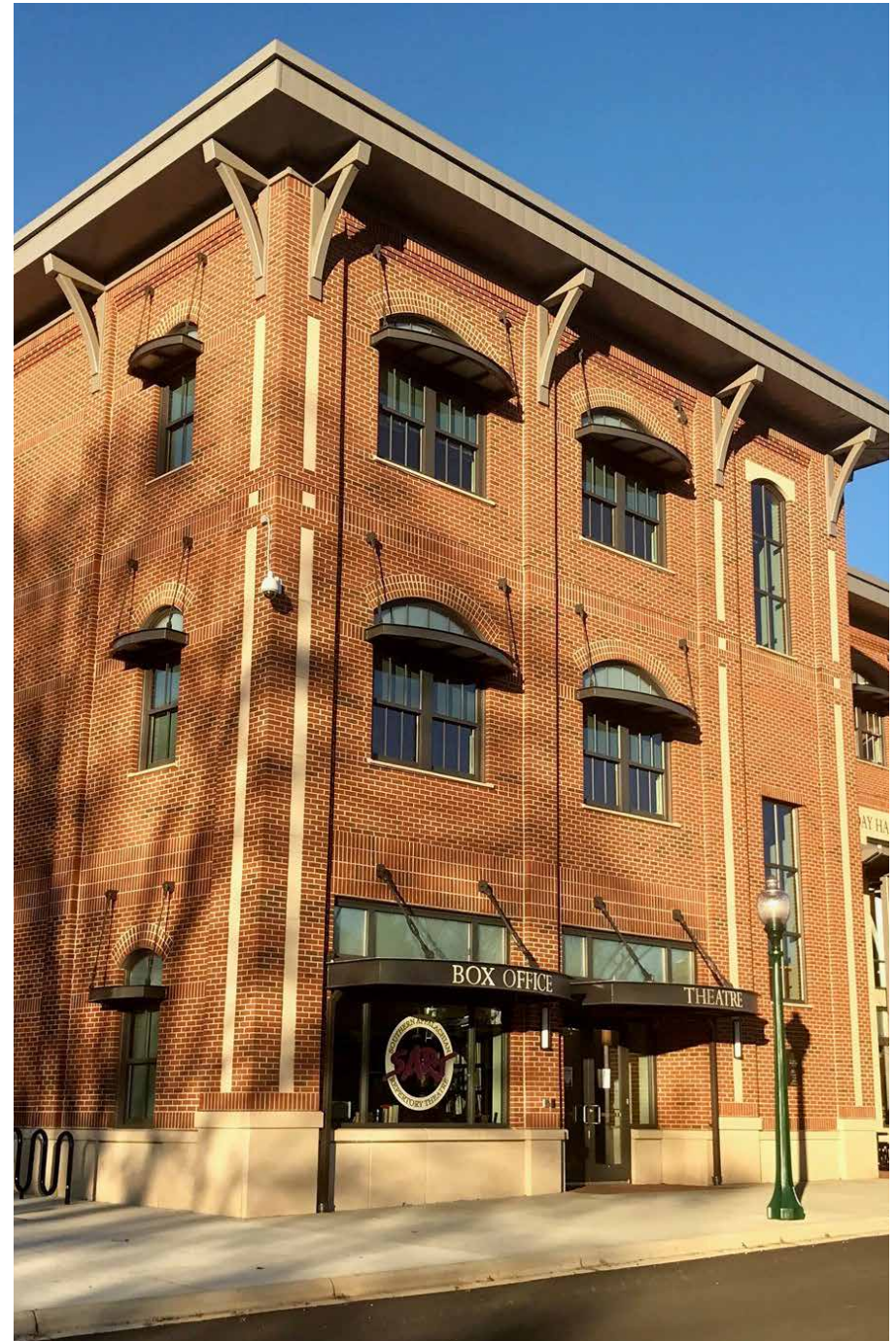
### GOALS AND OBJECTIVES

Goals and objectives give high-level structure to the MTP and communicates the primary areas of concern that are expected to be addressed through the planning process. The MTP 2045's goals focus on moving people and goods around the region while also supporting initiatives tied to livability and sustainability in areas where appropriate.

The MTP process must address the following planning factors outlined in the FAST Act:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety of the transportation system for motorized and non-motorized users;
3. Increase the security of the transportation system for motorized and non-motorized users;
4. Increase accessibility and mobility of people and freight;
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation movements and State and local planned growth and economic development patterns;
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
7. Promote efficient system management and operation;
8. Emphasize the preservation of the existing transportation system
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
10. Enhance travel and tourism.<sup>2</sup>

The MTP Goals and Objectives outlined in this section largely overlap with the required planning factors and are discussed more in-depth later in this section



# GOALS & OBJECTIVES

## 1: Improve Multimodal Transportation

- Improve Bicycle and Pedestrian Safety
- Increase Utilization of Public Transportation
- Increase Utilization of Other Modes
- Improve Multimodal Network Connectivity

## 2: Improve Safety

- Improve the Safety of Travelers and Residents
- Improve System Resilience to Incidents

## 3: Address Congestion and Bottlenecks

- Improve Travel-Time Reliability
- Improve Transit On-Time Performance

## 4: Improve Public Transit Options

- Improve Transit On-Time Performance
- Increase the Percentage of Population with Access to Public Transit
- Increase the Percentage of the Transportation Disadvantaged Population with Access to Public Transit

## 5: Ensure Changes Protect Our Unique Places and Environments

- Mitigate and Reduce Impacts to the Environment
- Minimize Impacts to Culturally and Environmentally Important Resources
- Reduce Overall Impacts to Communities
- Enhance Link between Transportation and Land Use Planning

## 6: Maintain and Improve Safe Freight Movement Within and Throughout the Region

- Reduce Crashes Involving Freight Vehicles
- Improve Freight Travel Time Reliability
- Increase Overnight and Rest Area Truck Parking

## 7: Maintain the Region's Infrastructure in Good Working Condition

- Increase the Number of Roadway Miles in Good Condition
- Improve the Transit Capital State of Good Repair
- Improve Bridge Safety

## 8: Develop a More Equitable Transportation System

- Increase Participation of Historically Underrepresented Groups in the Planning Process
- Decrease Adverse Impacts to Historically Underrepresented Groups

# 1

## IMPROVE MULTIMODAL TRANSPORTATION

*Expand the network of multimodal facilities to allow for safe, convenient, and attractive means of travel by bicycle, walking, or other non-motorized options.*

### **Objective 1A: Improve Bicycle and Pedestrian Safety**

- Increase the **Miles of Bicycle Infrastructure** to make bicycling a safer, more attractive way of making trips
- Increase the **Miles of Sidewalks** to make walking a safer, more attractive way of making trips
- Increase the **Miles of Multi-Use Paths** to provide a safe, attractive way for pedestrian and bicyclists to get around

### **Objective 1B: Increase Utilization of Other Modes**

- Increase the **Number of Trips Made by Transit, Biking, and Walking** through

### **Objective 1C: Increase Utilization of Public Transportation**

- Increase the number of **Fixed Route Passenger Trips**
- Increase the number of **Deviated Fixed Route Passenger Trips**
- Increase the number of **Demand Response Passenger Trips**

### **Objective 1D: Improve Multimodal Network Connectivity**

- Improve **First/Last Mile Connections for Transit Users**
- Provide More **Transit Connections to Park and Ride Lots**
- Improve **Connectivity of Pedestrian and Bicycle Infrastructure**

## COMPLETE STREETS

Complete Streets is a policy adopted by the French Broad River MPO, NCDOT, the City of Asheville, and the Town of Black Mountain that requires infrastructure components for all modes be considered for roadway projects and resurfacing. Such policies have helped to promote the inclusion of critical improvements to address the safety of pedestrians and bicyclists on our region's roads.



## VISION ZERO

Vision Zero is a policy adopted by the NCDOT Board of Transportation and hundreds of agencies around the world that aims to achieve a transportation system with no fatalities or serious injuries involving traffic. One of the guiding principles of Vision Zero is that roadway users are not solely responsible for their well-being but roadway planners and designers bear a responsibility to ensuring and promoting safety.



*Provide a transportation network that allows all users to get to their destination without harm.*

### **Objective 2A: Improve the Safety of Travelers and Residents**

- Reduce the **Number of Crashes**
- Reduce the **Number of Fatal Crashes**
- Reduce the **Crash Rate**
- Reduce the **Crash Severity Rate**
- Reduce the **Number of Non-Motorized Crashes and Fatalities**

### **Objective 2B: Improve System Resilience to Incidents**

- Reduce the **Crash Clearance Times on Major Roadways**
- Improve the **Transportation Network Resiliency to Major Incidents**

# 3

## ADDRESS CONGESTION AND BOTTLENECKS

Limit recurring congestion to appropriate parts of the transportation network to ensure reliable travel within and through the region and reduce impacts of non-recurring congestion events.

### Objective 3A: Improve Travel-Time Reliability

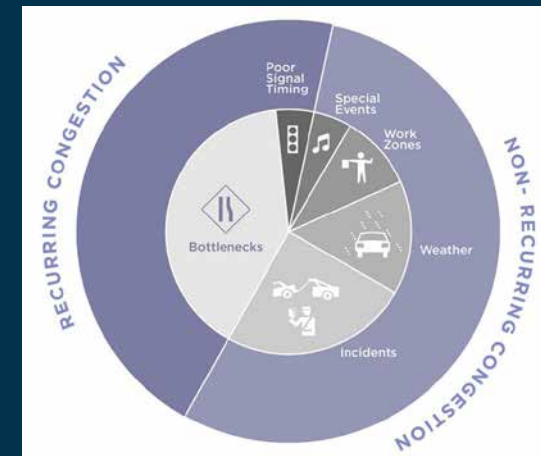
- Improve **Travel Time Reliability** for all vehicles on the region's major roadway facilities
- Improve **Truck Travel Time Reliability** on the region's major freight corridors

### Objective 3B/4A: Improve Transit On-Time Performance

- Improve **Average Percentage of On-Time Performance for Fixed-Route Transit Providers**

## RECURRING VS. NON-RECURRING CONGESTION

Not all congestion comes from rush-hour, in fact some studies have shown that 55% of congestion events are due to things like traffic incidents, work zones, weather, or other causes considered "non-recurring." Recurring congestion-causing an estimated 45% of congestion events- is when repeated peaks in volumes on roadways with insufficient capacities causes slowdowns and congestion.





## TRANSIT PROVIDERS IN WNC

Public transportation in our region is provided by several different agencies. The City of Asheville and Henderson County provide fixed-route service, and Buncombe County provides deviated-fixed-route service. All five counties provide demand-response transit services.



*Improve public transit to be a more responsive, attractive, and well-used mode in the region's transportation system.*

### Objective 3B/4A: Improve Transit On-Time Performance

- Improve Average Percentage of On-Time Performance for Fixed-Route Transit Providers

### Objective 4B: Increase the Percentage of Population with Access to Public Transit

- Increase the Percentage of Population Living Within ½ Mile of Fixed-Route or Deviated Fixed-Route Transit

### Objective 4C: Increase the Percentage of the Transportation Disadvantaged Population with Access to Public Transit

- Increase the Percentage of the Transportation Disadvantaged Population Living Within ½ Mile of Fixed-Route or Deviated Fixed-Route Transit

*Consider the context of areas where changes to the transportation network are proposed to preserve- and potentially enhance- the assets that make our region unique.*

#### **Objective 5A: Mitigate and Reduce Impacts to the Environment**

- **Decrease Vehicular Miles Traveled per Capita**

#### **Objective 5B: Minimize Impacts to Culturally and Environmentally Important Resources**

- Encourage design efforts to mitigate environmental impacts on **Highway Projects Intersecting Critical Ecological Corridors**
- Encourage design efforts to mitigate impacts on **Highway Projects Intersecting Areas with Culturally-Significant Resources**

#### **Objective 5C: Reduce Overall Impacts to Communities**

- Reduce **Mobile Source Emissions**
- Reduce **Noise Impacts on Residential Neighborhoods**

#### **Objective 5D: Enhance the Link Between Transportation and Land Use Planning**

- Increase **Collaborative Efforts Between Transportation and Land Use Planning Processes**

### THE LARGEST HISTORIC DISTRICT IN THE STATE

The Flat Rock Historic District makes up approximately 4,000 acres of property in and around the Village of Flat Rock, encompassing many historic residences and structures, as well as the Carl Sandburg Home National Historic Site. The Flat Rock Historic District is currently the largest historic district in the State of North Carolina.



## TRUCK PARKING SHORTAGE

"Jason's Law" was passed into federal legislation in 2012 that requires transportation agencies to plan for sufficient and safe parking for truck drivers. Recent studies have shown a shortage of truck parking in Western North Carolina, often resulting in trucks parking illegally on shoulders or in parking lots that may ticket illegally parked vehicles.



*Maintain and enhance the ability for goods to move within and through the region to ensure economic competitiveness and economic connections to areas outside the region.*

### **Objective 6A: Reduce Crashes Involving Freight Vehicles**

- Decrease the **Number of Crashes Involving Trucks**
- Decrease the **Number of Crashes Involving Freight Trains**
- Decrease the **Truck Crash Rate**

### **Objective 6B: Improve Freight Travel Time Reliability**

- Improve **Truck Travel Time Reliability** on roadways carrying a significant amount of freight

### **Objective 6C: Increase Overnight and Rest Area Truck Parking**

- Increase the **Number of Designated Truck Parking Spaces in the MPO Planning Area**

*Ensure that the region's infrastructure is maintained to continue providing the safe movement of people and goods.*

**Objective 7A: Increase the Number of Roadway Miles in Good Condition**

- Increase the **Percent of Interstate Miles in Good Condition**
- Increase the **Percent of Non-Interstate Miles in Good Condition**

**Objective 7B: Improve the Transit Capital State of Good Repair**

- Decrease the **Percent of Transit Vehicles that are Considered Beyond their Useful Life**

**Objective 7C: Improve Bridge Safety**

- Decrease the **Number of Bridges Considered Structurally Deficient**

## STRUCTURALLY DEFICIENT BRIDGES

As of 2017, North Carolina had more than 18,000 bridges maintained by various agencies and departments. Of those 18,183 bridges, 1,854, or 10.2%, were considered "structurally deficient" or in need of repair. This includes 174 structurally-deficient bridges on the National Highway System.



## ADA SERVICES

Every county in the FBRMPO planning area contains a higher percentage of seniors than state and national averages. This facet of our demography increases the demand for accessible transit services. All ART buses are ADA-accessible, provide priority seating, and allow service animals.



*Ensure that all people receive comparable benefits from, and are not disproportionately burdened by, MPO investments, regardless of race, color, nation origin, age, income, ability, or sex.*

### **Objective 8A: Increase Participation of Historically Underrepresented Groups in the Planning Process**

- Increase **Outreach Efforts to Historically Underrepresented Groups in the MPO Planning Area**

### **Objective 8B: Decrease Adverse Impacts to Historically Underrepresented Groups**

- Decrease **Disproportionate Impacts to Low-Income and Minority Communities from** Transportation Improvement Projects
- Improve **Low-Income Communities' Access to Employment Centers**
- Improve **Considerations for Individuals with Disabilities** into Planning and Design efforts

## SAFETY & SECURITY

The safe movement of people and goods in and through a region is a fundamental priority of the metropolitan planning process. In 2005, safety and security became fully integrated as an MPO planning factor requirement under SAFETEA-LU law. The FAST Act requires MPOs to address safety and security by considering projects and strategies that:

- Increase the safety of the transportation system for motorized and nonmotorized users
- Increase the security of the transportation system for motorized and nonmotorized users

In 2018, the five-county area had 17,170 recorded crashes which resulted in 67 roadway fatalities. Since 2010, the number of crashes and fatalities in the region have been trending upwards with more crashes correlating with an increase in vehicle miles traveled over that same time period. This also includes an increase in crashes involving vulnerable user groups- pedestrians, bicyclists, and motorcyclists. While many crashes involve driver behavior (distracted driving, substance-involvement), there is more the MPO and its partners can do to improve safety on the roadway to reduce crashes and roadway fatalities.

In North Carolina, transportation projects with a safety concern can be funded through several different funding programs. The largest funding opportunity is the data-driven Strategic Transportation Investments (STI) process, which evaluates safety components as part of the quantitative criteria used for selecting projects. The STI process funds the majority of roadway projects in the state, using measures of crash severity, frequency, and rate as well as measuring the general efficacy of proposed countermeasures.

Unlike traffic volumes and congestion, which can be projected by the MPO's Travel Demand Model there is not a standard method to model future safety concerns. Regional and state crash data and engineering research help guide project design, decision-making, and prioritization. That makes it important to include context sensitive design solutions for projects that consider the safety of all users. It remains important for NCDOT and the French Broad River MPO to proactively educate users about their responsibilities and safety hazards when driving, walking, bicycling, or using public transit around the region.

## Roadway Characteristics

Numerous factors can play a role in crash rate and severity trends, but roadway characteristics can play a major role. Roadways that encourage higher speeds with numerous conflict points are more likely to have more crashes- and more severe crashes. NCDOT and other public agencies regularly intervene when it becomes apparent that roadway characteristics are contributing to crashes. Sometimes these interventions are to increase driver awareness through better signage or the addition of rumble strips, other times it requires more costly interventions to add guardrail, turn lanes, or a redesign of significant parts of the roadway.

The data from the Highway Safety Improvement Program (HSIP) helps to provide a continuous and systematic process to review and address specific safety concerns along roadway corridors and intersections.<sup>3</sup> Once a roadway segment has been analyzed for five years, has a minimum number of crashes, and meets a crashes per mile threshold, it is warranted as a HSIP location. Those projects are divided into intersections and sections (roadway segments) and are scored accordingly.

Map 3.1: HSIP Safety Sections

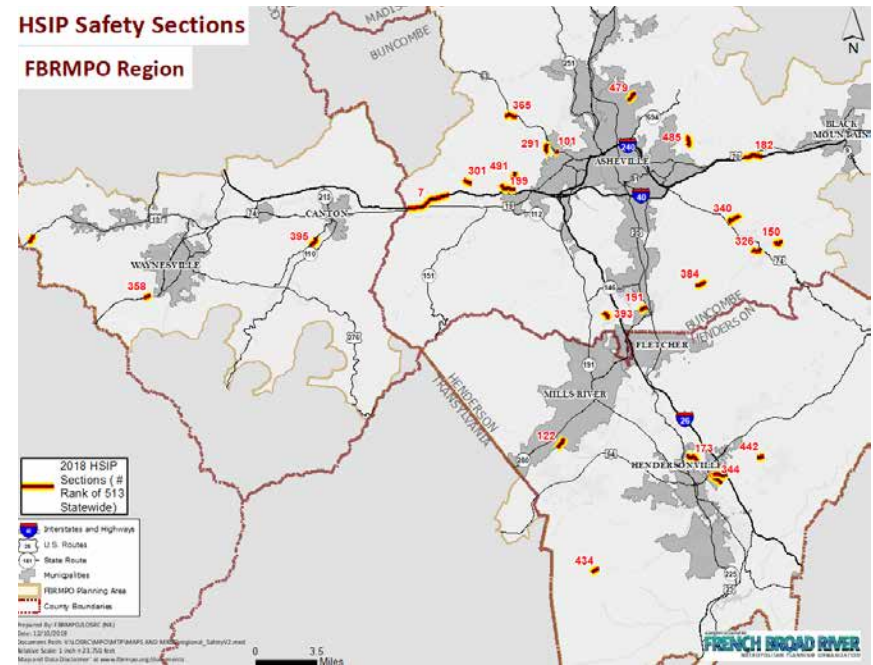


Table 3.1: Top 10 HSIP Safety Sections in the Region

Municipality	Section/Road	Rank – Statewide (Out of 513)	2013-2017 Fatal and Severe Crashes
Buncombe County	I-40 near Wiggins Road Exit	7	3
Asheville	NC 63 (New Leicester Hwy) at Old County Home Rd.	101	2
Mills River	Turnpike Rd near Brannon Rd	122	1
Buncombe County	Garren Creek Rd. near Whitaker Rd	150	0
Henderson County	Berkeley Rd. near Clear Creek Rd.	174	1
Buncombe County	I-40 near Patton Cove Rd Exit	182	0
Buncombe County/City of Asheville	Glenn Bridge Rd.	191	2
Buncombe County	Monte Vista Rd.	199	1
Buncombe County	Johnston School Rd	291	0
Haywood County	US 19/Soco Rd.	301	1

There are a total of 513 HSIP sections in the state, with 25 of those sections falling within the French Broad River MPO planning area. Only the I-40 section in western Buncombe County falls within the top 100 sections in the state. This section of I-40 is currently being considered for funding in the prioritization process for adding additional capacity. Table 3.1 summarizes the top 10 HSIP Safety Sections in the region.

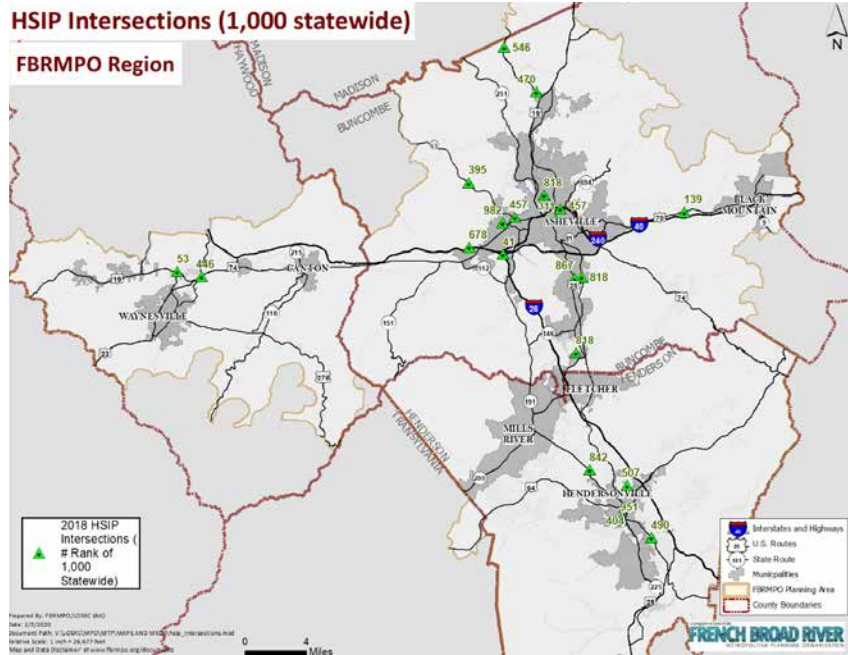
The French Broad River MPO has a total of twenty (20) intersections that fall within the top 1,000 statewide HSIP intersections. A number of factors determine top HSIP intersections, including the number of fatal and severe, frontal, nighttime crashes, and recent increases in crash

Table 3.2: Crashes At or Near the Top 10 HSIP Intersections

Municipality	Intersection/Road	Intersection Rank – Statewide (Out of 1,000)	2011-2015 Bike and Pedestrian Crashes	2013-2017 Fatal and Severe Crashes
Asheville	I-26 at I-40	41	0	4
Waynesville	US 19 (Dellwood Road) at US 276	53	0	2
Swannanoa	US 70 (Smokey Park Highway) at Patton Cove Road	139	0	2
Asheville	Biltmore Avenue at Southside Avenue	311	1	0
Buncombe County	New Leicester Highway at Newfound Road	395	0	1
Hendersonville	N. King Street at 6th Avenue	404	1	0
Waynesville	US 19 (Smokey Park Highway) at NC 209	446	0	2
Asheville	New Leicester Highway at Druid Rd	457	0	1
Asheville	Charlotte St. at Woodfin/US 240 Entrance	457	0	1
Weaverville	US 25/70 at Monticello Road	470	0	1

frequency. Table 3.2 summarizes the location and number of crashes at or near (within 250 feet) the top ten HSIP intersections. Four of the intersections are programmed in the TIP to be addressed with improvements.

Map 3.2: HSIP Intersections



### Current Efforts

The French Broad River MPO is planning and working towards a safer transportation network. When evaluating project priorities, programs, and initiatives NCDOT and the French Broad River MPO emphasize safety. Safety is highlighted through:

- Highway Safety Improvement Program (HSIP)
- North Carolina's Vision Zero
  - This initiative works toward meeting the goal of zero deaths on state roadways through community involvement and data-driven interventions. The City of Asheville took the Vision Zero pledge and organized a task force to address safety issues in the city in 2018.
- Active Routes to School
  - A program that helps identify and address safety issues that prevent children from biking or walking to school in their community. Coordinators work with communities and the French Broad River MPO to identify opportunities to improve access to physical activity.

- Watch for Me NC
  - A statewide safety program that provides various education and enforcement of bicycle and pedestrian safety. Drivers and active transportation users benefit from the education through this program. The City of Asheville and City of Hendersonville are Watch for Me NC partners.
- Congestion Management Process
  - The MPO's Congestion Management Process includes a number of recommendations that focus on improving safety on congested corridors to reduce non-recurring congestion events (congestion events caused by crashes)
- Safety Audits
  - Roadway safety audits focus on gathering stakeholders to identify issues and potential solutions for communities or hot spots with pedestrian and bicycle concerns. Stakeholders document the issues and learn about best practices or funding sources for projects. These are effective, low-cost countermeasures that the FHWA cites can result in up to a 60% crash reduction rate.<sup>4</sup>
- Performance Measurement
  - The MPO maintains safety performance targets, as required by FHWA and NCDOT

### Emphasis Areas

Safety emphasis areas reflect some of the most common causes of crashes, injuries, and fatalities within a particular region or state. The North Carolina 2019 Highway Safety Plan identifies safety emphasis areas, describes targets and measures related to key crash characteristics, and provides potential infrastructure and behavioral improvements.<sup>5</sup>

The 2019 plan set goals for the nine emphasis areas: demographic considerations, teen and senior drivers, driving while impaired, emerging issues and data, intersection safety, keeping drivers alert, lane departures, occupant protection/motorcycles, pedestrians, and bicyclists, and speed. This data, summarized in the figure above, shows senior drivers yielding the highest percentage of crashes but one of the smallest percentages of crashes resulting in serious injury or fatality. Meanwhile, crashes involving a pedestrian are not as frequent but 15.6% of them resulted in serious injury or fatality. The severity of



crashes must be considered in planning for the most vulnerable users including bicyclists, pedestrians, and motorcyclists who have little protection if involved in a crash with a vehicle.

### Highway Safety

From 2009 to 2018, there were approximately 102,794 crashes in the French Broad River MPO region with an average of 10,279 crashes per year (Figure 3.2). The overall number of crashes and fatalities has been on the rise since 2012, which correlates to an increased number of vehicle miles traveled (VMTs) in the midst of a strong economy with low gas prices.<sup>6</sup>

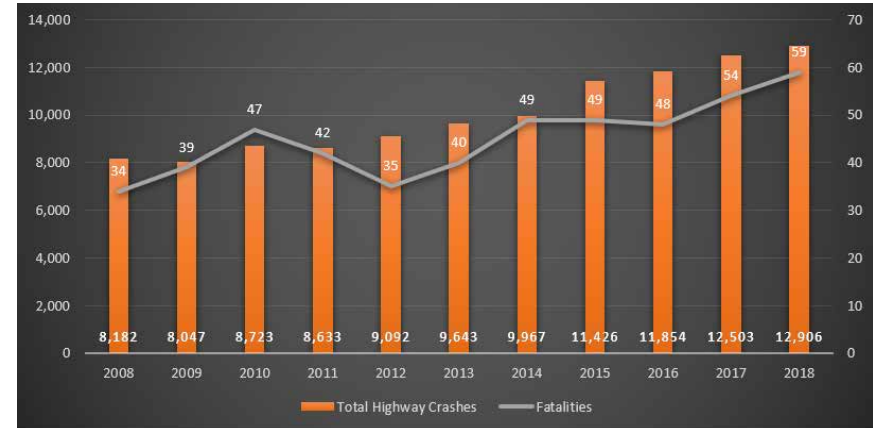
Using the most recent crash data from NCDOT TEAAS unit in five-year intervals (2013-2017) there were a total of 242 fatal crashes in the French Broad River MPO region. Of those crashes 152 were in Buncombe, 48 in Henderson, 38 in Haywood, and 4 in Madison. As expected, the majority of the crashes occurred on heavily traveled corridors with higher speeds including: US 19/23 in Buncombe County, US 25/Hendersonville Rd/Asheville Highway through Buncombe and Henderson Counties, the I-40 Corridor, and the I-26 Corridor.

A majority of the crashes that led to serious injuries or fatalities (52%) were caused by lane departures, which aligns with the FHWA report that lane departures account for 51% of all fatal crashes.<sup>7</sup> Lane departures are the result of human error or roadway design flaws, thus making it hard to address uniformly. According to the Insurance Institute for Highway Safety, technology such as lane departure warnings facilitated by visible lane markings can reduce crashes with injuries by 21%. However, technology should not be expected to eliminate all roadway safety issues.<sup>8</sup>

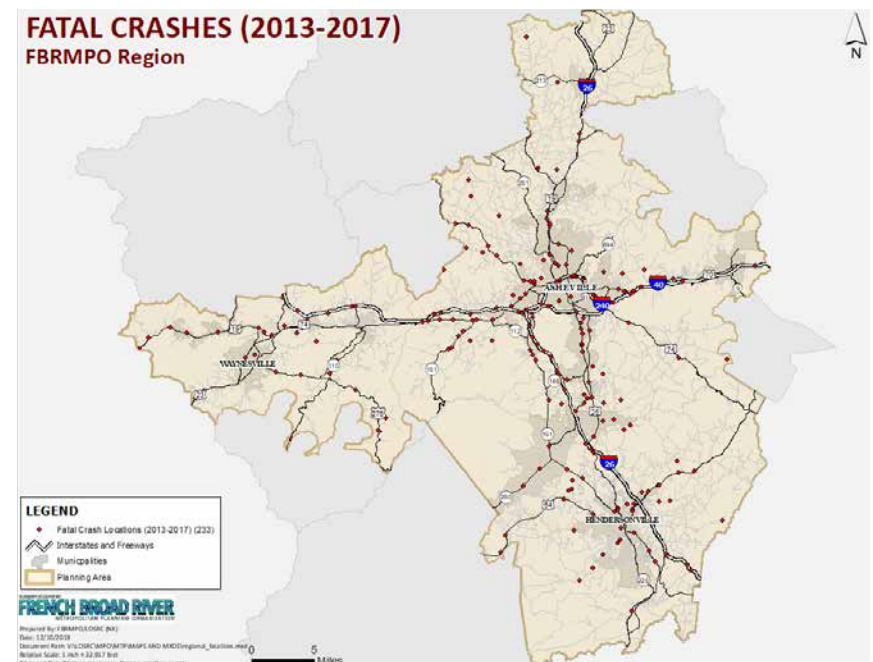
### Vulnerable Users

Vulnerable users are roadway users that are generally more exposed and likely to experience a severe or fatal outcome if involved in a crash. This group includes pedestrians, bicyclists, and motorcyclists. All three groups make up a disproportionate percentage of fatalities in the region, and in some cases, an increasing share of fatalities on the region's roadways. In the five-county area approximately 32% of the fatalities on the region's roadways are from vulnerable user groups. Topography, fragmented development, and limited bicycle and pedestrian infrastructure make bicycle and pedestrian trips in the region challenging and dangerous. In many places, bicycle and pedestrian

Figure 3.2: Total Crashes and Fatalities, 2018 French Broad River MPO Region



Map 3.3: Fatal Crashes



infrastructure is inadequate or nonexistent, leading to dangerous crossings with no buffer between motorized and nonmotorized traffic. From 2014 to 2018 as reported by NCDOT, there were a total of 694 crashes involving either a bicycle or pedestrian in the French Broad River MPO region (Figure 3.3).

A majority of crashes in North Carolina occur in urban areas, but there is still a large distribution of fatal and severe bicycle/pedestrian crashes outside the larger municipalities (Maps 3.4 and 3.5). Between 2014 and 2018, 17% of bike crashes and 25% of pedestrian crashes occurred at conflict points adjacent to the roadway. This includes sidewalks, parking lots, vehicle crossing driveways/sidewalks, and on private property. These crash rates highlight the need for bicycle and pedestrian infrastructure to be implemented as part of other projects. The French Broad River MPO passed a Complete Streets Resolution in 2012, which requires that all roadway projects consider the inclusion of bicycle and pedestrian infrastructure. Similar policies exist within NCDOT, the City of Asheville, and the Town of Black Mountain.

The region is also a major destination for motorcyclists, with its winding roads and picturesque vistas. Groups of motorcyclists can be frequently seen racing up the Blue Ridge Parkway or other scenic highways in the region. However, the five-county region averages more than 250 motorcyclist-involved crashes per year and between seven and eleven fatalities per year, or almost 17% of the region's roadway fatalities over the last five years.

## Recommendations

Roadway design, weather, season, vehicle type, and human error contribute to where and when crashes occur. Given the nuances of safety and safety data, there are a number of measures that the French Broad River MPO and its partners can undertake to improve safety throughout the region including:

- Support project designs that are proven to effectively improve the safety of all users of the transportation system.
  - Provide educational materials on design concepts that are likely to improve safety, especially the benefits of access management projects and techniques.

- Follow and implement best practice guidance from federal and state partners such as safety countermeasures, the FHWA Bikeway Selection Guide<sup>9</sup>, and FHWA Crash Reduction Factors<sup>10</sup>.
  - Some countermeasures, according to the FHWA<sup>11</sup>, include roadway medians, paved shoulders, buffers or planting strips, marked crosswalks, "road diets" (narrowing or eliminating travel lanes on roadways), traffic calming/traffic control devices, and rumble strips.
- Conduct educational outreach efforts to engage the public and promote safe driving, bicycling, and pedestrian behavior.
  - Enhance coordination of safety initiatives in the region to identify partners and leaders interested in safety planning, coordinate with existing efforts, gather and analyze targeted safety data, and provide more regionally-specific safety recommendations.
  - Encourage partners to apply for funding from the Governor's Highway Safety Program (GHSP).
- Promote initiatives such as roadway safety audits, Active Routes to School, and Watch for Me NC.
- Work to cooperatively develop safety targets and interventions for roadway projects.

<sup>3</sup> FHWA. (2019, Nov. 26). About HSIP. Retrieved from [safety.fhwa.dot.gov](https://safety.fhwa.dot.gov/hsip/about.cfm): <https://safety.fhwa.dot.gov/hsip/about.cfm>

<sup>4</sup> FHWA (2014, Oct. 15). Proven Safety Countermeasures. Retrieved from [safety.fhwa.dot.gov](https://safety.fhwa.dot.gov/provencountermeasures/): <https://safety.fhwa.dot.gov/provencountermeasures/>

<sup>5</sup> National Highway Traffic Safety Association (2018). Highway Safety Plan. Retrieved from [nhtsa.gov](https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/nc_fy19_hsp.pdf): [https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/nc\\_fy19\\_hsp.pdf](https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/nc_fy19_hsp.pdf)

<sup>6</sup> Reynard, M. (2019). Strong Economy Has Americans Driving More than Ever Before. USDOT. Retrieved from <https://highways.dot.gov/newsroom/strong-economy-has-americans-driving-more-ever>

<sup>7</sup> FHWA (2019, Jan. 9). Roadway Departure Safety. Retrieved from [safety.fhwa.dot.gov](https://safety.fhwa.dot.gov/roadway_dept/): [https://safety.fhwa.dot.gov/roadway\\_dept/](https://safety.fhwa.dot.gov/roadway_dept/)

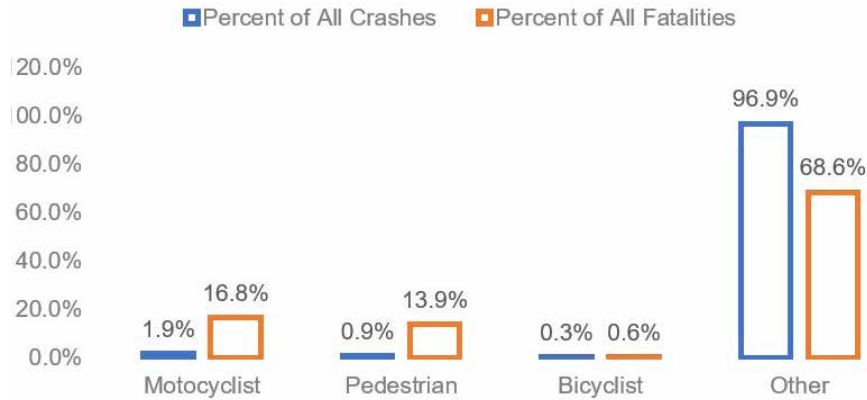
<sup>8</sup> Cicchino, JB. (2018, Sept.). Effects of lane departure warning on police-reported crash rates. *Journal of Safety Research*, 66: 61-70. Retrieved from: <https://doi.org/10.1016/j.jsr.2018.05.006>

<sup>9</sup> FHWA (2019). Bikeway Selection Guide. Retrieved from: [https://safety.fhwa.dot.gov/ped\\_bike/tools\\_solve/docs/fhwasa18077.pdf](https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf)

<sup>10</sup> FHWA (2014, Oct. 14). Crash Modification Factors Clearinghouse. Retrieved from [safety.fhwa.dot.gov](https://safety.fhwa.dot.gov/tools/crf/resources/#cmfc): <https://safety.fhwa.dot.gov/tools/crf/resources/#cmfc>

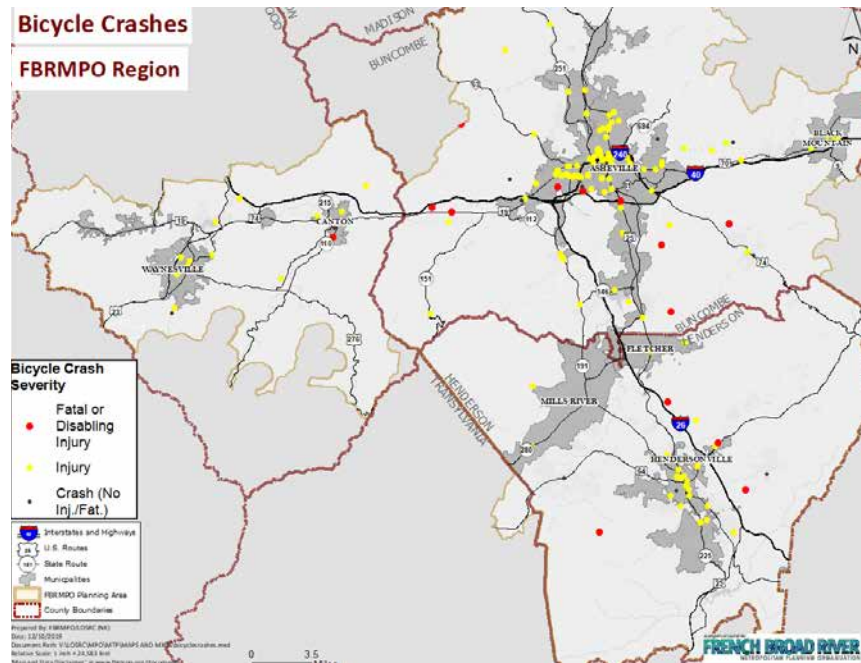
<sup>11</sup> FHWA (2014, Oct. 15). Proven Safety Countermeasures. Retrieved from [safety.fhwa.dot.gov](https://safety.fhwa.dot.gov/provencountermeasures/): <https://safety.fhwa.dot.gov/provencountermeasures/>

Figure 3.3: Crash and Fatality Proportion, By mode 2014-2018



Data: NCDOT Safety Performance Measures Target Setting Crash Data

Map 3.4: Bicycle Crashes



Map 3.5: Pedestrian Crashes

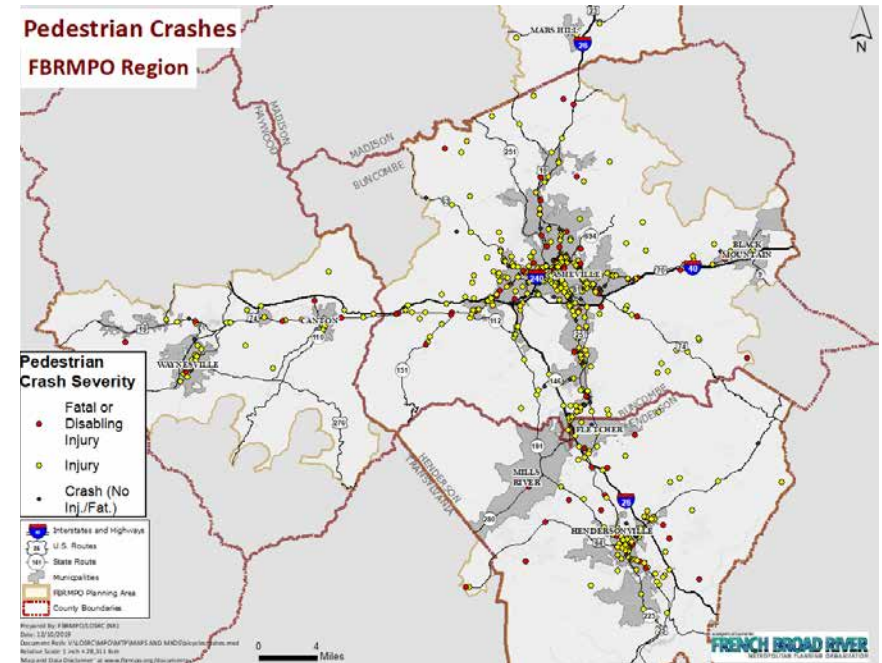
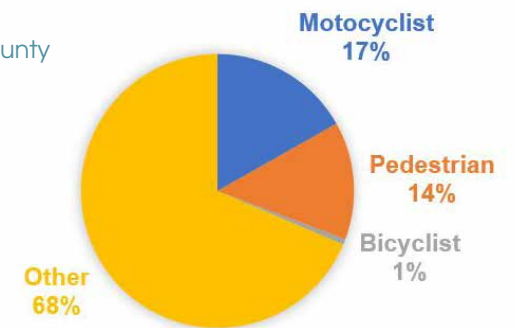


Figure 3.4: Percentage of Roadway Fatalities in Five-County Area, 2014-2018



## CONGESTION

Roadway congestion can occur for a variety of reasons, but the result is always the same- vehicles stopped or taking considerably longer to reach their destination due to traffic. Individuals get frustrated, people get late, and professional drivers get behind schedule. In the French Broad River MPO, like many urban areas across the country, roadway congestion is a part of life. But understanding the causes of congestion can help to better plan for interventions.

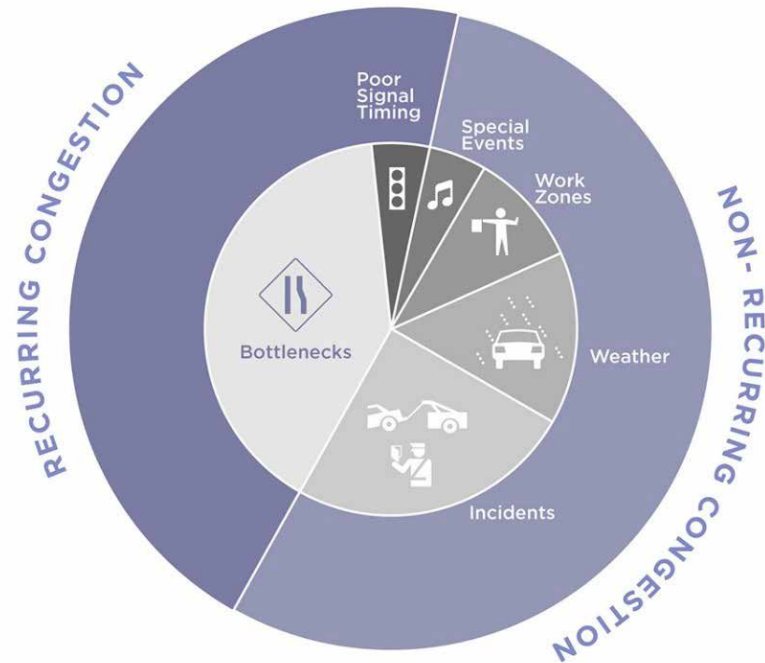
*Recurring congestion* is daily traffic that generally happens every day, or every weekday around the same time<sup>12</sup>. This type of congestion has two prevalent causes: excessive demand and bottlenecks. Excessive demand is typically happening in the morning and in the evening during commutes to appointments and employment when most people are on the road. Due to human behavior, workplace schedules, and development patterns, it can be expected that commuters will continue to drive during peak-demand in the mornings and evenings. Recurring conditions also correlates to seasonal traffic. Bottlenecks occur in locations where the capacity of a facility is suddenly reduced. For example, a bottleneck happens when a three-lane highway is suddenly reduced to two lanes as the right lane is forced to exit or a long-term construction project restricts the width of the highway.

*Non-recurring congestion* is typically unexpected due to unforeseen incidents like crashes, disabled vehicles, special events, weather, etc. Any of these events or a combination of these events can cause free-flowing traffic to suddenly slow, causing immediate and severe congestion. As shown in the diagram below, non-recurring events cause more congestion than recurring events. While capacity improvements such as widening a highway focus on solving recurring congestion, a considerable portion of the congestion will persist is due to non-recurring events. Therefore, solutions must focus on addressing both types of congestion.

### Current Conditions & Efforts

As the economic center of Western North Carolina, the French Broad River MPO often experiences significant congestion events- both recurring and non-recurring. With increased growth as well as increased traffic and freight moving through the region, several routes have become susceptible to congestion. I-26 in south Buncombe County regularly becomes backed up, but congestion also occurs at a variety of locations on secondary roads. Sometimes school traffic

Figure 3.5: Congestion



causes intermittent back-ups or inefficient signal timing can leave vehicles sitting through multiple cycles.

In a reflection of economic and demographic data, the congestion in the French Broad River MPO planning area is somewhat unique. With an economy that is more focused on sectors with irregular working hours, AM peaks throughout the region are generally not as problematic as PM peaks. Few roadways that aren't adjacent to schools tend to experience much recurring congestion. PM peaks, however, tend to be relatively problematic, especially on I-26 and I-240 in Buncombe County- likely due to a mixture of commuters and people coming to the City for nightlife. One unusual aspect to note is that the region has several areas that experience mid-day peaks- where congestion is often at its worst around noon.

As a destination for tourists, congestion events tend to differ on the day of the week as well. Most roadway congestion in the Asheville region tends to work in weekly cycles, slowly building up from Monday and peaking on Friday. The visitor travel pattern impacts can be noticed with

congestion often peaking on north/westbound I-26 and westbound I-40 on Fridays and congestion peaking in the opposite direction on Sunday afternoons.

Some congestion issues can be linked to connectivity and resiliency issues in the region. Steep slopes and river valleys limit the construction of new or expanded local and state routes, making connectivity at high connectivity nodes such as the I-240, I-26, and I-40 junction problematic. Navigating from the northern section of Henderson County up through Buncombe County stands as an example of a south-north connectivity issue. If construction or an accident causes severe congestion on I-26, there are few alternatives to continue northward travel through Buncombe County. NC 191 (Brevard Road) to the west of I-26, is a two-lane facility with already high-volumes that often lead to congestion during peak travel times. This corridor does not provide an ideal alternative to I-26 given its own congestion issues, as well as the limited number of intersections to access it. US-25 (Hendersonville Road) running parallel to I-26, is a five-lane facility but has similar issues as NC 191, and experiences major congestion during peak and non-peak travel times. Given the volume of commuter traffic traveling between Buncombe and Henderson counties, all these roadways experience problematic congestion with not enough options or capacity to alleviate it.

The French Broad River MPO has access to FHWA Regional Integrated Transportation Information System (RITIS), which provides aggregated data types such as traffic volumes, speeds, events, work zones, and incidents in the region. This data can identify congestion trends, bottleneck reports, and incident occurrences. By using several factors to determine total delay, the bottleneck ranking dataset provides a comprehensive look at problematic locations.<sup>13</sup> Table 3.3 summarizes the top 25 bottleneck locations in the French Broad River MPO region based on calendar year 2019 data; ranks are determined based on the composite score of the "impact factor that accounts for the number of days in an analysis period, the number of bottleneck occurrences, the duration of congestion in minutes, and the length of congestion in miles.

Many of the funded projects in the region include elements that address congestion. The Strategic Transportation Investments (STI) law, which uses a data-driven approach to score and prioritize projects,

examines congestion as a factor when funding projects. In SPOT P5.0, thirty-eight percent (\$4.4 billion) of highway funding was used to widen existing roadways, which can be attributed to the goal of reducing congestion. Some of the projects in the region that include congestion mitigation elements such as widenings, interchange improvements, and utilization of high-impact, low cost funding include:

- *I-26 Widening (TIP ID: I-4700)*: adding additional capacity between NC 280 and I-40 to improve traffic flows on a section of corridor that frequently experiences Level of Service "F" conditions. Additional capacity can improve freight mobility along with commuter traffic that utilizes this route.
- *I-26 at NC 191/Brevard Road Interchange Upgrade (TIP ID: I-5501)*: converting the existing interchange to a diverging diamond (DDI) configuration allows high volumes of left turns at signalized intersections by eliminating the need for left-turn phase signals<sup>14</sup>. This project has been completed since 2020 and allows for the smooth movement of vehicles on and off of I-26, while improving safety since no left turns must clear opposing traffic.
- *US 19/23/Patton Avenue at NC 63/New Leicester Highway (TIP ID: U-5971A and B)*: intersection improvements, include adding turn lanes and eventually multimodal accommodations at this intersection. Phase one of this project was completed by adding turn lanes for the most problematic peak-travel turn movements. As commuters travel in the A.M. from western Buncombe and Leicester heading downtown, the NC 63 turn is the primary route onto US 19/23 and adding another turn lane is expected to reduce the congestion experienced. Left turn movements from US 19/23 onto NC 63 are typically higher in the afternoon, and has lead to queuing in the travel lane during peak-travel times. Adding a turn lane for this leg has reduced traffic queuing. Phase II of this project will further improve mobility along this corridor, while better accommodating bicycle and pedestrian movements.
- *US 23 Business/South Main Street (TIP ID: U-4712)*: in Waynesville from Hyatt Creek Road to Pigeon Street widening. This proposed widening project is expected to better accommodate higher traffic volumes and access in the southwest part of Waynesville. As growth occurs near and along this corridor, a proposed roundabout and traffic signal are expected to improve congestion and mobility on a roadway that currently has roughly 14,000 vehicles a day.

Table 3.3: Top 25 Bottleneck Locations

Rank	Head Location	Total duration (days/ hours/minutes)	Total Delay
1	I-26 W @ NC-191/EXIT 33	23 d 16 h 36 m	246,411,826
2	I-40 W @ GOV RD/HARMON DEN RD/EXIT 7	9 d 13 h 33 m	116,643,311
3	I-26 E @ NC-146/LONG SHOALS RD/EXIT 37	8 d 4 h 9 m	104,607,540
4	US-19 N @ I-240/US-70/US-74-ALT/PATTON AVE	114 d 2 h 34 m	78,678,763
5	I-40 E @ GOV RD/HARMON DEN RD/EXIT 7	10 d 23 h 42 m	76,367,966
6	I-26 W @ NC-146/LONG SHOALS RD/EXIT 37	9 d 23 h 42 m	63,837,824
7	I-26 E @ NC-280/NEW AIRPORT RD/EXIT 40	10 d 4 h 20 m	58,311,295
8	US-19 S @ NC-63/NEW LEICESTER HWY	28 d 20 h 44 m	53,460,554
9	I-26 E @ NC-191/EXIT 33	16 d 8 h 2 m	46,337,321
10	I-40 W @ N CAROLINA/TENNESSEE STATE LINE	3 d 1 h 55 m	37,183,634
11	I-40 E @ FINES CREEK RD/EXIT 15	3 d 16 h 43 m	36,491,510
12	I-26 W @ I-40/EXIT 31A	2 d 12 h 43 m	35,633,753
13	I-40 E @ I-26/I-240/EXIT 46	9 d 22 h 3 m	34,390,753
14	I-40 W @ FINES CREEK RD/EXIT 15	2 d 9 h 47 m	33,438,066
15	I-26 E @ US-64/CHIMNEY ROCK RD/FOUR SEASONS BLVD/EXIT 49	2 d 15 h 4 m	32,156,336
16	I-26 W @ US-25/US-25-BR/ASHEVILLE HWY/EXIT 44	2 d 12 h 51 m	30,815,311
17	I-240 W @ HAYWOOD ST/MONTFORD AVE/EXIT 4C	11 d 13 h 42 m	30,311,240
18	I-240 E @ US-19/US-23/US-70/EXIT 4A	7 d 21 h 55 m	30,178,651
19	I-40 W @ US-19/US-23/EXIT 44	7 d 13 h 39 m	30,091,897
20	I-40 W @ NC-2531/DUNSMORE AVE/EXIT 66	7 d 6 h 46 m	29,345,013
21	I-40 W @ NEWFOUND RD/EXIT 33	2 d 1 h 31 m	27,044,103
22	US-19 S @ I-240/US-70/US-74-ALT/PATTON AVE	9 d 18 h 44 m	26,004,672
23	I-40 W @ NC-1200/GEORGES BRANCH RD/EXIT 37	2 d 17 h 45 m	25,719,372
24	US-64 W @ US-276/MAIN ST	76 d 23 h 34 m	24,767,842
25	I-26 W @ NC-280/NEW AIRPORT RD/EXIT 40	2 d 12 h 42 m	24,210,833

- *US 64 (TIP ID: U-5783)*: improvements from Blythe street to White Pine Drive in Laurel Park. This project will accommodate higher traffic volumes and multi-modal users along the US 64 corridor by adding a series of roundabouts, controlling driveway access, and improving the roadway shoulder. Controlled access and movements through roundabouts will limit left-turn movements that lead to congestion and crashes.
- *Asheville signal system improvements (TIP ID: U-4715)*: funding for improving signals citywide, particularly on major arterials such as Patton Avenue is important to improve traffic flow and allow for adjustment for dynamic traffic patterns (based on time of day or seasonal variances).

### Congestion Management Process

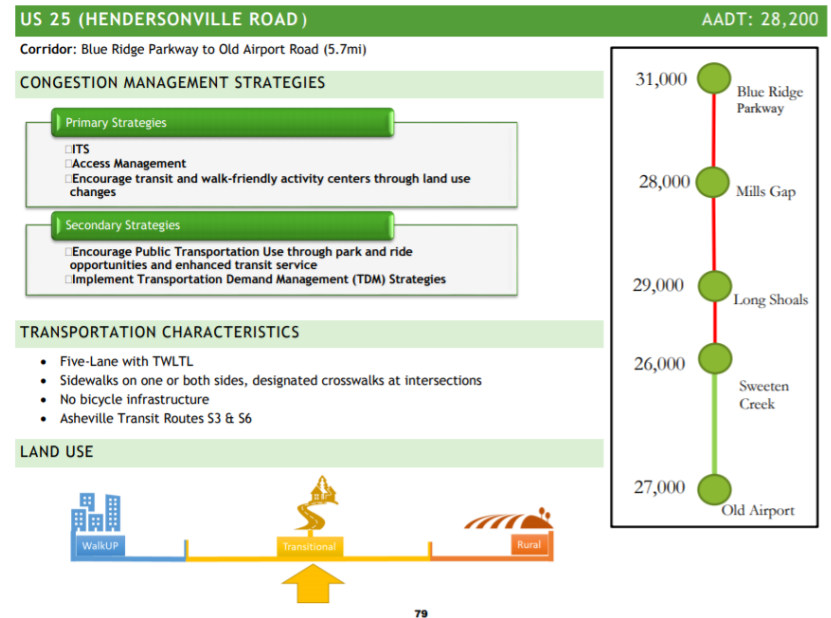
The Congestion Management Process (CMP) developed by the French Broad River MPO outlines the efforts underway to address regional congestion through a strategic process for identifying, managing, and monitoring congestion throughout the planning area. CMPs were first mandated by the 2005 SAFETEA-LU transportation bill and are required to follow an eight-step method for identifying regional congestion and incorporating mitigation goals and strategies. CMP recommendations are integrated into every stage of the transportation planning process from MTP project selection to SPOT prioritization, TIP funding, and project design.<sup>15</sup>

The French Broad River MPO's CMP divided corridors into three categories (freight, mobility, and destination) because congestion is experienced differently based on corridor context. Freight corridors primarily serve to transport freight and passengers within and through the region while most negatively being impacted by the recurrence of congestion. Mobility corridors are designated to move traffic from one part of the region to another, or what is typically thought of as commuter routes. Destination corridors are recommended as having a higher tolerance for congestion with priority being given to accommodate other modes and protecting the built environment.

Corridor conditions are evaluated and weighted based on which category they fall under. Truck volumes (Annual Average Daily Truck Traffic or AADTT) and high potential for recurring congestion on a freight corridor would be considered more problematic than if those conditions appeared on a destination corridor serving primarily local

trips. The CMP acknowledges the role that land use plays in determining future transportation needs by the patterns of population and job growth. As a project goes through the planning stages, the French Broad River MPO and municipalities can identify CMP strategies and incorporate them into project design. Figure 3.6 demonstrates corridor recommendations for Hendersonville Road.

Figure 3.6: Corridor Recommendations for Hendersonville Road



In order to monitor ongoing congestion and travel trends in the region, a CMP report will be generated biennially. Corridors can be evaluated to identify improvements or ongoing deficiencies through monitoring truck volumes, travel time index, and safety trends. CMP reporting is especially important for TIP funded projects so that the aforementioned criterion can be used to measure recurring congestion on a corridor before and after project implementation to show issues on the corridor.

### Intelligent Transportation Systems

Technological advancements have improved capabilities to mitigate and avoid congestion. ITS controls such as signal timing and addressing highway bottlenecks are often incorporated in roadway design to contend with recurring congestion. For nonrecurring congestion like in work zones, merge control signals can improve operations. Currently, the French Broad River MPO region has variable message signs in place to alert drivers of traffic or weather patterns and work zones. Major projects such as the I-26 widening as well as projects at key intersections provide an opportunity to incorporate ITS in order to mitigate congestion. Further recommendations and features of ITS are outlined in the Emerging Trends in Technology chapter.

### Challenges

**Geographic constraints have limited the development of an efficient multimodal transportation system.** The region's limited street network challenges interconnectivity. A grid network is one that has multiple streets running parallel and perpendicular to each other. Grids provide redundancies in a network, allowing multiple routes for traffic to be rerouted down if one street is blocked, and expanding options for pedestrians, cyclists, and motorists. The Asheville region does not have an extensive grid system outside of some downtowns, and even the downtowns with grid-like patterns.

**Development and growth patterns created urban sprawl.** In the 20th century, cars grew in popularity and modernists decried cities were synonymous with pollution, slums, and poverty, causing planners to lose sight of the tight grid network. After World War II, the desire for each man to have his own slice of the country replaced the desire to live downtown near factories and businesses. Development patterns expanded to the outskirts of the cities, with cul-de-sacs and large lots on dead-end streets becoming more common, leaving the family man to commute to work from his private driveway at the end of a cul-de-sac by taking a local street to a collector road then taking a large arterial highway into the city. These developments were seen to be safer for families; however, as foreclosure rates, vehicle miles traveled, and traffic fatalities increase, it becomes clear that cities had been intuitively developed for centuries to be most conducive to optimal growth by being intricately interconnected.<sup>16</sup>

### Transportation and Development Should Be Better Coordinated.

As regional growth patterns radiate out from the economic center of Asheville, spreading along corridors into urban areas of Henderson, Haywood, and Madison Counties, many of the activities that dictate transportation trips—work, school, and recreation—occur in the hubs of these counties. Trips are taken during constrained time periods. Typically, work and school start at relatively the same time for everyone, meaning the roads are filled with vehicles trying to reach the same destinations day after day. This results in motorists trying to access the same area. Much like why flooding occurs in river basins, there is too much volume feeding the system, which has a limited carrying capacity. With limited connections, the corridors that do exist experience congestion disproportionate compared to other regions in North Carolina and the United States with similar populations. This challenge is made even greater because without municipal coordination, transportation planners have no control over land use. As the French Broad River MPO population increases, it is imperative that the network support efficient methods to manage the anticipated increase in volumes associated with growth.

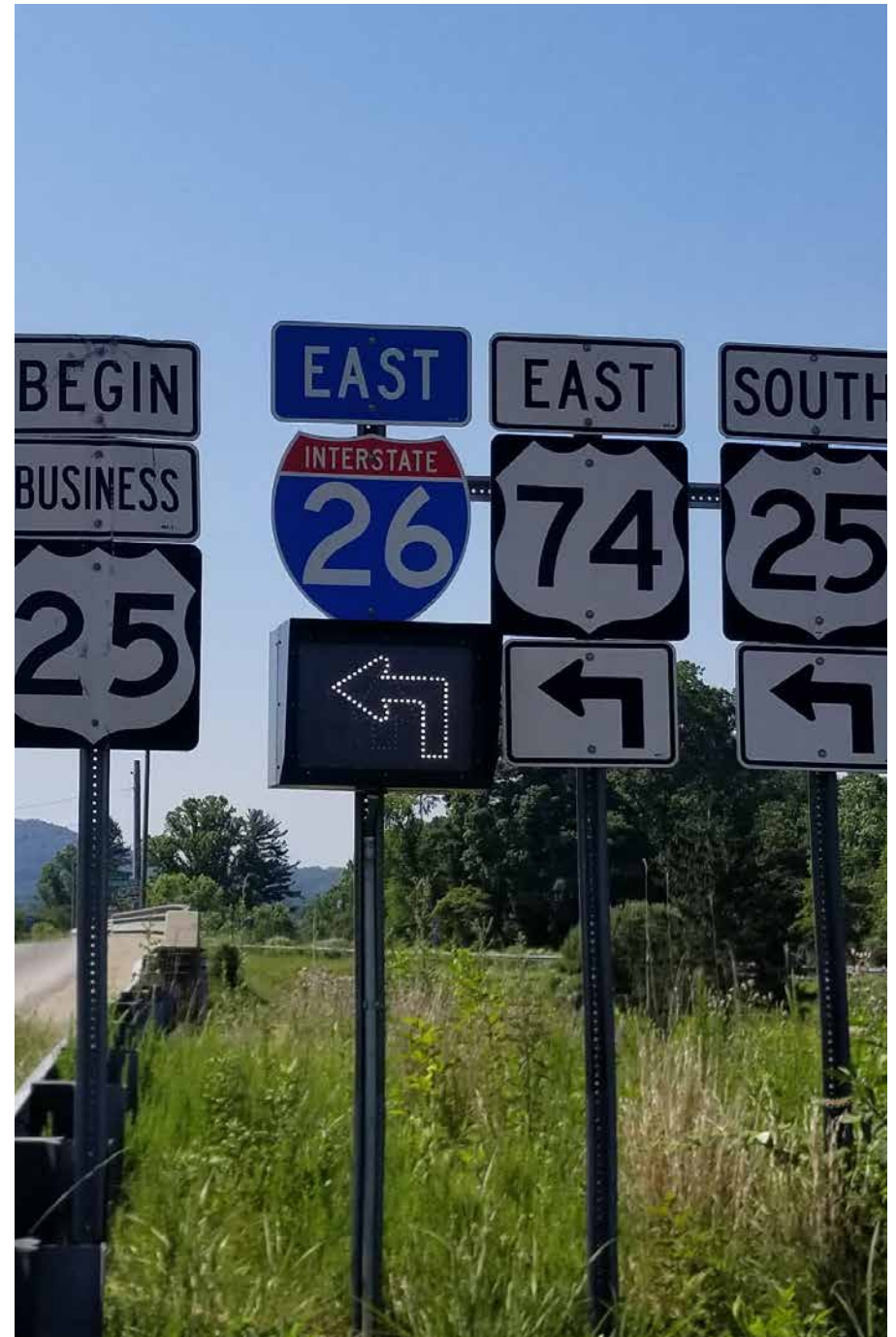
**Congestion is becoming more expensive.** As communities face more congestion, they are having difficulties implementing enough projects and programs to meet their regional demands. Between wasted fuel, travel delays, and idle-related auto emissions, the cost of congestion, though often unrecognized, is overbearing in communities of all sizes. The *2019 Urban Mobility Report*, the Texas Transportation Institute (TTI) estimated that the average auto commuter spends \$1,080 annually on congestion-related costs, wastes 21 gallons of fuel, and is delayed 54 hours, which is almost 7 full workdays.<sup>17</sup> The annual cost would be significantly higher if environmental impacts of emissions from idling cars and gas prices had been included in the calculations as well.



## Recommendations

Addressing congestion requires coordination and collaboration with municipalities. Some of the recommendations to do this include:

- Incorporate the CMP into project prioritization
- Improve connectivity throughout the region
  - Consider the development of guidebooks for member governments to consider connectivity ordinances and other measures to improve roadway connectivity in the development process, which might include connecting dead-end streets or adding new road locations to improve access.
- Create a Regional ITS Plan
  - Using snapshots of ITS best practices, make a plan with corridor specific recommendations that incorporates regional ITS architecture and includes recommendations such as congestion pricing implementing Travel Time Index (TTI) measures, and signal timing.
- Provide context sensitivity guidance
  - Work with member governments and NCDOT to provide context-sensitive guidance for major projects in the region utilizing NCDOT Complete Streets policy to design multimodal streets with wide-sidewalks, bike lanes, and vegetative buffers to carry more people per hour than traditional streets.<sup>18</sup> This is particularly important on congested urban corridors with compact development and could include corridor studies on future projects, pre-design discussions on environmental and cultural resources and other measures to prevent negative impacts on community resources.



<sup>12</sup> McGroarty, J. (2010). "Recurring and Non-Recurring Congestion: Causes, Impacts, and Solutions." The Niehoff Urban Studio, Winter. Retrieved from: [https://www.uc.edu/cdc/niehoff\\_studio/programs/great\\_streets/w10/reports/recurring\\_non-recurring.pdf](https://www.uc.edu/cdc/niehoff_studio/programs/great_streets/w10/reports/recurring_non-recurring.pdf)

<sup>13</sup> RITIS (2020). Bottleneck Ranking. Retrieved from [ritis.org](https://www.ritis.org/tools#bottleneckranking): <https://www.ritis.org/tools#bottleneckranking>

<sup>14</sup> Indiana DOT (2017). Diverging Diamond Interchange. Retrieved from [in.gov/indot](https://www.in.gov/indot/): <https://www.in.gov/indot/3259.htm>

<sup>15</sup> French Broad River MPO (2018). Congestion Management Process. Retrieved at [frenchbroadrivermpo.org](http://frenchbroadrivermpo.org): [http://frenchbroadrivermpo.org/wp-content/uploads/2019/08/DraftCMP\\_2018-1-1.pdf](http://frenchbroadrivermpo.org/wp-content/uploads/2019/08/DraftCMP_2018-1-1.pdf)

<sup>16</sup> Badger, E. (2011, Sept. 19). Debunking the Cul-de-Sac. Retrieved from [CityLab.com](https://www.citylab.com/design/2011/09/street-grids/124/): <https://www.citylab.com/design/2011/09/street-grids/124/>

<sup>17</sup> Shrank, D., Eisele, B., and Lomax, T. (2019). The 2019 Urban Mobility Report. Texas Transportation Institute: The Texas A&M University System.

<sup>18</sup> Boyac, Burak, and N. Geroliminis. (2011). Estimation of the network capacity for multimodal urban systems. *Procedia-Social and Behavioral Sciences*, 16: 803-813

## FREIGHT

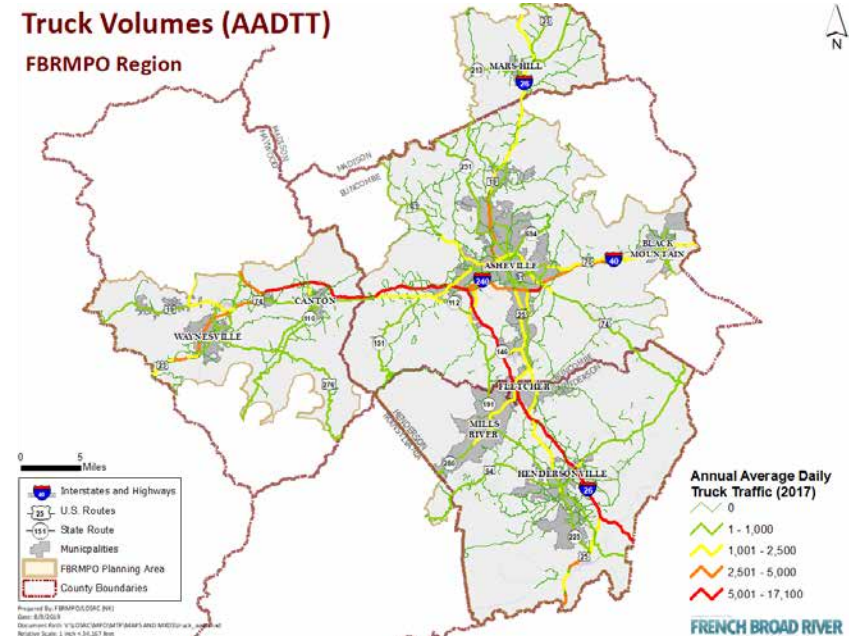
Strategic freight planning is crucial to fuel and sustain strong regional and domestic economies. Efficient freight systems not only improve the flow of goods and services through a region but helps to fortify the preservation of the entire transportation system. The French Broad River MPO planning area is unique in how freight moves in and through the region given the geographical constraints that limit the number of routes available. However, given that trucks make up the majority of our regional freight, it is important that strategic planning takes places to mitigate traffic and infrastructure issues in addition to reducing the harmful environmental impacts of freight traffic. The importance of freight in the planning process has been in recent transportation legislation, starting with the Transportation Equity Act for the 21st Century (TEA-21). TEA-21 ensured that freight stakeholders, such as shippers and manufacturers, were involved in the metropolitan and statewide transportation planning process in order to properly consider their needs<sup>19</sup>. The current legislation, the Fixing America's Surface Transportation Act (FAST Act), establishes a national policy for maintaining and improving the condition and performance of the National Multimodal Freight Network ("the Network")<sup>20</sup>. The FAST Act specifies goals associated with this policy related to the condition, safety, security, efficiency, productivity, resiliency, and reliability of the Network, while also including goals to reduce the adverse environmental impacts of freight movements on the Network. Regarding freight, the FAST Act outlines the following two programs:

- *National Highway Freight Program*: Provides \$1.2 billion per year on average for states according to a formula, for construction, operational improvements, freight planning, and performance measures. Up to 10 percent of this budget can be spent on rail, port or intermodal projects. The National Highway Freight Program requires state freight plans.
- *FASTLANE Grant Program*: Provides \$900 million per year on average for competitive grants or Transportation Infrastructure Finance and Innovation Act (TIFIA) loans. These funds can be used for projects on the National Highway Freight Network, National Highway System, rail and intermodal infrastructure, and rail-highway grade crossings. States, large Metropolitan Planning Organizations, Tribes, localities, and Federal Land Management Agencies may apply.

To implement the two programs above, the FAST Act:

- Requires a national freight strategic plan that presents multi-modal freight policy goals.
- Requires the designation of a National Multimodal Freight Network.
- Requires the designation of a National Highway Freight Network.
- Requires state freight plans and;
- Encourages state freight advisory committees.

Map 3.6: Truck Volumes



## Freight Trends/Planning for Freight Nationally

In the midst of economic growth, freight traffic by truck has risen steadily during the 2010s due to an increase of reliability and efficiency in freight. In 2015, the U.S. transportation system moved a daily average of 49 million tons of freight, nearly an 80% increase from 2000<sup>21</sup>. By 2045, it is expected that the daily average will rise to 57 million tons per day, an increase of 1.4% per year. North Carolina is expected to see a 57% increase in freight tonnage between 2015

and 2045, as reflected in Table xx. Given the capacity constraints that exist on our nation's major highways and arterials, effective policy solutions and creative project development will require coordinated and collaborative action by both public and private parties.

Planning for freight requires the recognition that the industry is experiencing a technological revolution as information and communication technologies are optimizing global supply chains. With real-time information and enhanced data, manufacturers and distributors can adapt more quickly than ever. Firms can match supply and demand using mobile technology that connects truck drivers to last-mile freight orders to fill excess capacity and improve delivery efficiency. Continued advances in information and communications technology improves data collection and analysis capacities of logistics firms, enabling faster, more accurate freight routes, travel times, and overall infrastructure capacity. These innovations may reduce the impact of the growing demand on the capacity of our freight transportation system. However, improved technology like GPS may lead to efficient routes that take drivers through constrained roads not designed to handle freight traffic, creating a safety hazard for truckers, roadway users, and existing infrastructure.

Advances in automation, including fully and partially automated trucks and freight-transfer facilities, may also transform the freight industry. While this will not be a short-term transition, automation trucks is already being tested on roads throughout the country. In a practice known as truck platooning or truck trains, partially automated trucks travel closely to improve fuel efficiency and improve safety by using sensors to allow one truck to communicate with another. In some ways, this technology can improve reliability and increase freight volumes, but it also has the potential to increase congestion by putting more trucks on the roadways. This form of technology can be challenging in terrain that exists in Western North Carolina (WNC), where roadways are constrained and geography is not consistent. Advanced automation technology relies on consistency, which proves problematic for arterials or secondary routes that may not be kept up to strict maintenance standards or have uniform striping or signage.

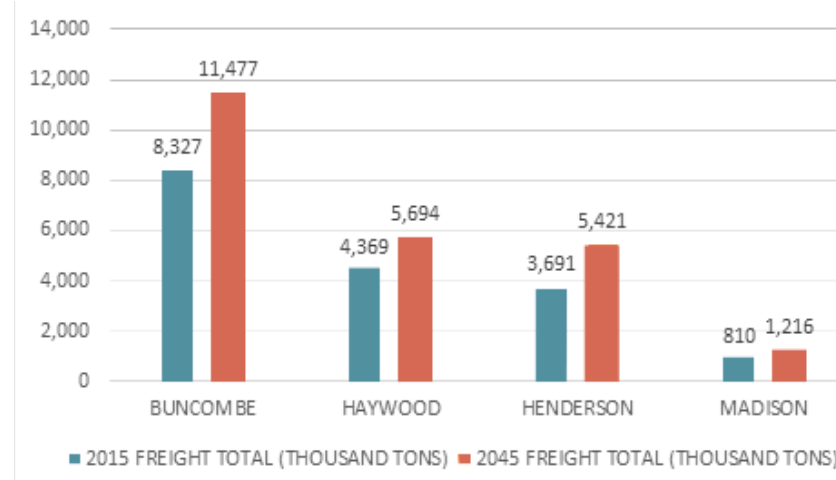
Table 3.4: NC Freight Tonnage and Value

North Carolina Freight Tonnage and Value		
2015	2045	
Thousand Tons	Thousand Tons	% Change
240,004	376,776	57%
Value USD (Millions)	Value USD (Millions)	% Change
\$ 518,552	\$1,009,787	94%

Table 3.5: FBRMPO Counties Freight

FBRMPO Counties Freight (Thousand Tons)			
County	2015	2045	%Change
Buncombe	8,327	11,477	27.4%
Haywood	4,369	5,694	23.3%
Henderson	3,691	5,421	31.9%
Madison	810	1,126	33.4%

Figure 3.7: Freight Growth 2015-2045



Freight directly affects the economy of the FBRMPO region. Like many areas throughout North Carolina, the FBRMPO region is in a period of economic transition as traditional textile plants and industry yield to businesses developing plastics, ceramics, and recreation equipment. The food, beverage, and biotech industries continue to see growth alongside population growth; these industries require the shipment of goods into and out of the region.

In November 2016, the French Broad River MPO held a regional freight meeting to discuss concerns and issues for freight in the region. 18 participants attended the meeting representing various businesses including manufacturing, government and food and beverage manufacturing, in addition to French Broad River MPO/Land of Sky staff. This group identified that their inbound and outbound freight volumes were projected to increase over the next five years. Table 3.6 verifies this expectation as freight volumes have increased through the region between 2012 and 2017. The stakeholders also identified that a majority of their freight comes from the Charleston, SC port, but occasionally from Savannah and Wilmington. Opportunities for improvement and recommendations identified by this group are referenced in the recommendations section below.

**Highway freight is the primary means by which goods move through the FBRMPO region.** It is the nature of transportation networks that they cross boundaries. As shown above, trucks plays a major role in the region and given that freight volumes are expected to increase 23-33% region wide between 2015-2045, the region needs to strategically plan for how to handle these increased volumes. Interstate 40 (running East to West for 55 miles through Buncombe and Haywood) and Interstate 26 (running 40 miles geographically North to South through Madison, Buncombe, and Henderson counties) comprise the two major thoroughfares that are designated as part of the National Highway Freight Network (see table below). These two major interstates connect the aforementioned ports on the Gulf and the East Coast to destinations along the Ohio River Valley. In addition to high volumes of freight on these routes, I-40 and I-26 also carry the principal amount of congestion in the region.

- I-40 brings freight into and through the region through Buncombe and Haywood counties. The major freight movements occur on the segment west of Asheville, continuing through Haywood County and up through Tennessee. During times of congestion due to construction or crashes on I-40, US-70 serves as an alternative

Table 3.6: FBRMPO Interstate Freight Traffic Volume

French Broad River MPO Interstate Freight Traffic Volume					
Route	Location	County	2017 AADTT - Estimated Daily Truck Volume (High to Low)	Daily Truck Traffic %	2012 AADTT
I-40	W of I-26/I-40/I-240 Interchange	Buncombe	9260	10.4%	8440
I-40	W of US 19/23/74 - Asheville Exit	Buncombe	8770	16.6%	8650
I-26	E of US 64 - Hendersonville	Henderson	8570	13.2%	6650
I-40	E of NC 215 - Canton	Haywood	6800	14.4%	8230
I-40	W of Wiggins Road	Buncombe	8350	14.6%	8360
I-40	W of Buncombe/Haywood County Line	Haywood	8350	14.6%	8260
I-26	E of Airport Road exit	Henderson	8330	12.0%	6510
I-26	W of US 25/Asheville Highway Exit	Henderson	8330	12.1%	6500
I-40	E of I-40/US 23 Interchange - Clyde	Haywood	8320	14.6%	8150
I-26	W of US 64 - Hendersonville	Henderson	8150	12.2%	6230

route. A few distribution plants serve freight traffic on this corridor, especially between Black Mountain and Swannanoa.

- I-26 carries freight coming westbound from Charleston and Savannah ports, using the I-40/I-26/I-240 interchange to continue westward on I-40. That interchange sees high roadway volumes, truck volumes, and is the connection between three interstate-corridors, leading to congestion and becoming a "pinch point" for freight trying to move through the region. NCDOT's project I-2513C is scheduled for construction in 2025 to address this interchange and the surrounding highways to improve mobility.

A continued increase in overall freight growth throughout the region is predicted through 2045. Urban freeways and arterials have become increasingly congested, which is expected to persist. Trucks lose time and freight reliability in the midst of congestion.

Additionally, truck freight takes a major toll on the health of a roadway system, especially in a region where trucks are the primary freight mode. This leads to major wear and tear on major roads, causing local divisions to re-pave and perform costly maintenance more often. The effects of trucks on roads are even more noticeable on secondary routes such as NC-112 (Sardis Road), as even low levels of freight adversely affect pavement which was not designed to withstand higher truck volumes. The lifespan and pavement condition of these roads quickly deteriorates.

**Freight flows in the region are driven by the manufacturing base and by freight moving through the region from ports to the south and to the east.** The recent widening of the Panama Canal has enabled larger ocean-going vessels to reach ports in the gulf and east coast ports. This includes the cities of Charleston, Savannah, and Wilmington, who send a significant amount of their freight through Western North Carolina. Looking at freight flows in the region, it is apparent that a majority of trucks move through the I-26 section of Henderson County, turn west on I-40 in Buncombe County, and then go through the I-40 Pigeon River gorge in Haywood County (or vice-versa)<sup>22</sup>. From here, the majority of freight continues up to Knoxville where it splits and part of it heads north into the Ohio Valley on I-75, and the other part continues westward on I-40 through Tennessee. FHWA projects an increase in volume out to 2045 using this same network. As a point of comparison,

I-26 in north Henderson county sees an annual average daily traffic truck (AADTT) volume of 8,330, with 6,440 AADTT on the I-40 section through the gorge in Haywood County. The section of I-40 near Black Mountain entering Buncombe county from the east averages around 1,910 AADTT, which is just a fraction of the freight volumes on I-26.

As shown in the Table XX, a majority of goods are being imported versus exported into the region. This emphasizes the need for projects that incorporate freight needs on arterials and secondary routes where trucks may travel to reach their destinations. One example of this is a new route and interchange being constructed off I-40 near Black Mountain, in order to access a technology facility. By incorporating freight needs in design and construction of arterials, local roads will experience less wear and tear, thus increasing longevity and improving freight access as trucks can utilize improved roads.

The establishment of truck networks to help move freight through the nation as efficiently and safely as possible was originally mandated in 1982 as part of federal transportation legislation and was most recently updated in North Carolina in 2015. The National Highway Freight Network includes I-40 and parts of I-26 in the FBRMPO region. Trucks following these routes are traveling on roads typically built to NCDOT standards and have limited access, meaning the highways/interstates used minimize drive time.

**Freight parking has also become a concern throughout the FBRMPO region,** North Carolina, and the U.S. for truck drivers, motor carriers, truck facility operators, and public officials. Tired drivers are the leading cause of truck crashes, highlighting the importance of maintaining public rest areas and having adequate, safe truck parking areas. Approximately 20% of all crashes and 12% of all near-crashes are caused by tired truck drivers.<sup>23</sup> Jason's Law was established as part of federal legislation in 2012 to provide long-term parking for commercial motor vehicles in response to the shortages occurring nationwide. FHWA issued an updated survey in 2018 to better understand the capability of transportation agencies in providing adequate facilities.

NCDOT released a [Statewide Freight Plan study](#) in 2017, which observed truck parking to provide an analysis of off-road truck parking and offer solutions to better serve freight transportation. The study proposed that a weigh station could serve truck parking given that there are no truck parking facilities nearby and that the location is

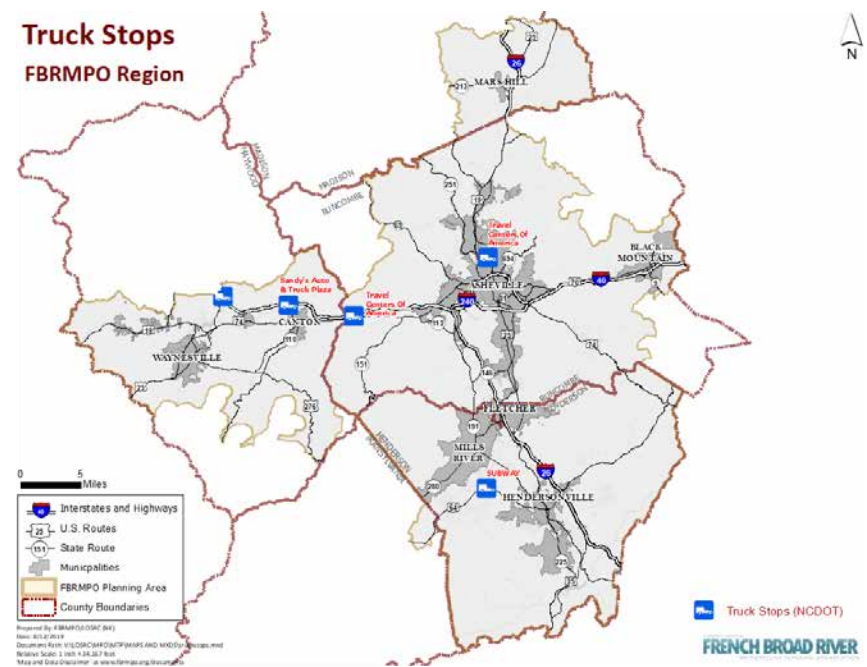
on a main freight corridor. It is a known issue that there is insufficient parking for overnight trips. This is particularly true given the sporadic locations of truck parking in the FBRMPO region. This has led to trucks parking illegally and dangerously on the shoulders of roads, onramps, exit ramps and private parking lots. In addition to the safety hazard of trucks being parked illegally, they also become liable to be ticketed or towed. The weigh station on I-26 is a good candidate for expansion to accommodate truck parking, but the study cited that it was too small to accommodate more than 2 or 3 trucks overnight. To expand parking, additional right-of-way would likely have to be purchased at this site. Along the I-40 stretch, the study showed that the closest available truck parking space was near Winston-Salem (145 miles away) because the ones in the FBRMPO region were cited as full. Some truck parking spaces do not have utilization information though they are often anecdotally reported as full. Near Candler along I-40, the travel center is ranked 9th in the state for top truck parking with 29 stopped trucks per 1,000.

Providing adequate and safe parking for trucks will likely require partnerships on both the public and private side. Some of the findings that could be used in this region are outlined in the freight plan including:

- **Partner with Truck Travel Centers seeking to expand facilities.** It was noted that the private sector controls 85 percent of truck parking in the state. Having a formalized partnership between NCDOT and travel centers would allow capital funding for maintaining existing operations, retrofitting older facilities and expanding or building new parking locations.
- **Employ technology solutions.** Utilizing existing technology has the potential to significantly improve the parking situation in the state. In order to help drivers plan their rest periods ahead of time, fixed and variable signage indicating available parking would be a low-cost solution. Other communication systems such as web-based or smartphone applications to crowd-source available parking has proven reliable elsewhere.
- Convene a Standing Truck Parking Committee. This statewide committee could help oversee the implementation of study recommendations and develop a plan to detail the actions and resources required to execute the plan.
- Coordinate with Metropolitan Planning Organizations (MPOs)

and Rural Planning Organizations (RPOs) to develop guidelines and mitigation strategies aimed at easing public opposition to private truck parking facilities. This would include mitigating public opposition to truck parking with local municipalities. As new businesses develop, the MPO can help ensure adequate truck parking and access is part of the development design process. Engaging private sector representatives and having them participate in the MPO process is important to be sure their concerns are discussed.

Map 3.7: Truck Stops



### Challenges

Having provided an overview of freight planning and the current state of freight networks throughout the FBRMPO region, the following summarize some of the primary challenges that freight faces in the region:

**Roads are not all adequately built to support freight.** Secondary routes, especially, are not built to support truck traffic; however, as technology advances and operators rely on GPS to take them to their destination quickly, secondary roads become increasingly utilized

by trucks. Even low levels of freight can negatively affect pavement. Potholes, broken pavement, and road debris pose a public safety hazard when they prevent safe roadway navigation.

**Terrain and weather challenges truck movement.** Steep mountainsides, sharp curves, and adverse weather create difficult passage for freight. In February 2019, a rockslide shut down all of I-40 through the Pigeon River Gorge for five days, leading to a major detour and economic toll for a section of the roadway that serves 6,400 trucks a day. Repairs were made so that the roadway was fully open a few months later, but the economic fall-out from the delays and detours were far-reaching as no alternative routes could conveniently serve freight traffic.

**Increased crashes on the road as a result of increased freight activity.** As congestion on the roads increases, so do crashes on roadways. For a five-year period between 2014-2018, there was a total of 3,144 crashes involving a truck in the five county region.<sup>24</sup> It is worth noting that there were 707 truck-involved crashes in 2018 compared to 493 in 2014. This accounts for 4.1% of all vehicle crashes in the region. These crashes resulted in 46 fatal or disabling injuries, which makes up 5.4% of all crashes of that severity. It is also important to note that those statistics are still significantly less than the U.S. average, where about 12% of all motor vehicle fatalities involve trucks.<sup>25</sup>

**Lack of truck parking in the region.** Truck parking serves the vital purpose of providing respite for drivers completing lengthy routes. Approximately 20% of crashes and 12% of all near-crashes are caused by tired truck drivers.<sup>26</sup> In the FBRMPO region, the lack of truck parking is well-known. Existing truck parking locations are sporadic and few. The Statewide Freight Plan study recommended partnering with truck travel centers to expand facilities, employing technological solutions, convening a standing truck parking committee, and coordinating with MPOs and RPOs to develop guidelines and mitigation strategies aimed at easing public opposition to private truck parking facilities.

## Recommendations

Considering the existing state of the freight network and the challenges faced in the FBRMPO region, the following recommendations are to be considered:

- Prioritize freight needs on secondary roads
- Improve signage throughout the region to encourage use of freight corridors
- Review and update thru-truck movement prohibitions
- Review the improvements on main thoroughfares with freight stakeholders such as manufacturers, truck companies, and municipal officials
- Improve and increase availability of truck parking
- Coordinate MPO and RPO to develop mitigation strategies to ease opposition to truck parking facilities
- Utilize existing technology to improve freight movement and problems.
- Increase mitigation measures and preventative repairs along major corridors to ensure efficient and safe freight movement throughout the region.
- Incorporate ample lane width and adequate turning radii into TIP improvement projects near industrial parks and manufacturers
- The following recommendations results from the regional freight workshop held in 2016:
  - As larger infrastructure projects including widenings and interchange improvements take place, consider construction at night and during non-peak hours to reduce traffic impacts
  - Coordination and communication to increase backhauls (returning to the origin with freight versus an empty load)
  - Address driver shortages
  - Enforcement and visibility of highway patrol needed for trucks and motorists

<sup>19</sup> <https://www.fhwa.dot.gov/tea21/summary.htm>

<sup>20</sup> <https://www.transportation.gov/fastact/freight-factsheet>

<sup>21</sup> [https://www.bts.dot.gov/sites/bts.dot.gov/files/docs/FFF\\_2017.pdf](https://www.bts.dot.gov/sites/bts.dot.gov/files/docs/FFF_2017.pdf)

<sup>22</sup> [https://ops.fhwa.dot.gov/freight/freight\\_analysis/state\\_info/north\\_carolina/truckflow.htm](https://ops.fhwa.dot.gov/freight/freight_analysis/state_info/north_carolina/truckflow.htm)

<sup>23</sup> [https://connect.ncdot.gov/projects/planning/Statewide-Freight-Plan/Documents/Truck\\_Parking\\_Study\\_Final.pdf](https://connect.ncdot.gov/projects/planning/Statewide-Freight-Plan/Documents/Truck_Parking_Study_Final.pdf)

<sup>24</sup> <https://ncvisionzero.org/visualizations/crashquerytool>

<sup>25</sup> <https://www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus-crash-facts-2017>

<sup>26</sup> [https://connect.ncdot.gov/projects/planning/Statewide-Freight-Plan/Documents/Truck\\_Parking\\_Study\\_Final.pdf](https://connect.ncdot.gov/projects/planning/Statewide-Freight-Plan/Documents/Truck_Parking_Study_Final.pdf)

## THE ENVIRONMENT & RESILIENCY

### Definition

Resiliency refers to “ the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.”<sup>27</sup> In the world of transportation, resilience also incorporates “reducing vulnerability and ensuring redundancy and reliability to meet essential travel needs”<sup>28</sup> and making sure that a system can “quickly respond to unexpected conditions and return to its usual operational state”<sup>29</sup>. It is challenging to measure resilience proactively; however, in the wake of extreme weather and public health crises, including resilience in long-range transportation plans becomes more important. Resilience planning is also essential for equitable responses to disruptions. Natural disasters, vulnerabilities, and other events that disrupt transportation often produce disparate effects on disadvantaged populations. It is important to consider the way resiliency planning will affect various communities.

### Current Efforts/Conditions

Rural and remote parts of the French Broad River MPO region can be difficult to access when natural disasters such as rock slides and land slides strike. Increased rainfall and development on slopes has increased the portion of the region susceptible to natural disasters. When the road network is limited, first responders face greater challenges. A flooded road can result in a lengthy detour that can be fatal when police, fire, or paramedics are trying to respond to an emergency. In addition to natural disasters, the French Broad River MPO aims to be resilient through other security threats. Buncombe, Haywood, Henderson, and Madison Counties have adopted Hazard Mitigation Plans. These plans were developed in coordination with transportation, law enforcement, planning, and other operational agencies within each county. Additionally, each county operates emergency 9-1-1 communications systems. This is critical in order to prevent the occurrence of street naming and address conflicts that can impact emergency response times.

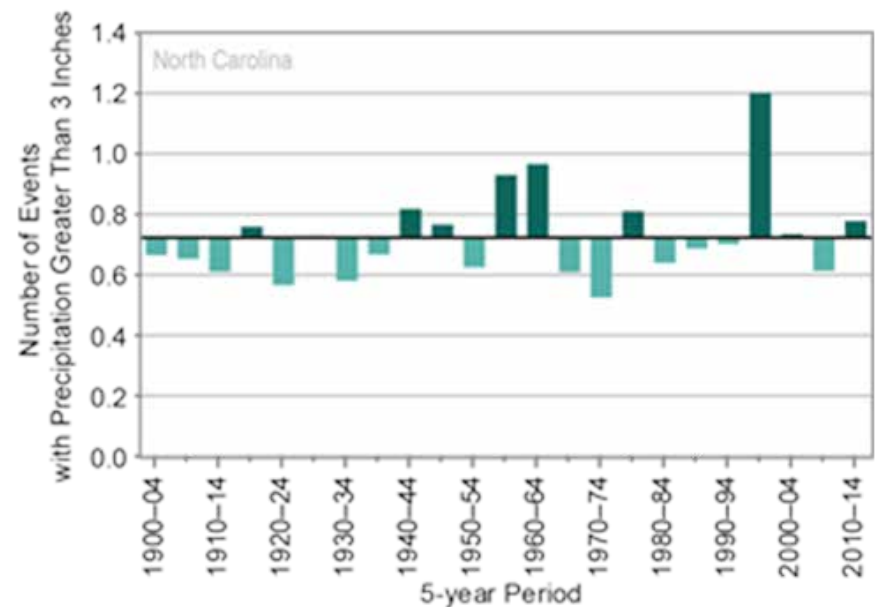
### Vulnerabilities

- **Flooding** - The mountains and steep slopes contribute to floodplain development in and along rivers and streams. This land use patterns results in higher occurrences of flooding for structures and transportation facilities. Flooding leads to extensive road closures, bridge failures, and expensive damage. Local government land use planners, emergency managers, NCDOT,

NC Department of Environment and Natural Resources, and other stakeholders work to identify potential impacts and seek solutions or redesign opportunities

- **Slope Failure/Rock Slides** - The region's mountainous terrain leads to a prevalence of roads in steep, narrow valleys subject to rockslides or slope failures. I-40 in the Pigeon River Gorge is particularly concerning, since there have been numerous landslides resulting in road closure, traffic re-routing, and slope stabilization. Chronic problems like that highlight the importance of considering safety from rock slides.
- **Wildfires** - Wildfires disturb ecosystems and create negative impacts on communities. Wildfires become more likely in drought conditions and can have more extreme impacts when there is a lack of fuel management and vegetation.
- **Wildlife Collisions** - Wildlife crashes occur in the urbanized area, as it is located close to large areas of preserved natural land and critical wildlife corridors. MPO staff consider innovative techniques to accommodate wildlife to reduce danger to drivers and at-risk wildlife.

Figure 3.8: Observed Number of Extreme Precipitation Events





## Roadway Impacts on the Environment

While the environment can have major impacts on the region's transportation network through flooding, wildfire, and landslides, the transportation network can also have a major impact on the environment. Better planning to reduce and mitigate impacts on the environment are especially important given the natural assets of the region. One of the major assets of Western North Carolina is its pristine waterways, highlighted by the presence of trout streams. Trout require cool, unpolluted streams to prosper and propagate. The presence of trout in Western North Carolina illustrates the work that has gone into environmental protection from communities and non-profits in the region.

To help maintain these pristine waterways, more can be done to reduce stormwater impacts from roadways. As rain falls on roadways, the water is carried into either a ditch or a curb and gutter system and eventually makes it way into nearby creeks, streams, and rivers- often carrying pollutants that accumulate on the roadbed. The stormwater can negatively impact through two primary means: (1) transmitting unmitigated pollutants into the region's waterways; and (2) increasing the flow of stormwater into creeks, streams, and rivers that causes erosion and warms water. While NCDOT and other agencies bear the brunt of responsibility to make sure stormwater impacts are minimized, but more can be done in planning to make sure projects are properly scoped to include stormwater mitigation elements and cost estimates reflect any additional work required.



Roadways also play a major impact on wildlife movements in and around the region. Non-profits and land conservancies have played a major role in mapping wildlife migration patterns, including elk, black bear, and deer, and have found numerous conflict points on major roads including I-40, I-26, US 74A, and US 19. While some work has been done in the region, especially on I-40 and I-26, to provide better wildlife crossings, numerous collisions happen every year involving wildlife. I-26 Wildlife Crossing in Madison County, GroWNC Regional PlanAs projects are scoped and developed, more can be done to improve the safety of known wildlife areas for the protection of the wildlife as well as roadway users.

## Ongoing Efforts

Land of Sky Regional Council currently operates an on-going resiliency effort to analyze asset/threat pairings throughout the region. The Land of Sky Regional Council based its analysis on the best available information for specific threats and assets in the region, presenting quantitative results based on data with uncertainties and assumptions<sup>30</sup>.

NCDOT has a resiliency committee that is organized at the state level.

## Challenges

**Geographic and network constraints limit the easily accessible alternate routes.** The lack of a grid system inherently limits the facility of planning for emergencies such as evacuation routes. For example, the Duke Energy natural gas plant is the only power plant in the region and is also located near a major highway. In the case of an emergency such as an explosion at the plant, access to I-26 would be critical and might be restricted.

**Resilience planning must continuously evolve, directly anticipate failure, be inclusive, and integrate across the transportation network.**

Planning for resiliency requires a comprehensive and holistic approach, considering every angle and collaborating with community groups and various agencies for the best outcome. It requires a systems-level perspective, which can be challenging because different organizations have different goals. Because there is not a one-size-fits-all approach to resilience, strong communication and cross-sector planning is crucial.

**Natural disasters cannot truly be anticipated or predicted—such as infectious diseases.** Existing Hazard Mitigation Plans in the region need to be updated, especially in the wake of the COVID-19 pandemic. The North Carolina Hazard Mitigation Plan, updated in 2018, included infectious diseases in their risk assessment. It seems prudent for counties in the French Broad River MPO region to update their plans by referencing the North Carolina Hazard Mitigation Plan. Ultimately, public health threats can occur anytime, so professionals in the field of public health should be included in the conversations regarding response.

**Resiliency planning requires a big imagination to plan for any and every possible disaster.**

### Recommendations

We must (a) find a way to rank resiliency issues as they relate to transportation, (b) determine how to prioritize projects whose main purpose is to address resiliency issues.

- Conduct a vulnerability assessment to create a foundation for a regionwide Hazard Mitigation Plan.
- Include resiliency in scoring projects to make sure that security components are explicitly addressed.
  - Create or maintain alternate routes to key transportation corridors, and repair and replace bridges that serve as major connection points or could be targets.
- Consider identifying metrics to measure resilience based on the components of **robustness** (measured by hours of congestion, travel time index, pavement condition, and volume of congestion), **redundancy** (measured by distance to alternate routes, percentage of corridor with alternate routes, congestion on alternate routes, adjacent park-and-ride lots, availability of alternate routes, and transit alternatives), **resourcefulness** (measured by average incident duration, funding availability, variable message signs, use of alternate routes, weather mitigation capability, and construction projects), and **rapidity** (measured by average construction project duration and time until reopened).
- Encourage transit operators to have plans in place to respond to epidemics and public health emergencies.

- Work with state and local partners to identify and secure funding for recurring hotspots for natural disasters like mudslides, debris flow, and flood prone roadways.
- Address gaps in local and statewide plans for emergency planning and security elements as it relates to transportation.
- Work with transit agencies to identify and implement security measures at the appropriate scale for their fleet based on ongoing research, including identifying and securing funding for communications technology such as automated vehicle locator systems and security cameras.
- Identify transportation system elements for evacuation planning including key roadway corridors and the use of transit vehicles to evacuate all roadway users.

<sup>27</sup> SDOT, Federal Highway Administration. (2014). FHWA Order 5520: Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events. Retrieved from <https://www.fhwa.dot.gov/legisregs/directives/orders/5520.cfm>.

<sup>28</sup> Minnesota DOT. (January, 2017). Minnesota Statewide Multimodal Transportation Plan: 2017 to 2036. Pp. 90. Retrieved from [http://minnesotago.org/application/files/2614/8614/1428/SMTP\\_PlanAppendices\\_Final\\_Jan2017\\_small.pdf](http://minnesotago.org/application/files/2614/8614/1428/SMTP_PlanAppendices_Final_Jan2017_small.pdf)

<sup>29</sup> Wisconsin DOT. (2009). Connections 2030: Statewide Long-Range Transportation Plan. Pp. 9-2. Retrieved from <https://wisconsin.gov/Documents/projects/multimodal/conn2030/2030-9.pdf>

<sup>30</sup> Hall, N., Fox, J., and D. Michelson. Economic Resilience Exposure Analysis: Phase 1 Report for the Land of Sky Regional Council. Asheville, NC: UNC Asheville's National Environmental Modeling and Analysis Center, June 2018. Retrieved from [http://www.landofsky.org/pdf/LGS/LOS\\_Resilience\\_Exposure\\_Phase1\\_Report.pdf](http://www.landofsky.org/pdf/LGS/LOS_Resilience_Exposure_Phase1_Report.pdf).

## PUBLIC TRANSIT

Public transit creates mobility choices for everyone in a community, especially for underserved populations such as the elderly, differently abled, and economically disadvantaged. Transit is an efficient, low-cost, high-capacity way to connect people to services, which supports the economy, improves the quality of life for a community, facilitates freight movement, and reduces environmental impacts. Throughout the French Broad River MPO region, 90-100% of public transit riders are transit dependent, highlighting the importance of renewing the commitment to equitable transit that attracts new riders.

For every dollar invested in public transit, it is estimated that \$4 are generated in economic returns, and approximately 50,000 jobs are created with every \$1 billion investment.<sup>31</sup> Transit riders save on transportation costs annually, which are estimated to be the second highest costs to U.S. residents after housing.<sup>32</sup> In addition to the economic and cost-saving benefits, public transit offers a safer form of mobility than SOVs. According to APTA, transit trips are 10 times

Figure 3.9: Transit Flowchart

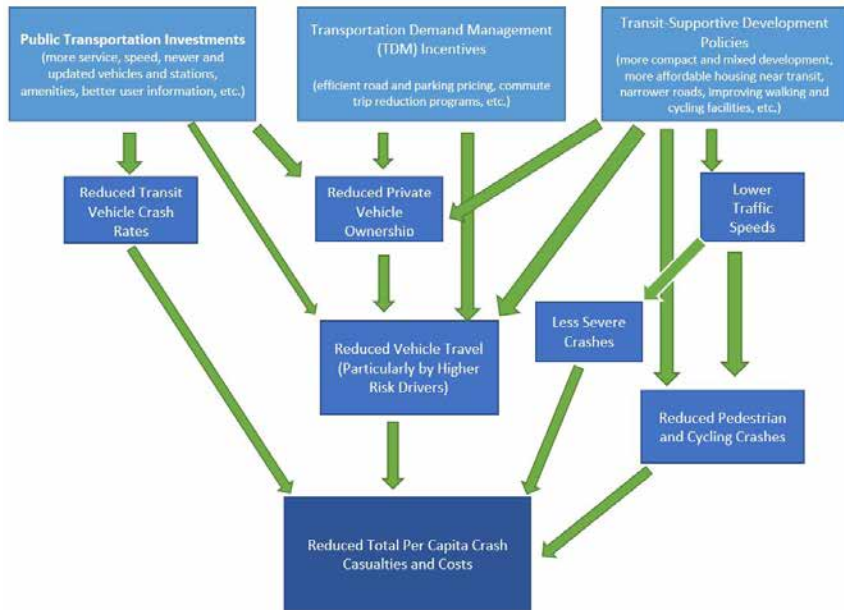
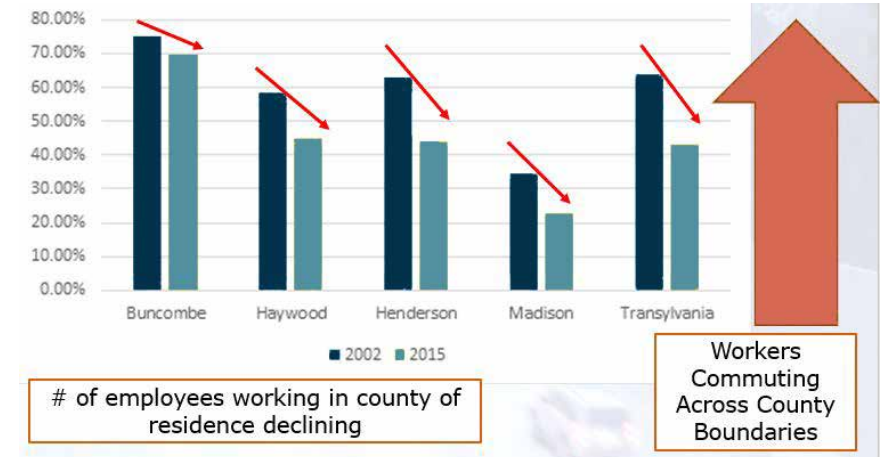


Figure 3.10: Residents Living and Working in the Same County



safer per mile than car trips, because of the urban design features that increase ridership and decrease higher-risk drivers.<sup>33</sup>

Public transit positively affects community health outcomes. SOVs encourage sedentary behavior, which contributes to lifestyle-related illness such as diabetes, obesity, and cardiovascular problems. By opting to take transit, physical activity is necessarily increased, which impacts health outcomes.<sup>34</sup> Since transit is a high-capacity form of transporting people, it offers the potential to reduce traffic congestion and in turn reduce air pollution caused by idling vehicles.

### Current Conditions

The French Broad River MPO region's population is increasing by 1.4% per year, which will lead to more vehicles on the road, increased congestion, and potentially new transit riders.<sup>35</sup> The number of residents that commute across counties for work is also growing. Based on 2017 data, 28,988 individuals from surrounding counties drive to Buncombe County for work each day and 10,659 people commute from Buncombe County to surrounding counties daily.<sup>36</sup>

Meanwhile, the demography of the region indicates that the older adult population is growing, which indicates the future need for improved paratransit services. Considering commuting patterns and changing demographics is essential in planning the future of transit.

Since the publication of the 2040 MTP, there have been many ongoing initiatives taken in the realm of public transit throughout the French Broad River MPO region including:

- **Regional Transit Feasibility Study.** As recommended in the 2040 MTP, a Regional Transit Feasibility Study is in the early stages of development. In early 2020, the French Broad River MPO issued an RFQ for this study, which will analyze opportunities for the establishment of a Regional Transit Authority to provide cross-county transit routes.
- **Asheville Transit Master Plan (2018).** The City of Asheville updated the Transit Master Plan, aimed to serve as a guide on topics like how and where ART would provide service while ensuring safety, convenience, and accessibility in public transportation for all residents, workers, and visitors. The plan provides a vision for long term service expansion and infrastructure needs. The first changes based on the updated TMP occur in FY2020—extension of service hours on all routes until 10:30pm on Sundays and holidays, extension of service hours on all routes to 10pm on weekdays and Saturdays, expansion of service to operate 365 days a year, route changes, and Fare Free Weekend throughout FY 2020.
- **Asheville in Motion (AIM).** The underlying philosophy guiding this 2016 mobility plan is the idea that vitality, growth, and quality of life are “best achieved when community mobility is maximized.”<sup>37</sup> AIM provides a cohesive strategy and method for prioritizing transportation projects with the goal of improving multimodal connections by working with existing bicycle and transit plans. This plan positioned Asheville to gain success against defined goals and metrics that are understandable and align with residents’ opinions.
- **Haywood County’s URBAN Fixed Route.** Haywood Public Transit rolled out a new fixed route service, designed as a route where riders walk to the nearest stop. There are two routes: Black Bear EAST serves Clyde and Canton, Mountaineer WEST serves Waynesville and Hazelwood. Mountain Projects, Inc. serves as the Central Hub.
- **CTABs.** Each county in the French Broad River MPO region has County Transportation Advisory Board meetings at least once every quarter. These groups are comprised of representatives from public human service agencies, transportation providers, public and business sectors, and government representatives.

- **5307 Suballocation Study.** The French Broad River MPO completed an Urban Transit Funding Formula Study in 2017 that covered Buncombe, Haywood, and Henderson Counties, including the City of Asheville. After the 2010 census reduced 5311 rural transit funds in several counties, the question was raised about how to redistribute 5307 urban funding to accommodate the needs of Asheville, Buncombe, Henderson, and Haywood. One of the most significant results of this study was the decision to set aside a percentage of 5307 funds for Job Access Reverse Commute (JARC) and then allocate a percentage of those funds to Haywood County.
- **Statewide Locally Coordinated Plan.** In 2018, NCDOT published a Statewide LCP to satisfy Section 5310 programming requirements, achieve greater efficiency, leverage limited resources, and reduce barriers to transportation service by expanding mobility options.

Taking public transit in the French Broad River MPO region differs based on where you are and where you are going. Three systems manage a fixed-route, running on a designated route with a set schedule. The City of Asheville’s transit system—Asheville Rides Transit (ART)—operates with the most frequency, with most routes running hourly. ART has a transit mobile application integrated with Google Maps, and provides real-time text updates. Haywood County (through Mountain Projects), Henderson County and Buncombe County operate fixed routes as well.

Each county in the French Broad River MPO region operate demand response transit that serves rural, elderly, and disabled populations. Demand-response service is shared transportation based on passenger demand rather than a schedule set on repeating the same route. In the most rural counties, demand response services are in high demand but with limited resources to provide services.

Fares for public transit vary based on the system. The table below shows the cost of standard, one-way fares in each system.

### **Buncombe County**

The two systems within Buncombe County serve the largest population and make up a majority of trips in the region.

- Mountain Mobility, established in 1989, provides deviated fixed-route, demand response, and subscription services. There are

Table 3.7: Cost of Standard, One-Way Fares

Transit System	Standard, One-Way Fare
Asheville Redefines Transit	\$1.00
Mountain Mobility	\$0.50
Apple Country Transit	\$0.75
Haywood Public Transit	Haywood-Buncombe - \$3.00
Madison County Transportation Authority	Madison County - \$2.50 Weaverville - \$3.00 Asheville - \$6.00

currently three deviated fixed routes called Trailblazer Routes that run to Black Mountain, Enka-Candler, and North Buncombe. Mountain Mobility also offers ADA paratransit in the City of Asheville within ¾ miles of ART fixed routes. In 2018, Mountain Mobility completed 131,689 unlinked trips, or total boardings on individual vehicles.<sup>38</sup>

- Asheville Rides Transit boasts the most extensive fixed-route service in the region. ART currently operates 17 routes that run 6 days a week—8 of those routes also run on Sundays. The routes begin and end at a central location in downtown Asheville. In 2018, ART provided 1.9 million unlinked trips.<sup>39</sup>

### Haywood County

- Haywood Public Transit contracts with Mountain Projects, Inc., a nonprofit organization, to provide demand response service throughout Haywood County and to Buncombe County. Haywood Public Transit launched the URBAN Fixed Route with two separate routes throughout Haywood County.

### Henderson County

- Henderson County maintains two cooperative transit services—Apple Country Public Transit, which is managed by the County, and Apple Country Transportation, which provides rural transit services through Western Carolina Community Action (WCCA.) Apple Country Public Transit provides urban fixed-route transit service with complimentary paratransit, including a route that connects to Asheville Rides Transit (ART) near the Asheville Regional Airport.

Apple Country Transportation maintains rural demand-response transit services, independent of the County."

### Madison County

- Madison County Transportation Authority provides county-wide demand response service, working closely with senior-care providers to offer transportation for individuals seeking medical care and general on-demand trips.

### Challenges

The transportation systems in the French Broad River MPO region face challenges that highlight the need for connected, reliable, and quality public transit. These challenges can be addressed in part by implementing transit capital investments, improving service, and introducing transit-supportive policy to move people along corridors and improve regional connectivity.

**Population growth carries numerous implications for transportation development.** Growth presents both opportunities and challenges for transportation development that can be addressed through implementing capital transit investments, improving service, and creating transit-supportive policies to move more people along corridors and to improve regional connectivity. As the population grows, so does roadway use, VMTs, and drivers. This leads to higher demand on all modes of transportation, increased congestion, and increased demand for alternative modes of transportation. Public transportation creates the opportunity to reduce the necessity of separate trips by SOV in urban areas. In the face of growth, transit becomes the most efficient mode of transportation provided that a system operates with enough frequency and reliability. Urban areas are growing more quickly than rural areas. According to the North Carolina Office of State Budget and Management, 51.5% of population growth from 2019-2038 will be concentrated in Divisions 5 and 10 (Raleigh-Durham and Charlotte)<sup>40</sup>. Thus, transportation planners must adjust and guide travel demand to avoid being overwhelmed with more roads, traffic, and emissions as a result of geographic preferences. Traffic volumes are growing faster than facilities, so determining policies and best practices for improving transit should be determined.

**Financial constraints limit transportation planning and expansion.** Transportation funding is not sufficient to meet demand in many places. Funding shortfalls pose a problem for public transportation.

There has been a decrease in the purchasing power of federal gas tax revenue due to inflation, more fuel efficient cars, and the fact that the gas tax has remained unchanged since 1993. Additionally, operating expenses have increased 39.8% since 2009 (NTD). As funding and ridership decrease, it becomes harder to maintain current levels of service and limits potential service expansion. However, creative funding mechanisms can be employed to address transportation-funding shortfalls.

**Ridership has decreased in recent years.** Many transit agencies across the country have seen decreases in ridership over the last several years and that trend can be seen in transit ridership in the French Broad River MPO. There are several ideas for why this is happening from limited transit resources becoming stretched too thin to increases prosperity leading to more people buying cars and not utilizing transit as much.

Table 3.8: 2014-2018 Annual NTD Ridership Data

2014-2018 Annual NTD Ridership Data					
	Asheville	Buncombe	Haywood	Henderson	Madison
2014	1,430,959	162,100	37,414	108,282	25,038
2015	1,458,306	165,382	39,992	110,611	23,892
2016	2,135,879	158,940	39,649	100,963	15,949
2017	2,125,214	146,079	38,132	90,829	18,332
2018	1,964,451	131,689	31,925	76,541	18,569

\*Numbers derive from NTD data and county reporting.<sup>41</sup>

**Cross-County Trips By Transit Can be Lengthy.** As employment centers and residential nodes crop up in areas without reliable transit, this challenge becomes more pressing. The MPO continues to hold meetings with the Transit Operators Workgroup in order to facilitate conversation and cooperation between counties. Additionally, the MPO will begin the process of conducting a Regional Transit Feasibility Study in order to gain insight into potential efforts that can be made to facilitate cross-county transit routes.

## Recommendations

- Increase coordination between transit agencies
- Complete Regional Transit Feasibility Study and consider the development of a Regional Transit Authority.
- Continue conversations with regional transit operators regarding how to best serve people throughout the entire French Broad River MPO region.
- Maintain and improve existing public transit services.
  - Add more park and ride lots.
  - Consider transit partnerships with employers to reduce congestion in central business districts.
  - Improve walkability and bikeability alongside transit improvements to address “first and last mile” trips that are currently unsafe near transit stops that lack bike/pedestrian infrastructure.
- Enhance convenience, attractiveness, and efficiency of service.
  - Study feasibility of fare-free service.
  - Increase frequency—ideally to every 15 minutes for fixed route service on high demand corridors.
  - Utilize tactical outreach to appeal to more potential riders.
- Explicitly consider transit in land use planning and development.
  - Continue conversations with land use planners throughout the region to determine how to work in tandem and more effectively plan transportation infrastructure.
- Consider reviving a streetcar in Asheville.
  - Since the infrastructure existed in Asheville until 1934, resuming a service that caters to tourists and downtown movements could serve to further decrease the number of cars within the city, attract more visitors to the region, and encourage locals to try public transit.

<sup>31</sup> National Express Transit (2017, July 18). g Benefits of Public Transit. Retrieved from [nationalexpresstransit.com](https://www.nationalexpresstransit.com/):

<https://www.nationalexpresstransit.com/blog/g-benefits-of-public-transportation>

<sup>32</sup> FHWA. (2017, May 16). Transportation and Housing Costs. Retrieved from [fhwa.dot.gov](https://www.fhwa.dot.gov/livability/fact_sheets/transandhousing.cfm): [https://www.fhwa.dot.gov/livability/fact\\_sheets/transandhousing.cfm](https://www.fhwa.dot.gov/livability/fact_sheets/transandhousing.cfm)

<sup>33</sup> APTA. (2016). The Hidden Traffic Safety Solution: Public Transportation. Retrieved from [apta.com](https://www.apta.com/wp-content/uploads/2020/02/Final-Report_LandUseStudy_013020.pdf): [https://www.apta.com/wp-content/uploads/2020/02/Final-Report\\_LandUseStudy\\_013020.pdf](https://www.apta.com/wp-content/uploads/2020/02/Final-Report_LandUseStudy_013020.pdf)

<sup>34</sup> Margolis, J. (2015, Oct. 28). Why Taking the Bus is Better Than Walking for our Health than Driving. Economics <https://www.pri.org/stories/2015-10-28/why-taking-bus-better-our-health-driving>

<sup>35</sup> French Broad River MPO. (2020). Land Use Study. Retrieved from [frenchbroadriv-ermop.org](http://frenchbroadriv-ermop.org/wp-content/uploads/2020/02/Final-Report_LandUseStudy_013020.pdf): [http://frenchbroadriv-ermop.org/wp-content/uploads/2020/02/Final-Report\\_LandUseStudy\\_013020.pdf](http://frenchbroadriv-ermop.org/wp-content/uploads/2020/02/Final-Report_LandUseStudy_013020.pdf)

<sup>36</sup> U.S. Census Bureau. (2017). LEHD Origin-Destination Employment Statistics (2002-2017) [computer file]. Washington, D.C.: U.S. Census Bureau, Longitudinal-Employer Household Dynamics Program [distributor], accessed on 12/19/19 at <https://onthemap.ces.census.gov/LODES74> [version]

<sup>37</sup> City of Asheville. (2016). Asheville in Motion: City of Asheville Mobility Plan. Retrieved from <https://drive.google.com/file/d/1-CWm7GvxcCDu6UORlniakhWFDHdloCy/view>

<sup>38</sup> National Transit Database (2018) at <https://www.transit.dot.gov/ntd/transit-agency-profiles/buncombe-county>

<sup>39</sup> National Transit Database (2018) at <https://www.transit.dot.gov/ntd/transit-agency-profiles/city-asheville>

<sup>40</sup> North Carolina Office of State Budget and Management, Population Projections, Vintage 2018.

<sup>41</sup> FOOTNOTE ABOUT APC DATA DIRECTING TO APPENDIX OR JUST SUMMARIZED HERE

## BICYCLE/PEDESTRIAN

Walking and bicycling form critical pieces of the French Broad River MPO's region transportation system. Creating an integrated, multimodal strategy ensures a system wherein each mode of transportation supports the others, moving people and goods safely, effectively, and efficiently. Bicycle and pedestrian travel are localized modes of transportation. Thus, its infrastructure centers around nodes of activity. While roads were originally designed for pedestrian and equine travel, over the last century, communities throughout the U.S. have been designed and built for motorized transportation, leaving the needs of pedestrians and bicyclists inadequately addressed by creating a sprawling, disconnected street network.<sup>42</sup>

The French Broad River MPO region boasts activity centers and cities that are inherent places for active transportation. Enhancing bicycle and pedestrian facility serves to improve accessibility of services, strengthen local economies, and increase tourism. An influx of growth in the region has led to a demand for better bicycle and pedestrian infrastructure. A 2011 study showed that bicycle/pedestrian infrastructure project investment created more jobs than projects for cars alone.<sup>43</sup> For every \$1 million invested in bike projects, 11.4 jobs were created—46% more jobs than road projects for cars. Small



business owners also ranked proximity and availability of open space and parks as the most important factor in choosing their location.<sup>44</sup> Investment in bicycle and pedestrian infrastructure also improves public health by reducing the environmental impact caused by SOVs and encouraging physical activity, which produces positive health outcomes in communities. Design contributes to an individual's transportation decisions, so prioritizing bicycle and pedestrian infrastructure could ultimately alter commuter patterns.

### Current Conditions

Communities in the French Broad River MPO have placed a high-priority on improving bicycle and pedestrian infrastructure. Most local governments have adopted bicycle and pedestrian plans and the region has adopted the Blue Ridge Bike Plan, a bicycle plan that covers seven counties in Western North Carolina.

The interest in active transportation is a reflection of the region's character. The region is made-up of walkable downtowns, long hiking trails that stretch into the mountains, and extensive mountain bike networks that attract people from around the world. Residents and visitors want to enjoy the region's environment and outdoor assets-providing infrastructure that facilitates an active and sustainable lifestyle is a part of that.

However, while the region can be an exciting and enjoyable place to walk and bike, safety concerns are a major problem in the region. Bicycle and pedestrian crashes are trending distinctly upwards throughout the region and roadway fatalities disproportionately skew towards bicyclists and pedestrians. Between 2014 and 2018, roughly 15% of roadway fatalities in the five-county region involved bicyclists and pedestrians.

The disproportionate danger to people walking and biking also poses a problem with equity. The region has an aging population, both one that is encouraged to maintain or engage in an active lifestyle for individual health or may not be able to drive a vehicle anymore. The region also has a large population without access to vehicles, individuals with disabilities, and low-income households. These groups are more likely to make trips by walking and biking and require safe infrastructure to access services and destinations. With limited safe infrastructure for walking and biking in the region, individuals in these groups may either be limited in their ability to access jobs and services or may be risking themselves to make those trips.

Figure 3.11: Pedestrian Crashes in the 5-County Region

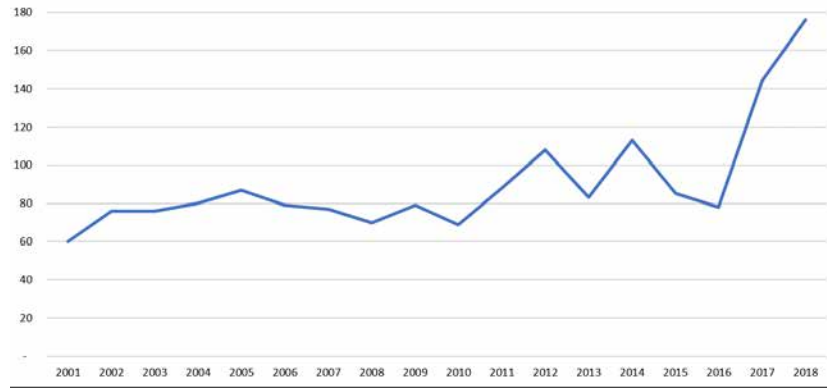
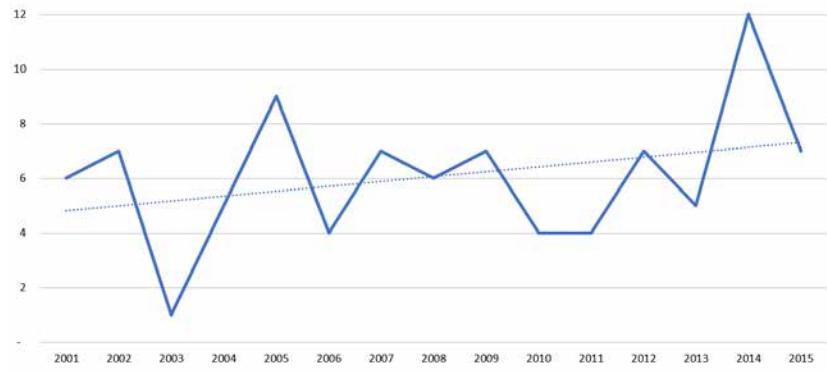
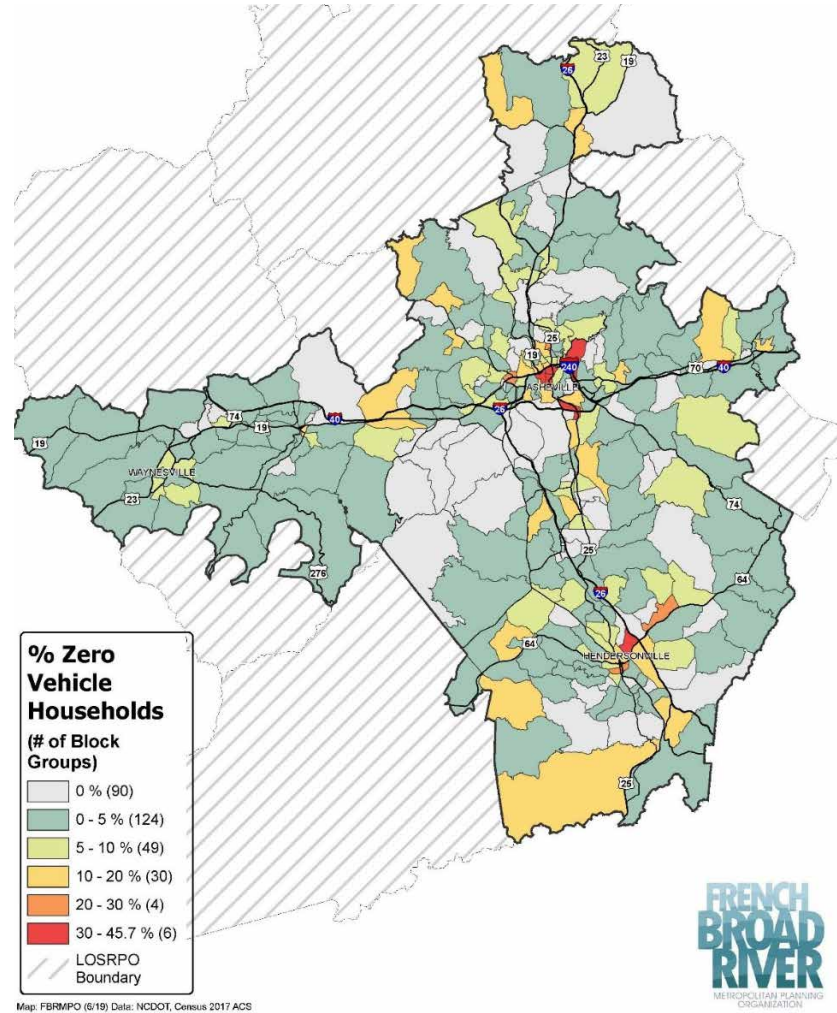


Figure 3.12: Pedestrian Fatalities in the 5-County Region



The equity issue is further exacerbated by the mechanisms for funding bicycle and pedestrian infrastructure in North Carolina and observed growth patterns. The vast majority of bicycle and pedestrian infrastructure in North Carolina resides within municipalities. There are no county roads in North Carolina and therefore counties don't generally have transportation departments. However, some of the most quickly growing parts of the region are in urbanizing parts of counties, just outside of municipalities. These were areas that used to fall under municipalities' extraterritorial jurisdictions (ETJs) that would often require sidewalks from developers before the area was annexed. However, annexation in North Carolina is a difficult endeavor and some communities no longer have ETJs. So in urbanizing parts

Map 3.8: Percent of Households: Zero Vehicle Households



of counties, this leaves residents much less likely to have safe infrastructure for walking and biking and a local government that has not historically provided transportation infrastructure. In those areas where housing is more affordable, more low-income residents are moving that may need to make trips by walking or biking. In sum, the places where many low-income residents are moving are the same places that are the least likely to accommodate affordable means of active transportation.



Pedestrian and bicycle infrastructure in the region can be extensive in places, but more is needed in order to provide a safe network that encourages residents and visitors to make trips by walking or biking. To date, there are 583 miles of sidewalks throughout the French Broad River MPO region, but only 15 miles of disconnected multi-use paths and one community with on-street bike lanes.

Growth patterns in the region also illustrate a problem with convenience that may deter many residents from making trips by walking or biking. Many areas that are growing the most quickly are not downtowns, but formerly rural areas being developed. In the US, these areas are often longer distances from jobs and services, lengths that are not normally covered by walking or biking.

### Initiatives and Plans

Communities in the French Broad River MPO have invested heavily in planning for improved bicycle and pedestrian networks. Bicycle and pedestrian plans in our region include:

- Oklawaha Greenway Study
- Buncombe Greenway Master Plan
- Haywood County Comprehensive Bicycle Plan
- NC 280 Corridor Bikeway Study
- Ecusta Rail Trail Planning Study & Economic Impact Analysis
- Bent Creek Greenway Feasibility Study: Brevard Road/191 Corridor
- Blue Ridge Bike Plan
- Black Mountain Bike Plan
- Black Mountain Pedestrian Transportation Plan 2015 Update
- Waynesville Greenway Feasibility Study
- Waynesville Comprehensive Pedestrian Plan (2010)
- Henderson County Greenway Master Plan 2017
- Apple Country Greenways Plan
- Laurel Park Bicycle and Pedestrian Plan
- Asheville Pedestrian Master Plan
- Asheville Bike Share Study
- Asheville Bicycle Master Plan
- Asheville-in-Motion Multimodal Plan
- Hendersonville Bicycle Plan
- Hendersonville Pedestrian Plan
- Fletcher Greenway Plan
- Fletcher Bike Ped Plan
- Clyde Pedestrian Plan
- Mars Hill Pedestrian Plan
- Canton Bicycle and Pedestrian Plan
- Mud Creek Greenway Study

The MPO has also undertaken a study to envision a regional trail network that can attract tourists and enhance regional connectivity for residents. This regional trail network has been dubbed The Hellbender, named after the giant, aquatic salamanders native to our region. As of now, it would include the US 70 multi-use path, Oklawaha Greenway, NC 280 multi-use path, Bent Creek Greenway, NC 251 Greenway, Hominy Creek Greenway, Ecusta Rail Trail, US 19/23 Trail, and an imagined trail to Mars Hill. The total regional trail system would consist of 146 miles. As of now there are 12 built miles, 18 potentially funded miles, 8 miles being engineered, 45 miles being studied, 49 miles in local plans, and 17 miles not in local plans.

In the midst of regional growth, it is important to plan for more walkable and bikeable communities, both to improve safety for those who need to access jobs and services by walking and biking but to help accommodate more trips without the use of a car. Some studies suggest it is more dangerous to walk and bike in the U.S. than it is to drive. According to a 2003 study, per kilometer traveled, pedestrians are 23 times more likely to get killed than car occupants and bicyclists are 12 times more likely to get killed.<sup>45</sup> Between 2008 and 2017, pedestrian and bicyclist fatalities increased by 32% while overall traffic fatalities decreased by 0.8%.<sup>46</sup>

### 2019 NCDOT Complete Streets Update

NCDOT updated their Complete Streets guidelines in 2019 in order to better accommodate multi-modal transportation when building new projects or making improvements to existing infrastructure. This policy is a requirement for NCDOT planners and designers to consider and incorporate multimodal facilities (sidewalks, bike lanes, paved shoulders, etc) in the design and improvement of roadway projects. The policy defines the cost share of these improvements as well.

The key to ensuring that NCDOT pays for Complete Streets elements of roadway projects is making sure that the elements are in an adopted plan. Numerous communities in the French Broad River MPO have locally adopted bicycle and pedestrian plans but, with the update to the complete streets document, every community should consider producing a plan and keeping it updated.

The NCDOT update to Complete Streets policy will have the greatest impact in communities that have documented multimodal needs in existing plans and could not afford to contribute to local share

Table 3.9: Complete Streets Cost Share

Complete Streets Cost Share			
Facility Type	In Plan	Not in Plan, but Need Identified	Betterment
Pedestrian Facility	NCDOT pays full	Cost Share	Local
On Road Bicycle Facility	NCDOT pays full	NCDOT pays full	Local
Side Path	NCDOT pays full	Cost Share	Local
Greenway Crossing	NCDOT pays full	Cost Share	Local
Bus Pull Out	NCDOT pays full	Cost Share	Local
Bus Stop (pad only)	NCDOT pays full	Cost Share	Local

previously. This step towards improving multimodal infrastructure is expected to significantly improve regional bicycle and pedestrian connectivity.

### Challenges

**Limited funding.** The prioritization of transportation projects calls for multiple rounds of scoring submitted projects on select criteria. Currently, this process primarily funds highway projects. The SPOT process puts a 10% cap on non-highway projects, including rail and aviation, and only requires a minimum of 4% of funding to go towards non-highway projects. Other sources of funds generally require a match from local governments, which can be barriers to towns with smaller tax bases. While a 20% local match does not sound unmanageable, bicycle and pedestrian infrastructure costs have continued to increase. For example, the average cost per mile of a greenway is \$1 million. For smaller communities, a local match of \$200,000 can be burdensome.

**Steep, mountainous topography.** The natural landscape of the French Broad River MPO region makes planning for and constructing bicycle and pedestrian infrastructure challenging. Terrain influences design and construction, making connections difficult. The steep nature of some of the region's streets attracts avid cyclists and deters infrequent cyclists. Adding infrastructure on or near mountainous roads can be difficult and expensive.

**Limited Right of Way.** In addition to the challenges posed by the landscape throughout the French Broad River MPO region, narrow roads restrict right of way in many areas. With narrow right-of-way, the space available for bicycle and pedestrian facilities is significantly limited, requiring more creative solutions to safely accommodate all modes.

**Land-use patterns.** Sprawling development patterns have generally encouraged the use of cars for all trips by spreading out residents from access to jobs and services, producing longer and longer trips. Not only does urban sprawl make trips by walking and biking less convenient but adds a degree of difficulty to effectively producing infrastructure that reaches important community destinations.

**Lack of documentation on usage and demand.** It is difficult and unreliable to measure bike and pedestrian infrastructure usage. Bicycle and pedestrian planning, as planning for cars, requires data to support the planning for new infrastructure. Collecting regular bicycle and pedestrian counts is necessary to inform planners about current infrastructure utilization.

### Recommendations

Improving bicycle and pedestrian infrastructure and travel offers a simple solution for a host of complex problems. Bicycle and pedestrian investments enhance connectivity, which can expand an overall transportation network and improve mobility and accessibility regionwide. Creating a walkable and bikeable environment starts with a supportive built environment. Studies have shown that bicyclists go out of their way to ride on infrastructure made for them.<sup>47</sup> Bicycle and pedestrian infrastructure also benefits all modes of transportation by decreasing motorist accidents and speeding accidents while increasing bike and pedestrian activity.<sup>48</sup> Recommendations for the

future of bicycle and pedestrian planning in the French Broad River MPO include:

- Encourage member governments to pursue ordinances that require new developments or major redevelopments to include the addition of bicycle and pedestrian infrastructure where appropriate.
  - Promote the benefits of roadway connectivity ordinances.
- Improve safety for bicyclists and pedestrians.
  - Improve sidewalks and bike lanes alongside roadway projects.
  - Utilize crash and fatality data to prioritize bicycle and pedestrian safety improvements.
  - Reduce the number of bicycle and pedestrian crashes and fatalities.
- Consider developing a bicycle and pedestrian model for the French Broad River MPO region.
- Prioritize connecting existing infrastructure, where possible, while also encouraging the development of new bicycle and pedestrian networks in appropriate areas
- Enhance coordination between land use and transportation
- Consider factors like direct, indirect, and cumulative health impacts of proposed projects along with baseline health status and health determinants when scoring projects including a project's effect on air quality, health, equity, and safety.
- Update plans to include Complete Streets designs proactively and keep up-to-date with changes in bicycle and pedestrian research.
  - Explore involvement in efforts like the North Carolina Non-Motorized Volume Data Program to increase the extent and quality of data for bicycle and pedestrian traffic, which can be used in scoring methodology

<sup>42</sup> [https://commons.wikimedia.org/wiki/File:Bike\\_and\\_pedestrian\\_lanes\\_in\\_Roger\\_Williams\\_Park.jpg](https://commons.wikimedia.org/wiki/File:Bike_and_pedestrian_lanes_in_Roger_Williams_Park.jpg)

<sup>43</sup> Garrett, Peltier, H. (2011). Pedestrian and Bicycle Infrastructure: A National Study of Employment Impacts. Political Economy Research Institute: University of Massachusetts, Amherst.

<sup>44</sup> Crompton, J., Love, L., & More, T. (1997). An Empirical Study of the Role of Recreation, Parks, and Open Space in Companies' (Re)location Decisions. *Journal of Park and Recreation Administration*, 15 (1). Retrieved from <https://js.sagamorepub.com/jpra/article/view/1695>

<sup>45</sup> Pucher, J. and Dijkstra, L. (2003). Promoting Safe Walking and Cycling to Improve Public Health: Lessons from the Netherlands and Germany. *American Journal of Public Health*, 93 (9): 1509-1516.

<sup>46</sup> USDOT. (2018). Safety. Retrieved from [http://www.pedbikeinfo.org/factsfigures/facts\\_safety.cfm](http://www.pedbikeinfo.org/factsfigures/facts_safety.cfm)

<sup>47</sup> DILL, J. (2009). Bicycling for Transportation and Health: The Role of Infrastructure. *Journal of Public Health Policy*, 30: 95-110.

<sup>48</sup> New York City DOT (2011). 2011 Sustainable Streets Index. Retrieved from <http://www.nyc.gov/html/dot/html/about/ssi.shtml>

## RAIL

After a challenging period of construction culminating in its completion in 1879, the Western North Carolina Railroad operated for close to 100 years, with regular passenger rail service to Salisbury ending in 1975.<sup>49</sup> The Murphy Branch of the Western North Carolina Railroad revolutionized business and travel throughout the region, connecting mountaineers to the outside world. By the early 1900s, passenger business was so good that there were six trains that ran daily between Asheville and Lake Junaluska and four that ran between Asheville and Murphy.<sup>50</sup> Passenger traffic on the Murphy branch declined with the popularity of automobiles, leading to discontinued service in 1948. After discontinuation of rail service to Asheville, it took less than 25 years before interest in reviving the service to Salisbury was sparked. Thus, in 1997, NCDOT produced the Western North Carolina Passenger Rail Study, which developed detailed estimates and plans for the previously proposed route from Raleigh to Asheville via Salisbury.<sup>51</sup> The ultimate cost estimate was over \$134 million, and the updated 2002 report recommended that the state not implement rail passenger service to WNC.

The rail network serves 86 of North Carolina's 100 counties. It provides access to strategic locations like power plants, mines, and military installations while facilitating the movement of goods for agriculture, forestry, plastic, furniture, coal, food, and chemicals. Most of NC's rail system is owned, operated, and maintained by the private sector. According to the NCDOT Rail Division, there are approximately 2,323 miles of Class 1 railroads, 956 miles of short line railroads, and 109 miles of state-owned corridors.<sup>52</sup> In the French Broad River MPO region, only Norfolk Southern and 20 short line railroads, which connect businesses to injury without disrupt the natural environment. Norfolk Southern and 20 short line railroads (which connect small businesses to larger businesses and operate on short distances) provide freight rail service through the French Broad River MPO region. *North Carolina's Rail System*<sup>53</sup>

As Map 3.9, the only rail service in the French Broad River MPO region is freight service by Norfolk Southern, namely a 139-mile line from Salisbury to Asheville carrying mostly coal, and various short lines. The Great Smoky Mountains Railroad (GSMR) is the only passenger

Map 3.9: North Carolina Rail System



rail service in Western North Carolina. The GSMR, located in Bryson City, provides scenic rail excursions throughout the WNC countryside ranging from 3.5 hours to a full day. The service runs both an historic steam locomotive, which was restored and then debuted in 2016, and five diesel locomotives that offer year round trips on the east bound Tuckasegee River and west bound Nantahala Gorge routes. GSMR caters to tourists with tickets ranging from \$42 to \$125 depending on the experience. The Nantahala Gorge route runs 44 miles, crossing Fontana Lake; the Tuckasegee River route runs a 32 mile round trip through old railroad towns and rolling meadows.

The freight rail industry in the United States is highly cost-effective and efficient, spanning approximately 140,000 miles.<sup>54</sup> It is also economically critical, progressively safer, and highly sustainable—one ton of freight

can move over 470 miles on one gallon of fuel and the greenhouse gas emissions are 75% less than with trucks.<sup>55</sup> Unlike freight rail, passenger rail in the U.S. is rare outside of the northeastern corridor, including Boston, New York, Philadelphia, and Washington, DC.<sup>56</sup>

Nationwide forecasts have suggested that long-term economic growth will lead to a demand for substantial additional capacity on main rail corridors, which railroad industry will not be able to pay for on its own. Public-private partnerships offer a strategy for achieving that capacity. North Carolina General Assembly created a House Select Committee on a Comprehensive Rail Service Plan in 2008 to study the potential development of a statewide, comprehensive rail plan. In 2015, the NCDOT Comprehensive State Rail Plan was adopted, presenting

a 25-year vision for rail movement in the state. The Comprehensive State Rail Plan resulted from the efforts of railroads, rail-users, agency stakeholders, and the general public and identified goals by region for rail in North Carolina. The Western goal was to “provide industrial access to freight rail lines to accommodate agribusiness and economic development while utilizing the multimodal transportation system”<sup>57</sup>. As an overall, or comprehensive, goal, the plan encourages the state to expand access to passenger rail service throughout all the regions in order to better accommodate changing demographics, address congestion, and meet needs—a goal that can begin with a statewide thruway bus service expansion.<sup>58</sup>

### Current Conditions

In 2017, the Western North Carolina Rail Committee, Inc was reconstituted and incorporated after functioning for nearly 20 years as the WNC Rail Corridor Committee, Inc. The Committee has three foci: (1) To improve and expand freight rail service in WNC; (2) To increase the number of tourist and excursion trains in the region (such as the Great Smoky Mountain Railroad and the Craggy Mountain Line); and (3) Re-establish a passenger rail connection to WNC beginning with AMTRAK Thruway Bus Service between Asheville and Salisbury as the first step toward launching a dedicated train to serve communities along this route.

However, this region attracts millions of visitors annually from areas that are served by Amtrak. Presently, passenger rail service in North Carolina includes 6 passenger routes with stops in 16 cities.<sup>59</sup> The Greater Hickory MPO aims to gain the approval of its TAC for submitting a NC Rail new passenger service project from Salisbury to Asheville as well as submitting a Public Transportation project for an intercity bus to and from the Amtrak station in Salisbury via Statesville, Conover, Valdese, Morganton, Marion, Old Fort, Black Mountain, and Asheville.

The Southeast Rail Forum will be held from June 8-10, 2021 in Raleigh. This forum will be amongst the states included in the Southeast High Speed Rail Corridor, aiming to connect Virginia, North Carolina, South Carolina, Tennessee, Georgia, and Florida ultimately. The Southeast Rail Forum displays the continued commitment to interstate connectivity via rail that is shared.

### Challenges

Rail improvements and construction to meet standards and upgrade infrastructure are costly, which makes funding for rail projects a challenge. Non-highway funds available through STI are capped at 10%. Thus, between the high cost of rail projects and the pre-existing cap making only 10% of STI funds available to non-highway projects (for competition), rail projects that lack current passenger use have little chance of securing state funds.

Lack of support for re-establishing passenger rail service. There has been a lack of support for re-establishing passenger rail service throughout the French Broad River MPO region in the past and a subsequent failure to receive funding through SPOT. The Greater Hickory MPO's renewed commitment to passenger rail and an intercity bus from Salisbury to Asheville may change the likelihood of such a project being funded.

### Recommendations

- Study the potential economic and connectivity impacts of passenger rail service in WNC
- Study the potential costs to reimplementing passenger rail service to Western North Carolina
- Work with NCDOT on improving highway rail crossings in problematic locations

<sup>49</sup> NCDOT. (2001). Western North Carolina Passenger Rail Study. Retrieved from <https://connect.ncdot.gov/resources/Rail-Division-Resources/Documents/2001%20-%20Archived%20-%20Western%20North%20Carolina%20Passenger%20Rail%20Study%20-%20Summary%20Report.pdf>

<sup>50</sup> Great Smoky Mountain Railroad. (n.d.). History. Retrieved from <https://www.gsmr.com/train-history#XmtgCJNKjUo>

<sup>51</sup> NCDOT. (2002, April). Report on Western North Carolina Rail Operations and Station Right-of-Way Acquisition. Retrieved from <https://connect.ncdot.gov/resources/Rail-Division-Resources/Documents/2002%20-%20Archived%20-%20Report%20on%20Western%20North%20Carolina%20Rail%20Operations.pdf>

<sup>52</sup> NCDOT Rail Division, personal communication, March 17, 2020 (see Appendix G)

<sup>53</sup> NCDOT. (2015). Comprehensive State Rail Plan. Retrieved from <https://connect.ncdot.gov/resources/Rail-Division-Resources/Documents/2015%20Comprehensive%20State%20Rail%20Plan-%20Full%20Report.pdf>

<sup>54</sup> Hoffrichter, A. (2019, April 1). Rail Travel is Cleaner than Driving or Flying, but will Americans buy in? Retrieved from TheConversation.com: <http://theconversation.com/rail-travel-is-cleaner-than-driving-or-flying-but-will-americans-buy-in-112128>

<sup>55</sup> Association of American Railroads. (n.d.). Railroad 101. Retrieved from <https://www.aar.org/railroad-101/>

<sup>56</sup> The Environmental Literacy Council. (2015). Rail Transportation. Retrieved from <https://enviroliteracy.org/environment-society/transportation/rail-transportation/>

<sup>57</sup> NCDOT. (2015). Comprehensive State Rail Plan. Retrieved from <https://connect.ncdot.gov/resources/Rail-Division-Resources/Documents/2015%20Comprehensive%20State%20Rail%20Plan-%20Full%20Report.pdf>

<sup>58</sup> Ibid.

<sup>59</sup> Ibid.

## AVIATION

Airports form a crucial part of the transportation system in North Carolina by connecting the state's economy to global activity. According to the 2019 NCDOT Division of Aviation's State of Aviation report, the annual economic impact of NC airports was \$52 billion, \$12.6 billion in personal income, and \$2.2 billion in state and local tax revenues.<sup>60</sup> Aviation stands as the only global transportation network and thrives through the efficient use of resources and infrastructure. By bringing in tourists, providing jobs, and carrying freight, airports like the Asheville Regional Airport contribute immensely to regional growth, economic strength, and residents' quality of life.

The Asheville Regional Airport (AVL) opened in 1961, is a Class C airport located in South Asheville. In 2019, AVL served over 1.6 million passengers—a record breaking year, and the 5th consecutive year of airport growth.<sup>61</sup> AVL ranks 3rd out of North Carolina's 10 commercial service airports in number of annual passengers and destinations, serving 18 cities with nonstop flights provided by Allegiant, American Airlines, Delta, Elite Airways, Spirit, and United Airlines.

### Current Conditions

The airport is in the process of completing Project SOAR, a 4-phase construction project to update the over 50 year old runway.<sup>62</sup> SOAR began in 2014 and is now in the 4th phase of construction—paving and electrical with the new runway expected to open in 2020. In 2013, AVL updated its master plan to plan for responsible development over 20 years by considering existing facilities, operational levels, and capacity to meet future needs. The airport has brought jobs, new airlines and routes, and new facilities to the region since its inception. Since 2015, there has been rapid growth and change at the airport.

#### 2015

- New Allegiant planes, crew, and facility
- New long-term parking lot completed and opened

#### 2016

- Completed the airport's strategic plan
- 3 new routes

- Design of five story garage

#### 2017

- Construction began on five story garage

#### 2018

- Garage completed and opened
- Spirit Airlines added

#### 2019

- New nonstop routes to Washington DC and Dallas

### Recommendations

- Continue to encourage growth of the Asheville Regional Airport and coordinate on funding opportunities

<sup>60</sup> NCDOT Division of Aviation. (2019, January). North Carolina The State of Aviation: What Aviation Means to our Economy. Retrieved from <https://www.ncdot.gov/divisions/aviation/Documents/state-of-aviation.pdf>

<sup>61</sup> Asheville Regional Airport. (2020, January 23). Retrieved from <https://flyavl.com/article/unprecedented-43-annual-growth-avl-served-16-million-passengers-2019>

<sup>62</sup> Asheville Regional Airport. (n.d.) Project Soar. Retrieved from <https://flyavl.com/project-soar>

## EMERGING TRENDS IN TECHNOLOGY

As technology continues to advance in the realms of infrastructure and mobility, it is important that the French Broad River MPO acknowledge and incorporate emerging technological trends into long-range plans. This chapter of the MTP covers five different emerging trends in technology and provides insight into how those may impact transportation in the region. The French Broad River MPO aims to understand the implications of changing technology and plan to the best of its ability for an uncertain future.

### Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems (ITS) stand as the jumping off point for technological change as it is the most integrated of advancements and has become commonplace since its introduction in 1984. ITS ensures maximum interoperability for technologies, vehicles, and drivers, improve safety and mobility, reduce environmental impacts, and enhance efficiency through the integration of communications-based information and electronic technologies into infrastructure. ITS technology includes GPS, traffic signal controls, variable message signs, license plate recognition and speed cameras, parking guidance, weather information, bridge de-icing systems, sensing technologies, emergency vehicle notification systems, traffic optimization systems, dedicated short range technology that enables vehicle-to-vehicle communication, and much more. ITS provides a high return on investment, especially when incorporated during construction. The cost of acquiring and installing ITS technology is only about 5% of the overall construction budget if installed simultaneously. The return on investment, measured in safety, travel time reliability, and quality of life, occurs after only 6 months following installation.<sup>63</sup> WRITE ABOUT NCDOT AND ITS

### Ride-Share

Ridesharing includes carpool, vanpool, and transportation network companies (TNCs) such as Uber and Lyft. Uber arrived in Asheville in 2014, followed by Lyft in 2016. The introduction of rideshare changes traffic patterns, reduces drunk driving incidents, increases congestion, creates jobs, and affects transit ridership. In one Boston survey, 42% of rideshare users claimed they would have taken transit if Uber was not available.<sup>64</sup> Because these companies provide fast, albeit costly

mobility, they decrease political support for transit too, since transit often entails lengthier trips. At the same time, TNCs create the potential to reduce reliance on SOV when shared as opposed to carrying a single rider and are often presented as solutions to congestion. However, according to the San Francisco County Transportation Authority, 20% of TNC vehicle miles traveled (VMT) in San Francisco are spent during out-of-service movement (i.e. with no passenger).<sup>65</sup> If TNCs obtained full participation and exhibited centralized optimization, their benefits would be immense and would actually offer the potential to reduce congestion and privately owned vehicles within cities. When integrated with mobility services through provision of first/last mile connections, TNCs can also create opportunities for improved equity.

A study conducted at UC Boulder gathered a dataset with 416 rideshare trips and 311 passenger interviews to analyze the effects of ridesourcing on a city. By observing origins and destinations of riders and considering trips that otherwise would have required parking, researchers concluded that the intentional use of TNCs reduced parking in urban cores. Thus, parking could be used as a Transportation Demand Model (TDM) tool to influence behavior and reduce car dependency if land use planning identified the value in guiding travel through design.<sup>66</sup>

The Asheville Regional Airport set rules for TNCs to follow. Drivers must wait in a designated zone and have their company name clearly displayed. Drivers must pick up passengers in the "Ride App Pickup Zone" and risk incurring fines if the guidelines are broken. TNCs must also pay fees to operate at the Asheville Regional Airport. The airport's proactive regulations were made to decrease congestion in the drop-off/pick-up entrance and could serve as an example in forming agreements with TNCs to guide travel behavior on a larger scale.

### Electric Vehicles

The growing popularity of electric vehicles (EVs) affects transportation planning in various ways. The Federal Highway Administration (FHWA) has taken strides towards incorporating and encouraging EVs on a national level through the establishment of a national network of alternative funding and charging infrastructure along the national highway system corridors. Thus far, the FHWA's Alternative Fuel

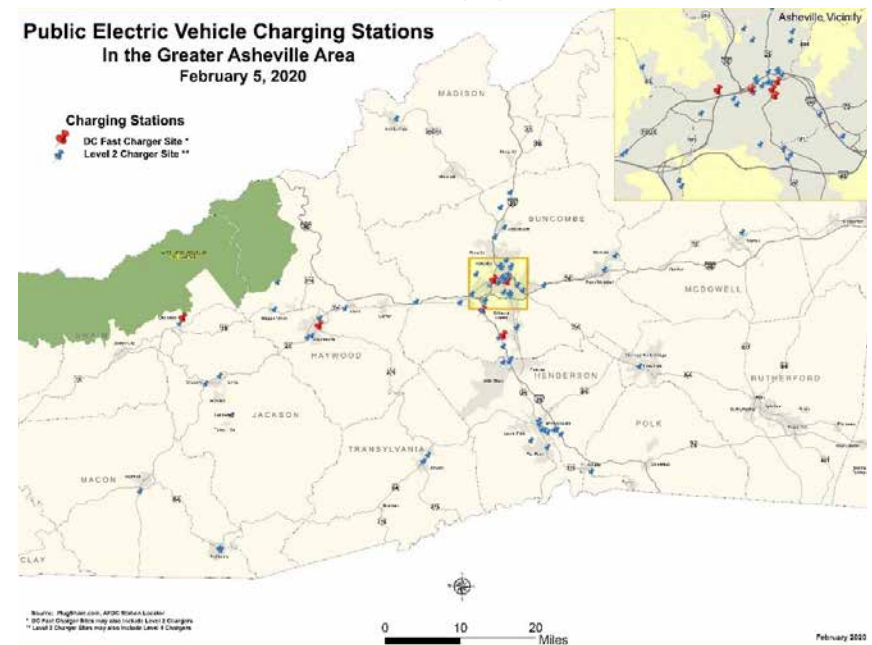
Corridor Designations have included 135,000 miles of the national Highway System, including the portions of 100 interstates and 76 US Highways/state roads.

In 2019, NCDOT published the ZEV Plan: A Strategic Plan for Accelerating Electric Vehicle Adoption in North Carolina. This plan came on the heels of Executive Order No. 80, which called for a 40% reduction in statewide greenhouse gas emissions by 2050. Since the transportation sector contributes 32% of greenhouse gas emissions statewide, devising a plan to implement zero-emission vehicles proved logical.<sup>67</sup> The ZEV Plan considered education, convenience, affordability, and policy surrounding zero-emission vehicles and their adoption, concluding that North Carolina was well-positioned to reduce emissions through adoption of electric vehicles. The ZEV Plan outlined short-, medium-, and long-term goals while identifying leaders and stakeholders to address those goals. Some goals included education about EV charging stations and the development of workplace and rest area charging stations. Map 3.10 shows the existing charging stations in the French Broad River MPO region.

EVs have affected revenue streams for transportation planning as well. The gas tax makes up a significant portion of Highway Trust Funds. The federal gas tax has not increased since 1993, thereby not keeping up with inflation and resulting in the short-term fix of general fund transfers to supplement the lack of gas tax revenue. Because EVs do not depend on gasoline at all, the revenue that normally flows from the gas tax is decreasing faster as EVs become more popular. North Carolina has three major sources of roadway funding: the gas tax, Highway Use Tax, and license/title/registration fees. Due to North Carolina's lack of road improvement funding through property taxes and a high percentage of state roads, the state relies heavily on the gas tax to support maintenance, operations, and capital needs.<sup>68</sup>

In 2019, the NC First Commission explored alternative funding strategies to the gas tax, surveying the public in the process.<sup>69</sup> The alternatives included mileage based fees (VMTs), a weight-based tax, and road use fees. Presently, North Carolina requires a \$130 fee on top of existing registration fees for EVs; however, that revenue doesn't equate to the revenue generated annually by non-electric vehicles through the gas tax.<sup>70</sup>

Map 3.10: Public Electric Vehicle Charging Stations



### Micromobility

Micromobility refers to shared use fleets comprised of fully or partially human powered light vehicles like bikes, e-bikes, and e-scooters, which may be rented through an app, picked up and dropped off in public right-of-way, and used for short trips of five miles or less.<sup>71</sup> E-scooter services surged in 2018, gaining widespread popularity throughout the U.S., offering a solution to first/last mile transit connections, and improving accessibility while providing a multimodal experience for users. According to the National Household Transportation Survey, 40% of car trips are two miles or less.<sup>72</sup> Micromobility could serve to replace those short distance SOV trips in urban cores.

Micromobility changes quickly and can be disruptive. In 2018, Asheville experienced the disruption of e-scooters, when a company deployed 200 scooters without permission at 4am, asking for waivers at 9am. The city seized the scooters and returned them to the company with a verbal promise that they would stay off the streets. However, the next day, the scooters were back. After that second deployment, the city issued a cease and desist order then voted to ban e-scooters entirely



the next month. This guerrilla manner of gaining footing in new cities has worked sometimes, as it did in Charlotte, but Asheville was not as lenient. Within the City of Asheville, micromobility faces the challenges of narrow streets, and steep terrain, which creates less safe conditions for users, along with limited right-of-way, and safety concerns and impacts on bicyclists and pedestrians when introducing vehicles using assigned facilities without understanding or education on regulation of e-scooters on either end. After the guerrilla scooter incident, Asheville added e-scooters to their Bike Share Feasibility Study, so that there could be a recommendation formed regarding next steps as far as scooters are concerned.<sup>73</sup>

Micromobility is most effective and safe in dense, urban cores, which excludes most of the French Broad River MPO region outside of the central Asheville area. However, understanding safe and effective ways to integrate micromobility into the transportation network is essential, especially as the region continues to grow in population.

### Autonomous and Connected Vehicles

The subject of autonomous and connected vehicles (ACVs), or self-driving cars, is one that requires background and definition. An autonomous vehicle is a car that is capable of sensing its environment and operating without human involvement. ACVs rely on sensors, algorithms, and processors to monitor, detect, and respond to road conditions. There are levels of autonomy as table 3.10 shows. Levels 1 and 2 of ACVs are relatively standard in cars today—features include automatic braking, adaptive cruise control, parking assist, and lane assist. A Level 3 autonomous vehicle would have some feature like self-parking where the driver does not need to use the gas, brake, or steering wheel to park, a feature that Teslas boast. There are currently no Level 4 or 5 vehicles available to consumers, though full automation is the ultimate goal of engineers.

When considering the impending effects of ACV, planners have a narrow window of opportunity to predict and appropriately pave the way for change. Presently, cities are designed for SOVs, which inherently limits alternative methods of mobility from traditional modes like bicycling and walking to anticipated modes like fully autonomous, or self-driving cars.

Table 3.10: Levels of Autonomy

<b>Level 0</b>
The human driver does all of the driving
<b>Level 1</b>
The vehicle might be able to assist with one or more functions like braking / accelerating or steering but not at the same time
<b>Level 2</b>
The vehicle can control both steering and braking / accelerating simultaneously under some circumstances
<b>Level 3</b>
The vehicle has a system which can perform all aspects of the driving task under some circumstances
<b>Level 4</b>
The vehicle itself can do all of the driving in certain circumstances
<b>Level 5</b>
The vehicle can do all of the driving in all circumstances

In 2018, the Consolidated Appropriations Act (Omnibus Bill) created US Department of Transportation funds for ACV research. Since 2012, more than 40 states (and D.C.) have introduced or enacted legislation related to ACVs.<sup>74</sup> In 2017, North Carolina General Assembly passed regulations on the operation of fully autonomous vehicles on public highways in the state via HB 469/ S 337. The bill defines fully autonomous vehicles and clarifies that its provisions only apply to fully autonomous vehicles. This legislation followed the January 2017 designation of the North Carolina Turnpike Authority by USDOT as one of the 10 national pilot program testing grounds for autonomous vehicles, incentivizing companies to deploy ACVs in North Carolina. In early 2020, NC State University and NCDOT launched Connected Autonomous Shuttle Supporting Innovation (CASSI), an autonomous vehicle, for testing on Centennial Campus to learn more about how technology can be effectively and safely used to offer mobility solutions in the future by accepting applications from municipalities and private

or public agencies to apply to become a CASSI deployment test site. Local policy also should match state and federal policy progress. Municipalities will be the testing grounds for ACV technology, so in order for the smooth integration of ACV technology into everyday life, local policies should facilitate safe testing, find ways to leverage data, improve interdepartmental communication, engage and educate residents on ACV issues, and consider how ACV adoption will impact transit services.

Ultimately, the future of ACVs is relatively unknown. It is best to prepare for the unknown. In this realm, that means planning and designing for ACV safety, embracing uncertainty, and aligning ACV planning with community visions and goals. ACVs will impact infrastructure and design, leading to impacts on existing transit networks, reducing the need for parking, and making more efficient right-of-way demands. Once technology is in place and hardware is developed, there will be a convergence and confluence that is necessary for ACVs to fully integrate into our lives. While we do not know exactly how or even when ACVs will integrate, we do know that there are certain steps, as mentioned in the previous paragraph, that can be taken in preparation for that day.

## Challenges

**The future is uncertain, and change is often unwelcome.** The greatest challenge that faces the French Broad River MPO regarding technological advances is the innate uncertainty of such advances. While definitive steps have been taken in the realm of technology in transportation, advances such as driverless cars may be in the near or distant future. When such dramatic technology does become more accessible, there will likely be significant resistance to it as well. Regardless of resistance that technology will face, the change itself is inevitable. The French Broad River MPO aims to position itself to be able to easily and painlessly adapt to trends as they emerge.

## Recommendations

- Educate and collaborate.
  - Inform the public and transportation stakeholders about how to navigate in mixed-fleets and what the future of ACVs could look like.
  - Work across levels of government and private sectors as well as through public engagement to gain various perspectives on

emerging trends in technology.

- Encourage further research into the effects of emerging technology trends on travel patterns.
- Create an ITS strategic plan for the region.
- Study the travel patterns connected to TNCs and the subsequent implications for land use planning.
- Consider partnerships with TNCs to provide first/last mile connections to existing transit.
- Continue adding more public charging stations for electric vehicles.

<sup>63</sup> County Health Rankings & Roadmaps. (2019). North Carolina, Buncombe. Robert Wood Johnson Foundation. Retrieved from <https://www.countyhealthrankings.org/app/north-carolina/2019/rankings/buncombe/county/outcomes/overall/snapshot>

<sup>64</sup> Schmitt, A. (2019, Feb. 4). All the Bad Things About Uber and Lyft in One Simple List. Retrieved from StreetsBlogU-SA: <https://usa.streetsblog.org/2019/02/04/all-the-bad-things-about-uber-and-lyft-in-one-simple-list/>

<sup>65</sup> San Francisco County Transportation Authority. (2017). TNCs Today: A Profile of San Francisco Transportation Network Company Activity. Retrieved from [https://www.sfcta.org/sites/default/files/2019-02/TNCs\\_Today\\_112917\\_0.pdf](https://www.sfcta.org/sites/default/files/2019-02/TNCs_Today_112917_0.pdf)

<sup>66</sup> Henao, A. (2017). Impacts of Ridesourcing—Lyft and Uber—On Transportation Including VMT, Mode Replacement, Parking, and Travel Behavior. University of Colorado. Retrieved from <https://pdfs.semanticscholar.org/e2cf/15b3a462917337062834c69213bf8ed41144.pdf>

<sup>67</sup> NCDOT. (2019, Oct. 1). North Carolina ZEV Plan: A Strategic Plan for Accelerating Electric Vehicle Adoption in North Carolina. Retrieved from <https://www.ncdot.gov/initiatives-policies/environmental/climate-change/Documents/nc-zev-plan.pdf>

<sup>68</sup> Jackson, S. (2019). At the Crossroads: Recommendations for the Future of Transportation in North Carolina. NC Justice Center. Retrieved from <https://www.ncjustice.org/wp-content/uploads/2019/02/At-The-Crossroads-final-pdf.pdf>

<sup>69</sup> NCDOT. (2019). The NC Motor Fuels Tax. Issue Brief: Edition 1. NC First Commission. Retrieved from <https://www.ncdot.gov/about-us/how-we-operate/finance-budget/nc-first/Documents/nc-first-brief-edition-1.pdf>

<sup>70</sup> NC General Statutes § 20-87

<sup>71</sup> NACTO (2019). Guidelines for Regulating Shared Micromobility. Retrieved from [https://nacto.org/wp-content/uploads/2019/09/NACTO\\_Shared\\_Micromobility\\_Guidelines\\_Web.pdf](https://nacto.org/wp-content/uploads/2019/09/NACTO_Shared_Micromobility_Guidelines_Web.pdf)

<sup>72</sup> Flusche, D. (2010, Jan. 22). National Household Travel Survey—Short Trip Analysis. Retrieved from BikeLeague.org: <https://www.bikeleague.org/content/national-household-travel-survey-short-trips-analysis>

<sup>73</sup> City of Asheville. (2020). Bike Share and E-Scooter Feasibility Study. Retrieved from <https://www.ashevillenc.gov/departments/transportation/current-projects/bike-share-and-e-scooter-feasibility-study/>

<sup>74</sup> National Conference of State Legislatures. (2020, Feb. 18). Autonomous Vehicles: Self-Driving Vehicles Enacted Legislation. Retrieved from <https://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx>

## TOURISM

Tourism and travel are driving economic factors for many communities in the French Broad River MPO region. The City of Asheville draws the largest number of visitors to the region, attracting over 11 million tourists per year and generating \$199.2 billion in state and local taxes.<sup>75</sup> Just as Asheville's history, cuisine, and brewing culture brings in visitors, the mountain scenery, fast-flowing rivers, and outdoor recreation draw visitors and residents to various destinations throughout the year. The livelihood of many businesses and communities in the French Broad River MPO region depends on seasonal tourists, most of whom travel within the region via private automobile.

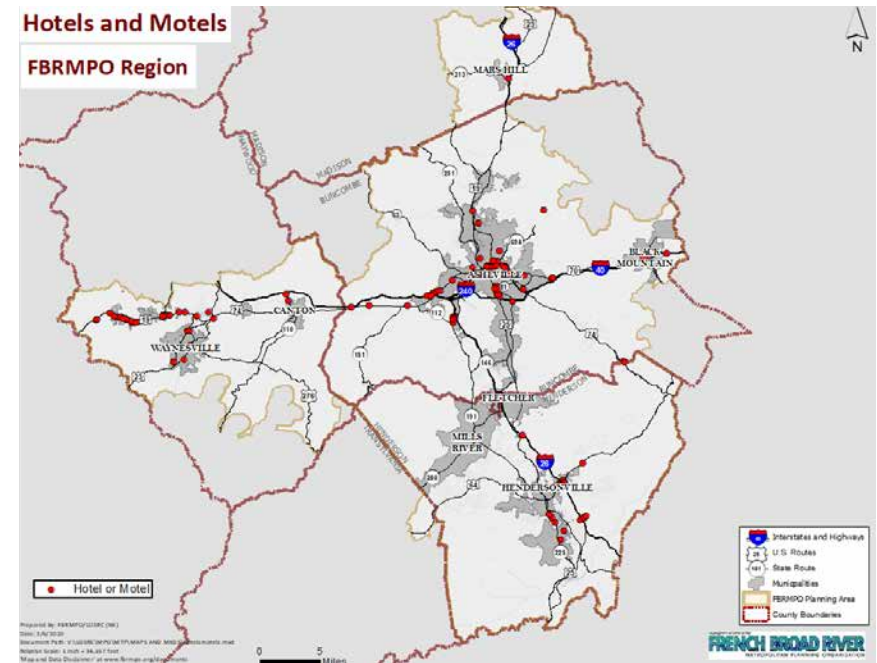
While the population of the five-county region was around 458,000 in 2017, it was estimated that there were over 11 million visitors to Buncombe County alone in that same year.<sup>76</sup> In only a five year time span, from 2012-2017, the number of visitors to Buncombe county went from 9 million to 11 million.<sup>77</sup> This growth in tourism has increased traffic and the number of hotels and short-term rentals. While only 3.8 of the 11 million tourists stayed overnight, many of them still visited destinations where they supported local businesses and jobs. As this region boasts many unique attractions, overnight visitors in Buncombe County are also likely to visit destinations in Haywood, Henderson, Madison and/or Transylvania counties.

Map 3.11 shows where the more than 320 hotels and motels in the region are located. Outside of the ones in urbanized areas, many are located along the highways and arterial routes. This map does not show the numerous short-term rental properties scattered throughout the region.

### Current Conditions (trends)

Given the limited regional connections to transit and aviation terminals, over 95% of visitors drive into Asheville from their origin cities, with a majority being from surrounding Charlotte, Greenville, Atlanta, and Raleigh.<sup>78</sup> While most tourist activity is evenly spread throughout the year, there is a measurable seasonal peak from March to October, putting a strain on the transportation network. Activities once driven mainly by specific, discrete recreational attractions are now complemented by the growing appeal of intown nightlife (live music, restaurants, breweries, etc.). The region's amenities and infrastructure near popular destinations see the highest use in the summer, which

Map 3.11: Hotels and Motels



creates a challenge for transportation planning and management during "peak tourism" season.

As part of the effort to see how key tourism-related destinations impact traffic volumes and fluctuating demand in the region, French Broad River MPO maps and maintains a list of the points of interest listed below. The data regarding location and number of visitors to a few key tourism destinations is integrated into the Travel Demand Model which helps forecast future traffic volumes. Some of the key tourism destinations in the MPO region are listed in Table 3.11.

Many establishments that are not listed above also attract a large number of tourists to the region. Frequently cited as having more breweries per capita than any U.S. city, Asheville and the surrounding region draw visitors from all over for brewery tours, beer festivals, and unique atmospheres. Many craft beverage manufacturers have started to export to regional markets, with a few companies distributing

Table 3.11: Key Tourism Destinations

BUNCOMBE	HAYWOOD	HENDERSON	MADISON
Asheville Downtown	Blue Ridge Parkway (various access points and hiking destinations including Black Balsam)	Apple Valley Model Railroad Museum	The Appalachian Trail (various access points including Max Match)
Biltmore Estate	Cataloochee Valley/Ski Area	Carl Sandburg Home	French Broad Rafting and Ziplines
Biltmore Village	Maggie Valley	Flat Rock Playhouse	Hot Springs Resort and Spa
Bent Creek Trails	Great Smokey Mountains National Park	Dupont State Forest	Marshall Downtown
Black Mountain Downtown	Pisgah Inn	Historic Village of Flat Rock	Wolf Ridge Ski Resort
Grove Park Inn	Waynesville Downtown	Hendersonville Downtown	
North Carolina Arboretum	Wheels Through Time Museum	Jump Off Rock	
West Asheville Haywood Road Corridor			
Weaverville Downtown			

nationally and as far as Europe. In addition to new breweries continuing to open, a wide variety of wineries, distilleries, and craft beverage manufacturers have located to the region. A variety of festivals and special events such as Lake Eden Arts Festival (LEAF) and North Carolina Apple Festival also attract both locals and visitors and can have a significant traffic impact during the duration of the event.

The various Tourism Development Authorities (TDAs) in the region put a portion of the tax revenue they receive back into community in several ways. As part of their grant funding programs, TDAs have funded transportation related projects such as wayfinding signage, greenway development and other projects that sustain local tourism. The Buncombe County TDA through its Tourism Product Development Fund, has reportedly awarded \$44 million of occupancy tax revenue to 39 projects, including recently awarding the Town of Woodfin \$2.25 million for their greenway/blueway system.<sup>79</sup> Henderson County granted \$473,000 to the county to showcase 72 signs showing people how to reach popular destinations while Haywood County rolled out a similar tourism signage program using their “1% zip code occupancy tax.”

Buncombe County TDA estimated that 1 in 7 jobs are supported by visitors spending, while generating \$368 million in tax revenue annually.<sup>80</sup> In their 2018 Tourism Impact Report, Henderson County found that travel and tourism directly employs more than 2,500 people in the county.<sup>81</sup> Looking statewide, tourism has become the second largest industry in North Carolina, while employing 161,000 people and having \$2.5 billion in annual payroll.<sup>82</sup>

In 2015, new FAST Act requirements involving tourism were established to “include projects, strategies and services that will enhance travel and tourism [23 U.S.C. 135(d)(1)(I) & (J)]. Through dialogue with Tourism Development Authority (TDA) stakeholders and planning efforts, the French Broad River MPO has developed strategies to incorporate tourism and travel planning into the region. In 2018 and 2019, French Broad River MPO staff met with TDAs to solicit feedback on future transportation planning efforts. French Broad River MPO staff held group-discussions with staff and stakeholders within Buncombe County TDA/Explore Asheville, Henderson County TDA and Haywood County TDA.

## Challenges

**Tourism significantly contributes to the regional economy and is affected by statewide, national, and global factors, making it unpredictable at times.** While the seasons can generally predict tourist volumes, unpredictable events—such as COVID-19—severely affect the tourism sector and overall regional economic climate.

**Congestion hotspots and management of growth.** The Buncombe County TDA identified congestion as a challenge facing the tourism and travel sector.

**Lacking connectivity complicates regional travel between Henderson County and Buncombe County.** The region has numerous attractions that draw tourists, spread out across the counties in the French Broad River MPO planning area. However, the existing infrastructure does not provide direct connections between the attractions. Lack of connectivity creates additional congestion on major and secondary roads, affecting the state of repair of the roads and increasing congestion during seasons with heavy tourism.

**Tourism contributes to population growth as visitors who visit often decide to relocate.** This creates a challenge because it places additional strain on the transportation network. Regional TDAs identified the following challenges:

- Workforce and how to get employees from home to the job site (Buncombe County TDA);
- Congestion hotspots and management of growth (Buncombe County TDA);
- Support of greenway and local transportation projects (Buncombe County TDA);
- Opportunity to capitalize on natural areas in the county (Henderson County TDA);
- Connectivity issues given the limited number of roads that connect Henderson County to Asheville and Buncombe County (Henderson County TDA);
- Growth in particular geographies of Henderson County, such as the eastern part as more destinations appear (Henderson County TDA)

- Consider the role tourism plays in driving relocation, as visitors who frequently visit consider moving here (Henderson County TDA)
- Increased number of visitors in the winter months (Haywood County TDA)
- Desire for new lodging and wayfinding options (Haywood County TDA)

## Recommendations

The following recommendations indicate how the French Broad River MPO could contribute to Tourism in the region:

- Compile a comprehensive set of visitor data and figures from regional TDAs to better understand trends and challenges.
- Continue to explore opportunities that the Transportation Demand Management (TDM) program has to work with tourism related employers and employees regarding commute options.
  - Encourage improvements along key travel corridors that are “tourist dense” such as downtowns in order to address commute needs within the travel and tourism sector while enhancing access to other attractions outside the downtowns.
- Continue to work with NCDOT, TDM, and local municipalities to identify areas where Park and Rides would benefit commuters.
- Continue to support projects that promote connections between the regions' major destinations and travel choices.

<sup>75</sup> BCTDA. (2018 September). The Economic Impact of Tourism in Buncombe County, North Carolina: 2017 Analysis. Retrieved from <https://www.ashevillecvb.com/economic-impact/>

<sup>76</sup> Buncombe County Tourism Development Authority. (n.d.) 2013-14 Annual Report. Retrieved from <https://www.ashevillecvb.com/wp-content/uploads/2015/06/BCTDA-2013-14-Annual-Report.pdf>

<sup>77</sup> Ibid.

<sup>78</sup> D.K. Shifflet & Associates, Ltd. (2015, September). 2014 Asheville Visitor Profile. Retrieved from <https://www.ashevillecvb.com/wp-content/uploads/2014-Asheville-Visitor-Profile-09212015.pdf>

<sup>79</sup> BCTDA. (n.d.). Look Who's Counting on Tourism. Retrieved from <https://www.ashevillecvb.com/tourism-builds-community/>

<sup>80</sup> BCTDA. (2020). Annual Report 2018-2019. Retrieved from [https://www.ashevillecvb.com/wp-content/uploads/2018-19-BCTDA-Annual-Report\\_FINAL\\_WEB.pdf](https://www.ashevillecvb.com/wp-content/uploads/2018-19-BCTDA-Annual-Report_FINAL_WEB.pdf)

<sup>81</sup> Baker, K. (2019, August 25). TDA: Tourism spending in Henderson County is up, with visitors from around the world. Retrieved from BlueRidgeNow.com: <https://www.blueridgenow.com/news/20190825/tda-tourism-spending-in-henderson-county-is-up-with-visitors-from-around-world>

<sup>82</sup> Preservation North Carolina. (1998). Profiting from the Past. Retrieved from <https://www.presnc.org/profitting>

### FEDERAL PERFORMANCE MEASURES

As part of federal transportation legislation requirements, measures for both highway and transit system performance have been developed. These measures offer a strategic approach to make investment and policy decisions that reflect and achieve transportation system goals as outlined in MAP-21 and the FAST Act. Although federal performance measures are defined at the federal level, it is a key task for MPOs, state DOTs, and transit agencies to establish their own targets based on these measures. The targets are a quantifiable way to measure level of performance that is achieved within a specific time period.

The highway performance measures align with the seven national planning goals as listed below in Table 3.12. Highway targets are generally required to be adopted by State DOTs first, and then MPOs have 180 days after the state targets are established to define their own targets. MPOs can establish target one of two ways: 1) Agree to contribute toward the accomplishment of the State DOT target, or 2) Develop a quantifiable target for the MPO planning area. As of development of this MTP, the French Broad River MPO has selected to support and contribute towards the accomplishment of NCDOT targets. While this is a collaborative effort, it is ultimately the responsibility of NCDOT to report target data and measures to FHWA.

Table 3.12: Seven National Planning Goals

NATIONAL GOAL AREA	RULEMAKING CATEGORY	PERFORMANCE MEASURE
Safety	Safety	Number of Fatalities
		Rate of Fatalities
		Number of Serious Injuries
		Rate of Serious Injuries
		Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries
Infrastructure Condition	Infrastructure	Percentage of Pavements in Good Condition (Interstate)
		Percentage of Pavements in Poor Condition (Interstate)
		Percentage of Pavements in Good Condition (Non-Interstate NHS)
		Percentage of Pavements in Poor Condition (Non-Interstate NHS)
		Percentage of Bridges in Good Condition (NHS)
		Percentage of Bridges in Poor Condition (NHS)
System Reliability	System Performance	Percentage of Reliable Person-Miles Traveled (Interstate)
		Percentage of Reliable Person-Miles Traveled (Non-Interstate NHS)
Freight Movement & Economic Vitality	System Performance	Truck Travel Time Reliability (TTTR) for the Interstate System
Environmental Sustainability	System Performance	Total Emissions Reduction
Congestion Reduction	System Performance	Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita on the National Highway System (NHS)
		Percent of Non-Single Occupancy Vehicle (SOV) Travel

Source: <https://fhwa.dot.gov/tpm/about/regulations.cfm>

Table 3.13 summarizes the FHWA measures as determined by NCDOT and breaks them into four categories referred to as PM1, PM2, and PM3 and Transit Assets. The chart also shows the current status for each target area based on NCDOT adoption.

Table 3.13: FHWA Measures

	Final Rules (FHWA – 23 CFR 490)	States Set Targets By	NCDOT Status
FHWA	PM1 – Safety (5 measures)	Aug. 31, 2017	✓ <b>Completed</b> – 2018 targets established in Highway Safety Improvement Program (HSIP)
	PM2 – Pavement/Bridge (6 measures)	May 20, 2018	✓ <b>Completed</b> – Pending submission to FHWA, NCDOT set 2-year and/or 4-year targets
	PM3 – System Performance (6 measures)	May 20, 2018	✓ <b>Completed</b> – Pending submission to FHWA, NCDOT set 2-year and/or 4-year targets
FTA	Transit Assets	Jan. 1, 2017	✓ <b>Completed</b> – 2017 targets and Transit Asset Management Plan

### Safety Targets or “PM1”

The MPO and NCDOT are required to evaluate and report on safety targets, on an annual basis, for five safety measures. These five measures include: number of fatalities, fatality rate (per 100 million vehicle miles traveled), number of serious injuries, serious injury rate (per 100 million vehicle miles traveled), and number of non-motorized fatalities and serious injuries. Beginning in February 2018, the French Broad River MPO Board passed safety targets for the region that supported the state’s target noting that the MPO lacked the ability to set and monitor its own targets due to insufficient data. Most recently in February 2020, the French Broad River MPO Board adopted NCDOT safety targets for FY 2020 that are reflected in Table 3.14. The NCDOT target supported by these goals is based on cutting fatalities and serious injuries, for all modes, by 50% by 2030 based on 2013 figures. The projects programmed in the FBRMPO’s 2045 MTP are intended to enhance safety and contribute to the accomplishment of NCDOT’s safety targets.

Table 3.14: 2020 HSIP Targets

2020 HSIP TARGETS			
Target	2014-2018 Average	2016-2020 Average	% Reduction
Reduce Total Fatalities	1,396.40	1,227.80	6.23%
Reduce the Fatality Rate	1.211	1.084	5.39%
Reduce Total Serious Injuries	3,362.60	2,812.80	8.84%
Reduce the Serious Injury Rate	2.886	2.462	7.64%
Reduce the Total Nonmotorized Fatalities and Serious Injuries	494.60	426.60	7.13%

### Infrastructure and System Performance Targets or “PM2” and “PM3”

PM2 measures relate to the pavement and bridge performance and condition on both the interstate and non-interstate system. PM3 measures relate to the system performance of the system which includes measures such as travel time reliability and congestion mitigation. Table 3.15 details the targets for each of these measures. These were set by NCDOT with 2-year targets covering 2018 and 2019 as well as 4-year targets covering 2018-2021.

In October 2018, the French Broad River MPO in coordination with the City of Asheville (as the direct recipient of transit funds in the region) signed a Performance Measure Agreement with NCDOT agreeing to adhere to protocols for meeting programming requirements as they relate to performance measure planning. This agreement demonstrates interagency coordination and allows the MPO and NCDOT to share data regarding performance measures. It also provides language that shows MPO support of the 2-year and 4-year targets for PM2 and PM3 adopted by NCDOT.

As of development of the 2045 MTP, the current TIP covering 2020-2029, includes projects and language specifying that the MPO has established performance measure targets in concurrence with NCDOT.

Table 3.15: PM2 & PM3 Targets

	PERFORMANCE MEASURE	2 YEAR TARGET 1/1/2018 – 12/31/2019	4 YEAR TARGET 1/1/2018 – 12/31/2021
PM2	Interstate Pavement Condition (Good)	--	37.0 %
	Interstate Pavement Condition (Poor)	--	2.2 %
	Non-Interstate NHS Pavement Condition (Good)	27.0%	21.0%
	Non-Interstate NHS Pavement Condition (Poor)	4.2%	4.7%
	NHS Bridge Condition (Good)	33.0%	30.0%
	NHS Bridge Condition (Poor)	8.0%	9.0%
PM3	Interstate Level of Travel Time Reliability	80.0%	75.0%
	Non-Interstate NHS Level of Travel Time Reliability	--	70.0%
	Interstate Truck Travel Time Reliability	1.65	1.70

**Transit Assets**

Effective in October 2016, Transit Asset Management (TAM) Final Rule became effective and established a strategic and systematic process of operating, maintaining and improving public capital assets for transit. These performance measures for transit are reported to FTA by NCDOT. The performance measures apply to transit agencies and must be established and monitored by MPOs. The four performance measures include the following:

- **Equipment:** percent of equipment valued > \$50,000 (support, non-revenue service vehicles) that have met their Useful Life Benchmark (ULB)
- **Rolling Stock:** percent of revenue vehicles surpassing their ULB by Asset Class
- **Facilities:** percent of facilities with condition rating below 3.0 on FTA Transit Economic Requirements Model (TERM) scale
- **Infrastructure:** percent of guideway directional route miles with performance restrictions by class

Since the City of Asheville is the direct recipient of transit funds for the region, they are listed in the performance management agreement signed in October 2018 and set their own targets for each asset category. The NCDOT Public Transportation Division prepared a Group TAM plan for all community transportation systems and small urban systems opting to be included in the plan. This removed the local reporting burden for smaller systems. The transit agencies in the region opting in to the TAM group plan include: Buncombe County, Madison County Transportation Authority, Mountain Projects Inc. (Haywood County) and WCCA (Henderson County). Table 3.16 summarizes the adopted measures for FY 2021 set by NCDOT regarding TAM. The Asheville Redefines Transit (ART) set a 20% target for 2019 – 2023 in parallel with the NCDOT Group TAM. These were adopted by resolution, in addition to the performance management agreement by the French Broad River MPO Board in October 2018.



Table 3.16: FY21 NCDOT Adopted Measures

Asset Category - Performance Measure	Asset Class	2021 Target
<b>REVENUE VEHICLES</b>		
Age - % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB)	AB - Articulated Bus	N/A
	AO - Automobile	20%
	BR - Over-the-road Bus	N/A
	BU - Bus	20%
	CU - Cutaway Bus	20%
	DB - Double Decked Bus	N/A
	FB - Ferryboat	20%
	MB - Mini-bus	20%
	MV - Mini-van	20%
	RT - Rubber-tire Vintage Trolley	N/A
	SB - School Bus	N/A
	SV - Sport Utility Vehicle	20%
	TB - Trolleybus	N/A
	VN - Van	20%
	TR - Tram	N/A
Custom 2	N/A	
Custom 3	N/A	
<b>EQUIPMENT</b>		
Age - % of vehicles that have met or exceeded their Useful Life Benchmark (ULB)	Non Revenue/Service Automobile	20%
	Steel Wheel Vehicles	N/A
	Trucks and other Rubber Tire Vehicles	N/A
	Maintenance Equipment	20%
	Computer Software	20%
	Office Equipment	20%
<b>FACILITIES</b>		
Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale	Administration	20%
	Maintenance	20%
	Parking Structures	20%
	Passenger Facilities	20%
	Shelter	20%
	Storage	20%
	Custom 3	N/A

### Related Performance-Based Plans

There are several other plans maintained by state and local transportation agencies, including the French Broad River MPO, that contribute to performance management. It is important that the goals and objectives of those plans are incorporated into the MPO's overall performance-based planning efforts. The following plans contain applicable components:

- **NCDOT Strategic Highway Safety Plan (SHSP):** This plan, most recently updated in 2014, is the basis in which NCDOT safety performance measures were set. The focus of the SHSP is to establish partnerships to identify and implement safety improvements for all roadway users in addition to fostering awareness around safety measures.
- **Transportation Asset Management Plan:** This plan accounts for the National Highway System and is one of the federal requirements associated with performance-based planning. NCDOT developed a three-phase plan to cover highway assets, other highway assets (rest areas, weight stations) and other modes (airports, rail).
- **Transit Asset Management (TAM) Plan:** Tier I transit providers are required to develop a TAM Plan that includes an implementation strategy, key activities, and list of resources, along with an outline of how the provider will monitor, update, and evaluate its TAM plan.
- **Congestion Management Process (CMP):** As discussed in previous sections, the CMP is a systematic and regionally-accepted approach for managing congestion based on system performance. In addition to being a requirement for the French Broad River MPO, the CMP utilizes travel data to offer alternative approaches to meet state and local needs regarding congestion.

### Additional Targets and Performance Measures

The projects programmed in the FBRMPO's 2045 MTP are intended to enhance and meet the targets and performance measures as established by FHWA and NCDOT. This emphasizes the importance of continuing to monitor and adopt measures that support the transition to performance-based planning and programming, as required by MAP-21 and the FAST Act.

#### Resources

Metropolitan Planning Organization Safety Performance Measures Fact Sheet  
[https://safety.fhwa.dot.gov/hsip/spm/docs/mpo\\_factsheet.pdf](https://safety.fhwa.dot.gov/hsip/spm/docs/mpo_factsheet.pdf)  
 FHWA Safety Target Setting Resources  
[https://safety.fhwa.dot.gov/hsip/spm/target-setting\\_resources.cfm](https://safety.fhwa.dot.gov/hsip/spm/target-setting_resources.cfm)  
 North Carolina Strategic Highway Safety Plan  
<http://ncshsp.org/>





## CHAPTER 4: PLAN DEVELOPMENT

## PLAN DEVELOPMENT

### PUBLIC INVOLVEMENT

The French Broad River MPO is committed to making public involvement a critical factor in the development of the MTP. Early on in the MTP 2045 process, the MPO outlined strategies and efforts of ways to engage the public. These efforts are guided by both federal and state requirements, as well as best practices identified by the MPO.

The Public Involvement Policy (PIP) adopted in 2014 and most recently adopted in 2019 has served as a guiding document for involvement efforts and outlines minimum requirements for MTP public involvement.<sup>83</sup> As stated in the PIP, the goals and objectives of the MTP Public Involvement Process are to:

- Encourage citizens to take a proactive role in the development of Transportation Plans.
- Bring a broad cross-section of members of the public into the public policy and transportation planning decision-making process.
- Educate the public and elected officials in order to increase public understanding both the options and constraints in transportation alternatives.
- Determine public concerns and/or perceived impacts of Transportation Plan elements.
- Determine which elements of the Long Range Transportation Plan would support or diminish the citizens' desired lifestyle.
- Establish a channel for an effective feedback process.

### MTP 2045 Steering Committee

The Prioritization Subcommittee at the MPO served as the MTP Steering Committee. This committee has been responsible for reviewing draft components of the plan and providing feedback, receiving input from the Citizens Advisory Committee (CAC), and working with MPO staff to incorporate changes into the final draft of the Plan. Key Responsibilities of the Steering Committee include:

- Assist in developing this Public Outreach Plan that actively seeks the input and participation from the municipalities, agencies, businesses and residents within the French Broad River MPO region. The steering committee emphasized the role of CAC and

MPO staff efforts to collect public input

- Communicate with organizations they represent and assist with other public involvement efforts
- Develop updated MTP goals and objects along with performance measures
- Balance and prioritize competing public objectives
- Establish and recommend project priorities for area transportation needs based on a fiscally constrained list

### Stakeholders

In order to engage as many constituents in the planning region as possible, the MPO compiled a list of stakeholders in the region with help from the Citizens Advisory Committee (CAC). This list of stakeholders comes from a wide variety of interest and community groups, as listed below but it is not comprehensive. Using publicly known names and organizations, in addition to entries from CAC members, an on-going email contact list was developed for outreach. This list includes a large number of area residents that are involved with advocacy groups, homeowners associations, business groups, and other civic organizations. Throughout development of the plan, information about upcoming workshops and chances for input was sent via Mailchimp to this list of over 380 community stakeholders. This is in addition to information being sent out via email to a list of nearly 300 MPO stakeholders that includes the TCC, Board and interested citizens whom previously signed up via the MPO website. The chart below lists the various groups that were potential stakeholders to participate in MTP efforts.

Table 4.1: Stakeholders

AREA RESIDENTS	Advocacy Groups	Community Associations
	Homeowners Associations	Historically Under-Represented Groups
CIVIC ORGANIZATIONS	Bike/Ped Advocacy Groups	Faith Based Organizations
	County-City Tourism and Development	Volunteer Organizations
ECONOMIC DEVELOPMENT	Municipality Chamber of Commerce	Industry Boards
	Business Associations	Career/Workforce
ELECTED OFFICIALS	City Council and Mayors	Planning Commissions
	State Legislators	Transportation and Public Works Committees
PUBLIC AGENCIES	Municipal Administrators/Planners (Local Government)	Environmental Resource
	State/Federal Department of Transportation	Parks and Recreation Departments
TRANSPORTATION SYSTEM USERS	Bicyclists and Pedestrians	Freight
	Transit Riders	Commuting/Telecommuting Programs
TRANSPORTATION AND COMMUNITY SERVICE PROVIDERS	Intercity and municipal Bus Service	County Transit Providers and Boards
	Airport and Freight	Aging and Disability Providers
FBRMPO	Staff	TCC and Board
	Prioritization Subcommittee	Citizens Advisory Committee

## Events and Involvement Efforts

In order to gather feedback from as many citizens as possible, and to do so in an efficient manner, MPO staff utilized a variety of outreach methods. Table 4.3 provides an overview of the efforts and events that have taken place as part of this plan. Staff also participated in other events such as "Coffee with a Transportation Planner" and presentations to community groups that while not focused on the MTP, were an opportunity to inform the public about the MTP and offer a chance to subscribe to the email/newsletter list.

Staff visited various community events at different stages of the plan development in order to meet people where they were already gathering. This type of engagement, often called "meeting in a box", allows for quick setup and engagement of populations that may not traditionally attend public meetings. By posting components of the plan on the MPO website and accepting feedback via email and/or via surveys, this information was more readily available for those who wanted to participate on their own time. For example, early in the process, staff utilized the MetroQuest platform for soliciting feedback on what goals matter most to the public, identifying transportation hotspots/areas of concern. This online survey ran for a few months in early 2019 and garnered over 620 responses, which provided valuable feedback to the steering committee regarding the priority goal areas (picture of goal/vote results? In appendix?). Later in 2019, staff setup at holiday events around the region with posters of the goals and maps to identify hotspots in order to reach additional citizens. The events MPO staff setup at is listed below in Table 4.2. For event by event results, as well as reports regarding surveys, refer to Appendix xx.

Table 4.2: Public Involvement Timeline

Municipality	Event	Date	MTP Focus Area
Asheville	The Lighting of Downtown Asheville	November 22, 2019	MTP Goals and Transportation Areas of Concern
Canton	Canton Christmas Parade	December 5, 2019	MTP Goals and Transportation Areas of Concern
Black Mountain	Black Mountain's Holly Jolly	December 6, 2019	MTP Goals and Transportation Areas of Concern
Hendersonville	Hendersonville Christmas Parade	December 7, 2019	MTP Goals and Transportation Areas of Concern
Fletcher	Fletcher's Christmas in the Park	December 7, 2019	MTP Goals and Transportation Areas of Concern
Mars Hill	Mars Hill Candlelit Stroll	December 7, 2019	MTP Goals and Transportation Areas of Concern
Henderson County	Public Workshop	March 2, 2020	MTP Overview and Draft Project Input
Waynesville	Public Workshop	March 5, 2020	MTP Overview and Draft Project Input
Asheville	Public Workshop	March 11, 2020	MTP Overview and Draft Project Input
Summer events			

Table 4.3: Public Involvement Timeline

<b>Stakeholder Email List Development</b>	<b>September 2018 - December 2018</b>
<ul style="list-style-type: none"> <li>•386 contacts organized through MPO staff and CAC efforts</li> <li>•Compiled and utilized for various Mailchimp newsletters</li> </ul>	
<b>Goals and Areas of Concern Metroquest Survey</b>	<b>March - April 2019</b>
<ul style="list-style-type: none"> <li>•Over 620 users took the online survey for the more than 60 days it was open.</li> <li>•Full summary of results provided in the Appendix.</li> </ul>	
<b>Priority Goals and Areas of Concern Public Events</b>	<b>December 2019</b>
<ul style="list-style-type: none"> <li>•Staff setup at six public events to gather feedback on goals of the MTP and collect problematic "hotspots" in the region</li> <li>•Full summary of results provided in the Appendix.</li> </ul>	
<b>MTP Overview and Draft Projects Public Workshops</b>	<b>March 2020</b>
<ul style="list-style-type: none"> <li>•Staff hosted three drop-in style workshops at three public libraries around the region to showcase the plan and ask for feedback on the draft project list</li> <li>•36 participants attended the three events</li> <li>•The maps and data presented at the workshops were posted on the MPO website and open for public comment March through April 2020.</li> </ul>	
<b>Draft MTP Input</b>	<b>Summer 2020</b>

## Ongoing Involvement Strategies

Given the varying success of engagement efforts and events held throughout development of the plan, staff worked to identify challenges and future opportunities for addressing those challenges. While some of them are specific to particular events or engagement methods, they can help provide a template for engagement over the course of the MTP implementation.

<sup>83</sup> French Broad River MPO. (2014). Public Involvement Policy. Retrieved from <http://frenchbroadrivermpo.org/wp-content/uploads/2019/08/Public-Involvement-Policy.pdf>

Table 4.4: Ongoing Involvement Challenges and Opportunities

CHALLENGE	OPPORTUNITY
<p><b>Lack of familiarity with the French Broad River MPO:</b> The general perception citizens have of transportation planning is that NCDOT owns a majority of the roads, and that municipalities tell them where to build or maintain. M people, locally and statewide, are not aware that MPOs exist or what their r</p>	<p><b>Expand in-person and virtual outreach efforts:</b> This includes continued coordination with local planning partners to distribute surveys and workshop information, in addition to holding smaller workshops and events such as “coffee with a transportation planner” to increase familiarity. Social media outreach is also a beneficial way to inform and engage the public. A future update to the Public Involvement Policy should outline strategies.</p>
<p><b>Timing of workshops:</b> The March workshops took place around the 2020 primary elections, when a lot of citizenry were focused on voting and engaging with local issues, which can lead to “meeting fatigue”. Additionally, the outbreak of the COVID-19 virus nationwide quickly led to people avoiding crowds and gatherings, making them less likely to attend public meetings.</p>	<p><b>Online engagement:</b> If circumstances for in-person engagement appear challenging, more emphasis can be placed on setting up online platforms for collecting feedback. The MPO received over 2,400 responses electronically to its SPOT 5 survey asking for project priorities in 2018. There are ample online tools available to the MPO such as MetroQuest and Survey Monkey. Paper copies and printed materials should accompany online surveys to ensure equal accessibility for those unable or unwilling to use online tools.</p>
<p><b>Consideration of localized versus regional issues:</b> It can be a challenge for the public to think regionally about the transportation system versus the few routes they take to get to their destinations. Planning for the region over the next twenty-five years can be a long-time frame for the general public, as they are more likely to have comments on projects that directly impact their neighborhood or businesses over the next five to ten years.</p>	<p><b>“3-C” approach:</b> The MPO should continue to ensure that the transportation planning process is continuous, cooperative and comprehensive. Transparency and partnerships are crucial aspects for ensuring public trust. Breaking down the complexity of transportation funding and project prioritization for the publics understanding can help citizens feel more empowered and engaged, thus more likely to participate in giving feedback. Updating resources and providing opportunities for public input at all stages of the planning process is fundamental to a continuous process.</p>
<p><b>Overload of information:</b> Some of those who attended the March workshop voiced concerns over the amount of information to consider for the MTP. Understandably, over 160 highway projects being considered for the MTP is a lot to provide feedback on, in addition to thinking about bike, pedestrian, and transit projects.</p>	<p><b>Segmenting of workshops:</b> Since the primary focus of the March workshops was to get feedback on the draft project list, having two or three direct questions soliciting feedback could provide better results than overarching what do you like/not like questions. However, it is important that citizens understand how those projects factor into the long-range planning process.</p>
<p><b>Time and location of workshops:</b> Considering the time and place of events is an on-going public engagement challenge. Regarding the Mar workshops, two of the workshops were held mid-day, with the other extending into the evening. All the workshops were held in library mee rooms. While they were publicly accessible, it could be a challenge for with work commitments or transportation limitations. The same persisted with the December events being held at community events wher participants may have been pre-occupied with family, the parade, et</p>	<p><b>Shorter and more frequent engagement efforts:</b> It has been discussed nationally that getting people to show up is the greatest hurdle to improving public engagement. Holding short (1-2 hour) events at multiple locations or giving a quick talk to a group of stakeholders may be better than holding a few ~3 hour workshops at one location on one day. This approach requires additional resources and planning but may also increase familiarity with the MPO. The CAC can provide feedback on how best to time and locate future events.</p>
<p><b>Engagement with materials:</b> The maps and data provided may not hav encouraged specific feedback regarding project preferences and Not enough “hands on” material may have discouraged participa resulted in lack of engagement from some citiz</p>	<p><b>Focused engagement:</b> Providing a limited number of maps and having interactive charts/ranking lists/projects to select from could improve feedback. This could involve online tools (virtual Q/A, responsive questions and prompts) or interactive ranking games (i.e. budgeting for projects, prioritizing goals).</p>

## FINANCIAL PLAN

Metropolitan Transportation Plans are required to have a financial plan, meaning there must be a reasonable assumption that funding will be available in the next twenty-five years for the projects programmed in the MTP.

### Assumptions

The French Broad River MPO Financial Plan is based on several assumptions that fit the guidelines of FHWA's requirements for MTP financial plans. No major changes in legislation are assumed, no funding sources that do not currently exist are expected, and there are no increases in funding programs that cannot be reasonably assumed based on current legislative bills and local planning.

The other primary funding assumption is that the Strategic Transportation Investments (STI) Law of North Carolina will continue to be in place. This primarily impacts the distribution of state and federal funds for highway and bike/ped modes. STI splits funding into three tiers based on the facility type of the project: Statewide Mobility, Regional Impact, and Division Needs.

### Statewide Mobility

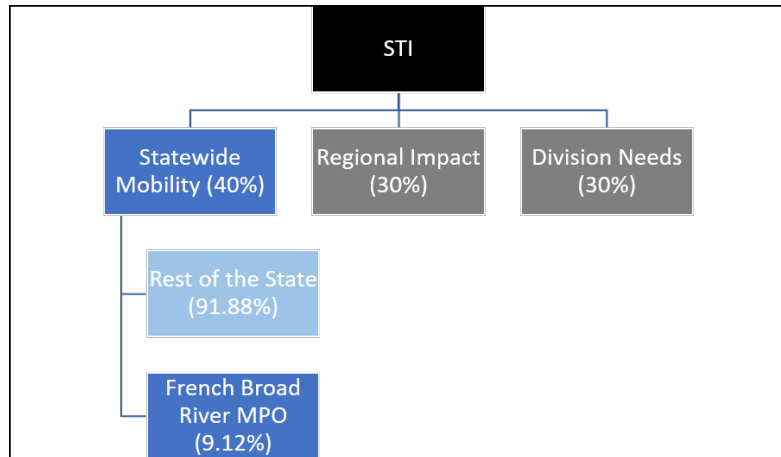
The Statewide Mobility tier makes up 40% of funding programmed through STI and is available for Interstate and facilities on the Strategic Highway System (STRAHNET). In the French Broad River MPO region, this funding can be applied to projects on I-26, I-40, I-240, and US 23/74 in Haywood County.

Projects funded in the Statewide Mobility tier are determined by the data-drive quantitative SPOT score. That means there is no funding guaranteed to specific regions; funding is just applied to projects considered to have the greatest need. To determine how much statewide mobility funding the French Broad River MPO would receive, the assumption is that the French Broad River MPO will continue to take down the same percentage of statewide mobility funds from the 2020-2029 State Transportation Improvement Program (9.12%) as it will over 25 years. This would result in- by far- the single largest source of funding for transportation funding in the French Broad River MPO Planning Area.

Table 4.5: Financial Plan Assumptions

Funding Source	Assumption
Highway- Federal Funding Programs (NHP, STBG, TAP)	Maintain current funding levels to keep up but not exceed the rate of inflation
Highway- State Funding	Maintain current funding levels to keep up but not exceed the rate of inflation
Highway- Local	Maintain current funding levels; primarily focused on maintenance
Bike/Ped- Federal Funding Programs (STBG, TAP)	Maintain current funding levels to keep up but not exceed the rate of inflation
Bike/Ped- State Funding	No state funding available for bike/ped
Bike/Ped- Local Funding	Local funding for bike/ped projects limited to Asheville, Hendersonville, Waynesville, and Black Mountain
Transit- Federal Funding (5307, 5310, JARC, 5339)	Maintain current funding levels to keep up but not exceed the rate of inflation
Transit- State Funding (ADTAP, ROAP)	Maintain current funding levels to keep up but not exceed the rate of inflation
Transit- Local Funding	Maintain current funding with expected expansions in Asheville
Aviation- Federal Funding	Maintain current funding levels to keep up but not exceed the rate of inflation
Aviation- State Funding	Maintain current funding levels to keep up but not exceed the rate of inflation
Aviation- Local Funding	Maintain current funding levels to keep up but not exceed the rate of inflation
Maintenance- Federal Funding (NHP, NHPP)	Maintain current funding levels to keep up but not exceed the rate of inflation
Maintenance- State Funding (including POWELL Bill)	Maintain current funding levels to keep up but not exceed the rate of inflation
Maintenance- Local Funding	Maintain current funding levels to keep up but not exceed the rate of inflation

Figure 4.1: Statewide Mobility Tier



### Regional Impact

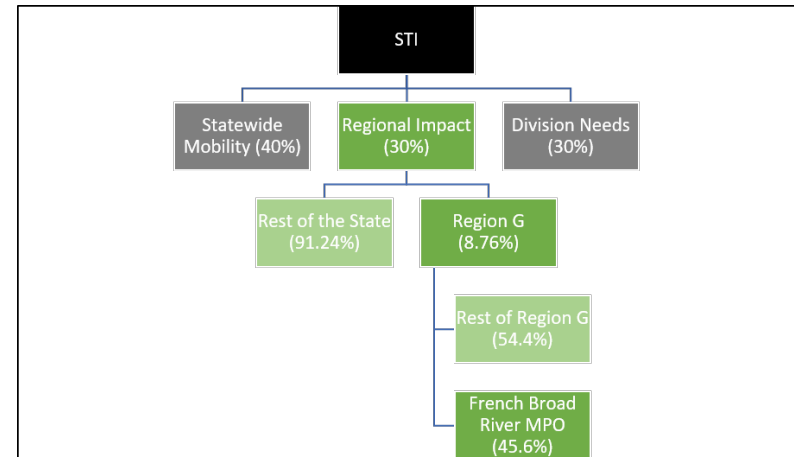
The Regional Impact tier makes up 30% of funding programmed through STI and is available for US and NC highways, transit facilities that serve multiple counties, and any project also eligible for the Statewide Mobility tier. Funding is divided among seven different regions in the State with each region's allocation being determined by population. The French Broad River MPO is in Region G which is made up of all the counties in NCDOT Divisions 13 and 14. Region G is the second least populated region in the state and therefore receives the second smallest amount of funding for this tier. Regional impact funding is determined by a mixture of quantitative data and local input points."

To project the amount of funding the French Broad River MPO will receive over 25 years, the French Broad River MPO assumes the MPO will receive a percentage of funding in-line with the French Broad River MPO's percentage of Region G population (45.6%). Other MPOs and RPOs in Region G (Land of Sky RPO, Isothermal RPO, Southwestern RPO, High Country RPO, and Hickory MPO) would be likely to receive the remaining percentage.

### Division Needs

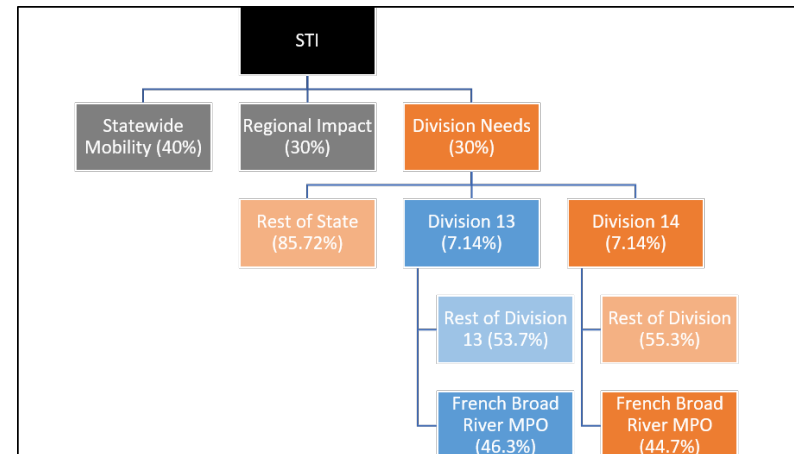
The Division Needs tier makes up 30% of funding programmed through STI, is determined by quantitative data and local input points, and is available for secondary roads, bike/ped projects, transit projects, and any projects also eligible in the Statewide Mobility and Regional Impact

Figure 4.2: Regional Impact Tier



tiers." Division Needs funds are split equally between the 14 NCDOT Divisions. Projects compete within each NCDOT Division. The French Broad River MPO lies partially within Divisions 13 and 14. To project the amount of funding in the Division Needs tier, two calculations have been done. One for Division 13, which projects the French Broad River MPO would receive 46.3% of the Division Needs funds in Division 13, based on the MPO's proportion of population within the Division. For Division 14, the French Broad River MPO is projected to receive 44.7% of the Division Needs funds in Division 14, based on the MPO's proportion of population within the Division.

Figure 4.3: Division Needs Tier





## Bicycle and Pedestrian Funds

Funding for bicycle and pedestrian projects is considerably different than funding for highway projects. Not all bicycle and pedestrian projects are meant to or are going to be reflected in this section of the MTP- the primary focus is on larger bicycle and pedestrian projects that may require the application of state or federal funds or may play a significant role in changing mode choice for a large number of users and trips.

One important distinction for this section is that it only focuses on funding for stand-alone bicycle and pedestrian projects. This is an important distinction because bicycle and pedestrian improvements may also be planned and implemented as part of highway projects. Bicycle and pedestrian improvements made as part of highway projects would be budgeted under the highway financial plan. Bicycle and pedestrian improvements that are stand-alone (i.e. primarily not including vehicular improvements to the roadway) is what's considered in this section.

Bicycle and pedestrian funding being focused on in the MTP are funding opportunities that can be reasonably expected to continue and can be projected over twenty-five years. This primarily includes federal and local funds—North Carolina does not allow state funds to be applied towards stand-alone bicycle and pedestrian projects. The funds that are more irregular or do not follow FHWA guidance on being reasonably expected are not included in this financial plan, such as potential local bonds in the future, major private donations, and USDOT Build funds.

Federal funds are expected to come from three primary sources. The first, and most prominent source, is the MPO's Surface Transportation Block Grant- Direct Allotment (STBGDA) which has gone primarily towards bicycle and pedestrian projects since 2012. These are federal pass-through funds that are programmed by the MPO for eligible uses by member governments. Currently, the French Broad River MPO receives approximately \$4,250,000 of STBGDA funds per year. The second source is the MPO's Transportation Alternatives Program-Direct Allotment (TAPDA) which is very similar to STBGDA. These are funds programmed by the MPO; however, bicycle and pedestrian projects receive a considerably smaller amount receiving only \$330,000 per year."The third is federal funding that comes through the State's prioritization process for bicycle and pedestrian projects.

Bicycle and pedestrian projects are eligible at the Division Needs tier, the French Broad River MPO anticipates utilizing approximately four percent of anticipated Division Needs tier revenues for bicycle and pedestrian projects.

Figure 4.4: How is a Stand-Alone Bike/Ped Project Different from a Complete Streets Project?

### Complete Streets

- **Primary Project Purpose:** Improve the Road for Vehicular Travel but Bike/Ped Improvements are To Be Considered
- **Local Match:** no match required, unless unplanned bike/ped improvements are requested

### Stand-Alone Bike/Ped

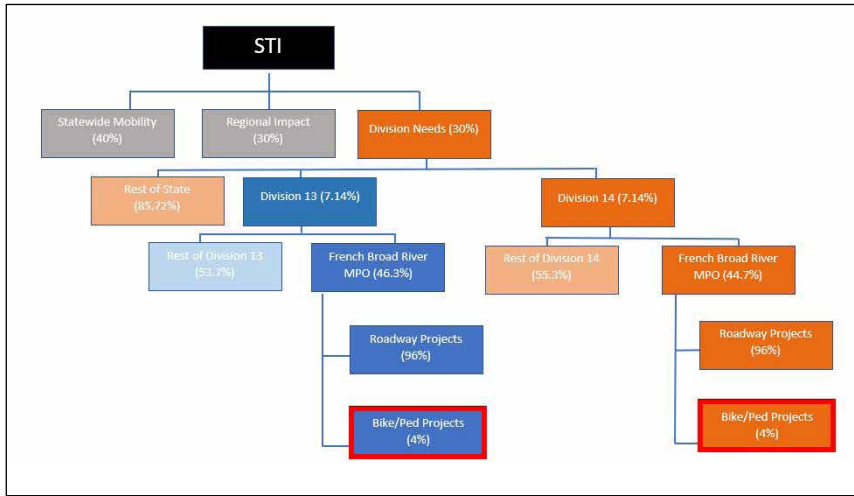
- **Primary Project Purpose:** Improve Bicycle and Pedestrian Travel but May Require Changes to Roadways
- **Local Match:** 20% of total project costs from non-federal sources

Local funds also play a significant role in funding bicycle and pedestrian projects. This includes funding from local governments, TDAs, and other non-federal sources. Local funding is necessary in order for federal funds to be utilized in our region and some local governments have taken on major bicycle and pedestrian projects without the use of other sources- including sections of the Richland Creek Greenway by the Town of Waynesville, improvements to Main Street by the Town of Canton, sidewalk projects by the Cities of Asheville and Hendersonville, and sections of trail and sidewalk by the Town of Black Mountain. However, for this MTP's financial plan local funding will be considered broadly as local match for federal funds. Currently there are no local bond referendums planned for the ballot and no dedicated local funds for bicycle and pedestrian improvements by the local government. We do anticipate that local investments will continue- and likely continue to increase- but those investments are not considered to be reasonably anticipated, based on FHWA guidance.

## Transit Funds

All financial data in this section is presented in Year 2020 constant dollars, meaning that the values indicate what it would cost to build the system if all projects were paid for and built today. Projects will be built over 25 years and the connected costs will be affected by inflation.

Figure 4.5: Bike/Ped Projects in the Division Needs Tier



The 2045 MTP divides funding into five (5) time periods for projection:

- 2021-2025
- 2026-2030
- 2031-2035
- 2036-2040
- 2041-2045

**Federal Funding.** The FTA administers several programs funding public transportation services within the French Broad River MPO area. It is assumed that the cost of providing the current levels of public transportation services is expected to rise moderately due to inflation. Salaries and fringe benefits will continue to burden operating budgets for transit agencies. The demand for paratransit, as the elderly population grows, will create more pressure on regional operating budgets.

Figure 4.6: Total Transit Funding in FBRMPO Region (25 years)

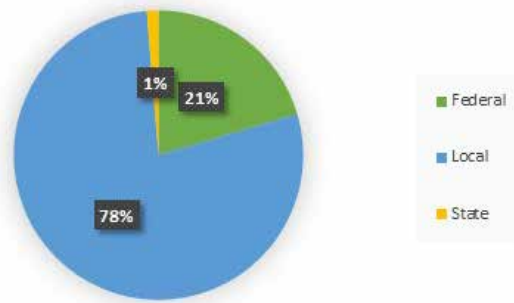
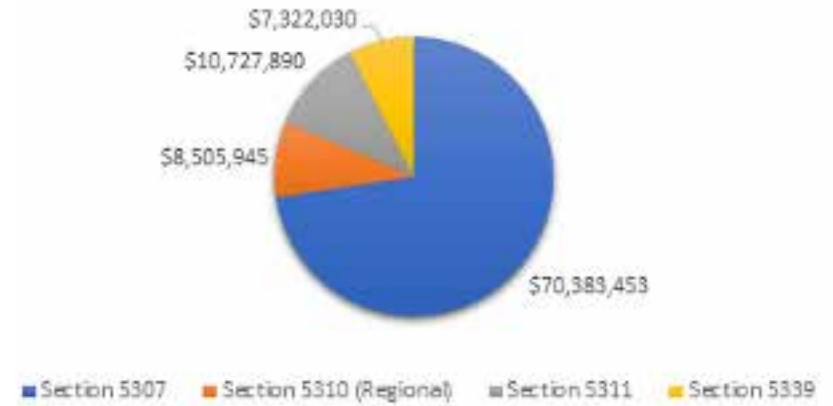


Table 4.6: Total Transit Funding in FBRMPO Region (25 years)

	Local	State	Federal
2021-2025	\$73,466,447	\$1,221,753	\$19,387,863
2026-2030	\$73,889,319	\$1,221,753	\$19,387,863
2031-2035	\$74,316,420	\$1,221,753	\$19,387,863
2036-2040	\$74,747,792	\$1,221,753	\$19,387,863
2041-2045	\$75,183,477	\$1,221,753	\$19,387,863
TOTAL	\$371,513,459	\$6,108,765	\$96,939,315

Figure 4.7: Federal Funding for Transit in FBRMPO Region (25 years)



Section 5307 Formula Grants provide funding to urbanized areas for public transportation capital, planning, job access and reverse commute projects, as well as transit operating assistance. For urbanized areas (greater than 50,000 in population) the funding formula is based on population, population density, and the number of low-income individuals.

5310 Enhanced Mobility of Seniors and Individuals with Disabilities provides funding for programs to service the special needs of transit-dependent populations beyond the traditional public transportation services or the complementary paratransit services of the Americans with Disabilities Act (ADA). Eligible activities include capital and operating projects that assist seniors and individuals with disabilities. Funds are apportioned for urbanized and rural areas based on the number of seniors and individuals with disabilities.

Section 5311 Formula Grants are available rural areas (less than 50,000 in population) for public transportation capital, planning, and operating assistance. A majority of the funding formula is based on land area and population in rural areas with a small percentage apportioned based on revenue vehicle miles and number of low-income individuals.

Section 5339 Bus and Bus Facilities allocates funding to states and subrecipients for capital funding to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities.

**State Funding.** The State of North Carolina provides funds for capital and operating assistance programs partially funded by FTA. Most funding levels are based on formulas that consider population and transit trips. Rural Operating Assistance Program (ROAP) and Elderly and Disabled Transportation Assistance Program (EDTAP) funds are only received by Henderson County and Madison County. State funds make up a significantly small portion of transit funding in the French Broad River MPO region. The systems that receive funding from the state are expected to continue receiving funding.

**Local Funding.** Local jurisdictions provide matching funds for capital and operating programs that are partially funded by federal and state transit monies. This local funding comes from the General Fund. Fare-box revenue and advertising displays on vehicles also provide additional financial support for transit revenue. The incremental increase in local funding seen in the charts and tables conform to Asheville’s Transit Master Plan. Other local funding sources are forecasted to remain flat, keeping up with inflation but not exceeding it.

**Maintenance Funding.** The preservation and maintenance of the existing highway system is crucial for the safe and efficient movement of people and freight through the region. State and federal roadway

maintenance funds are set to equal expected expenditures in consideration of previous levels of revenues and expenses. The Highway Maintenance Improvement Program (HMIP) reflects state funding and provides anticipated cost for each maintenance project at the county level, and is available for fiscal years 2021-2025. Years 2021-2025 are detailed in HMIP Plans, with the remaining years (2026-2045) being based on the aforementioned assumption that funding will be maintained to keep up but not exceed the rate of inflation. This result means funding will remain flat, which is consistent with assumptions made for other funding sources. Since estimated costs are known at the county level, but not for specifically the MPO region, the amount reflects the percentage of roadway miles within the MPO for each county.

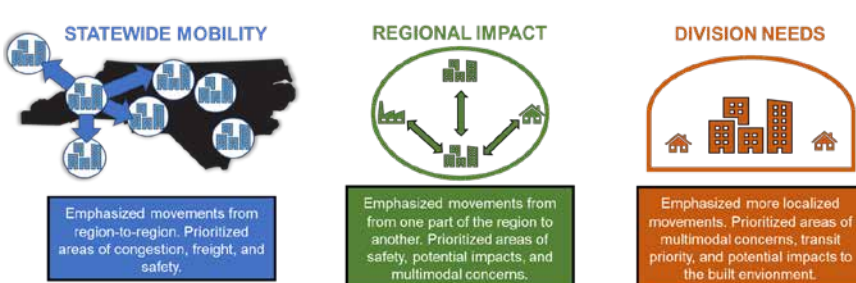
Federal funding for maintenance is made available through the National Highway Performance Interstate Maintenance (NHPIM) apportionment via the FAST Act. Additionally, bridge maintenance is covered under the National Highway Performance Program Bridge (NHPB). Funding estimates for these federal programs are listed in the TIP for fiscal years 2020-2023. The remaining years (2024-2045) are estimated based on the average of the known years. The federal maintenance funding is listed in the “Regionwide” column of the table. Local funds for roadway maintenance are reflected by what is distributed to local municipalities via Powell Bill funding. Additionally, on-road bicycle and pedestrian facility maintenance is reflected as part of federal and state road maintenance.

Based on this methodology, it is expected that over \$797 million in maintenance funding will come to the region between 2021 and 2045.

Table 4.7: Maintenance Funding:2021-2045

Maintenance Funding: 2021-2045 \$797,237,850			
Funding Type (Source)	Federal (NHPIM and NHPB)	State (HMIP)	Local (Powell Bill)
2021-2025	\$65,143,000	\$72,950,040	\$21,354,530
2026-2030	\$65,143,000	\$72,950,040	\$21,354,530
2031-2035	\$65,143,000	\$72,950,040	\$21,354,530
2036-2040	\$65,143,000	\$72,950,040	\$21,354,530
2041-2045	\$65,143,000	\$72,950,040	\$21,354,530
TOTAL	\$325,715,000	\$365,750,200	\$106,772,650

Figure 4.8: Project Prioritization Process



## PROJECTS

The MTP is required to reflect projects that are already funded in the region and to reflect regional priorities that fit within expected revenues over the 25-year time horizon. Projects selected for the MTP were done so under the guidance of the MPO's steering committee with input provided from the public and the MPO's TCC and Board.

Projects for the MTP were selected over several months in late, 2019 and early, 2020, through a process with the steering committee. Candidate projects were drawn from the region's Comprehensive Transportation Plan, the Madison County Comprehensive Transportation Plan, locally-adopted bicycle and pedestrian plans, the regionally adopted Blue Ridge Bicycle Plan, and additional suggested projects from MPO TCC and Board members. Together, the full list of candidate projects comprised more than 350 potential projects around the region.

The next step was to prioritize projects based on both the MTP's goals as well as the financial constraints. The project prioritization process reflected the process which determines the majority of funding for transportation projects: the Strategic Transportation Investments (STI) Law of North Carolina. Each tier was provided with eligible projects and different needs were prioritized based on steering committee input and project eligibility.

This process reflects the financial opportunities and constraints under the current STI Law. Under the MTP 2045 financial projections, the French Broad River MPO would be expected to program more than \$2 billion in Statewide Mobility projects- a boon that, if realized, could only be applied to Interstates and US 23/74 (Great Smokey Mountains Expressway) in the region. Regional Impact funding, however, is divided at the state-level based on population- the region in which the French Broad River MPO falls is the second least populated in the state, meaning available funding is limited for Regional Impact projects. Division Needs is projected to be slightly more

### Gaps Between MTP Recommendations and Projects

The French Broad River MPO MTP has a noted gap between recommendations and projects. While improving non-highway modes are clear priorities of the MTP, these priorities stand in contrast to the MTP's financial plan. The reason is that the goals and recommendations are more aspirational- a direction in which the region wants to move with planning activities that may help the MPO move in that direction.

The financial plan, however, reflects the current funding policies that impact our region. These funding policies are largely set at the state and federal levels and the MPO/region has minimal means for their alteration.

Current funding policies have programmed a substantial amount of funding towards highway improvements in our region. There are currently more than \$2 billion in highway investments planned with more than half of that programmed towards widenings and other improvements on I-26. These are not funds that can be easily moved to other activities within the current constraints of state and federal funding policies.

At the same time, it should be recognized that a blanket term of "highway improvements" does not necessarily account for everything being addressed through highway projects. Park and Ride lots may be added as part of the scope of projects, if deemed appropriate- a recommendation in the MTP. Bicycle and pedestrian facilities may be added as part of highway projects as well, per NCDOT's Complete Streets Policy. Projects such as Russ Avenue in Waynesville, NC 280 in Mills River, and Amboy/Meadow in Asheville are all programmed with the primary intent of addressing roadway/vehicular deficiencies but are being designed to include improvements for other modes as well.

In conclusion, while the gap may be somewhat less in reality than it may seem in this plan, it still very much exists and is worth acknowledging. Our region has a number of challenges and has access to limited resources, so the funding that is projected to come to our region based on current policies does not necessarily match the priorities set forth in this document. Providing a financial plan that reflects funding realities enables us to be better prepared for projects that are likely coming, plan for improvements that address deficiencies for more modes, and prioritize local and regional resources to better plan for these on-coming investments. This approach provides an opportunity to better examine how funding policies are expected to play out over the long-term and enable a discussion of their fit with our region.

Projects are listed below by horizon year; roughly when projects are expected to be completed.

TOTAL HIGHWAY FUNDING IN MTP FINANCIAL PLAN: \$3,881,564,000  
TOTAL HIGHWAY PROJECT COSTS IN MTP: \$3,840,955,000  
TOTAL BIKE/PED FUNDING IN MTP FINANCIAL PLAN: \$200,000,000  
TOTAL BIKE/PED PROJECT COSTS IN MTP: \$199,722,000

Table 4.8: Horizon Year 2030 (Projects Committed in the TIP)

HORIZON YEAR 2030 (PROJECTS COMMITTED IN THE TIP)							
MTP ID	TIP ID	ROUTE	FROM	TO	COST	GENERAL IMPROVEMENT	COUNTY
HS4501	I-4400B	I-26	US 25	US 64	\$82,152,000	Widening	Henderson
HR4514	I-4400C	I-26	NC 280	US 25	(Costs Accounted For Previously)	Widening	Henderson
HS4502	I-4700	I-26	I-40	NC 280	\$62,468,000	Widening	Buncombe
HS4505	I-2513B	I-26/I-240	Exit 25/NC 251	North of Haywood Road	\$644,505,000	Widen and Build New Bridges over the French Broad River	Buncombe
HS4506	I-2513C	I-26	I-40/I-240	-	\$217,602,000	Upgrade Interchange	Buncombe
HR4501	I-2513A	I-26/I-240	I-40	North of Haywood Road	\$163,690,000	Widening	Buncombe
HS4503	I-4759	I-40	Liberty Road	-	\$41,722,000	Convert Grade Separation to New Interchange	Buncombe
HS4504	I-4409	I-40	Blue Ridge Road	-	\$13,250,000	Convert Grade Separation to New Interchange	Buncombe
HR4502	A-0010AA	Future I-26	Exit 19 (Weaver Boulevard)	Exit 25 (NC 251)	\$116,900,000	Widening and Upgrade to Interstate Standards	Buncombe
HR4504	U-5783	US 64	Blythe Street	White Pine Drive	\$17,870,000	Widening with Complete Streets Improvements	Henderson
HR4505	U-6049	NC 225 (S Main Street)	S King Street	US 176 (Spartanburg Highway)	\$4,633,000	Bridge Widening	Henderson
HR4506	U-6124	NC 280	NC 191	NC 191	\$9,600,000	Access Management	Henderson
HR4507	U-3403B	NC 191	Ledbetter Road	Blue Ridge Parkway	\$13,464,000	Widening	Buncombe
HR4508	U-5781	US 25@ Edgewood Rd	-	-	\$1,003,000	Intersection Improvement	Buncombe
HR4509	U-2801A	US 25A	US 25	Rock Hill Road	\$39,000,000	Widening	Buncombe
HR4510	U-5972	NC 63	US 19/23	Newfound Road	\$28,400,000	Access Management	Buncombe
HR4511	U-5971	US 19 (Patton Avenue)	NC 63	-	\$2,700,000	Intersection Improvement	Buncombe
HR4512	U-5973	US 25	New Stock Road	-	\$1,300,000	Intersection Improvement	Buncombe

MTP ID	TIP ID	ROUTE	FROM	TO	COST	GENERAL IMPROVEMENT	COUNTY
HR4513	AV-5735	Runway Construction	-	-	\$300,000	Runway Construction	Buncombe
HD134501	R-5779	Crossroads Parkway	Current limits of SR 1631	SR 1632	\$4,071,000	New Roadway	Madison
HD134502	U-5832	NC 81	Biltmore Avenue	S Tunnel Road	\$10,550,000	Widening	Buncombe
HD134503	U-5837	Riceville Road	US 70	Clear Vista Lane	\$2,000,000	Modernization	Buncombe
HD134504	U-6163	Mills Gap Road	Cane Creek Road	-	\$1,300,000	Intersection Improvement	Buncombe
HD134505	U-4739	Amboy/ Meadow Road	I-240	Biltmore Avenue	\$49,300,000	Modernization	Buncombe
HD134506	U-6230	New Access Road for Enka Commerce Park	US 19/23	NC 112	\$1,300,000	New Roadway	Buncombe
HD134507	U-5834	Mills Gap Road	US 25	Weston Road	\$15,333,000	Widening	Buncombe
HD134508	U-6162	N Louisiana Avenue	US 19/23	Emma Road	\$5,800,000	Modernization	Buncombe
HD134509	U-6046	NC 81 (Swannanoa River Road)	US 70	US 74A	\$23,302,000	Modernization	Buncombe
HD134510	U-6047	NC 112 (Sand Hill/Sardis Road)	NC 191	US 19/23	\$44,515,000	Widening	Buncombe
HD144501	U-6172	US 23/74	Balsam View Drive	Old Balsam Road	\$23,000,000	Modernization	Haywood, Jackson
HD144502	R-5921	US 276	US 19	I-40	\$20,700,000	Modernization	Haywood
HD144503	R-2588B	NC 191	Mountain Road	NC 280	\$79,700,000	Widening	Henderson
HD144504	R-5746	Kanuga Road	US 25B	Little River Road	\$13,050,000	Modernization	Henderson

MTP ID	TIP ID	ROUTE	FROM	TO	COST	GENERAL IMPROVEMENT	COUNTY
HD144505	U-6048	US 19/23	Chestnut Mountain Road	Wiggins Road	\$4,535,000	Modernization	Buncombe, Haywood
HD144506	U-5888	US 23B	Walnut Street	-	\$3,450,000	Intersection Improvement	Haywood
HD144507	U-6159	US 276	US 23/74	US 19	\$13,600,000	Access Management	Haywood
HD144508	U-5839	US 276	US 23/74	US 23B	\$21,200,000	Access Management	Haywood
HD144509	U-6158	US 276	Crymes Cove Road	-	\$2,700,000	Intersection Improvement	Haywood
HD144510	U-5886	White Street	Willow Road	US 176	\$33,370,000	Roadway Realignment	Henderson
HD144511	U-5887	Highland Lake Road	NC 225	US 176	\$3,100,000	Modernization	Henderson
HD144512	U-5840	Old Airport Road	US 25	Mills Gap Road	\$8,785,000	Widening	Henderson
HD144513	U-4712	US 23B (South Main Street)	Hyatt Creek Road	US 276	\$50,540,000	Widening	Haywood
HD144514	U-5548	Brown Avenue	Boyd Avenue		\$500,000	Roadway Realignment	Haywood
HD134514	I-2513D	Riverside Drive	Hill Street	Broadway Avenue	\$9,500,000	Widening	Buncombe

Table 4.9: Bicycle and Pedestrian Projects - Horizon Year 2030

BICYCLE AND PEDESTRIAN PROJECTS – HORIZON YEAR 2030							
MTP ID	TIP ID	Route	From	To	Cost	Improvement	County
BP134514	EB-5790	Asheville Greenway Connectors	River Arts District	Beaucatcher Greenway	\$1,146,000	Bike Improvements	Buncombe
BP144517	EB-5860	Blythe Street	US 64	NC 191	\$960,000	Sidewalks	Henderson
BP134505	EB-5965	Deaverview Road	Patton Avenue	Westmore Drive	\$3,205,000	Sidewalks	Buncombe
BP134519	EB-5824	Enka Heritage Trail	Sand Hill School Road	Enka High School	\$6,400,000	Multi-Use Path	Buncombe
BP134503	U-5019B	French Broad River West Greenway	Haywood Road	French Broad River Park	\$5,000,000	Multi-Use Path	Buncombe
BP144508	EB-5963	Grove Street	US 176	Barnwell Street	\$904,000	Sidewalks	Henderson
BP144520	EB-5859	Hazelwood Avenue	Plott Creek Road	Will Hyatt Road	\$183,000	Sidewalks	Haywood
BP134515	EB-5944	Johnston Boulevard	Patton Avenue	Iona Circle	\$2,350,000	Sidewalks	Buncombe
BP134521	EB-5919	McDowell Street/Choctaw Street	Southside Avenue	Biltmore Avenue	\$446,000	Pedestrian Improvements	Buncombe
BP134511	EB-5774	NC 251/Beaverdam Creek Greenway	Broadway	US 25	\$7,530,000	Multi-Use Path	Buncombe
BP134513	EB-5947	New Haw Creek Road	Beverly Road	Bell Road	\$2,375,000	Sidewalks	Buncombe
BP134506	EB-5822	North RAD Greenway	Hill Street	Broadway	\$3,179,000	Multi-Use Path	Buncombe
BP134516	EB-5948	Onteora Boulevard	Lincoln Avenue	Raleigh Road	\$1,140,000	Sidewalks	Buncombe
BP134507	EB-5547	Riverwalk Greenway	Flat Creek Greenway	Into the Oaks Trail	\$6,009,000	Multi-Use Path	Buncombe
BP134504	U-5019A	Town Branch Greenway	US 25	Depot Street	\$4,275,000	Multi-Use Path	Buncombe
BP144512	EB-5926	US 19 (Soco Road)	US 19	Soco Road	\$1,975,000	Complete Streets	Haywood



# MTP 2045 Projects

## Highway - FBRMPO Region

### Horizon 2030 (Committed)

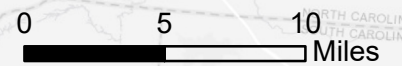
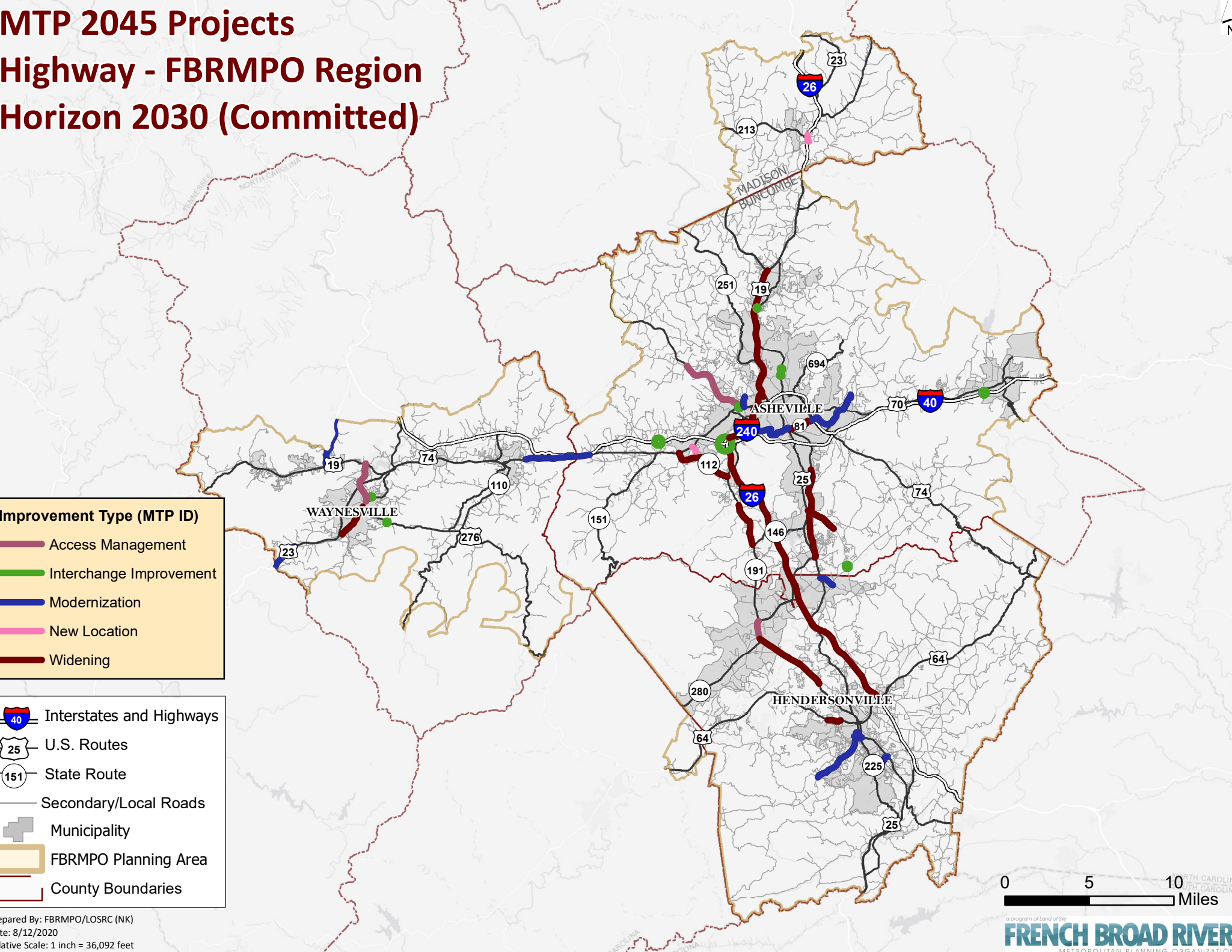


**Improvement Type (MTP ID)**

- Access Management
- Interchange Improvement
- Modernization
- New Location
- Widening

- Interstates and Highways
- U.S. Routes
- State Route
- Secondary/Local Roads
- Municipality
- FBRMPO Planning Area
- County Boundaries

Prepared By: FBRMPO/LOSRC (NK)  
 Date: 8/12/2020  
 Relative Scale: 1 inch = 36,092 feet  
 'Map and Data Disclaimer' at [www.frenchbroadrivermpo.org](http://www.frenchbroadrivermpo.org)



# MTP 2045 Projects

## Bicycle and Pedestrian - FBRMPO Region

### Horizon 2030 (Committed)



**BikePed**

**Improvement Type**

- Bike Improvements
- Pedestrian Improvements

- Interstates and Highways
- U.S. Routes
- State Route
- Secondary/Local Roads
- Municipality
- FBRMPO Planning Area
- County Boundaries

Prepared By: FBRMPO/LOSRC (NK)  
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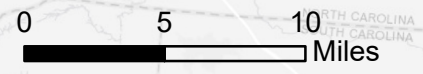
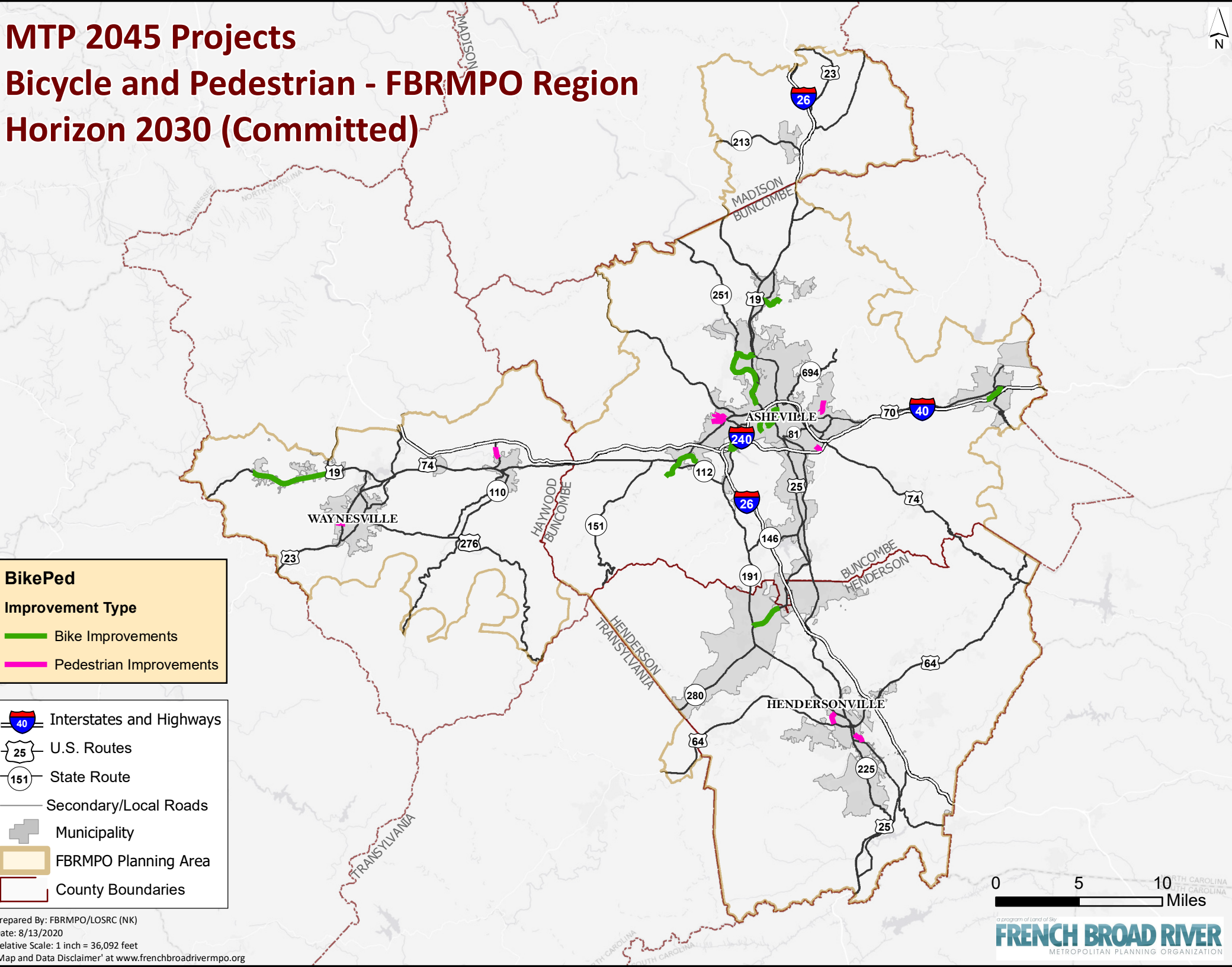


Table 4.10: Horizon Year 2040 (Projects in the Prioritization Process from the MPO)

HORIZON YEAR 2040 (PROJECTS IN THE PRIORITIZATION PROCESS FROM THE MPO)							
MTP ID	TIP ID	ROUTE	FROM	TO	COST	GENERAL IMPROVEMENT	COUNTY
HS4507	I-6018	I-40	I-240/US 74A	-	\$35,100,000	Interchange Improvement	Buncombe
HS4508	I-6021	I-40	Porter's Cove Road	-	\$7,200,000	Interchange Improvement	Buncombe
HS4509	I-4400A	I-26	US 25	US 64	\$80,000,000	Widening	Henderson
HS4510	I-6054C	I-40	Wiggins Road	Monte Vista Road	\$102,900,000	Widening	Buncombe
HS4511	I-6054A	I-40	US 74	NC 215	\$60,500,000	Widening	Haywood
HS4512	I-6054B	I-40	NC 215	Exit 37 (Wiggins Road)	\$169,500,000	Widening	Haywood
HS4513	A-0010AB	Future I-26	US 25	SR 2207	\$72,500,000	Interstate Modernization	Buncombe
HS4514	A-0010AC	Future I-26	SR 2207	South of SR 2148	\$27,500,000	Interstate Modernization	Buncombe
HR4515	U-3403A	NC 191	Ledbetter Road	NC 280 (Boylston Highway)	\$31,212,000	Widening with Complete Streets Improvements	Buncombe, Henderson
HR4516		US 25 (Hendersonville Road)	Blue Ridge Parkway	NC 146 (Long Shoals Road)	\$56,189,000	Access Management with Complete Streets Improvements	Buncombe
HR4517		US 25 (Hendersonville Road)	NC 146 (Long Shoals Road)	NC 280 (Airport Road)	\$40,859,000	Access Management with Complete Streets Improvements	Buncombe
HR4518		US 25A (Biltmore Avenue), US 25 (McDowell Street), Southside Avenue	Hilliard Avenue	All Souls Crescent	\$15,339,000	Roadway Upgrade to Improve Multimodal Accommodations	Buncombe
HR4519		US 25 (Merrimon Avenue)	Wembley Road	I-240	\$10,890,000	Road Diet	Buncombe
HR4520		US 23A (Haywood Road)	State Street, N Louisiana Avenue			Multiple Intersection Improvements with Complete Streets Improvements	Buncombe

MTP ID	TIP ID	ROUTE	FROM	TO	COST	GENERAL IMPROVEMENT	COUNTY
HR4521		US 70 (Tunnel Road)/US 74A (South Tunnel Road)	I-240	Blue Ridge Parkway	\$37,900,000	Access Management with Complete Streets Improvements	Buncombe
HR4522		US 25/US 19/23B (Weaverville Highway)	Elkwood Avenue	Reems Creek Road	\$6,253,000	Access Management with Complete Streets Improvements	Buncombe
HR4523		New Clyde Highway	NC 215	Midway Crossings Drive	\$8,283,000	Access Management with Complete Streets Improvements	Haywood
HR4524		US 19 (Dellwood Road)	US 276 (Russ Avenue)	US 276 (Jonathan Creek Road)	\$15,987,000	Access Management with Complete Streets Improvements	Haywood
HR4525		US 25B (Asheville Highway)	North Main Street	-	\$2,952,000	Intersection Improvement with Complete Streets Improvements	Henderson
HR4526		US 19/23 (Smokey Park Highway)	I-40	NC 151	\$44,041,000	Access Management with Complete Streets Improvements	Buncombe
HD134511		Bruce Road	N Main Street	Bailey Street	\$2,914,000	Modernization with Complete Streets Improvements	Madison
HD134512		Blue Ridge Road	Blue Ridge Assembly Drive	NC 9	\$1,844,000	Modernization with Complete Streets Improvements	Buncombe
HD134513		Woodfin Street	Central Avenue	Lexington Avenue	\$5,000,000	Modernization with Complete Streets Improvements	Buncombe
HD134514		US 70	Blue Ridge Road	NC 9	\$13,106,000	Road Diet	Buncombe
HD134515		US 25A (Sweeten Creek Road)	I-40	US 25 (Biltmore Avenue)	\$3,838,000	Roadway Upgrade with Complete Streets Improvements	Buncombe
HD134516		US 70 (Tunnel Road)/US 74A (South Tunnel Road)	The Tunnel	NC 81 (Swannanoa River Road)	\$51,815,000	Access Management with Complete Streets Improvements	Buncombe
HD134517		US 25 (Hendersonville Road)	I-40	Blue Ridge Parkway	66,557,000	Access Management with Complete Streets Improvements	Buncombe

MTP ID	TIP ID	ROUTE	FROM	TO	COST	GENERAL IMPROVEMENT	COUNTY
HD144533	U-6160	US 19 (Soco Road)	Fie Top Road	Blue Ridge Parkway	\$26,610,000	Modernization with Complete Streets Improvements	Haywood
HD144515		US 19/23	Chestnut Mountain Road	NC 215	\$6,475,000	Roadway Upgrade with Complete Streets Improvements	Haywood
HD144516		Fanning Bridge Road	US 25 (Hendersonville Road)	NC 280 (Airport Road)	\$6,628,000	Modernization with Complete Streets Improvements	Henderson
HD144517		White Pine/Hebron Road	US 64	Kanuga Road	\$17,875,000	Modernization with Complete Streets Improvements	Henderson
HD144518		Signal Hill/Thompson/Berkley	NUS 64 (Four Seasons Boulevard)	US 25B (Asheville Highway)	\$11,613,000	Modernization with Complete Streets Improvements	Henderson
HD144519		Blythe Street	NC 191	US 64	\$6,891,000	Modernization with Complete Streets Improvements	Henderson
HD144520		Butler Bridge Road	US 25B (Hendersonville Road)	NC 191 (Boylston Highway)	\$18,000,000	Modernization with Complete Streets Improvements	Henderson
HD144521		Duncan Hill Road	US 64 (Four Seasons Boulevard)	Signal Hill Road	\$5,650,000	Modernization with Complete Streets Improvements	Henderson

Table 4.11: Bicycle and Pedestrian Projects - Horizon Year 2040

BICYCLE AND PEDESTRIAN PROJECTS – HORIZON YEAR 2040							
MTP ID	TIP ID	Route	From	To	Cost	Improvement	County
BP134518	EB-5823	Bent Creek Greenway	Hominy Creek River Park	WNC Farmer's Market	\$4,000,000	Multi-Use Path	Buncombe
BP144502	EB-5945	Champion Drive	North Canton Road	Thickety Road	\$2,380,000	Sidewalks	Haywood
BP134509	EB-5831	Coxe Avenue	Patton Avenue	Short Coxe Avenue	\$5,250,000	Complete Streets	Buncombe
BP134510	EB-5830	Lexington Avenue	Patton Avenue	Southside Avenue	\$6,750,000	Complete Streets	Buncombe
BP144501	EB-5946	Mills River Valley Trail	French Broad River	NC 191	\$3,000,000	Multi-Use Path	Henderson

MTP ID	TIP ID	Route	From	To	Cost	Improvement	County
BP134522	EB-5821	Reems Creek Greenway	Western Weaverville Town Limits	Karpen Soccer Fields	\$6,000,000	Multi-Use Path	Buncombe
BP144533		Allen Branch Greenway	US 64	I-26	\$3,755,000	Multi-Use Path	Henderson
BP144531		Allen's Creek Road	Lickstone Road	Piney Mountain Road	\$590,000	Sidewalks	Haywood
BP134538		Bailey Street	Bearwood Drive	Forest Street	\$955,000	Sidewalks	Madison
BP134539		Banjo Branch Greenway	Hickory Drive	Banjo Branch Road	\$2,625,000	Multi-Use Path	Madison
BP144535		Brooklyn Avenue	NC 225	US 176	\$2,665,000	Sidewalks	Henderson
BP144529		Champion Drive	North Canton Road	Thickety Road	\$3,130,000	Bike Improvements	Haywood
BP144537		Ecusta Trail	Kanuga Road	Transylvania County Line	\$18,400,000	Multi-Use Path	Henderson
BP134523		Emma Road	North Louisiana Avenue	Boone Street	\$2,190,000	Sidewalks	Buncombe
BP134524		Fonta Flora Greenway	Yates Avenue	Black Mountain Town Limits	\$6,945,000	Multi-Use Path	Buncombe
BP134525		North Blue Ridge Road	US 70	Fortune Street	\$1,145,000	Sidewalks	Buncombe
BP144534		Oklawaha Greenway (Southern Extension)	Jackson Park	Blue Ridge Community College	\$4,535,000	Multi-Use Path	Henderson
BP144532		Old Clyde Highway	Blackwell Drive	Granberry Street	\$1,850,000	Sidewalks	Haywood
BP134528		Old Haywood Road	US 19/23 (Patton Avenue)	US 19/23 (Patton Avenue)	\$5,500,000	Sidewalks	Buncombe
BP134526		Reed Creek Greenway Connector	Reed Creek Greenway	Clingman Avenue	\$3,910,000	Bike Improvements	Buncombe
BP144530		Richland Creek Greenway	Waynesville Rec Park	Haywood High-Tech Center	\$3,570,000	Multi-Use Path	Haywood
BP134527		Riverside Drive	Hill Street	I-240	\$905,000	Bike Improvements	Buncombe
BP144536		US 64	Orrs Camp Road	Howard Gap Road	\$2,675,000	Sidewalks	Henderson

# MTP 2045 Projects

## Highway - FBRMPO Region

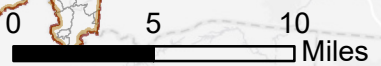
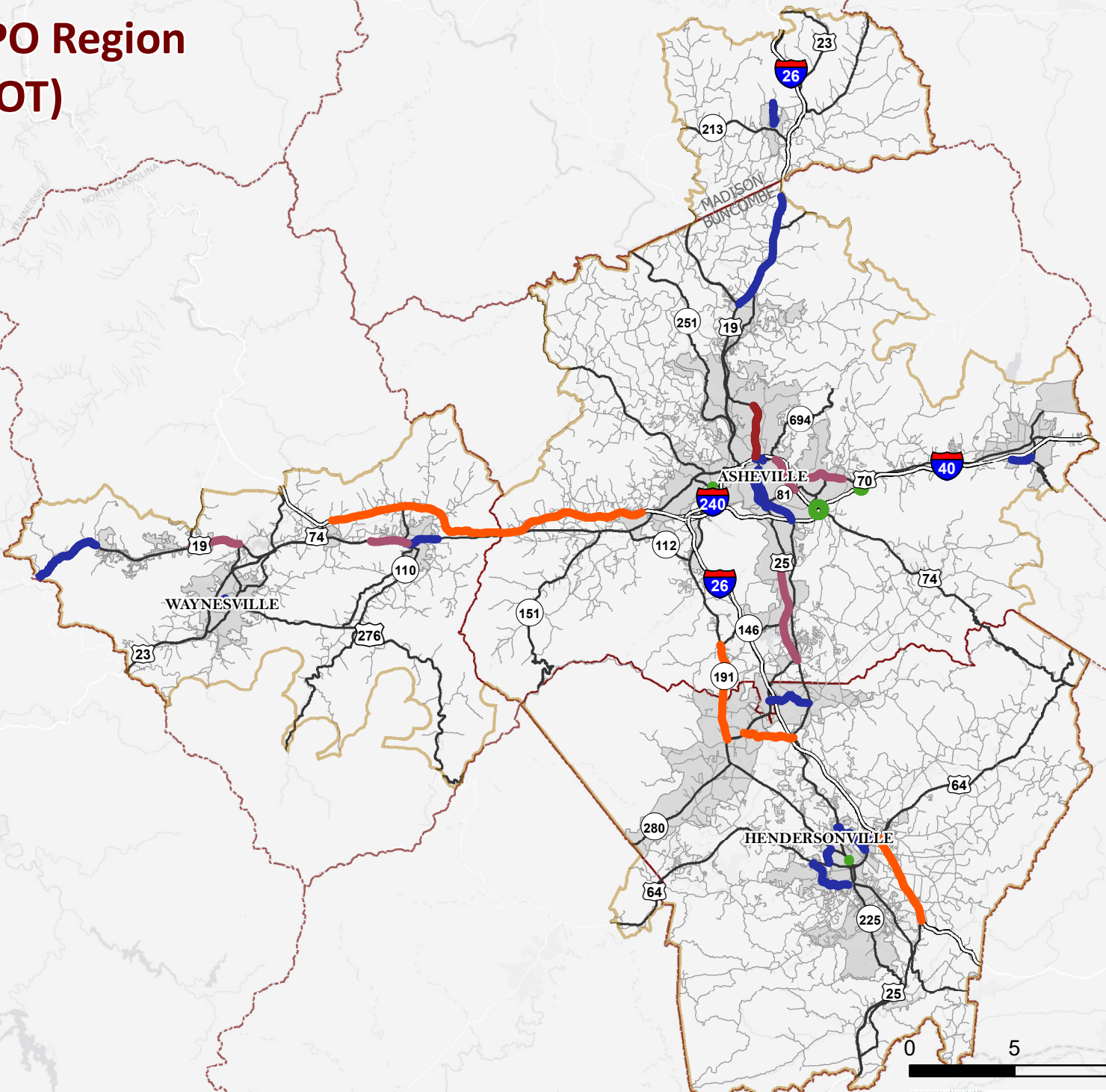
### Horizon 2040 (SPOT)



**Improvement Type (MTP ID)**

- Access Management
- Intersection Improvements
- Modernization
- Road Diet
- Widening

- Interstates and Highways
- U.S. Routes
- State Route
- Secondary/Local Roads
- Municipality
- FBRMPO Planning Area
- County Boundaries



Prepared By: FBRMPO/LOSRC (NK)  
 Date: 8/12/2020  
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Table 4.12: Horizon Year 2045 (Longer-Term Priorities)

HORIZON YEAR 2045 (LONGER-TERM PRIORITIES)							
MTP ID	TIP ID	ROUTE	FROM	TO	COST	GENERAL IMPROVEMENT	COUNTY
HS4515		I-240	Charlotte Street	-	\$9,225,000	Interchange Improvement	Buncombe
HS4516		I-240	Merrimon Avenue	-	\$26,986,000	Interchange Improvement	Buncombe
HS4517		US 23/74 (Great Smokey Mountains Expressway)	I-40	Blue Ridge Parkway	\$243,022,000	Access Management / Widening	Haywood
HS4518		I-40	US 25 (Hendersonville Road)	Patton Cove Road	\$177,285,000	Widening	Buncombe
HD144525		US 19 (Dellwood Road)	US 23/74 (Great Smokey Mountains Expressway)	US 276 (Russ Avenue)	\$19,094,000	Access Management with Complete Streets Improvements	Haywood
HD134518		US 19/23 (Patton Avenue/ Smokey Park Highway)	I-40	Haywood Road	\$55,764,000	Access Management with Complete Streets Improvements	Buncombe
HD134519		Rock Hill Road	US 25 (Hendersonville Road)	US 25A (Sweeten Creek Road)	\$2,817,000	Modernization with Complete Streets Improvements	Buncombe
HD134520		Haywood Road	Craven Street	US 19/23 (Patton Avenue)	\$15,441,000	Modernization with Complete Streets Improvements	Buncombe
HD134521		Broadway	Chestnut	I-240	\$13,366,000	Modernization with Complete Streets Improvements	Buncombe
HD134522		NC 280 (Airport Road)	US 25 (Hendersonville Road)	I-26	\$27,332,000	Access Management with Complete Streets Improvements	Buncombe
HD134523		Beaverdam Road	US 25 (Merrimon Avenue)	Webb Cove Road	\$7,714,000	Modernization with Complete Streets Improvements	Buncombe
HD134524		US 25A (Sweeten Creek Road)	I-40	Rock Hill Road	\$24,037,000	Access Management with Complete Streets Improvements	Buncombe
HD134525		New Location (Peachtree Road Extension)	US 25 (Hendersonville Road)	US 25A (Sweeten Creek Road)	\$22,063,000	New Roadway with Complete Streets Improvements	Buncombe
HD134526		US 74A (Fairview Road)	NC 81 (Swannanoa River Road)	Cedar Street	\$29,859,000	Access Management with Complete Streets Improvements	Buncombe



MTP ID	TIP ID	ROUTE	FROM	TO	COST	GENERAL IMPROVEMENT	COUNTY
HD134527		Elkwood Avenue	NC 251 (Riverside Drive)	US 25 (Merrimon Avenue)	\$7,451,000	Modernization with Complete Streets Improvements	Buncombe
HD134528		NC 280 (Airport Road)	I-26	French Broad River	\$29,831,000	Access Management with Complete Streets Improvements	Buncombe
HD144532		Dellwood Road	US 276 (Russ Avenue)	Miller Street	\$3,000,000	Modernization with Complete Streets Improvements	Haywood
HD144531		US 25B (Asheville Highway)	NC 191	I-26	\$53,363,000	Access Management with Complete Streets Improvements	Henderson
HD144522		Walnut Street	US 276	N Main Street	\$6,000,000	Modernization with Complete Streets Improvements	Haywood
HD144523		US 64	Howard Gap Road	Fruitland Road	\$12,068,000	Access Management with Complete Streets Improvements	Henderson
HD144524		Sulphur Springs/Smathers Street	Hazelwood Avenue	Miller Street	\$7,818,000	Multiple Intersection Improvements with Complete Streets Improvements	Haywood
HD144526		Brown Avenue	Belle Meade Avenue	Hazelwood Avenue	\$3,000,000	Modernization with Complete Streets Improvements	Haywood
HD144527		US 64	Fruitland Road	Gilliam Road	\$11,944,000	Modernization with Complete Streets Improvements	Henderson
HD144528		Elysinia Avenue	US 23/74 (Great Smokey Mountains Expressway)	Hazelwood Avenue	\$2,500,000	Modernization with Complete Streets Improvements	Haywood
HD144529		US 176 (Spartanburg Highway)	NC 225	Upward Road	\$40,701,000	Access Management with Complete Streets Improvements	Henderson
HD144530		Shepherd Street/Airport Road	NC 225	Tracey Grove Road	\$11,798,000	Modernization with Complete Streets Improvements	Henderson

Table 4.13: Bicycle and Pedestrian Projects - Horizon Year 2045

BICYCLE AND PEDESTRIAN PROJECTS – HORIZON YEAR 2045						
MTP ID	Route	From	To	Cost	Improvement	County
BP144551	Balsam Drive Sidewalks	Browne Ave	S Main	\$1,425,000	Sidewalks	Haywood
BP134554	Caribou Rd Sidewalks	Sweeten Creek Rd	Shiloh Rd	\$1,405,000	Sidewalks	Buncombe
BP134541	Depot St Connector	-	-	\$2,000,000	Multi-Use Path	Buncombe
BP144543	Greenville Highway (NC 225) Sidewalks	Spartanburg Hwy	Brooklyn Ave	\$1,405,000	Sidewalks	Henderson
BP134550	Lake Julian Greenway	I-26	Lake Julian Park	\$4,525,000	Multi-Use Path	Buncombe
BP134542	Montford Greenway	French Broad River	Montford Ave/ Riverside	\$4,020,000	Multi-Use Path	Buncombe
BP134546	Owen Spur Greenway Alternate - River	Brock Park	Owen HS	\$11,595,000	Multi-Use Path	Buncombe
BP144545	Richland Creek Greenway	Rec Park	Hyatt Creek Rd	\$10,885,000	Multi-Use Path	Haywood
BP134555	Rock Hill Road Sidewalks	Ridgelawn Rd	Edgewood Dr	\$1,010,000	Sidewalks	Buncombe
BP134552	Smoky Park Highway - South of I-40	I-40	Sand Hill Rd	\$3,125,000	Sidewalks	Buncombe
BP134553	Smoky Park Highway Sidewalks - North of I-40	Old Haywood Rd	I-40	\$2,445,000	Sidewalks	Buncombe
BP144548	Vance St Sidewalks	W Marshall/Walnut St	Waynesville Rec Park	\$1,030,000	Sidewalks	Haywood
BP144556	Wall Street Sidewalks	US 276/Pigeon St	N Main St/ Assembly St	\$870,000	Sidewalks	Haywood
BP134547	West Asheville Rails to Trails - Enka Section	Buncombe County Sports Park	Old Haywood Rd	\$6,245,000	Multi-Use Path	Buncombe
BP134540	West Asheville Rails to Trails - West Asheville Section	Old Haywood Rd	Emma Greenway	\$8,200,000	Multi-Use Path	Buncombe



# MTP 2045 Projects

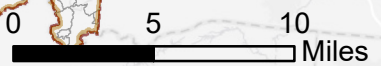
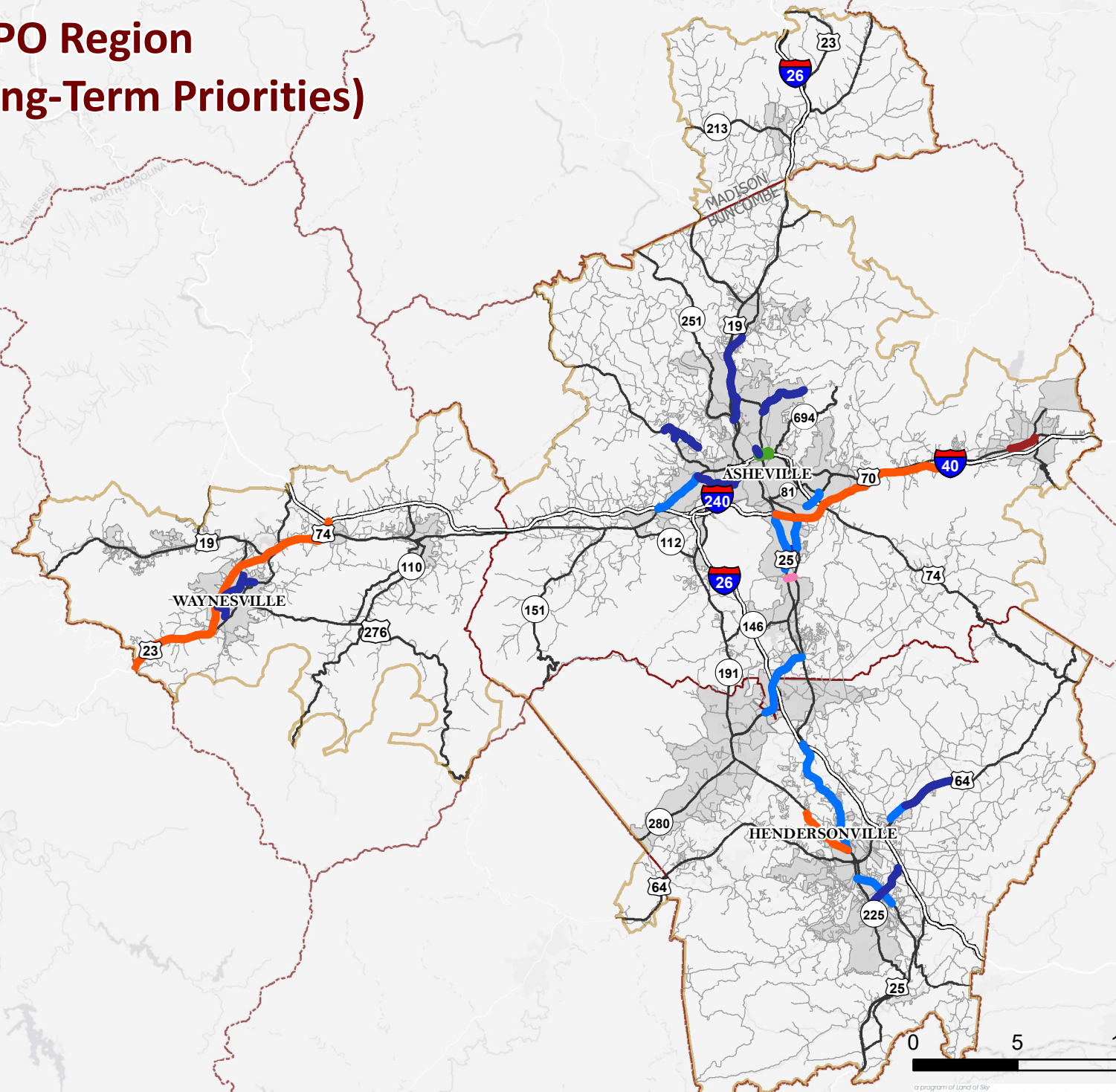
## Highway - FBRMPO Region

### Horizon 2045 (Long-Term Priorities)

**Improvement Type (MTP ID)**

- ▬ Access Management
- ▬ Intersection Improvements
- ▬ Modernization
- ▬ New Location
- ▬ Road Diet
- ▬ Widening

- Interstates and Highways
- U.S. Routes
- State Route
- Secondary/Local Roads
- Municipality
- FBRMPO Planning Area
- County Boundaries



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 Date: 8/12/2020  
 Relative Scale: 1 inch = 36,092 feet  
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# MTP 2045 Projects

## Bicycle and Pedestrian - FBRMPO Region

### Horizon 2040-2045 (SPOT and MTP)



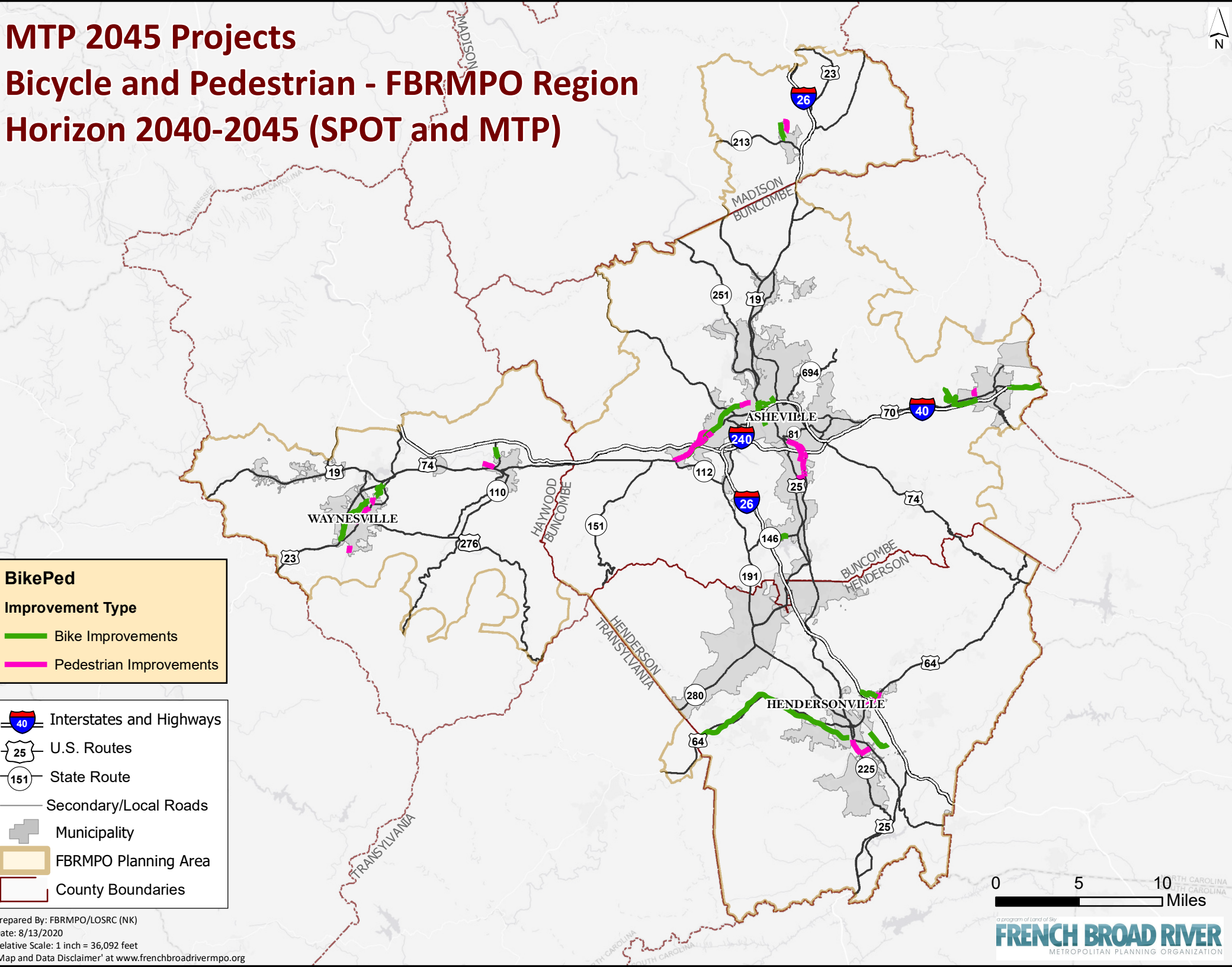
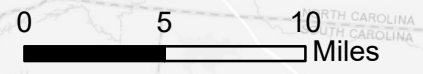
**BikePed**

**Improvement Type**

- Bike Improvements
- Pedestrian Improvements

- Interstates and Highways
- U.S. Routes
- State Route
- Secondary/Local Roads
- Municipality
- FBRMPO Planning Area
- County Boundaries

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### **A Note on Projects Deemed Not (Currently) Financially Feasible**

Several projects were suggested by members of the public, local government staff, or elected officials that do not fit into the MTP's financial plan but may be pursued at some level through additional study. The MTP's financial plan requires looking at reliable revenue streams that can be used for distinct purposes (i.e. funding that is specifically available for one purpose (ex. Interstates) should not be applied for MTP projects that don't meet that purpose (ex. Light Rail.) Certain projects that would require major investments to realize do not have reliable revenue streams currently, but that does not mean funding streams won't become available in the future. The following projects have been noted as suggestions that were not evaluated for the MTP due to financial considerations, but may merit further study:

**Passenger Rail to Western North Carolina** - Passenger rail service used to be provided to Asheville until the 1970s, but several groups have been working to revive the service and some local plans note potential locations for passenger rail stations in Black Mountain and Asheville. The primary route identified would be between Salisbury and Asheville, likely connecting to Greensboro and Raleigh. This recommendation also appears in the North Carolina Statewide Rail Plan. To provide this service, there would likely be considerable capital costs, including upgrading the rail to safely accommodate both passenger and freight service. This project is planned to be submitted by the Hickory MPO for prioritization considerations in P 6.0, with French Broad River MPO support, however the funding mechanisms in-place would likely make funding the project unfeasible with state limits on non-highway spending. This project should merit further study and coordination with French Broad River MPO staff, but funding the project under current financial policies is very unlikely.

**Asheville Streetcar** - The City of Asheville once had one of the most extensive streetcar systems in the southeast but was slowly dismantled over the early 20th century. Given the City and Region's numerous historical assets, a streetcar may be culturally appropriate and attractive for visitors and residents. However, installation of streetcars requires lots of capital funding, which like Passenger Rail, is not readily available based on current financial policies, and is not reflected as a priority in the Asheville Transit Master Plan.

**Light Rail** - MPO staff received a suggestion of providing passenger light rail between Downtown Asheville and South Asheville/Arden. South Asheville's increasing population density could potentially be connected to Biltmore Village and the River Arts District with existing rail lines. However, these rail lines are still active and would likely require considerable study to determine feasibility and work required to accomplish. Like previous studies, funding for light rail in the state is limited and requires considerable local contributions. Light rail is also not reflected as a priority in the Asheville Transit Master Plan.

**Hendersonville-Asheville Passenger Rail** - A group working on reviving rail priorities in the region has proposed reviving passenger rail service between Hendersonville and Asheville, potentially as a recreational and entertainment experience. An existing rail line exists but is still active and would require further study to consider implementation.

## **ENVIRONMENTAL JUSTICE / TITLE VI**

Environmental Justice (EJ), as defined by the EPA, 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.<sup>84</sup> In the transportation decision making process, it is important to understand the needs, perspectives, and limitations of all populations that may be affected by transportation projects since the projects produce long-lasting effects on communities. In 1994, the Presidential Executive Order 12898 directed every Federal agency to make Environmental Justice part of its mission. The United States Department of Transportation, North Carolina Department of Transportation, and French Broad River MPO are committed to a comprehensive, inclusive, and equitable approach to transportation planning and development, aiming to achieve environmental justice.

### **Environmental Justice Fundamental Principles**

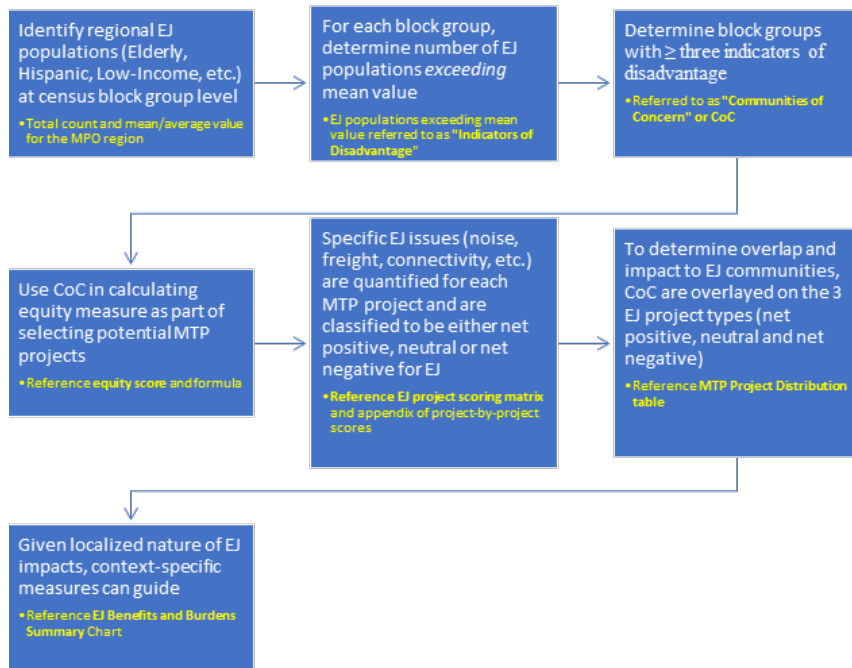
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process;
- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority or low-income population; and
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority or low-income populations.<sup>85</sup>

EJ underscores the importance of utilizing existing laws-including National Environmental Policy Act (NEPA) and Title VI of the Civil Rights Act of 1964 to ensure that all persons live in a safe and healthy environment. Specifically, Title VI prohibits discrimination on the basis of race, color, or national origin in programs or activities receiving federal financial assistance.

The French Broad River MPO has a Title VI Program Plan<sup>86</sup>, initially adopted in 2011 and updated in June 2019, to ensure that disadvantaged persons, as characterized in federal regulations, do not suffer discrimination in the transportation planning and implementation process. The following sections describe the environmental justice activities that occurred as part of the 2045 MTP.

The flowchart below displays the Environmental Justice scoring and calculation process:

Figure 4.9: Environmental Justice Scoring and Calculation Process



## Adverse Impacts

Investments in transportation infrastructure have a wide range of impacts that both positively and negatively impact affected populations. In the planning process, it is important to consider not only the regional need for a project, but the local impacts that may result from the project. For example, while road widening projects may increase overall mobility, the residents near the project may be impacted by increased traffic through their neighborhoods, increased vehicle speeds, land acquired for necessary right-of-way, a change in neighborhood character and land uses, etc. A roadway expansion can either create barriers to walking and biking or incorporate multimodal infrastructure through context sensitive design. Unfortunately, a project's perception differs across populations and its net impact is not always clear. Adverse impacts include the totality of significant individual or cumulative human health and/or environmental effects, including interrelated social and economic effects that may include, but are not limited to:

- Bodily impairment, infirmity, illness or death
- Air, noise, water pollution and soil contamination
- Destruction or disruption of man-made or natural resources
- Destruction or diminution of aesthetic values
- Destruction or disruption of community cohesion or a community's economic vitality
- Destruction or disruption of the availability of public and private facilities and services.
- Vibration
- Adverse employment effects
- Displacement of persons, businesses, farms or nonprofit organizations
- Increased traffic congestion, isolation, exclusion or separation of minority or low-income individuals within a given community or from the broader community
- The denial of, reduction in or significant delay in the receipt of benefits of Federal Highway Administration (FHWA)/Department of Transportation (DOT) programs, policies or activities.

### Affected Communities Addressed by Title VI and Environmental Justice Guidelines

In order to further understand what communities are being impacted, the MPO explored different methods to approach the fundamental question, “What is a community of concern?” Through its Title VI and Environmental Justice program, the MPO identifies six demographically based EJ populations in the planning area. These populations include:

- **Minority Populations (non-Hispanic or Latino)** – People who are African-American, Asian American, American Indian and Alaskan Native, and Native Hawaiian and other Pacific Islander. Excludes Hispanic and Latinos.
- **Hispanic or Latino Populations** – People who are of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- **Elderly Populations** – Individuals aged 65 and over.
- **Limited English Proficiency (LEP)** – the Census Bureau has a range of four classifications of how well people speak English. The classifications are ‘very well’, ‘well’, ‘not well’, and ‘not at all’. For analysis purposes, we are considering people that speak English ‘not well’ or ‘not at all’ as Limited English Proficient persons.
- **Low-Income Populations** - a person whose household income (or in the case of a community or group, whose median household income) is at or below the U.S. Department of Health and Human Services poverty guidelines.
- **Zero-Vehicle Households** – Households where no cars, vans, pickups, or trucks are owned and available to be used by household members."

Maps of the region's Title VI populations are included in the Appendix XX

These communities were identified using Census and American Community Survey data at the Census Block Group level. This level of geography provides a reasonably accurate scale to measure and observe trends in localized communities. Block groups generally contain between 600 and 3,000 people, with an optimum size of 1,500 people. It is also the smallest geographical unit for which the Census Bureau publishes sample data, which is collected from a fraction of all households.

Table 4.14: Regional Thresholds for EJ Populations

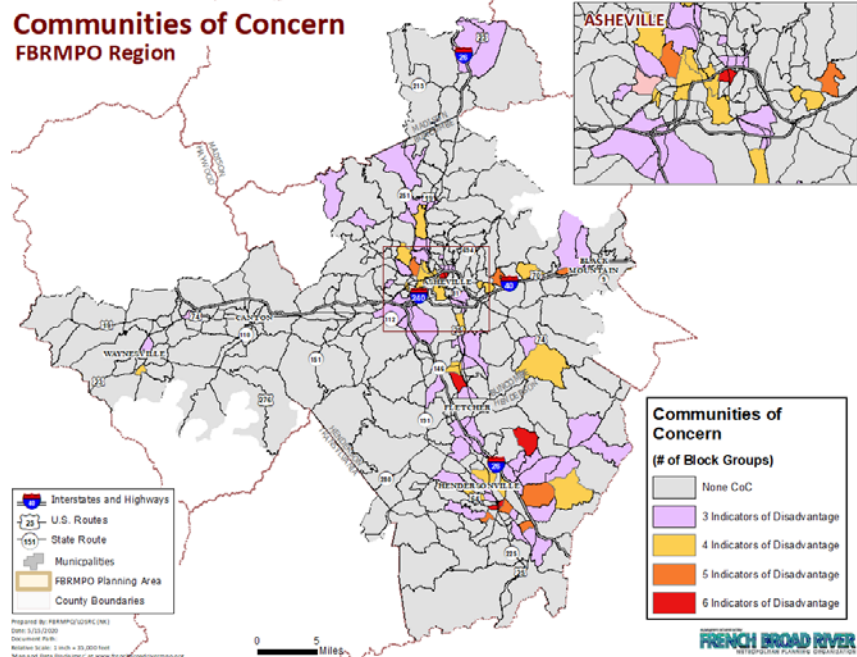
Regional Thresholds for EJ Populations	Total Value (French Broad River MPO Region)	Regional Threshold %	Total # Block Groups Over Regional Threshold
<b>Total Population</b>	445,625	N/A	N/A
Total Number of Households	187,845	N/A	N/A
Total Number of Block Groups	315	N/A	X / 315
Racial Minority Population	63,819	14.32%	105
Hispanic/Latino Population	30,180	6.77%	97
Elderly Population	92,774	20.82%	145
Limited English Proficiency Households	4,181	2.23%	69
Low-Income Block Groups (< \$26,015)	22	6.90%	140
Zero-Vehicle Households	9,376	4.99%	100

In considering populations evaluated, it is important to note that some exclusions took place. Even though gender is a protected class, the nearly even distribution of men and women does not make it a useful measure for transportation analysis. The same is true for persons with disabilities, and it was determined that zero-vehicle households

is a more useful surrogate measure. Regardless, regional-scale level proxies for actual EJ communities means this analysis is just a screening tool to begin identification of the actual communities.

Based on analysis methods used in the French Broad River MPO MTP 2040 and on the Research Triangle Regions 2045 Metropolitan Transportation Plans, the following approach was taken. Using the six identified EJ population groups, the total number of people in these populations was summarized as a percentage of all persons within a block group. Census block groups with EJ populations exceeding the planning area mean/average based on each of the six criteria are flagged as a "Indicator of Potential Disadvantage". An assessment scale was applied to block groups that have three or more overlapping indicators of potential disadvantage and those block groups are referred to as "Community of Concern"(CoC). Map 4.1 shows the indicators of potential disadvantage by block group. Given this methodology, communities shown in blue, pink or red are considered communities of concern.

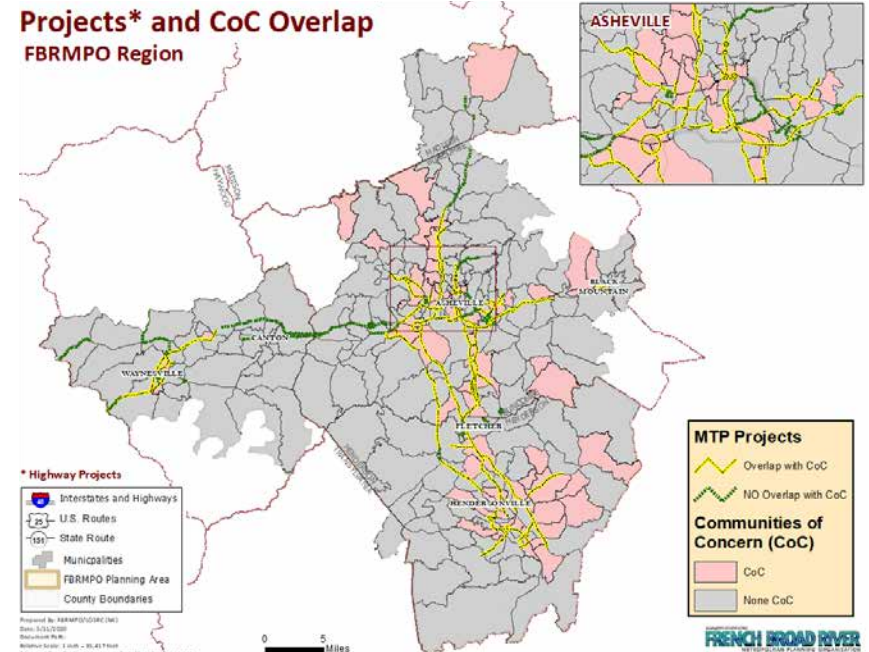
Map 4.1: Communities of Concern



Out of the 315 block groups in the French Broad River MPO region, a total of 77 are designated as **Communities of Concern (CoC)**. 45 CoC are in Buncombe County, 3 CoC are in Haywood County, 28 CoC are in Henderson County and 1 CoC is in Madison County. Looking at specific indicators that trigger disadvantage, age tends to appear in many places where other issues like race and limited English proficiency do not. Age/elderly population triggers the greatest amount of block groups in the region, and commonly overlaps with low-income block groups.

Of the 105 highway projects programmed in the MTP, 70 of them intersect or are adjacent to a CoC, as shown in map 4.2. Bicycle and pedestrian projects are not displayed on this map. For understanding benefits and burdens of projects, further analysis needs to take place.

Map 4.2: Projects and CoC Overlap





### Environmental Justice Analysis

Although it is difficult to assess the overall impact of the highway projects included in the 2045 MTP at a regional level, MPO staff devised a method to analyze the potential impacts (positive, negative, or neutral) that projects may have on affected communities. By taking a preliminary look at project impacts on communities, it can be theorized if the benefits and burdens from the projects are equitably distributed.

When prioritizing and scoring projects for inclusion in the MTP, projects in all three “tiers” of statewide, regional and division were given an “equity” score that relates to environmental justice measures. The equity metric is in addition to consideration of fixed-route transit availability (for regional and division projects) which intrinsically has an environment justice component. Other measures included volume, AADT, freight volumes, crash rate, crash severity, water quality, biodiversity, wildlife, historical impact and walkability. The equity score is formulated below and utilized the “Communities of Concern” (CoC) block group indicators.

$$\Sigma = \lceil ((x/145)/(y/28)) \times 100 \rceil + z$$

x = sum of EJ CoC intersected or adjacent to project (145 denotes sum of all projects)

y = sum of EJ CoC with 3+ variables triggered (28 denotes sum of block groups with 3+ indicators)

z = project impact type ( 1=road diet, 2=modernization or intersection improvement, 3= access management, 4= widening, 5=new location)

Using this score provided an initial look if projects may overlap with EJ communities or not. However, individual projects in the 2045 MTP may have unforeseen impacts that will be studied in-depth and mitigated during project development and design. This scoring does not substitute that need for individual project analysis during its development. This assessment and understanding of regional impacts is based on initial work done by DCHC MPO in their 2014 Environmental Justice Report. The following summary chart looks at a variety of project types and weighs the tradeoffs regarding benefits, burdens and what measures can be taken to mitigate adverse effects.

The indicators that were measured and affect the y-value in the Environmental Justice Score formula are displayed in the chart below:

When considering adverse impacts, one way to analyze communities impacted is using available data to understand where problematic health, social or economic indicators may be occurring. Map 4.3 shows data from the EPA’s National Air Toxics Assessment at the block group level representing particulate matter from diesel exhaust. Each block group is shown as a percentile versus other block groups across North Carolina, with higher percentages correlating to higher amounts of diesel particulate matter. The data shows a concentration of particulate matter in the urban areas, particularly in Asheville and Hendersonville. There is more local and inter-local freight traffic in these areas, equating to higher emissions. Block groups adjacent to interstate corridors such as I-26 and I-40 appear to be in the 50th percentile and below, indicating that diesel particulate matter is not especially high in these areas. However, this is just one measure of a pollutant and other air, noise, water issues may exist in these areas. For these reasons, it is important to take a larger look at how projects may impact communities.

Map 4.3: Diesel Particulate Matter

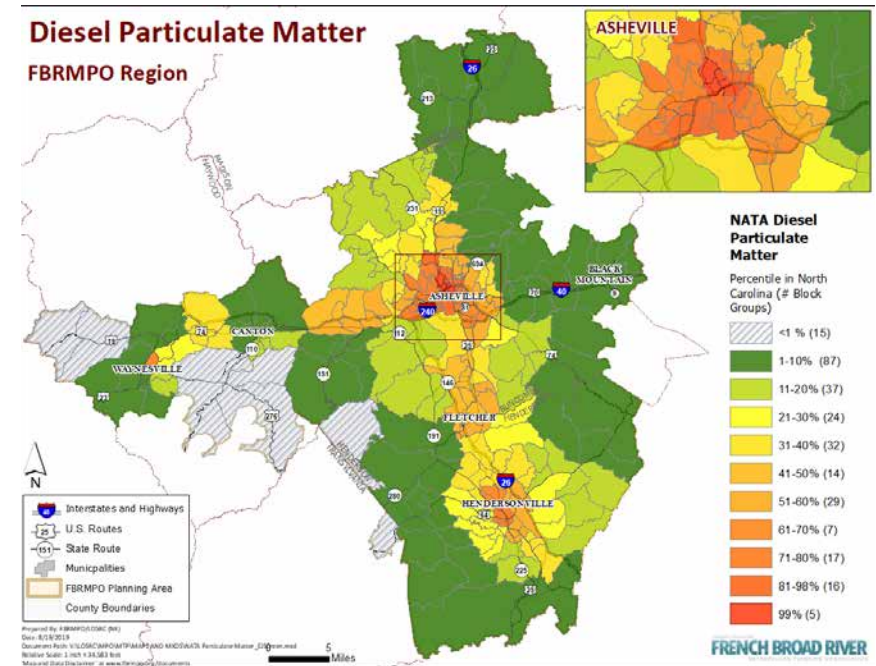


Table 4.15: 2045 MPT - Environmental Justice Qualitative Analysis Matrix

2045 MPT - Environmental Justice Qualitative Analysis Matrix			
Qualitative Performance Measure: Will This Project Contribute to or Deduct from:	Sub-Category	What is the rule that we use to determine impact of a specific project?	Measure
Accessibility (-2 to +2)	Improves or impairs transit travel times and quality of service	Improves transit travel times (e.g. improving traffic flow in corridor=travel time savings for bus route; improving a transit center=improving quality of service)	-1 Decrease travel time/decreases quality service 0 No change to travel time +1 Improves (decreases) travel time/improves quality service
	Connectivity of network including access to amenities and bike/ped connections	Any new link including new transportation link or improved service to regional amenities (medical, social, employment etc.)- positive; cutting off local link (i.e. with interstate)-negative). Bike/Ped improvement type improves connection	-1 Removes one or more existing connections or links 0 No change +1 Creates one or more new connections or links
Safety (-2 to +2)	Project addresses high automobile and/or bike/ped crash locations	Project is on a 2014-2018 HSIP segment (>66.7 "High"), 2014-2018 HSIP intersection (>30 crashes or >= 1 FATAL) includes bike/ped elements on a SPOT Bike/Ped crash score segment > 45.0 (MPO region mean 42.8)	-1 Creates/exacerbates potential safety issues 0 No change +1 Improves/removes potential safety issues
	Does project add shoulder (usable by bike/ped) width or bike lanes/sidewalks/MUP	Adding infrastructure to benefit pedestrians and bicyclists. Adding shoulder to allow safer passing or separating vulnerable users from traffic is a benefit, removal or reduction of those facilities is detrimental	-1 Removes/downgrades existing bike/ped 0 No change +1 Creates/Improves bike/ped facilities
Environmental Health (-2 to +2)	Air Quality	If VPD increase of 5,000 veh/day and at least 10% increase within 500 ft buffer -1; If ITS, Access Mgt, Intersection Improvements, or CMP +1	-1 Predicted AAQ worsens 0 No change +1 Predicted AAQ improves
	Noise	This is a multi-faceted measure that differs between facility types based on speed and volume: if traffic volumes increase by 5,000 veh/day and within 500 ft of EJ -1, no change 0, decrease by same +1; for corridors with posted speeds 40 mph+ if traffic speeds increase and within 500 ft of EJ -1 (Neutral if noise wall included), no change 0, if traffic speeds decrease and within 500 ft of EJ +1; for corridors with posted speeds less than 40, if stop-and-go traffic traffic decreases +1, no change 0, increases -1	Sum of noise criteria scores (left) will sum to a +1, 0, or -1 (net positive, neutral, or negative impact)
Social Equity (-2 to +2)	Does project disproportionately affect the space where EJ populations live, work, recreate or spend a lot of time?	Context-specific decision. Consider corridor, surrounding land uses, purposes of project, users of project etc. Bike/Ped projects within 100ft an EJ community (>= 3 CoC) +1 for potential improvement	+1 For potential improvement to EJ neighborhood 0 No Disproportionate Effect -1 Disruption of EJ population
	Does this project increase freight and/or traffic volumes in EJ Neighborhoods?	Negative if freight volumes increase, neutral = 0, positive if freight volumes reduced or shifted away from EJ neighborhood beyond 500' buffer **	+1 Reduced/shifted away 0 No change -1 Increased

### EJ Impact

The next step in the EJ analysis was scoring the MTP projects based on their potential EJ impact. (Spreadsheet xx /appendix?) explains the data and scoring criteria used with a complete project by project list following on page xx. There were a total of 8 categories used including measures for transit, connectivity, crash locations, bike/ped infrastructure, air quality, noise, EJ resident/business impact and freight volumes. For each category, projects scored either a -1, 0 or +1 based on the criteria as listed. The composite "score" of these projects were summed up and they fell between -4 to +4.

For categorical purposes, projects were separated into net negative (-4 to -1), neutral (0) and net positive (+1 to +4) categories. Of the 161 projects in the MTP, including bicycle and pedestrian, 120 were considered a net positive, 18 were neutral and 23 were net negative. For purposes of this analysis, transit projects have not been mapped or included.

Table 4.16 breaks out the overlap between the three scoring categories and the number of CoC indicators that they overlap with. For determining overlap, it was considered where the majority (>50% by mileage) of the project was located. For example, the I-26 widening project, MTP ID: HS4508, crosses six block groups but the majority of it is located in or adjacent to two CoC block groups.

Table 4.16: Overlap Between Three Scoring Categories and the Number of CoC Indicators

	Net Negative Projects Intersecting	Neutral Projects Intersecting	Net Positive Projects Intersecting
Number of CoC Indicators	x/23 Negative Projects	x/18 Neutral Projects	x/120 Positive Projects
0 – 2 (Low Concern – Not designated CoC)	22	15	105
3 – 4 (CoC, Medium Concern)	13	10	74
5 – 6 (CoC, High Concern)	1	5	21

When considering impacts, it is important to consider what impact previous and ongoing projects have had to EJ communities. While the ranking of projects into positive, neutral and negative categories relies on subjective criteria, it is worth considering the geographic and historical spread of impacts. One way of understanding this is looking at where the net negative projects are located.

Map 4.4 shows the location of the 23 net negative projects and how they overlap with the CoC. Geographically, 13 are in Buncombe County, 6 are in Haywood County and 5 are in Henderson County. All the projects receiving net negative scores were highway projects, with a majority being widening and modernizations, and a few being new location and intersection improvements. As previously mentioned, it is important to consider what projects have already been programmed for in the TIP or are under construction. 12 of the 23 net negative projects are committed in the STIP, 8 have been submitted in the most recent round of Prioritization (P6.0), and 4 of them are considered long-term project ideas in the MTP.

Table 4.17: Project Distribution Impact of Communities of Concern (CoC)

MTP Project Distribution	Region Total Miles	Region Miles in CoC	Percent Investment in CoC	Total Investment*	Total Investment in CoC
Net Negative Projects (23 total)	94	64	68 %	\$1,785,113,000	\$759,183,000
Net Neutral Projects (18 total)	39	25	64 %	\$725,578,000	\$186,542,000
Net Positive Projects (120 total)	191	137	72 %	\$1,413,028,000	\$941,376,000
Bicycle and Pedestrian Projects**	83	59	71 %	\$139,802,000	\$91,127,000

\*Cost is an estimate and may include or exclude projects that are part of segmented projects (I.E. TIP ID I-2513A, I-2513B, I-2513C)

\*\*Bicycle and Pedestrian cost estimate not available for all projects

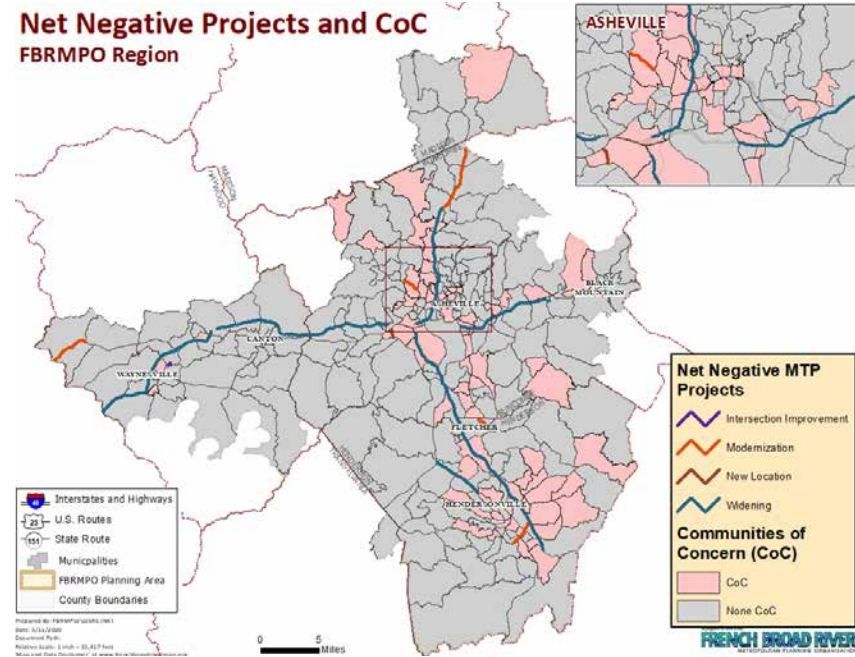
Table 4.17 summarizes the distribution of the net positive, neutral and negative projects. There is a similar distribution of overlap within CoCs ranging from 64% to 72% between the three project types. Net negative projects fall near the middle of positive and neutral investment at 68% within or adjacent to CoCs. Overall, the spread of projects to EJ communities throughout the region is well-distributed. Since the way benefits and burdens are applied uniquely to each project, it is difficult to assess the regional perspective but some patterns can be discerned from this information.

As previously mentioned, the majority of net negative projects are widening and modernization and make up the bulk of project miles in the region as shown in Map 4.4. There are some caveats to interpreting this data and the assumptions made in this chapter. When categorizing projects, what one individual may perceive as a burden could be seen by another individual as a benefit. For example, a resident in the Swannanoa EJ community that commutes on I-40 may not perceive the burdens of higher freight volumes and noise as negatives given that the I-40 widening could improve their daily commute. Similarly, the benefit of a project providing bike lanes and sidewalks may not be viewed as a benefit to a business owner in an EJ community who would potentially lose right-of-way due to these amenities. Also, bicycle and pedestrian projects tend to be in and near the urban-cores and are likely contained within one block-group given their shorter length.

### Recommendations

- The French Broad River MPO shall continue to practice Environmental Justice principles to benefit minority, low-income, and older populations.
- Seek out Environmental Justice grants that support solutions to local environmental and public health issues.
- Conduct targeted public outreach for future planning efforts and during the NEPA process.
- Conduct meetings that are in places that are convenient and easily accessible to Title VI and Environmental Justice populations.
- Develop a practice of connecting with key community leaders, organizations, and institutions within minority and low-income communities to ensure effective public outreach in those communities.

Map 4.4: Net Negative Projects and CoC



- Where feasible and as funding allows, evaluate enhanced transit options to low income residents in the French Broad River MPO region and to residents in rural areas.
- Increase the bicycle and pedestrian infrastructure for a more interconnected network in low-income and minority communities.

<sup>84</sup> [Epa.gov/environmentaljustice](http://Epa.gov/environmentaljustice)

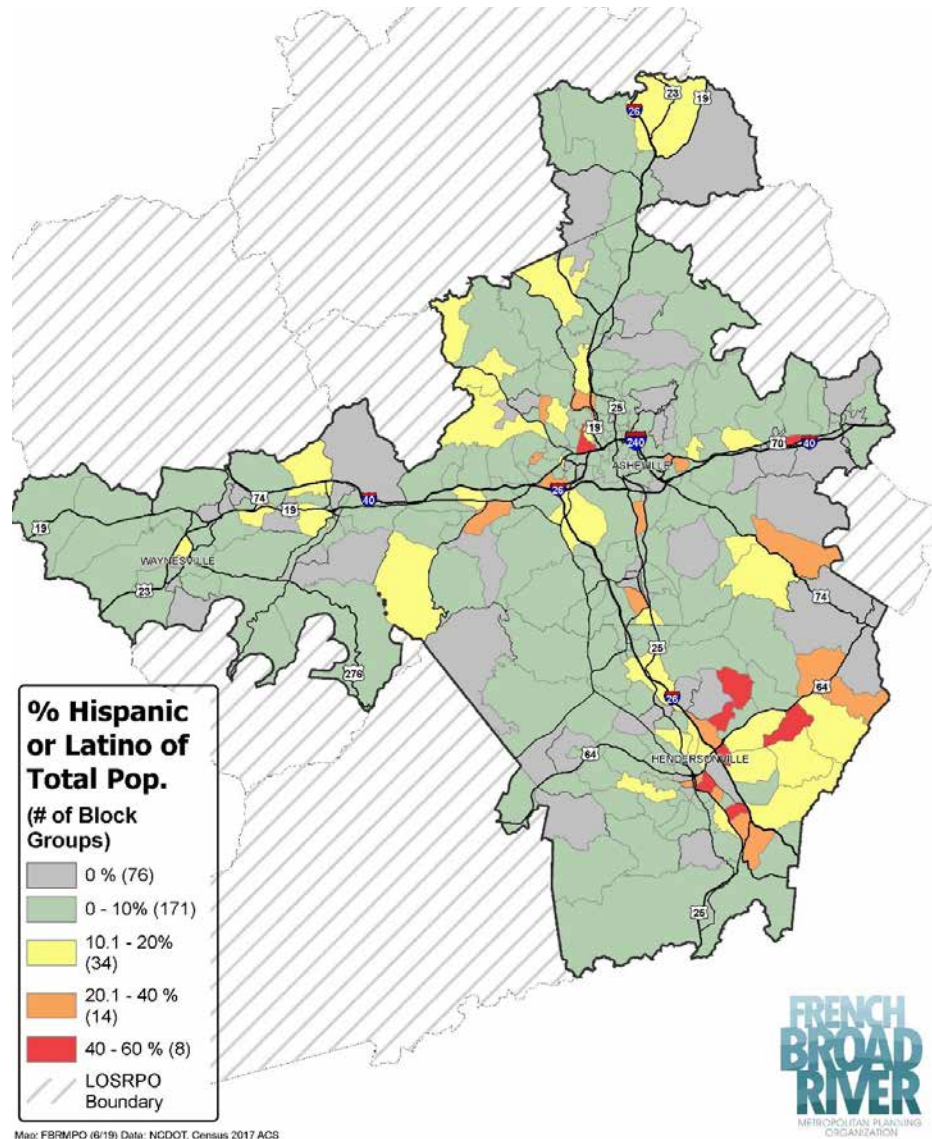
<sup>85</sup> [Transportation.gov/transportation-policy/environmental-justice/environmental-justice-strategy](http://Transportation.gov/transportation-policy/environmental-justice/environmental-justice-strategy)

<sup>86</sup> [http://frenchbroadrivermpo.org/wp-content/uploads/2019/10/French-Broad-River-MPO\\_TitleVI\\_June2019Update.pdf](http://frenchbroadrivermpo.org/wp-content/uploads/2019/10/French-Broad-River-MPO_TitleVI_June2019Update.pdf)

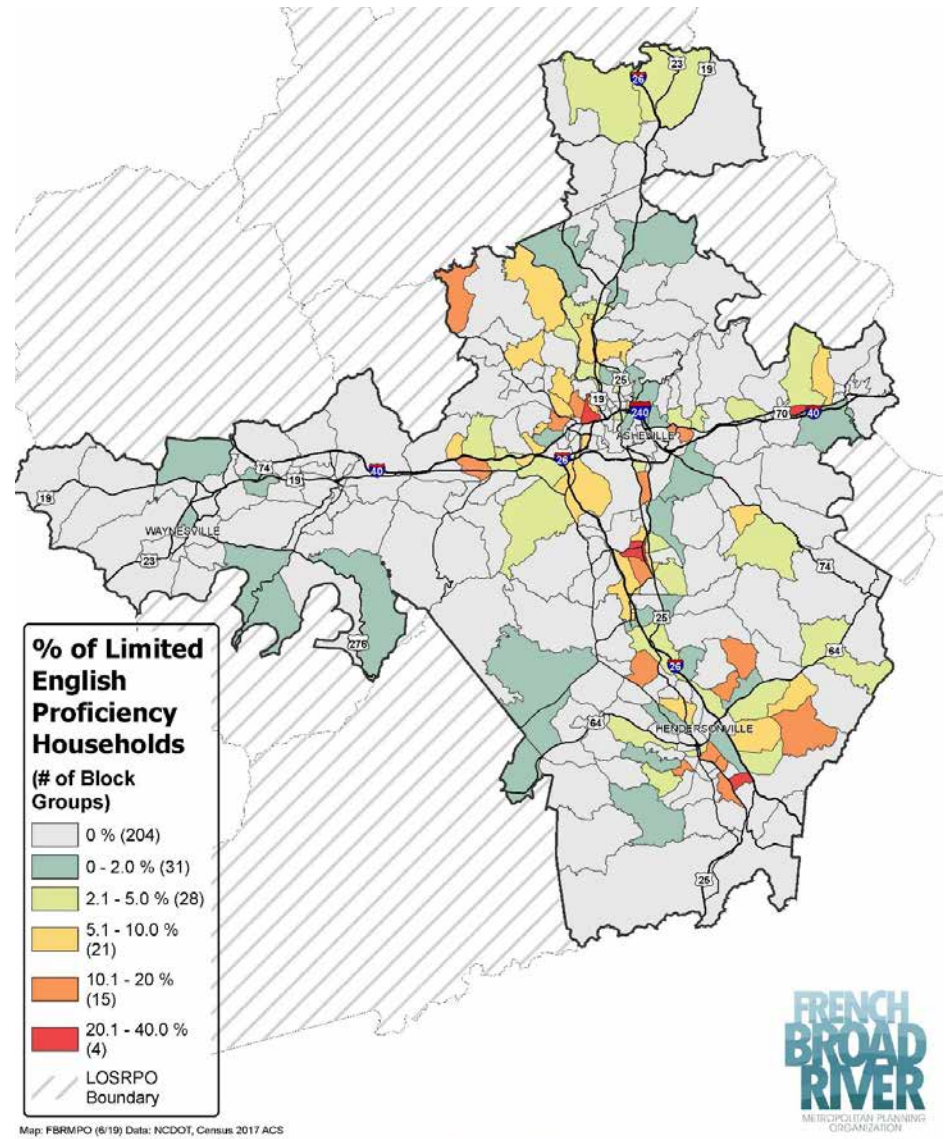
Table 4.18: Potential EJ Benefits and Burdens Summary Chart

PROJECT TYPE/GROUPING	POTENTIAL BENEFITS	POTENTIAL BURDENS	MITIGATION STRATEGY(IES)
Bicycle and pedestrian infrastructure (Bike Lanes, Multi-Use Paths, Sidewalks, Crossings)	<ul style="list-style-type: none"> <li>• Reduced Emissions</li> <li>• Community Health Improvements</li> <li>• Safety Improvements</li> <li>• Reduced Parking</li> </ul>	<ul style="list-style-type: none"> <li>• Impact to motor vehicle capacity and travel times</li> <li>• Additional conflicts at intersections</li> <li>• Need for additional right-of-way (particularly in EJ areas)</li> </ul>	<ul style="list-style-type: none"> <li>• Grade separate bike and pedestrian crossings/conflicts where feasible</li> <li>• Adding pedestrian-crossing time to signal; add bike boxes or separate bike signals for cycletracks</li> <li>• Utilize context-sensitive designs to select alternatives with the least EJ impact</li> </ul>
Widening or new location roadway	<ul style="list-style-type: none"> <li>• Increased connectivity and mobility</li> <li>• Increased network redundancy thus reduced travel time</li> <li>• Freight efficiency and economic incentive</li> </ul>	<ul style="list-style-type: none"> <li>• Additional Vehicle Miles Traveled (VMT)</li> <li>• Noise and emissions to existing land uses</li> <li>• New traffic patterns can shift congestion to new locations</li> </ul>	<ul style="list-style-type: none"> <li>• Include bike/ped accommodations to encourage short trips</li> <li>• Reduce speeds and minimize signalized intersections for idle reduction</li> <li>• Identify and plan for related new location congestion in MTP model</li> </ul>
Intersection/roadway improvements	<ul style="list-style-type: none"> <li>• Reduce number and/or severity of crashes</li> <li>• Increase operational efficiency</li> <li>• Reduced travel time</li> </ul>	<ul style="list-style-type: none"> <li>• Increased congestion/access issues to adjacent business during construction</li> <li>• Increased corridor width (impinging on adjacent property)</li> <li>• Adjustment period for new traffic pattern (roundabouts, DDIs, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Limit closures to nights and weekends</li> <li>• Use of curb and gutter over open swale to reduce footprints</li> <li>• Education and outreach efforts</li> </ul>
Access Management	<ul style="list-style-type: none"> <li>• Improved travel times</li> <li>• Reduced conflict points/increased safety</li> </ul>	<ul style="list-style-type: none"> <li>• Decreased access for pedestrians and bicyclists</li> <li>• Support from adjacent businesses</li> </ul>	<ul style="list-style-type: none"> <li>• Incorporation of pedestrian and bicycle infrastructure (crossings, signalized crosswalks)</li> <li>• Education and outreach</li> </ul>
Road diet/roadway reconfiguration	<ul style="list-style-type: none"> <li>• Increased connectivity for pedestrians and bicycles</li> <li>• Improved safety for all roadway users</li> </ul>	<ul style="list-style-type: none"> <li>• Increased travel times for motorists</li> <li>• Conflict between motorists and bicycles/pedestrians</li> </ul>	<ul style="list-style-type: none"> <li>• Proper allocation of reclaimed space for context-sensitive features (refuge islands, parking, bus pullouts, etc.)</li> <li>• Protected pedestrian/bicycle infrastructure to reduce conflict (bike boxes, refuge islands)</li> </ul>

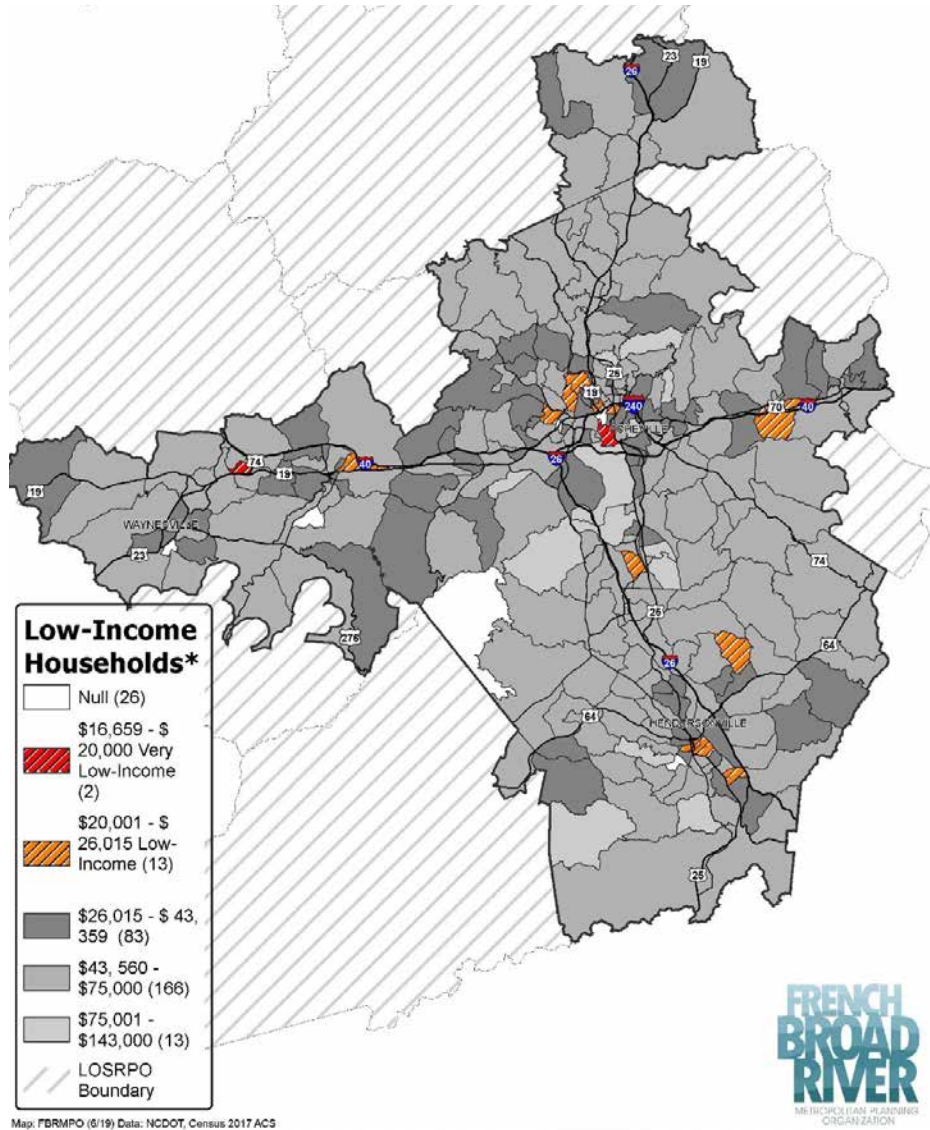
Map 4.5: Percentage of Population: Hispanic or Latino Ethnicity Origin



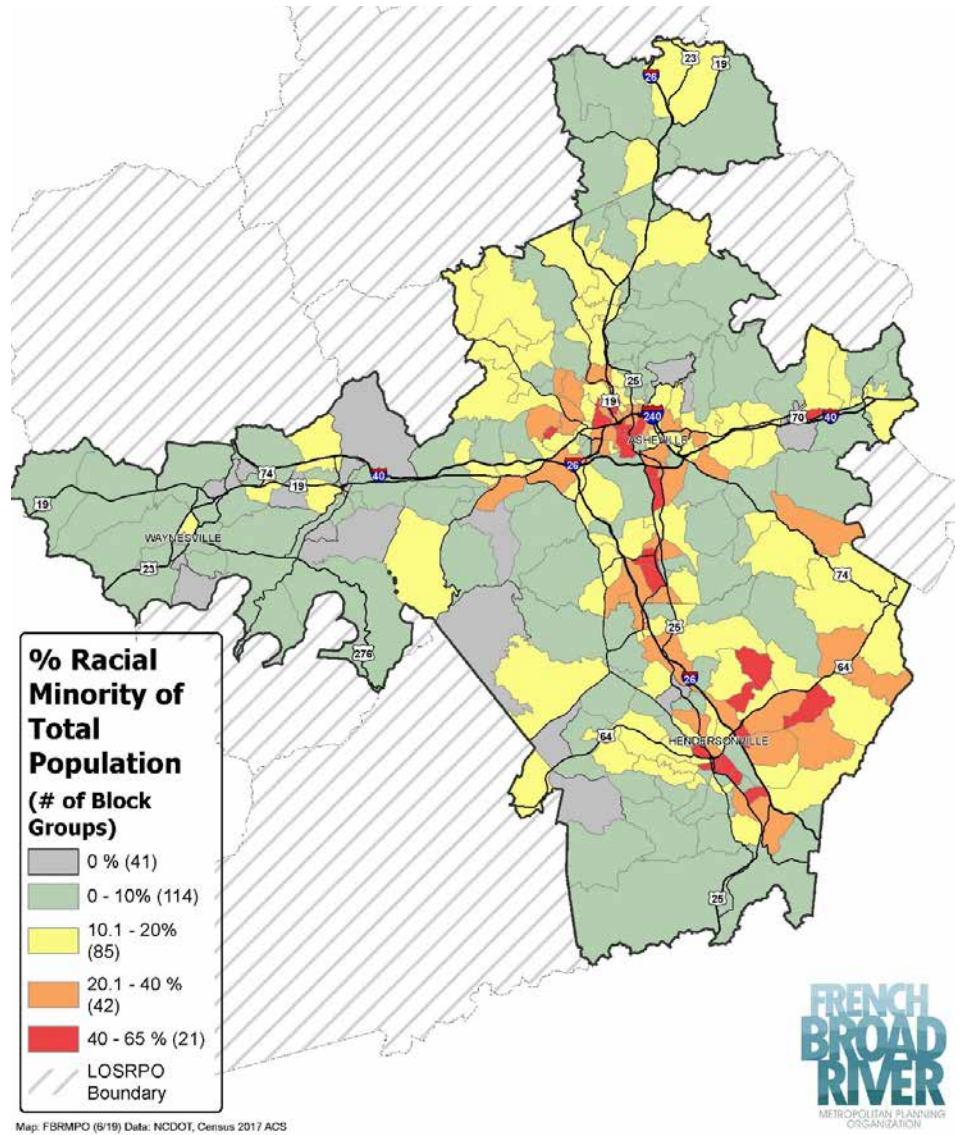
Map 4.6: Limited English Proficiency



Map 4.7: Low-Income and Extremely Low-Income Households  
\*Average Household Income: \$43, 359



Map 4.8: Percentage of Population: Racial Minority



**FRENCH  
BROAD  
RIVER**

METROPOLITAN PLANNING  
ORGANIZATION



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