



BGMPO Metropolitan Transportation Plan 2045

June 2020



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**RESOLUTION ADOPTING THE 2045 METROPOLITAN TRANSPORTATION PLAN
FOR THE BURLINGTON – GRAHAM METROPOLITAN PLANNING ORGANIZATION**

A motion was made by TAC member Jim Butler and seconded by Eddie Boswell for adoption of the resolution below, and upon being put to a vote was duly adopted on this 16th day of June, 2020.

WHEREAS, the provisions of 23 CFR Part 450 requires Metropolitan Planning Organizations (MPOs) to develop a multimodal, financially constrained Metropolitan Transportation Plan (MTP) with at least a twenty year planning horizon and,

WHEREAS, the Transportation Advisory Committee (TAC) of the Burlington – Graham Metropolitan Planning Organization (BGMPO) is the MPO for the Burlington - Graham metropolitan planning area; and,

WHEREAS, through the conduct of a continuing, comprehensive and coordinated transportation planning process in conformance with applicable federal and state requirements, the BGMPO developed the latest MTP with a 2045 horizon year; and,

WHEREAS, the BGMPO, in cooperation with the North Carolina Department of Transportation and with operators of publicly owned transit services, rail operators, the aviation authority and the bicycle and pedestrian community, adhered to the metropolitan transportation planning process in the development of the BGMPO 2045 MTP; and,

WHEREAS, the 2045 MTP was developed through a strategic, proactive, comprehensive public outreach and involvement program, which included: an adopted public participation plan; advertising in regional newspapers; distribution of public information materials; a dedicated website; an interactive web-based visualization tool; five workshops to facilitate public comments on the draft 2045 MTP; three public hearings to receive comments on the draft 2045 MTP; and local, regional and federal interagency coordination and involvement; and,

WHEREAS, the 2045 MTP contains an integrated set of strategies and investments to maintain, manage and improve the transportation system in the planning region through the year 2045 and calls for development of an integrated intermodal transportation system that facilitates the based reasonable available funding provisions; and,

WHEREAS, the 2045 MTP integrates a Congestion Management Process identifying the most serious congestion problems and evaluating and incorporating, as appropriate, all reasonably available actions to reduce congestion, such as travel demand management and operational management strategies for all corridors with any proposed capacity increase; and,

WHEREAS, the 2045 MTP meets federal air quality standards and is in attainment status for these standards; and,

WHEREAS, the 2045 MTP includes, to the maximum extent practicable, a discussion of the performance measures and targets used in assessing the performance of the transportation system (Ref:

23 CFR 450.324) (f) (3)); and subsequent updates evaluating the condition and performance of the transportation system with respect to the performance targets described in 23 CFR §450.306(d); and,

WHEREAS, the 2045 MTP includes a financial plan that demonstrates how the adopted transportation plan can be implemented; and,

WHEREAS, the BGMPO shall review and update the 2045 MTP at least every 5 years in attainment areas to confirm the transportation plan's validity and consistency with current and forecasted transportation and land use conditions and trends and to extend the forecast period to at least a 20-year planning horizon; and,

WHEREAS, the 2045 MTP was released for public comment from May 12 to June 12, 2020.

NOW, THEREFORE, BE IT RESOLVED, that the Burlington – Graham Metropolitan Planning Organization Transportation Advisory Board hereby approves and adopts the 2045 Getting There Metropolitan Transportation Plan on June 16, 2020 for the Burlington – Graham metropolitan planning area.

CERTIFICATE: The undersigned certifies that the foregoing is a true and correct copy of a resolution adopted by the voting members of the TAC on June 16, 2020.

Date: June 16, 2020

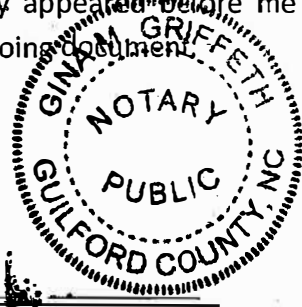
By: [Signature]
TAC Chair

STATE of: North Carolina

COUNTY of: Alamance

I, Gina M. Griffeth, Notary Public of Guilford County, North Carolina do hereby certify that Leonard Williams personally appeared before me on the 19th day of June, 2020 to affix his signature to the foregoing document.

Gina M. Griffeth
Notary Public



My Commission expires: 9-26-2021

Acknowledgements

The Burlington-Graham Metropolitan Planning Organization (BGMPO) would like to thank the project team, Technical Advisory Committee, Technical Coordinating Committee, and Steering Committee members for their efforts in the development of the 2045 MTP Update.

BGMPO Technical Advisory Committee (TAC)

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Michael S. Fox – *Chairman Division 7
NCDOT Commissioner*

Bob Ward – *Vice Chairman, City of Burlington*

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Commissioner

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BGMPO Technical Coordinating Committee (TCC)

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Nishith Trivedi – *Vice Chair, Orange County*

Wannetta Mallette – *BGMPO Administrator*

Mike Nunn – *City of Burlington*

Nolan Kirkman – *City of Burlington*

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Pamela DeSoto – *Town of Elon*

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Jay Heikes – *GoTriangle*

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Transportation*

Theo Letman – *Orange County Public
Transportation*

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Scott Rhine – *PART*

Meg Scully – *GoTriangle*

Ralph Gilliam – *ACTA*

Glen LaBar – *Link Transit*

MTP Steering Committee

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Peter Bishop – *City of Burlington*
Bob Ward – *City of Burlington*
Nathan Page – *City of Graham*
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Alan Branson – *Guilford County*
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Tim Schwantes – *Active Living by Design*
Mac Williams – *Alamance Chamber of Commerce*
Marcy Green – *Impact Alamance*
Carolyn Rhodes – *Alamance Community College Foundation*

Executive Summary

Study Purpose

The 2045 Metropolitan Transportation Plan updates the Metropolitan Transportation Plan (MTP) for the Burlington-Graham Metropolitan Planning Organization (BGMPO) planning area. An MTP is a federally-required plan for any urbanized area over 50,000 in population that serves as a vision for the future transportation system of the region, and includes a fiscally-constrained list of recommended transportation improvements that will be needed to support the vitality and transportation needs of the region going forward.

Study Process

The study was conducted over a sixteen-month period beginning in March 2019 and concluding in June 2020. The study was overseen by a Project Team comprised of BGMPO and North Carolina Department of Transportation (NCDOT) Transportation Planning staff and VHB, Inc staff. The public involvement process consisted of a Steering Committee and stakeholders representing agencies within the planning area, public meetings, surveys, and review of draft recommendations. The final plan was adopted by the BGMPO Transportation Advisory Committee. The final plan was adopted June 16, 2020 following public review and hearing.

Study Recommendations

Federal regulations require MTPs to be “fiscally constrained.” MTPs, demonstrate fiscal constraint by including financial plans to ensure that project recommendations can be implemented using committed or available revenue sources and the federally supported transportation system will be adequately operated and maintained. A fiscally-constrained plan, 2045 Metropolitan Transportation Plan lays out multimodal improvements across the funding horizons years that correspond to the

adopted Piedmont Triad regional travel demand model (PTRM): 2025, 2035 and 2045. Additional projects that were identified but not included in the fiscally-constrained project list will be carried forward as an update to the region's Comprehensive Transportation Plan (CTP).

Additionally, highway and transit future year project recommendations are consistent with the Moving Ahead for Progress in the 21st Century (MAP-21) Act and the Fixing America's Surface Transportation (FAST Act) performance-based requirements.

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Introduction

1.1 Burlington – Graham Metropolitan Planning Organization (BGMPO)

Metropolitan Planning Organizations (MPOs) are regional decision-making bodies that are federally designated and responsible for conducting regional transportation planning in a continuing, cooperative, and comprehensive manner. Federal legislation requires urbanized areas with populations greater than 50,000 to have an MPO to carry out the transportation planning process among the member jurisdictions within its established planning area boundary. A Transportation Advisory Committees (TAC) is the name of the MPO's decision-making body, comprised of local elected officials, and regional, state and federal transportation agencies from the communities that the MPO serves. A Technical Coordinating Committee (TCC) is also part of the structure of an MPO, bringing together staff from local jurisdictions and stakeholder agencies to discuss the data and make technical recommendations for the TAC consideration.

The Burlington-Graham MPO (BGMPO) is the federally designated agency responsible for working with residents and local, state, and federal agencies to coordinate transportation planning and project development within the Burlington-Graham urbanized area.

In partnership with FHWA, NCDOT and area transit providers, the BGMPO provides transportation planning for the following jurisdictions:

City of Burlington	Town of Haw River
City of Graham	Town of Whitsett
City of Mebane	Village of Alamance
Town of Elon	Alamance County
Town of Gibsonville	Guilford County (partial)
Town of Green Level	Orange County (partial)

Metropolitan Planning Organizations are required to provide transportation planning for a planning area that includes the urbanized area designated by U.S. Census, as well as the additional contiguous geographic area (or areas) expected to urbanize over the next twenty years. While the Burlington Urbanized Area designated by U.S. Census as a result of 2010 Decennial Census included a smaller portion of Alamance County in addition to portions of Guilford and Orange Counties, with maps available for reference on the U.S. Census website¹, the entirety of Alamance County is included in the BGMPO Planning Area, illustrated in Figure 1 to the right.

Figure 1: BGMPO Planning Area



1.2 What is 2045 Metropolitan Transportation Plan?

The 2045 Metropolitan Transportation Plan is an update to the 2040 Metropolitan Transportation Plan (MTP) adopted in 2015. The plan identifies the Burlington-Graham region’s transportation needs across various modes and provides a vision for mobility over the next 20+ years, as required by federal regulations, that will support the growth and development of the region and its people and businesses. The process of bringing a transportation project to implementation requires many steps and is dependent on funding availability, environmental and community concerns, and project complexity. Adopting a fiscally-constrained, long range transportation plan for the region is the first step as this planning process helps the local jurisdictions and stakeholder agencies prioritize projects that are the most important to advance.

MTPs are one type of plan in a series of regional and smaller subarea plans that North Carolina MPOs develop in coordination with NCDOT. A Comprehensive Transportation Plan (CTP) reflects the transportation needs of the region over a longer (30+ years) timeframe, and is not fiscally-constrained. Both funded and unfunded projects identified as part of 2045 Metropolitan Transportation Plan will be considered for incorporation into the future CTP update for the Burlington – Graham MPO region.

¹ U.S. Census. 2010 Urban Area Reference Maps. <https://www.census.gov/geographies/reference-maps/2010/qeo/2010-census-urban-areas.html>

Transportation special studies, bicycle and pedestrian plans, feasibility studies and other subarea plans, and updates are important both to identify transportation issues and to explore potential solutions.

The BGMPO will continue to utilize North Carolina’s Strategic Prioritization process to advance projects drawn from long-range plans and locally-adopted plans for funding in the Statewide Transportation Improvement Program (STIP). The Strategic Prioritization process is the methodology that NCDOT uses to develop the State Transportation Improvement Program (STIP). The process involves scoring projects submitted across a variety of modes using a data-driven approach. In addition to a data-based score, Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs) and the NCDOT Division offices contribute to the final project score by assigning local priority points. BGMPO selects projects for submission into the scoring process and then assigns local input points for projects. The Strategic Prioritization process P5.0 resulted in the currently-adopted 2020-2029 State Transportation Improvement Program and BGMPO Transportation Improvement Program.

As part of the plan approach, a Public Involvement Plan was developed for the MTP update. A Steering Committee was formed, made up of MPO member jurisdictions staff and additional stakeholders. Three rounds of public meetings were held and a plan website was created to host information and materials about the plan. Additional information regarding the process and input received through public and stakeholder involvement is detailed in Chapter 3, Public and Stakeholder Involvement.

1.3 2045 Metropolitan Transportation Plan Vision, Goals and Objectives

Working with the 2045 Metropolitan Transportation Plan Steering Committee and subcommittees, and with support from stakeholder groups and the general public, the BGMPO staff and the study team developed a guiding Vision statement as well as goals and objectives for the plan. The goals and objectives were cross-correlated with the ten federally-required transportation planning factors to ensure that the required elements were included as part of the plan considerations. The goals and objectives were used to inform the project selection methodology for the plan.

Figure 2: From Vision to Strategies and Projects



2045 Metropolitan Transportation Plan Vision

The 2045 Metropolitan Transportation Plan promotes investment in a multimodal transportation network supporting a vibrant and prosperous Burlington-Graham region where all residents have access to opportunities and a good quality of life, and where businesses can grow and thrive while natural and cultural resources are protected.

2045 Metropolitan Transportation Plan Goals and Objectives

The 2045 Metropolitan Transportation Plan goals and objectives were selected by the Steering Committee in consideration of existing conditions and pressing transportation concerns in the community. Public input received through the online public survey was also taken into account when formalizing the vision, goals, and objectives for the plan.

Table 1: Goals, Objectives and Performance Metrics

Goal and Objective Number	Description	Potential Metrics
GOAL 1	Provide a safe, secure, comprehensive, and effective transportation system to move people and goods within and through the area	
Objective 1A	Enhance mobility and accessibility and manage congestion across the transportation system and across modes of transportation	<ul style="list-style-type: none"> • Travel Time Reliability utilizing TTI (Travel Time Index from INRIX/HERE data) for interstates and US routes • Bicycle, pedestrian and transit access to passenger rail stations • Ridership on passenger rail and transit
Objective 1B	Support projects, programs, and policies that advance safe and secure travel for all transportation system users	<ul style="list-style-type: none"> • Reduce non-motorized fatalities and serious injuries rate (5-year average) (utilizing NCDOT data) • Reduce serious injury and fatality crash rates (utilizing NCDOT data)
Objective 1C	Plan and support a freight transportation system that allows for the efficient movement of goods	<ul style="list-style-type: none"> • The number of at-grade rail crossings
Objective 1D	Improve resiliency and reliability of the transportation system through increasing roadway network connectivity and supporting multiple route options	<ul style="list-style-type: none"> • The number of deficient bridges/roads

GOAL 2	Provide a transportation system that enables mobility choices	
Objective 2A	Integrate walking and bicycling with vehicular travel and encourage the use of walking and bicycling	<ul style="list-style-type: none"> • Miles of existing sidewalks, bike facilities and greenways • Percentage of CBDs and Designated TOD areas with a walk score of 50 or higher • Number of communities within the region recognized as Walk-Friendly or Bicycle-Friendly Communities • Funding for a follow-up study to identify bicycle and pedestrian network gaps
Objective 2B	Develop an integrated public transportation system that supports multimodal transportation options	<ul style="list-style-type: none"> • Percentage of the region's population located within 1/4-mile buffer of fixed route transit • Percentage of the population served with 30-minute frequency (within ¼ mile buffer)
Objective 2C	Maximize rail and air transportation opportunities (no changes)	<ul style="list-style-type: none"> • Percentage of identified future economic development sites that can be potentially served by rail
Objective 2D	Support transportation demand management strategies including park and ride lots, carpooling and vanpooling throughout the region	<ul style="list-style-type: none"> • Number of park and ride lots • Number of people registered for carpooling and vanpooling (data from PART)
Objective 2E	Support better coordination and integration of existing transit services in Alamance County	<ul style="list-style-type: none"> • Fund and program a Regional Transit Feasibility Study
GOAL 3	Seek to optimize the existing transportation system	
Objective 3A	Prioritize maintaining existing assets before exploring system expansion options	<ul style="list-style-type: none"> • Number of deficient/posted bridges
Objective 3B	Utilize existing transportation capacity through targeted economic redevelopment in areas with sufficient infrastructure	

GOAL 4	Promote equity and accessibility in transportation options for transportation-disadvantaged populations	
Objective 4A	Improve opportunities to serve transportation-disadvantaged populations with convenient transportation to needed services and desired travel destinations	<ul style="list-style-type: none"> • Percentage of the region's block groups with a high EJ concern score located within ¼ mile of fixed route transit • Percentage of the region's key community resources including town halls, parks, libraries, post offices, K-12 schools, colleges, universities, health and social services offices and grocery stores within ¼ mile of fixed route transit
Objective 4B	Provide meaningful opportunities for public involvement in the transportation planning process	
Objective 4C	Use inclusive design to make the system work for all users	<ul style="list-style-type: none"> • Number of ADA Transition plans for local communities completed or updated in the last 10 years
GOAL 5	Integrate land use and transportation planning	
Objective 5A	Support land use planning strategies that facilitate efficient transportation system use and development	<ul style="list-style-type: none"> • Number of activity centers (nodes) across the region designated as accessible (via walk and transit) • Number of locally-adopted comprehensive plans
Objective 5B	Align the transportation infrastructure investment with community vision of future growth	<ul style="list-style-type: none"> • Percentage of major transportation capacity projects that align with locally-adopted plans for growth areas
Objective 5C	Encourage density and destination clustering which will increase accessibility and multimodal transportation options	<ul style="list-style-type: none"> • Residential and employment density in activity centers
Objective 5D	Support areas designated for additional economic development potential under programs such as Opportunity Zones and North Carolina Industrial Commission Certified Sites through transportation infrastructure investments	Percentage of major transportation capacity projects that overlap with and/or provide access to designated Opportunity Zones, N.C. Industrial Commission Certified sites or other locations designated for targeted economic development

1.4 Transportation Planning Factors

An MTP is required to address the transportation planning factors established by Federal transportation legislation. Eight of those factors were initially defined in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), enacted in 2005, and carried forward by MAP-21 in 2012. The FAST Act, signed into law in 2015, included the addition of two planning factors (focused on resiliency and reliability, and on tourism), for a total of ten transportation planning factors.

The projects and strategies recommended in the MTP must support these planning factors. The Federal planning factors can be summarized as follows:

- Support the economic vitality of the metropolitan area
- Increase the safety of the transportation system for motorized and non-motorized users
- Increase the security of the transportation system for motorized and non-motorized users
- Increase the accessibility and mobility of people and for freight
- Protect and enhance the environment, promote energy conservation, and improve the quality of life
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight
- Promote efficient system management and operations
- Emphasize the preservation of the existing transportation system
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation
- Enhance travel and tourism

Figure 3: Stormwater Features Can be Incorporated as Part of Complete Streets Retrofit Projects



As can be seen in Table 2 below, the MTP goals align with the federal planning factors to ensure that the federal guidelines are addressed throughout the 2045 Metropolitan Transportation Plan development.

Table 2: MTP Goals and Objectives and Federally-Required Transportation Planning Factors

	Goal 1: Provide a safe, secure, comprehensive, and effective transportation system to move people and goods within and through the area	Goal 2: Provide a transportation system that enables mobility choices	Goal 3: Seek to optimize the existing transportation systems	Goal 4: Promote equity and accessibility in transportation options for transportation-disadvantaged populations	Goal 5: Integrate land use and transportation planning
Federal Planning Factors	Support the economic vitality of the metropolitan area				
	○	●	●	○	●
	Increase the safety of the transportation system for motorized and non-motorized users				
	●	●	●	●	○
	Increase the security of the transportation system for motorized and non-motorized users				
	●	○	○		
	Increase the accessibility and mobility of people and freight				
	●	●	●	●	●
	Protect and enhance the environment, promote energy conservation, and improve the quality of life				
	○	●	○	○	●
	Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight				
	●	●	●	●	●
	Promote efficient system management and operations				
	○	●	●	●	○
	Emphasize the preservation of the existing transportation system				
	○	●	●	●	●
Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation					
○	○		○	●	
Enhance travel and tourism					
●	●	●	○	●	
# of Federal Planning Factors Addressed	10	10	9	9	9

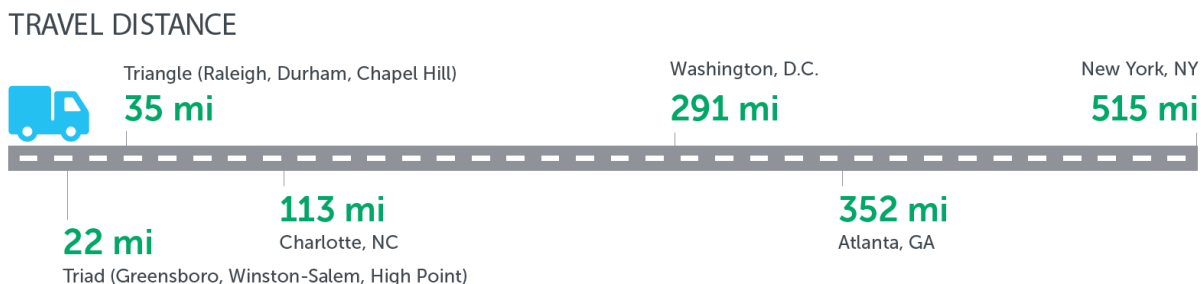
Burlington – Graham Planning Area Overview

2.1 Burlington-Graham Planning Area Overview

The Burlington-Graham region is strategically positioned in the center of North Carolina, between the Piedmont Triad and the Research Triangle regions. The BGMPO Planning area had a population of 176,711 in 2017². The area is well-served by transportation networks including the I-40/I-85 interstate corridor running east-west through the heart of the BGMPO region. Two large commercial airports accessible by I-40 are just outside the MPO planning area--Piedmont Triad International Airport to the west and Raleigh-Durham International Airport to the east. The region also has access to a local general aviation airport, Burlington-Alamance Regional Airport (BUY) with a 6,400-foot runway serving over 74,000 operations (take-offs and landings) per year. Norfolk Southern operates freight trains on the rail corridor through the region, and the Amtrak passenger train station in Burlington sees four southbound and four northbound trains per day operating between Charlotte and Raleigh (including the Piedmont and the Carolinian; the Piedmont gives passengers an option to travel to New York).

² Base year population based on the regional socio-economic data projections developed to support the Piedmont Triad Regional Model (PTRM) and adopted by the BGMPO TAC in October 2019.

Figure 4: Travel Distance to Major Metro Areas, Source: Alamance Chamber of Commerce Economic Development



In decades past, the region’s economic development saw a slowdown due to transition away from textile-oriented industries. As of mid-2019, the economy was growing and diversified across a variety of manufacturing, medical testing, distribution and consumer goods companies, with LabCorp alone accounting for 3,000 jobs in Alamance County³. Government and higher education sectors are also among the top ten employers for the region. While there is likely to be a slowdown in economic development due to COVID-19 related social distancing measures and higher unemployment rates across a variety of industries, having a diverse economic base means that the region will likely be well-positioned for recovery and return to a growth trajectory in the near future.

The region’s population has slightly lower postsecondary educational attainment when compared with the larger region encompassing both the Piedmont Triad and the Research Triangle metro areas—22 percent of Alamance County residents have a Bachelor’s or higher degree, versus 29 percent of population with a Bachelor’s or higher degree for the larger area.

Figure 5: Educational Attainment in Alamance County, Source: U.S. Census Bureau, 2015, Alamance Chamber of Commerce Economic Development Infographics



³ Alamance County Chamber of Commerce, Economic Development Infographics. Retrieved from <http://www.alamancechamber.com/economic-development-infographic-downloads/>

Figure 6: Employment by Industry in Alamance County, Source: Labor & Economic Analysis Division, NC Department of Commerce, 2016

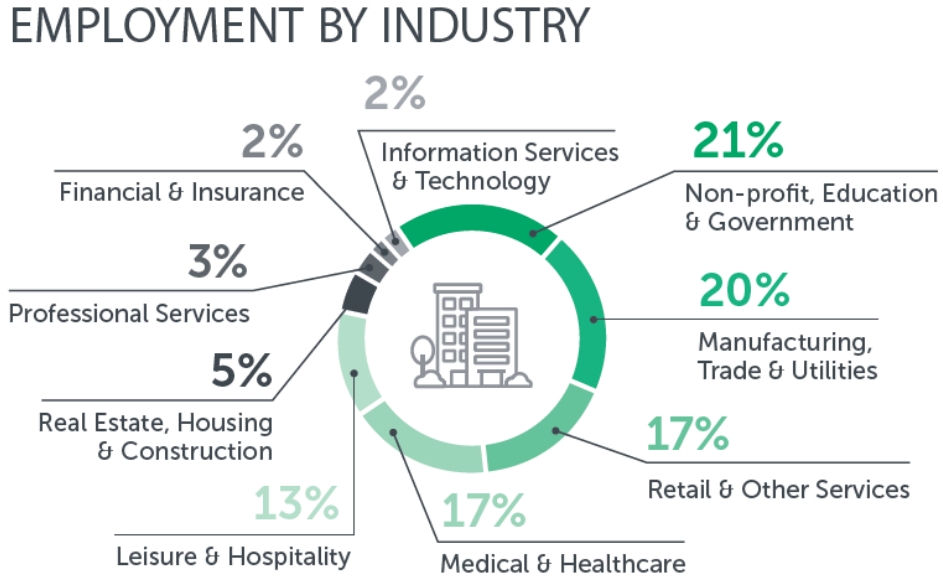


Figure 7: Major Employers in Alamance County, Source: Employer Information 2016-2017, Alamance Chamber of Commerce Economic Development Infographics

TOP EMPLOYERS		TOP INDUSTRIAL EMPLOYERS	
 ALAMANCE-BURLINGTON SCHOOL SYSTEM Education	3,500	 LABCORP OF AMERICA Medical Testing	3,000
 LABCORP OF AMERICA Medical Testing	3,000	 GKN DRIVELINE NORTH AMERICA Automotive Parts	800
 CONE HEALTH ALAMANCE REGIONAL Healthcare	2,000	 HONDA POWER EQUIPMENT Small Engine Manufacturing	750
 ELON UNIVERSITY Education	1,500	 WAL-MART STORES INC. Food Distribution Center	600
 WAL-MART STORES INC. Food Distribution Center & Retail Stores (3)	1,200	 GLEN RAVEN, INC. Engineered Textiles	500
 CITY OF BURLINGTON Government	1,100	 KAYSER-ROTH CORP Hosiery	460
 ALAMANCE COUNTY Government	950	 JABIL PACKAGING SOLUTIONS Medical and Consumer Packaging	400
 HONDA Small Engine and Jet Engine Manufacturing	850	 LIGGETT GROUP, LLC Tobacco Products Manufacturing	250
 GKN DRIVELINE NORTH AMERICA Automotive Parts	800	 SHEETZ Bakery and Distribution Center	250
 ALAMANCE COMMUNITY COLLEGE Education	650	 SPORTS ENDEAVORS, INC. Sports Retailer	150

The diversity of local employers presents an opportunity to continue to grow the region’s economy and median household income, which as of 2014 was at \$44,209—below North Carolina median household income of \$48,256.

Figure 8: 2014 Median Income, Source: 2011-2015 American Community Survey, U.S. Census Bureau 2014, as cited in Alamance Chamber of Commerce Economic Development Infographics

2014 MEDIAN INCOME

HOUSEHOLD

Alamance County	\$43,209
North Carolina	\$48,256
United States	\$55,322

PER CAPITA

Alamance County	\$23,989
North Carolina	\$26,779
United States	\$29,829

Source: 2011 – 2015 American Community Survey, US Census Bureau, 2014

Due to its unique geography of being located between two larger regions – the Piedmont Triad to the west and the Research Triangle to the east – BGMPO sees some unusual commuting patterns. Workers from Burlington-Graham region households often choose to commute to nearby job centers in the Piedmont Triad or the Research Triangle metro areas. Of approximately 68,000 people in the labor force in Alamance County as of 2015, a little over 36,000 (53 percent) were working outside the area and just under 32,000 (47%) of the labor force were living and working in Alamance County. Approximately 53% travel to other areas, with the following break-down between neighboring metro areas:

- 24% travel to the Triangle region for work
- 17% travel to the Piedmont Triad region to work
- About 5% travel to jobs in the greater Charlotte region

An additional 31,000 employees were commuting into Alamance County for work as of 2015. This points to the importance of major transportation corridors like I-40, I-85, US 70 and NC 54 to the economic vitality of the region and to the well-being of households that call Burlington-Graham metropolitan area their home. Figures 9 and 10 below further illustrate the “desire lines” of travel into Burlington and the numbers of commuter into the region and out of the region.

Figure 9: 2017 Desire Lines, Travel to Burlington



Source: NCDOT Statewide Commuter Bus Study, June 11, 2020 Presentation

Figure 10: Inflow and Outflow Commuting Patterns for Alamance County, 2015



Source: Census on the Map, U.S. Census.

2.2 Natural Resources, Water and Sewer Service Area, and Future Growth

Development patterns in the region are currently concentrated where people already live and work (the wider corridor along I-40/I-85), which generally corresponds to existing municipal boundaries.

Water and sewer infrastructure will influence the type and density of future development across the region. Three municipal governments in the BGMPO area operate water and sewer systems: Burlington, Graham, and Mebane. Remaining municipalities rely on neighboring jurisdictions for water and sewer services and may be more limited in their opportunities for growth and expansion.

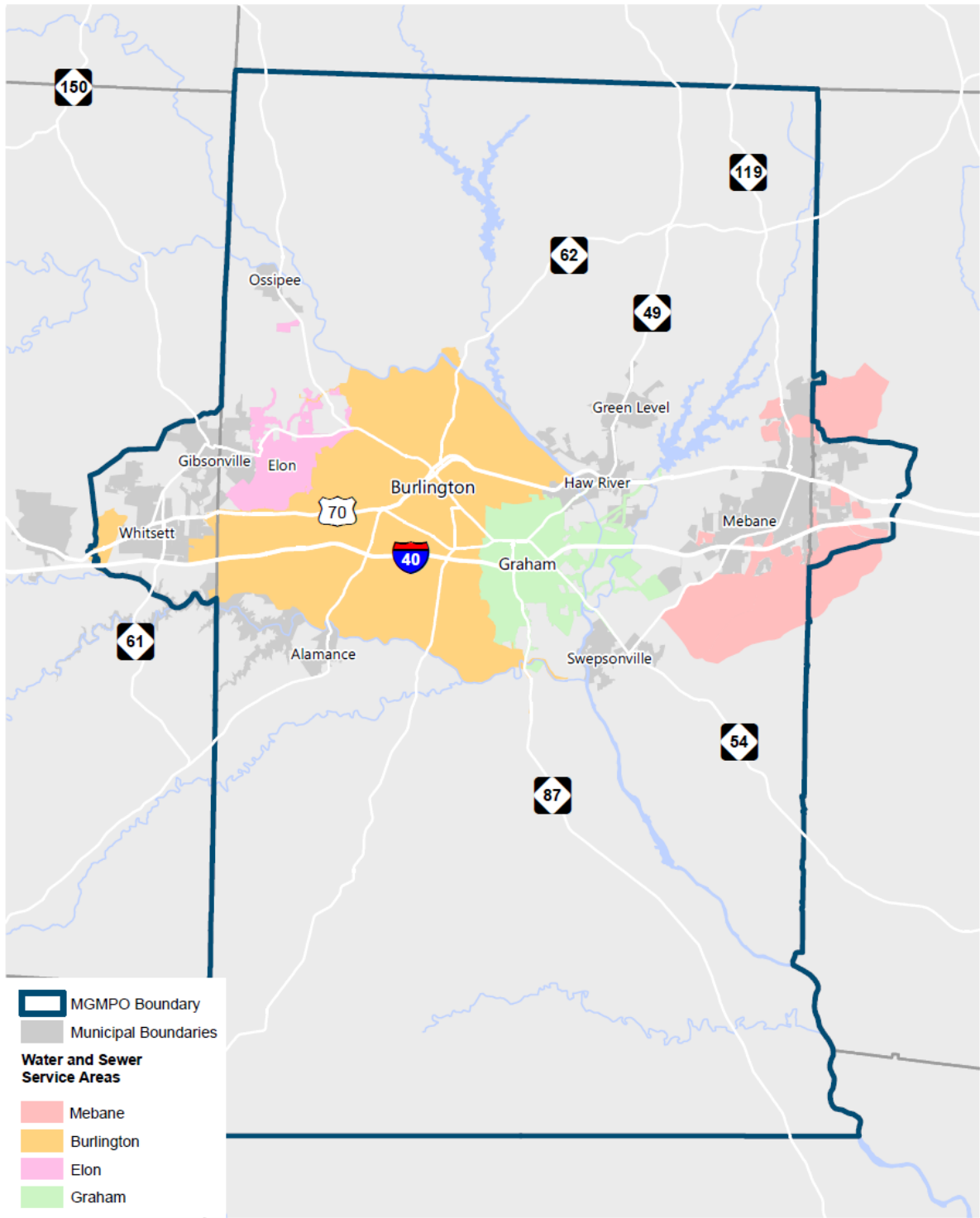
The region's natural and cultural resources will also impact future growth and development, imposing constraints on improvements to the transportation infrastructure. The Haw River flows through the region and several critical watershed areas and lakes are important for the region's water supply:

- Graham-Mebane Lake is a 650-acre municipal reservoir, fed by Quaker Creek and four other creeks (Otter Creek, Mill Creek, Stagg Creek, and Back Creek). The lake's primary purpose is as a source of drinking water for the citizens of Graham, Mebane, Green Level, and Swepsonville, and no swimming or wading is allowed⁴.
- Stoney Creek Watershed
- Big Alamance Creek Watershed

The region's rivers represent a resource in terms of outdoor recreation, scenic beauty, and biodiversity. They can also be a constraint in terms of transportation infrastructure- roadways and greenways -crossing over the bodies of water.

⁴ Graham Recreation and Parks. <https://www.cityofgraham.com/departments-2/recreation-and-parks/graham-mebane-lake/>

Figure 11: Water and Sewer Service Areas

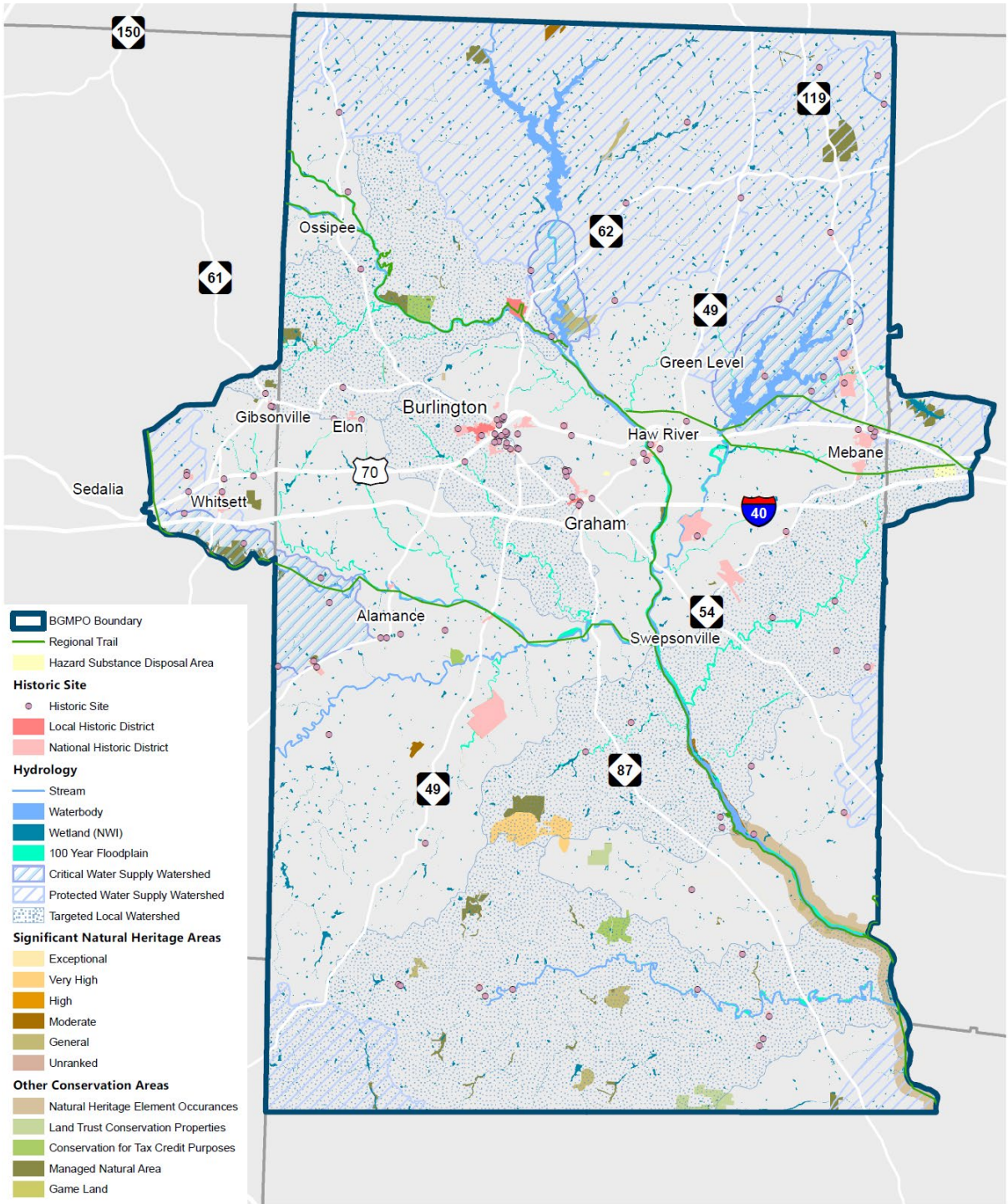


Water and Sewer Service Areas
MTP 2045

0 5 Miles



Figure 12: Environmental Features



Environmental Features
MTP 2045



Historic preservation sites and districts can be a source of community pride, preserving local landmarks and a sense of place and heritage. When it comes to transportation projects, it is important to avoid negative impacts to historic districts and places. Historic districts and landmarks are common throughout the Burlington-Graham region, including the following districts and places⁵:

- Alamance Battleground State Historic Site (Alamance vicinity)
- Alamance County Courthouse (Graham)
- Alamance Mill Village Historic District (Alamance)
- Bellemont Mill Village Historic District (Bellemont)
- Beverly Hills Historic District (Burlington)
- Cedarock Park Historic District (Coble Township)
- Cross Roads Presbyterian Church and Cemetery and the Stainback Store (Cross Roads)
- Downtown Burlington Historic District (Burlington)
- East Davis Street Historic District (Burlington)
- Elon College Historic District (Elon College)
- Glencoe Mill Village Local Historic District (Burlington/Glencoe)
- Granite Mill (Haw River)
- James Monroe Thompson House (Saxapahaw vicinity)
- Mebane Commercial Historic District (Mebane)
- North Main Street Historic District (Graham)
- Old South Mebane Historic District (Mebane)
- Saxapahaw Spinning Mill (Saxapahaw)
- South Broad-East Fifth Street Historic District (Burlington)
- Southern Railway Passenger Station (Front & Main Streets, Burlington-see Figure 13 below)
- West Davis Street-Fountain Place Historic District (Burlington)

⁵ A selection of historic districts and landmarks obtained from <https://www.ncdcr.gov/about/history/division-historical-resources/state-historic-preservation-office/architectural-3>

Figure 13: Southern Railway Passenger Station in Downtown Burlington



2.3 Future Population and Employment Distribution

The BGMPO Planning Area population is expected to grow from 176,711 in 2017 to 241,734 in 2045—an almost 37% increase—based on the regional socio-economic data projections developed to support the Piedmont Triad Regional Model (PTRM) and adopted by the BGMPO in October of 2019. Those population and employment projects for the region are developed and maintained by the Piedmont Area Transportation Authority.

Table 3: Population and Employment Projections, 2017-2045

BGMPO Planning Area			
PTRM Socio-Economic Values Adopted	Year	Population	Employment
	2017	176,711	73,611
	2025	195,663	78,751
	2035	219,554	91,582
	2045	241,734	114,934

While the BGMPO Planning Area population might cross the 200,000 threshold as early as 2030, it is not expected that the urbanized area population will exceed 200,000 by 2045. Under current Federal legislation, exceeding 200,000 population in the urbanized area would redefine the BGMPO region as a Transportation Management Areas (TMA). This would add new federal transportation planning requirements, and could provide access to additional federal transportation funding for the region (STBG-DA).

A subset of select demographic parameters is provided in Table 4 below for Alamance County. It should be noted that this includes a smaller area and a smaller total population than the overall BGMPO Planning Area. Of particular interest during the COVID-19-associated social distancing and working from home trends is the percentage of households with a broadband internet subscription—approximately 75.9 percent of households, which means the remaining 24.1 percent of Alamance County households rely on mobile connection for their internet access or might not have at-home internet access at all.

Table 4: Demographic Characteristics for Alamance County, U.S. Census Quick Facts⁶

Demographic Characteristics for Alamance County, U.S. Census Quick Facts	Population Values or Percentage
Population estimates, July 1, 2019, (V2019)	169,509
Population estimates base, April 1, 2010, (V2019)	151,155
Persons under 18 years, percent	22.20%
Persons 65 years and over, percent	16.90%
Black or African American alone, percent	20.60%
American Indian and Alaska Native alone, percent	1.40%
Asian alone, percent	1.80%
Two or More Races, percent	2.20%
Hispanic or Latino, percent	12.90%
White alone, not Hispanic or Latino, percent	63.40%
Foreign born persons, percent, 2014-2018	7.90%
Language other than English spoken at home, percent of persons age 5 years+, 2014-2018	12.60%
Mean travel time to work (minutes), workers age 16 years+, 2014-2018	23.8
Households with a broadband Internet subscription, percent, 2014-2018	75.90%
Median household income (in 2018 dollars), 2014-2018	\$45,735
Persons in poverty, percent	13.50%

⁶ U.S. Census Quick Facts. Alamance County, North Carolina. <https://www.census.gov/quickfacts/geo/chart/alamancecountynorthcarolina/PST045219>

Figure 14: BGMPO Planning Area Projected Population Growth, 2017-2020

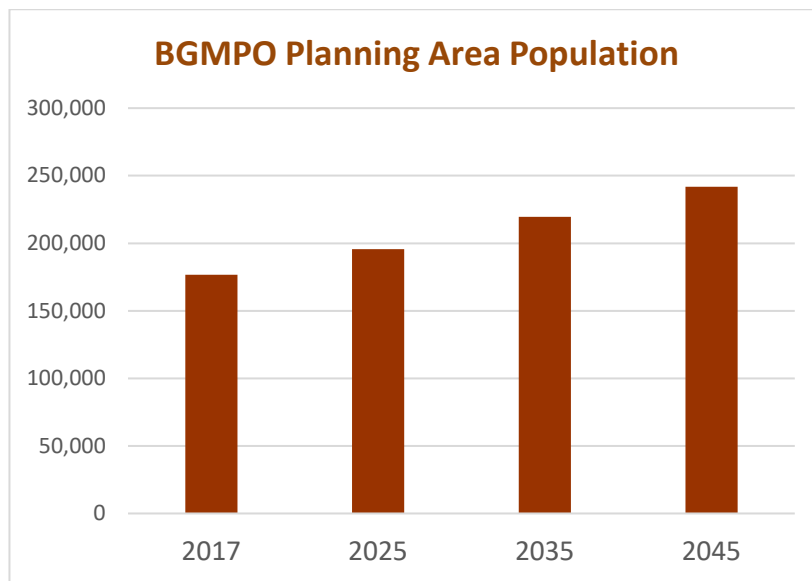
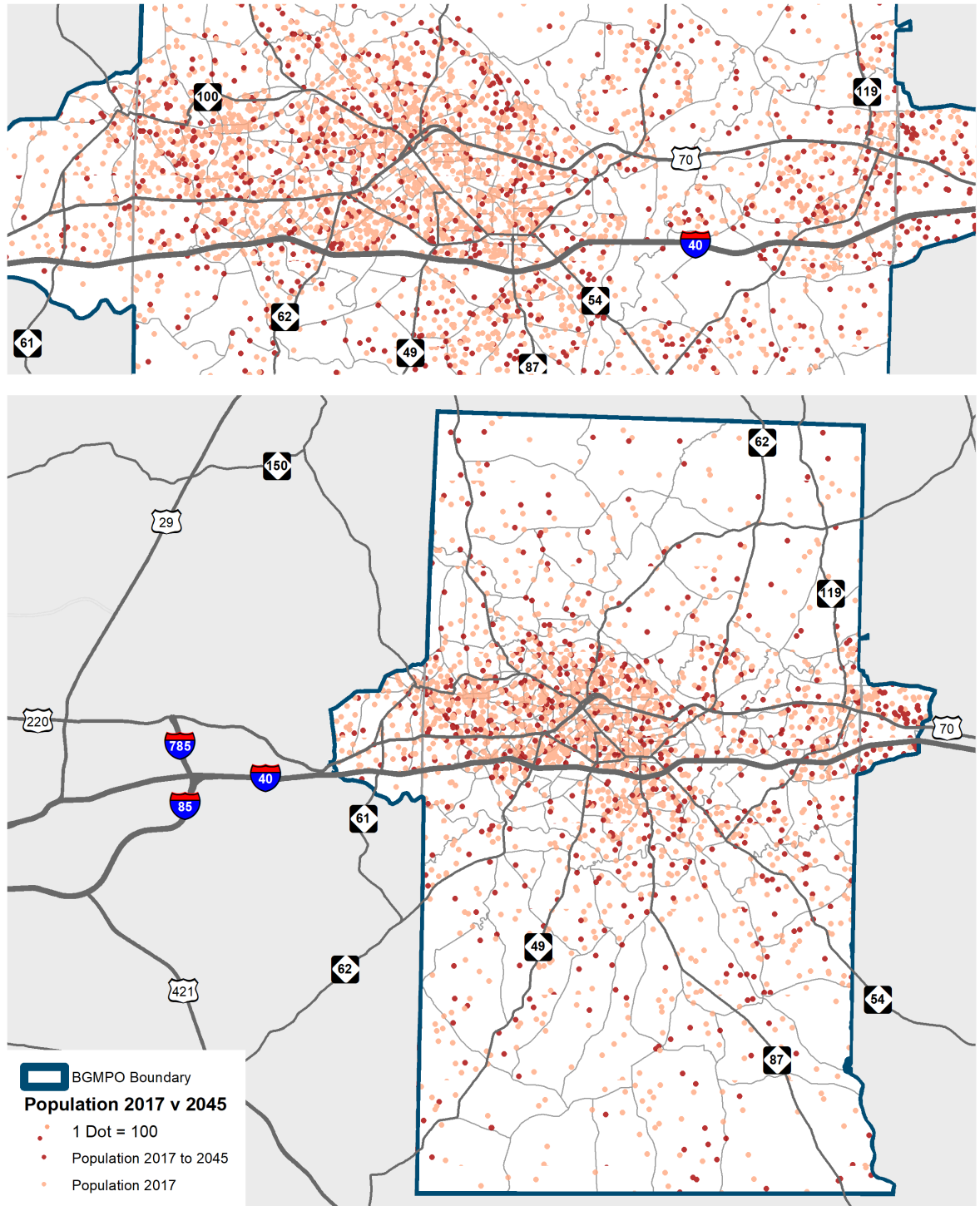


Figure 15 below illustrates future population growth dispersal expected to occur across the region by 2045. Population growth trends across the region indicate concentration in existing municipalities and along the key travel corridors, including I-40/I-85, US 70, and NC 54. However, a portion of the population growth is more spread out across the region.

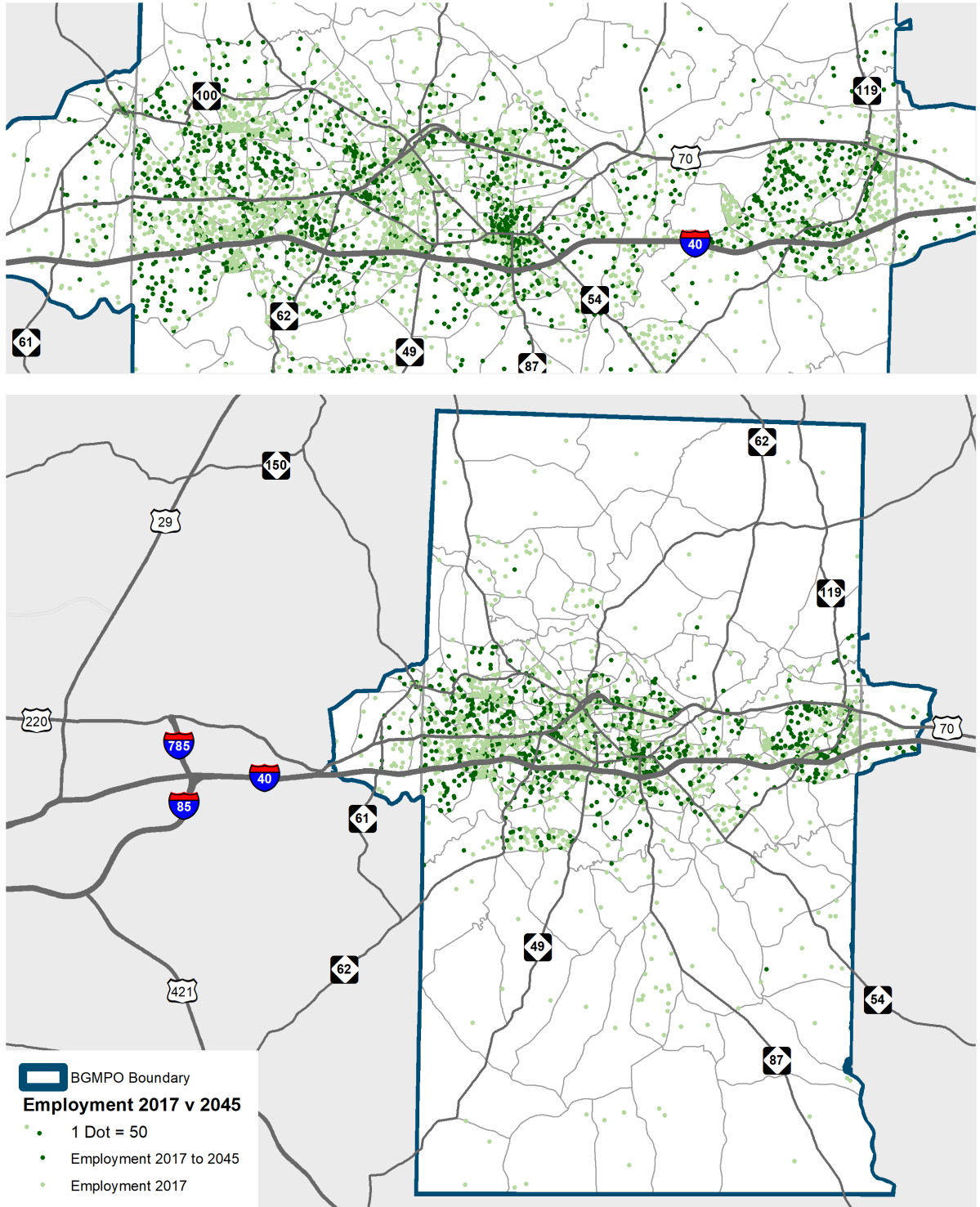
Figure 15: Socioeconomic Comparison for Population, 2017 v. 2045



Employment growth between 2017 and 2045 is projected to be more concentrated than population growth, concentrating closer to the region's core—and falling mostly within existing municipalities.

Employment in the planning area is expected to grow from 73,611 in 2017 to 114,934 in 2045 (by approximately 40,000 jobs).

Figure 16: Socioeconomic Comparison for Employment, 2017 v. 2045



Public and Stakeholder Involvement

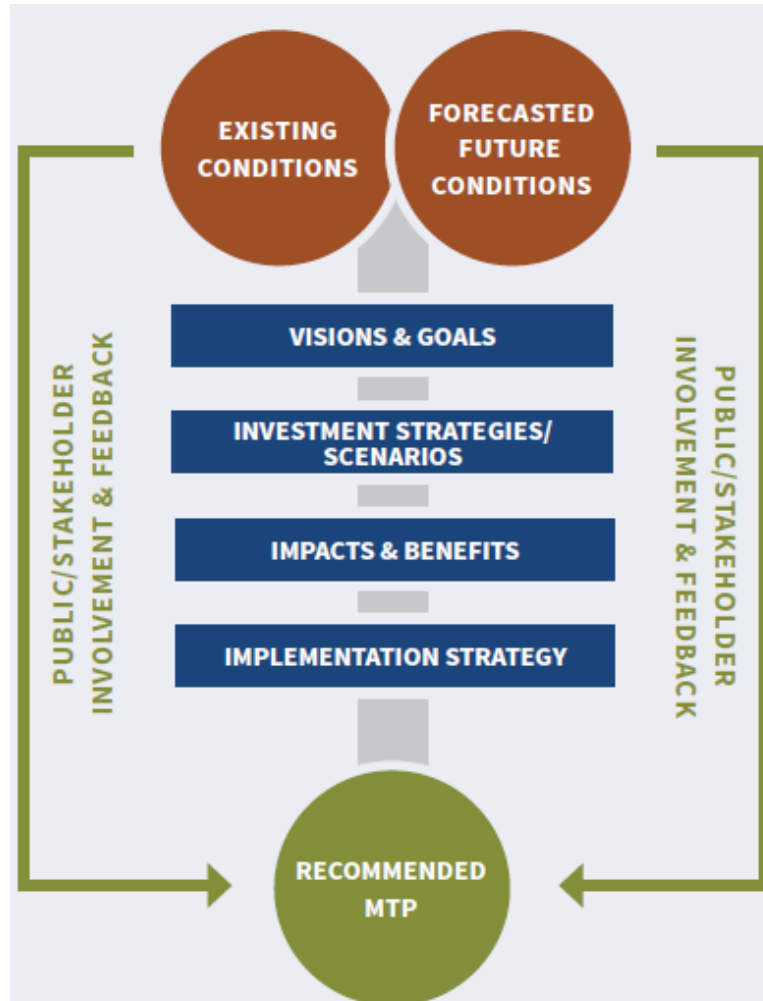
3.1 Overview

Public and stakeholder engagement was a critical component in developing 2045 Metropolitan Transportation Plan. The following elements helped ensure the study team heard from a variety of stakeholders and members of the public:

- A dedicated study website established at the following URL: bgmpo2045gettingthere.com
- A Steering Committee made up of MPO member jurisdictions staff and additional stakeholders was created; four subcommittees under the MTP Steering Committee were established, focusing on transit, land use, rail and freight and bicycle and pedestrian issues.
- Initial public survey in August 2019 in MetroQuest format, including an interactive mapping feature to solicit feedback regarding specific issues and transportation needs; second public input survey held in May-June 2020
- Stakeholder interviews were conducted to ensure that the perspective of business groups, colleges, and community and health services groups was captured in the process.
- Three public input meetings held throughout the plan process
- Three newsletters reviewing the study progress
- Interactive online map of recommended projects developed to supplement static maps and report documents posted for public comment
- Press releases were sent out for public meetings to support media awareness and coverage of the process

- A video was created and posted online to raise the awareness and build audience around the MTP plan update
- Three rounds of public input meetings were held during the plan process, including the first public input meeting on July 23, 2019; a second public input meeting on January 14, 2020; and a third public input opportunity held in virtual format due to COVID-19 social distancing restrictions in May 2020.

Figure 17: Public and Stakeholder Involvement Approach



3.2 Public Involvement Policy

The BGMPO amended its adopted Public Involvement Plan (PIP) on May 19, 2020. This policy document establishes formal policies and strategies for ensuring the general public is given, and notified of opportunities to participate in the development of all transportation-related plans and programs in the urban area. The PIP is designed to ensure residents are involved in all transportation planning decision-making processes. The PIP has five key objectives:

- Engage a broad cross-section of the public in the transportation planning decision-making processes
- Enhance the public’s knowledge of the BGMPO multimodal transportation system, costs and funding
- Evaluate the BGMPO’s public involvement procedures and its effectiveness for increasing public engagement and access to relevant information.
- Coordinate with the statewide transportation planning public involvement and consultation processes
- Periodically reviewing the effectiveness of the procedures and strategies contained in the participation plan to ensure a full and open participation process

The PIP is an umbrella policy document that applies to all public involvement efforts for the Metropolitan Transportation Plan (MTP), Transportation Improvement Plan (TIP), Major Investment Studies (MIS), Program of Projects (POP) and the Unified Planning Work Program (UPWP). A copy of the adopted PIP can be found in Appendix B.

3.3 Stakeholder Interviews

As part of the BGMPO’s 2045 Metropolitan Transportation Plan, interviews were conducted with eight stakeholder groups in May and June of 2019. These groups were selected with the guidance of the BGMPO and represent the diverse educational, health, economic development, and transportation interests and needs of the planning area. Interviews were conducted in-person at Impact Alamance and over the phone. The summary of the comments is included below and grouped by major theme. While all stakeholders were asked a similar set of questions, some questions were tailored to capture the specific needs of certain populations (i.e. students, senior, low-income householders, prospective businesses, etc.). The following agencies participated in the stakeholder interviews and were able to provide a response within the time constraints:

- Burlington Recreation and Parks
- Alamance County Recreation and Parks Department
- Wellness Collaborative
- Burlington Chamber of Commerce
- Alamance County Chamber of Commerce
- Elon University
- Alamance Community College
- Alamance Network for Inclusive Health Care
- Kernodle Senior Center

The following are themes that were repeated over the course of the interviews. Specific information on responses can be found in Appendix A.

- **Unfamiliarity among the stakeholders with the BGMPO**, its functions, and the MTP process was cited; however there was consistent interest in participating in the transportation planning process.
- Interviewees stressed the **existing deficiencies of the pedestrian, bicycle, and transit networks** for access to social services, recreation, employment, and supporting a high quality of life.
- There was **strong support for coordinating future multimodal transportation** investments with the region’s growth.
- The BGMPO transportation area was reported as **lacking north-south connections** to the interstate system and that gap was affecting mobility and economic development.
- Key roadways near the interstates and large institutions were identified where congestion during peak hours and events presents mobility and safety issues with **recommendations for widenings, intersection improvements, and additional roadways**.
- Requests were made to include other **considerations such as health and transportation options for the mobility impaired, low-income populations and populations with limited vehicle access** in transportation investment decisions.

3.4 Online Survey Results

The BGMPO 2045 Metropolitan Transportation Plan survey was administered as an online survey hosted on the MetroQuest platform. Survey respondents were able to respond through the web (54% of responses) or on a mobile device (46% of responses). The survey recorded 137 unique respondents between August 8 and August 28, 2019. The BGMPO 2045 Metropolitan Transportation Plan survey was posted on the bgmpo.org and bgmpogettingthere2045.com websites and by steering committee members. Specific responses can be found in Appendix E.

3.5 Public Input Meetings

July 2019 Meeting

The first meeting was held at Graham Council Chambers in Downtown Graham on the evening of July 23, 2019. The study team provided an overview of existing conditions and asked participants to comment regarding transportation issues and concerns, as well as study goals and objectives most important to consider as part of project selection. A link to the website was provided for the participants to fill out the online survey.

Figure 18: Attendees at the Public Meeting on July 23, 2019



January 2020 Meeting

The second public input meeting was held at Gibsonville Community Center on the evening of January 14, 2020. Study team reviewed the project selection approach and presented a draft list of recommended projects for review.

Figure 19: Public Meeting on January 14, 2020 at Gibsonville Community Center



May 2020 Virtual Public Meeting

The third public meeting was held in virtual meeting format due to the COVID-19 social distancing measures, on May 19, 2020. Interested members of the public could join via Zoom to watch in real time, or could watch a recording and fill out the online survey on their own time.

Burlington-Graham Transportation System

4.1 Roadway

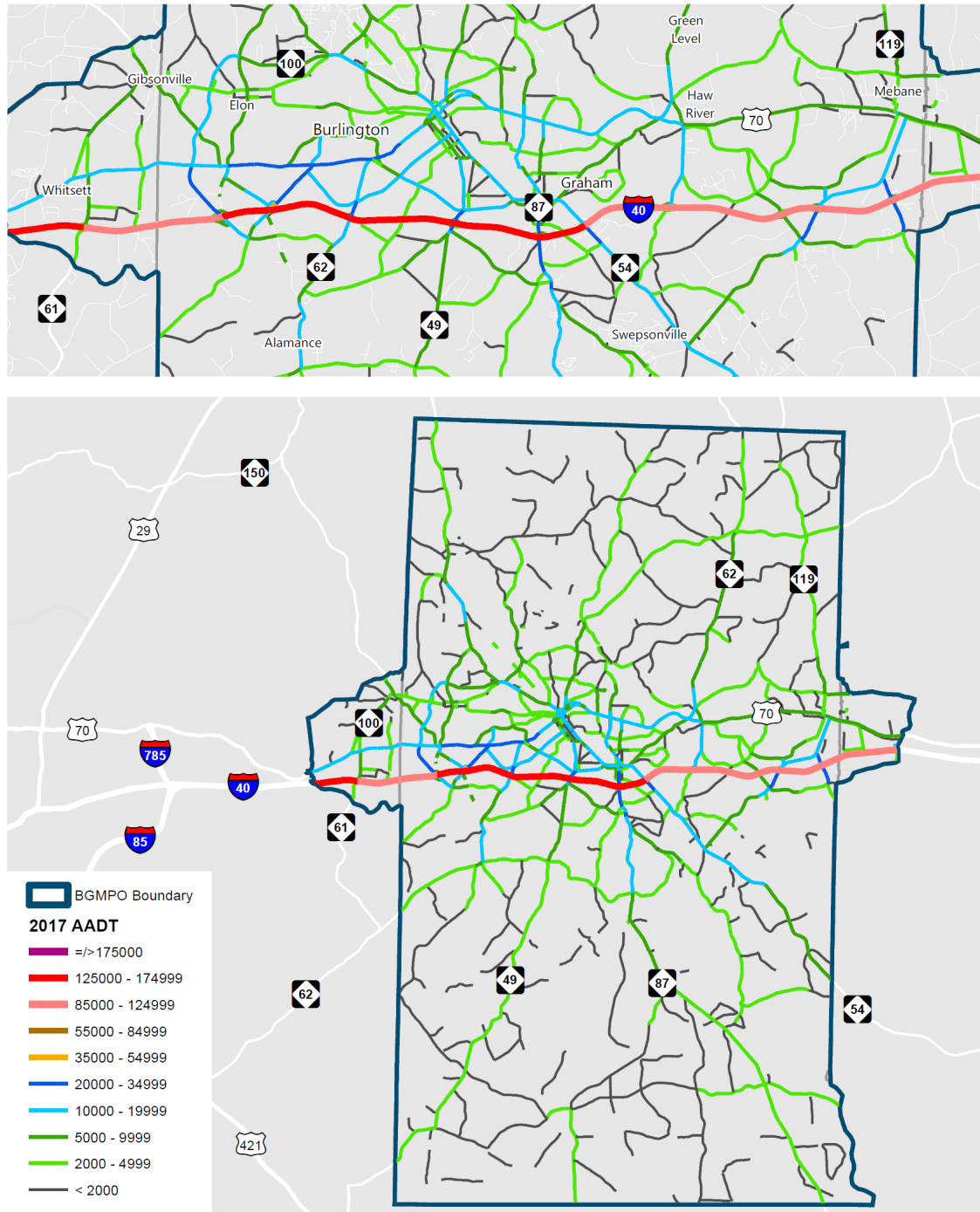
Traffic Volumes and Congestion

The BGMPO planning region includes approximately 1,950 roadway miles, including:

- One interstate facility: I-40/I-85
- One US route: US 70
- Six NC routes—NC 49, NC 54, NC 61, NC 62, NC 87 & NC 119

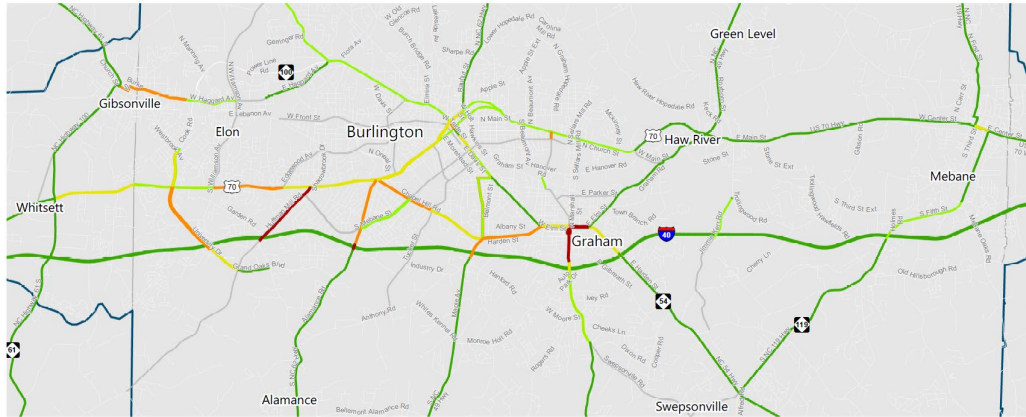
The I-40/I-85 corridor carries the highest volumes of traffic across the region, peaking at around 134,000 vehicles per day near Exit 143 for NC 63 Alamance Road (Burlington exit). Outside of interstate traffic volumes, several key corridors that carry higher volumes include Huffman Mill Road between I-40 at Exit 141 and US 70 (at 34,000 vehicles per day) and University Drive just north of I-40 at Exit 140 (at 31,000 vehicles per day). US 70 west of downtown Burlington, between Chapel Hill Road and Huffman Mill Road tends to average around 27,000-29,000 vehicles per day based on 2017 counts.

Figure 20: Annual Average Daily Traffic Volume (AADT), 2017 Data

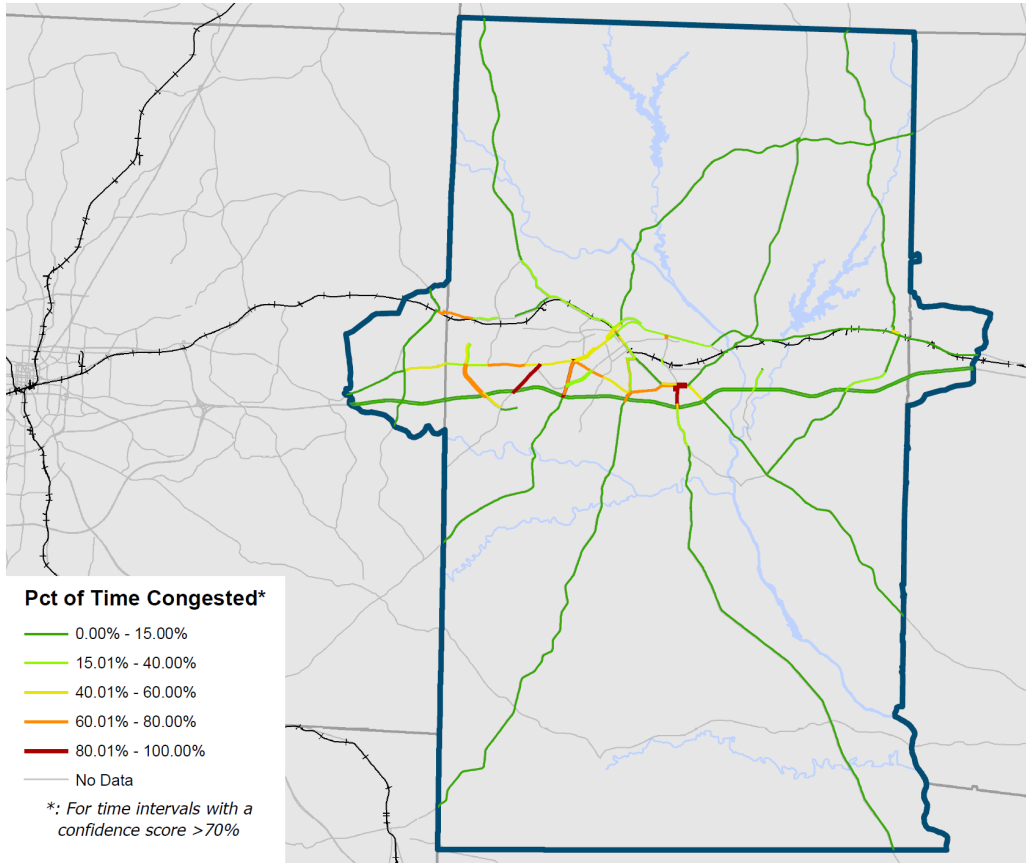
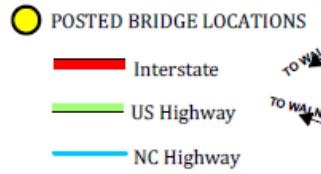


Traffic congestion during the PM peak period, 4:00pm-6:00pm was analyzed using real-time cell phone HERE data from 2018. Based on cell phone data, congestion appears to be most frequent and severe along US 70 and major arterials connecting to I-40, as well as along portions of NC 87 and NC 54. HERE data is not available for all roadway corridors, so some roadway corridors with known congestion issues are not showing all on this map if they are not NC or US routes.

Figure 21: Major Roadway Corridors-Percent of Time Congested During Afternoon Peak, Based on 2018 HERE (Cell Phone) Data



JAN 2020



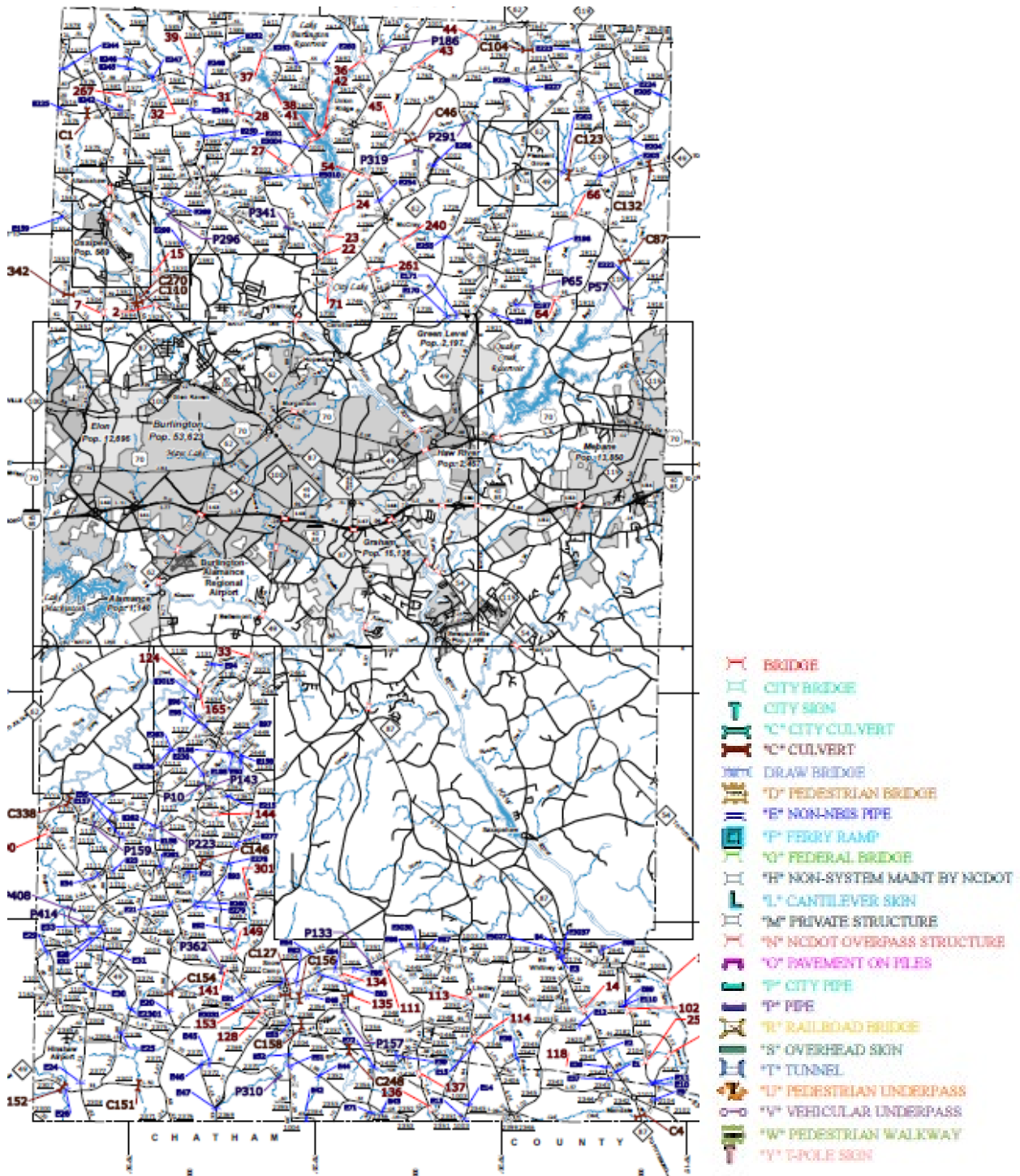
Bridges

A significant number of bridge and culvert structures are present throughout the BGMPD region, as visible in the map from NCDOT on Figure 22 below. NC 54 bridge over the Haw River (see Figure 22 below) spans 365 feet and has a 64-foot wide, 5-lane cross-section with a narrow sidewalk on one side.

Figure 22: NC 54 Bridge over the Haw River



Figure 23: Alamance County Bridges, Source: NCDOT County & Bridge Maps

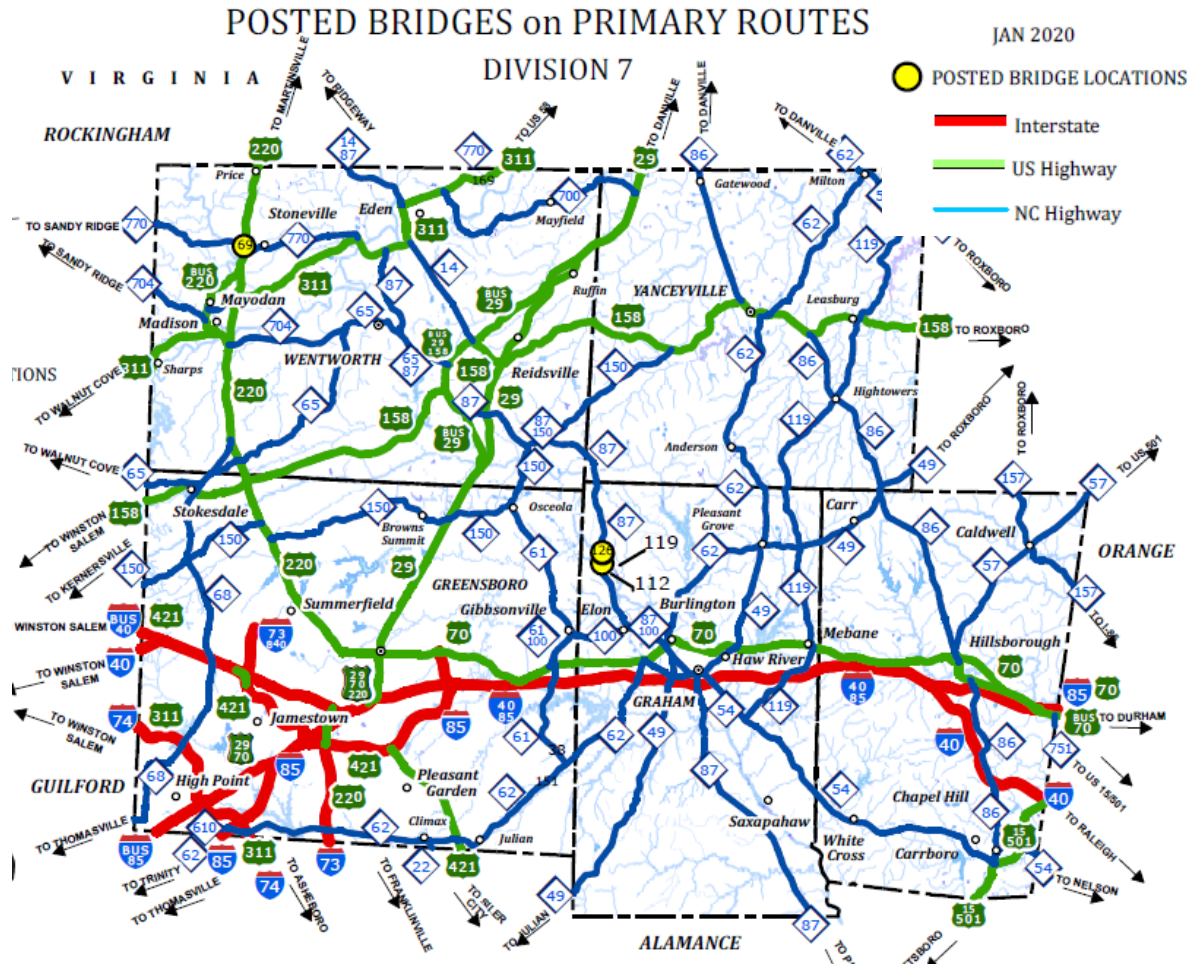


The North Carolina Department of Transportation indicates the maximum amount of weight a bridge can safely support by “posting” bridges where some deficiencies and weight limitations for heavier freight vehicles are in place. This is a service to the freight industry, law enforcement and local, state and federal

agencies. Of the three known posted bridges below, two already have an associated improvement programmed in the STIP:

- #112 NC 87 across Reedy Fork Creek
- #119 NC 87 across Haw River (STIP project B-5239)
- #126 NC 87 across Mill Race (STIP project B-5239)

Figure 24: Map of Division 7 Posted Bridges, Source: NCDOT Posted Bridges Maps



Projects Funded in the STIP

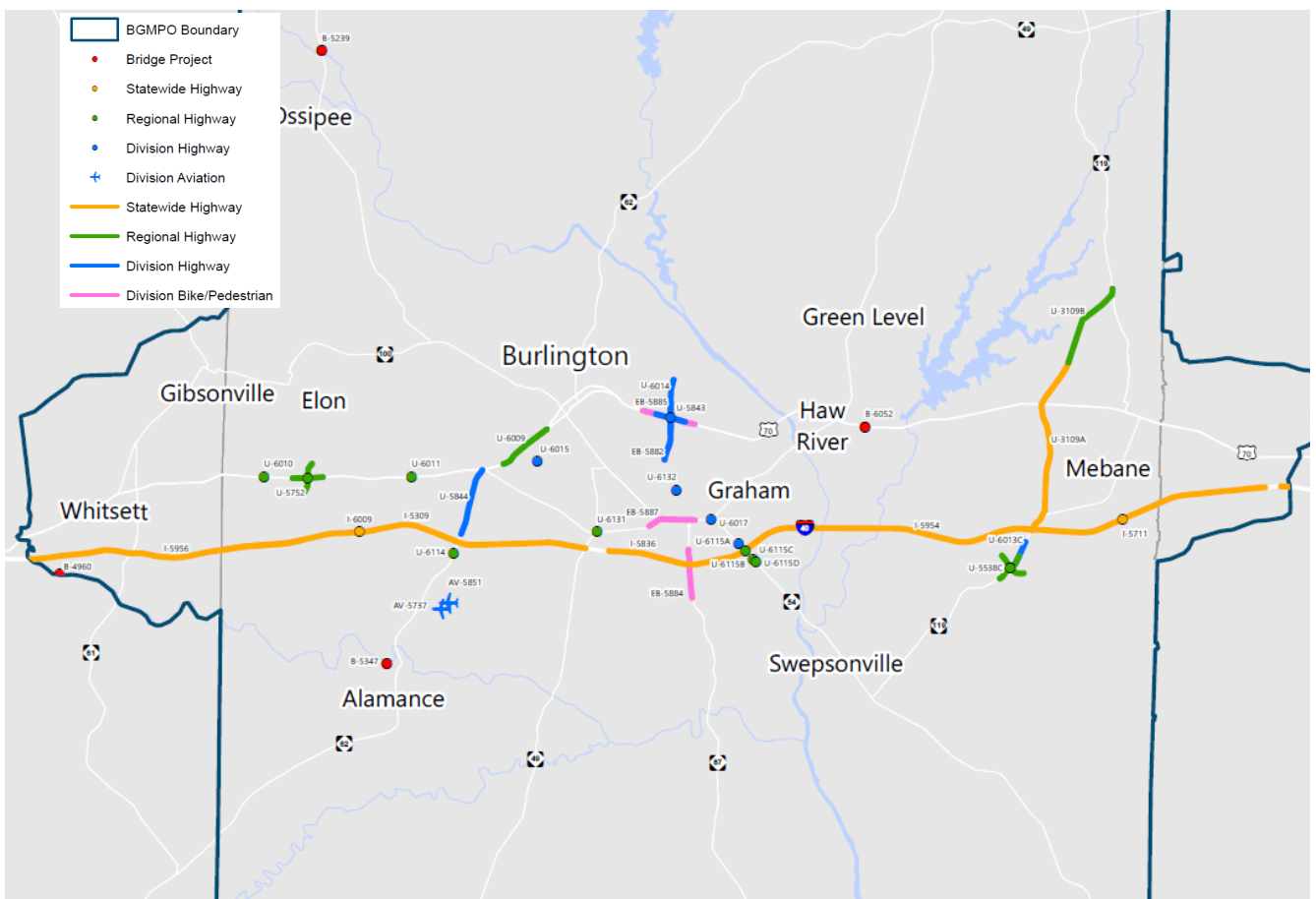
A variety of interstate, other roadway, aviation, bicycle, pedestrian, transit, and passenger rail improvements in the BGMPO region are included for funding in the 2020-2029 STIP. As a result of the latest two-year Strategic Prioritization process P5.0, fourteen new projects have been added to the draft 2020-2029 STIP, including one sidewalk project and a variety of intersection and interchange improvements and modernization projects.

The following interchange improvements are funded in the 2020-2029 STIP:

- I-6009 I-40/I-85 at Huffman Mill Road (Burlington)
- I-5711 I-40/I-85 at Mebane Oaks Road (Mebane)
- I-6059 I-40/I-85 at Trollingwood Hawfields Road (Mebane)
- I-6004 I-40/I-85 at Rock Creek Dairy Road (Guilford County, just outside of BGMPO planning area)

The map and the tables below illustrate STIP projects, with the map showing only those projects considered "committed" (funded for ROW or PE in FY 2025 or earlier). The tables exclude pavement rehabilitation and transit operations projects, except transit operations for new or expanded transit routes.

Figure 25: Projects Committed for Funding in 2020-2029 STIP



**Table 5: Projects Included in the 2020-2029 STIP
(Repaving and Transit Operations on Existing Routes not Included)**

STIP ID	Facility	City/ County	Location	Project Description	PE/ROW	Construction	Cost
INTERSTATE							
I-6009	I-40/85	Burlington	Huffman Mill Road	Construct left turn lane and improve Garden Road Operations	FY 2025	FY 2026	\$ 1,533,000
I-5711	I-40/85	Mebane	Mebane Oaks Road	Interchange Improvements		FY 2019/21	\$ 16,176,000
I-6059	I-40/85	Mebane	Trollingwood-Hawfields Road	Interchange Improvements	FY 2027	FY 2028	\$ 12,400,000
I-6004	I-40/85	Guilford	Rock Creek Dairy Road	Upgrade Interchange	FY 2025	FY 2026	\$ 5,510,000
HIGHWAY							
R-5787	Various	Division 7	Division wide	ADA Intersection Upgrades	Under Construction		\$ 3,089,000
U-6011	US 70	Burlington	Huffman Mill Road	Intersection Improvements	FY 2020	FY 2021	\$ 1,750,000
U-5752	US 70	Burlington	St. Marks Church Road	Intersection Improvements	Under Construction		\$ 4,278,000
U-6009	US 70	Burlington	Tarleton Avenue to Fifth Street	Widen and Construct Center Turn Lane	FY 2020	FY 2021	\$ 11,719,000
U-6183	NC 49	Haw River	Wilkins Road and Bason Road	Intersection Improvements	FY 2027	FY 2028	\$ 2,700,000
U-6115	NC 54	Graham	Riverbend Road to Whittemore Road	Intersection Improvements and Upgrade Culvert	FY 2025	FY 2026	\$ 6,700,000
U-6184	NC 54	Burlington	South O'Neal Street	Intersection Improvements	FY 2027	FY 2028	\$ 1,900,000
U-6010	US 70	Burlington	University Drive	Intersection Improvements and Widening of US 70	FY 2020	FY 2021	\$ 1,750,000
U-5844	NC 62	Burlington	Ramada Road to Church Street	Widen to Multilanes	FY 2020	FY 2021/22	\$ 11,400,000
U-6182	NC 87	Burlington	Flora Avenue	New Traffic Signal/Turn Lanes	FY 2027	FY 2028	\$ 1,300,000
U-3109	NC 119	Mebane	I-85 to S. Mrs. White Road	Widen to Multilanes, New Location	In Progress		\$ 155,840,000
U-6013	NC 119	Mebane	Trollingwood-Hawfields Road to Lowes Boulevard	Widen to Multilanes	FY 2021	FY 2023	\$ 9,100,000
U-6214	E. Haggard	Elon	W. Webb at University Drive	Improve Intersection	FY 2027	FY 2029	\$ 13,100,000
U-5538	New Route	Mebane	Trollingwood-Hawfields Road to Industrial Site	Construct Two-Lane Road	In Progress		\$ 3,740,000
U-3110	New Route	Elon	US 70 to NC 100	Construct Multilane Facility	Under Construction		\$ 30,477,000
U-6114	NC 62	Burlington	Hatchery Road at Bonnie Lane	New Traffic Signal/Turn Lanes	FY 2025	FY 2027	\$ 1,310,000
U-6014	Graham-Hopedale Road	Burlington	W. Hanover Road to Morningside Drive	Widen to Multilanes with Bike/Ped Lanes	FY 2021	FY 2023/25	\$ 15,600,000
U-6132	N. Main Street	Graham	W. Parker Street	Intersection Improvements	FY 2025	FY 2026	\$ 3,000,000
U-6010	US 70	Burlington	University Drive	Intersection Improvements and Widening	Coordinate with U-5752		\$ 1,750,000
U-6131	NC 54	Burlington	Maple Avenue	Intersection Improvements	FY 2025	FY 2026	\$ 1,600,000
U-6017	NC 54	Graham	East Elm Street	Intersection Improvements	FY 2020	FY 2021	\$ 1,566,000
U-5843	US 70	Burlington	Graham-Hopedale Road	Intersection Improvements	In Progress	FY 2019	\$ 3,998,000

**Table 5: Projects Included in the 2020-2029 STIP-Continued
(Repaving and Transit Operations on Existing Routes not Included)**

STIP ID	Facility	City/ County	Location	Project Description	PE/ROW	Construct ion	Cost
SIGNAL SYSTEM							
U-6015	Burlington	Burlington /Graham	Upgrade	Upgrade Signal System	Under Construction		\$ 15,075,00 0
BRIDGE REPLACEMENT							
B-5239	NC 87	Alamance	Mill Race and Haw River	Bridge Replacement	Under Construction		\$ 5,865,000
B-5347	Pond Road	Alamance	Alamance Creek	Bridge Replacement	Under Construction		\$ 1,560,000
SAFETY							
W-5207	Various	Division 7	Division wide	Safety improvements at various locations in Division 7	In Progress		\$ 5,636,000
W-5707	Various	Division 7	Division wide	Safety improvements at various locations in Division 7	In Progress		\$ 1,350,000
R-5787	Various	Division 7	Division wide	Intersection Upgrades for ADA Compliance	In Progress		\$ 3,089,000
STIP ID	Facility	City/ County	Location	Project Description	PE/ROW	Construct ion	Cost
AVIATION							
AV-5851	Burlington /Alamance Airport	Burlington	Runway	Construct Paved Overrun/Safety Improvements		FY 2020	\$ 2,080,000
AV-5737	Burlington /Alamance Airport	Burlington	Runway 24 Approach Improvements	Easements and Construction Clearance	FY 2019		\$ 1,363,000
BICYCLE AND PEDESTRIAN							
EB-5879	US 70	Burlington	Graham-Hopedale Road to Sellars Mill Road	Construct Sidewalk	FY 2019	FY 2019	\$ 110,000
EB-5885	US 70	Burlington	Beaumont Avenue to Graham-Hopedale Road	Construct Sidewalk		FY 2020	\$ 120,000
EB-5882	Graham- Hopedale Road	Burlington	W. Hanover Road to N. Mebane Street	Construct Sidewalk	FY 2020	FY 2021	\$ 137,000
EB-5887	NC 49/ NC 54	Graham	W. Pine Street to N. Marshall Street	Construct Sidewalk	FY 2019/21	FY 2022	\$ 175,000
EB-5884	NC 87	Graham	Ivey Road to East Gilbreath Street	Construct Sidewalk	FY 2020	FY 2021	\$ 539,000
EB-5988	Lee Avenue	Elon	W. Lebanon Avenue to W. Haggard Avenue	Construct Sidewalk	FY 2025	FY 2026	\$ 246,000

**Table 5: Projects Included in the 2020-2029 STIP-Continued
(Repaving and Transit Operations on Existing Routes not Included)**

STIP ID	Facility	City/County	Location	Project Description	Phase/Funding Year	Cost
TRANSIT						
TA-6664	ACTA	Alamance		Capital Assistance		\$ 259,000
TA-6116	ACTA	Alamance		Capital Assistance		\$ 1,875,000
TA-5176	LinkTransit	Burlington/ Gibsonville		Purchase Five Vehicles		\$ 1,066,000
TG-6794	LinkTransit	Burlington/ Gibsonville		Capital Assistance		\$ 749,000
TG-5259	LinkTransit	Burlington/ Gibsonville		ADA Services		\$ 75,000
TG-5258	LinkTransit	Burlington/ Gibsonville		Routine Capital Assistance		\$ 2,347,000
TP-5155	LinkTransit	Burlington/ Gibsonville		Planning		\$ 100,000
TO-5206	Orange Public Transit	Alamance/ Orange		Two New Circulator Routes /Eastern Burlington		\$ 480,000
TG-6137B	PART	Alamance		Capital		\$ 1,000,000
TO-6145	PART	Alamance		Expansion of Route 4		\$ 217,000
TS-5115	PART	Alamance		Safety and Security		\$ 39,000
TS-6187	Statewide	Alamance Providers		Capital Assistance/Urban Area		\$ 3,751,000
TA-5195	Triangle Transit Authority	Alamance		Purchase One Replacement Vehicle		\$ 475,000
TA-5193	Triangle Transit Authority	Orange		Purchase One Replacement Vehicle		\$ 475,000
TA-5175	Triangle Transit Authority	Orange		Purchase One Transit Bus for Mebane Park and Ride		\$ 498,000
PASSENGER RAIL						
P-4405	Various	Division 7		Private Crossings Safety	In Progress	\$ 10,291,000
P-5719	NCRR	Division 7		Purchase and Refurbish Rail Cars	In Progress	\$ 45,2770,000
P-5205	Piedmont Corridor	Alamance	Graham to Haw River	Siding and Curve Realignment	Under Construction	\$ 11,605,000
P-2918	Piedmont Corridor	Division 7	Train 74/75	Equipment and Capital Yard Maintenance	In Progress	\$ 174,422,000

4.2 Transit

Figure 26: Link Transit Vehicle at a Park and Ride Lot Locations Served by PART Express Route 4



Benefits of Public Transportation

Public Transportation services bring a variety of benefits not just to users who have improved mobility options, but to the society as a whole. Todd Littman in *Evaluating Public Transit Benefits and Costs: Best Practices Guidebook* identifies the following public transit project benefits categories: improved transit service, increased transit travel, reduced automobile travel and transit-oriented development.⁷ Under the umbrella of reduced automobile travel, the following benefits to the society at large and to the traveling public are recognized:

Reduced Automobile Travel Benefits:

- Reduced traffic congestion
- Road and parking facility cost savings
- Consumer savings
- Reduced chauffeuring burdens
- Increased traffic safety
- Energy conservation
- Option value (the value of having the option to take public transit for one of the trips)

⁷ Littman, Todd. *Evaluating Public Transit Benefits and Costs: Best Practices Guidebook*. June 5, 2020. Victoria Transport Policy Institute. Retrieved from <https://www.vtpi.org/tranben.pdf>

- Improved operating efficiency
- Air and noise pollution reductions⁸

Public transportation benefits have a significant overlap with BGMPO 2045 Metropolitan Transportation Plan goals and objectives. Of those multiple benefits, improved safety and reduction in air pollution are of particular benefit to society as they can be linked to direct impacts to human health and life expectancy. Littman notes that motor vehicle air pollution is estimated to cause a similar number of premature deaths as vehicular crashes, and that public transit reduces pollution emissions per passenger-mile.⁹ As public transportation services in an area improve, more potential riders can take advantage of transit for their everyday trips thus reducing driving solo trips, potential number of crashes and transportation sector-related air pollution.

Existing Transit Service in the Region

The BGMPO planning area is served by publicly-funded transit providers that are able to accommodate both local and regional transit trips within and through Alamance County. Alamance County also supports a demand response service for general public use, special needs, medical trips, and shopping trips. The following is a list of public transportation providers in the region:

- Piedmont Authority for Regional Transportation (regional commuter/express bus)
- GoTriangle (regional commuter/express bus)
- Link Transit (fixed route)
- Orange County Public Transportation (fixed route)
- Alamance County Transportation Authority (demand-response system)
- Elon BioBus (student shuttle routes which are open to the general public)

PART

The Piedmont Authority for Regional Transportation (PART) provides public transportation service through Alamance County and coordinates planning efforts among the BGMPO and other MPOs in the Piedmont Triad. PART's regional programs include:

- Regional transit system (PART Express)
- Maintains and operates the regional travel demand model
- Air quality conformity planning and coordination
- Air quality awareness outreach and education
- Regional land use and transportation planning
- Planning for future regional transit services
- Regional Travel Demand Management program including ridesharing and vanpooling

⁸ Littman, Todd. Evaluating Public Transit Benefits and Costs: Best Practices Guidebook. June 5, 2020. Victoria Transport Policy Institute. Retrieved from <https://www.vtpi.org/tranben.pdf>

⁹ Littman, Todd. Evaluating Public Transportation Health Benefits. April 3, 2020. Victoria Transportation Policy Institute. Retrieved from https://www.vtpi.org/tran_health.pdf

The PART Express system provides regional bus connecting the local bus systems of Alamance County, including the City of Burlington and Town of Elon, with surrounding counties. The PART Express Route 4 is a peak-only service that operates every 20-40 minutes between Burlington and Mebane. PART Express Route 4 does not operate during the evening or on weekends.

Figure 27: PART Route 4 Express Bus at Alamance Regional Medical Center Park and Ride Lot. Image Courtesy of PART, <https://twitter.com/PARTNC/>



GoTriangle

GoTriangle provides regional transit services between Wake, Durham, Orange, and Alamance Counties. In addition to regional bus operations, GoTriangle offers the following resources:

- Paratransit services
- Ridematching and vanpools
- Emergency ride home program

Orange-Durham Express route provides hourly peak only service between Durham Station and Mebane City Hall. The ODX route does not operate during the evening or on weekends.

Figure 28: GoTriangle Express Bus



Link Transit

Link Transit is the City of Burlington's public transit system, established in 2016. Link Transit has five routes that serve the City of Burlington, Town of Gibsonville and Alamance Community College. These routes operate Monday through Friday 6:30am – 8:00pm. The agency operates ADA-accessible LTVs (Light Transit Vehicles) that can hold up to two bicycles at a given time.

Figure 29: Link Transit Bus with Bicycle Rack on the Front



Orange County Public Transportation

Orange County Public Transportation (OPT) is Orange County's transportation agency responsible for providing transportation services to residents of Orange County, the Town of Hillsborough, Efland and a part of the City of Mebane. OPT provides community transportation including demand response and circulator bus service. The Orange-Alamance Connector provides hourly service between major activity centers in Hillsborough, Efland and Mebane. The connector operates Monday-Friday from 10am-3pm.

Figure 30: Orange County Public Transportation Vehicle. Image Courtesy of GoForward Initiative, <https://goforwardnc.org/county/orange-county/get-involved/>



ACTA

The Alamance County Transportation Authority provides transportation for the elderly, disabled, and general public in Alamance County. The Authority uses ADA-accessible vans and buses to assist individuals with special needs. All transportation services are available Monday-Friday from 5:00am-5:30pm and require a reservation the day before.

Figure 31: ACTA Public Transportation Vehicle. Image Courtesy of the Times News



Elon BioBus

The Elon University BioBus system provides free transportation to all Elon students, faculty, staff and community members. The system operates six routes throughout the campus and surrounding neighborhoods and commercial districts.

Figure 32: BioBus Stop on Elon University Campus



Park and Ride Lots

There are currently four park and ride lots in BGMPO Region based on information shared on the PART website¹⁰

- Alamance Regional Medical Center Park & Ride: Located on the Alamance Regional Medical Center campus at 1240 Huffman Mill Road, Burlington. This location is served by PART Route 4, Link Red Route, and Alamance County Transportation Authority (ACTA)
- Alamance Community College: Located at 1247 Jimmie Kerr Road, Graham; Served by PART Route 4, and Link Orange Route.
- Graham Park & Ride: Located at the intersection of Highway 87 and Crescent Square Drive, near PNC Bank. Served by PART Route 4, and Link Orange Route.
- Mebane Cone Health Park & Ride: Located at 3940 Arrowhead Boulevard, Mebane. Served by PART Route 4, GoTriangle ODX/OA. This location provides a key point of connection between the Triangle and the Triad. This lot is frequently full based on anecdotal information. An expanded parking area or an evaluation of a new site is needed for Mebane Park & Ride lot.

Figure 33: Alamance Regional Medical Center Park & Ride



¹⁰ Piedmont Authority for Regional Transportation, <https://www.partnc.org/162/Park-Ride-Locations>

Number of People Registered for Carpooling and Vanpooling

PART currently supports six registered 15-passenger vanpools that originate in the BGMPO region and travel outside the region; there are no known registered vanpools traveling into the BGMPO region. The break-down by destination is as follows:

- Two 15-passenger vans that travel to UNC-Chapel Hill at 200 West Cameron Avenue (UNC-Chapel Hill main campus, Orange County)
- One 15-passenger van that travels to UNC-Chapel Hill at 101 Manning Drive (UNC Health Care Hospital, Orange County)
- One 15-passenger van that travels to the VA Hospital in Durham (Durham County)
- One 15-passenger van that travels to Butner Hospital in Butner (Durham County)
- One 15-passenger van that travels to the NC Dept. of Insurance in downtown Raleigh (Wake County)

Carpoolers register through the PART website, but no official count of active carpool users exists.

Transit Ridership

Figure 34: Link Transit Bus Shelters in Downtown Burlington



PART Express Route 4 ridership has been on the increase, as indicated in the graph and table on the next page.

Figure 35: PART Route 4 Ridership Trends, 2015-2019

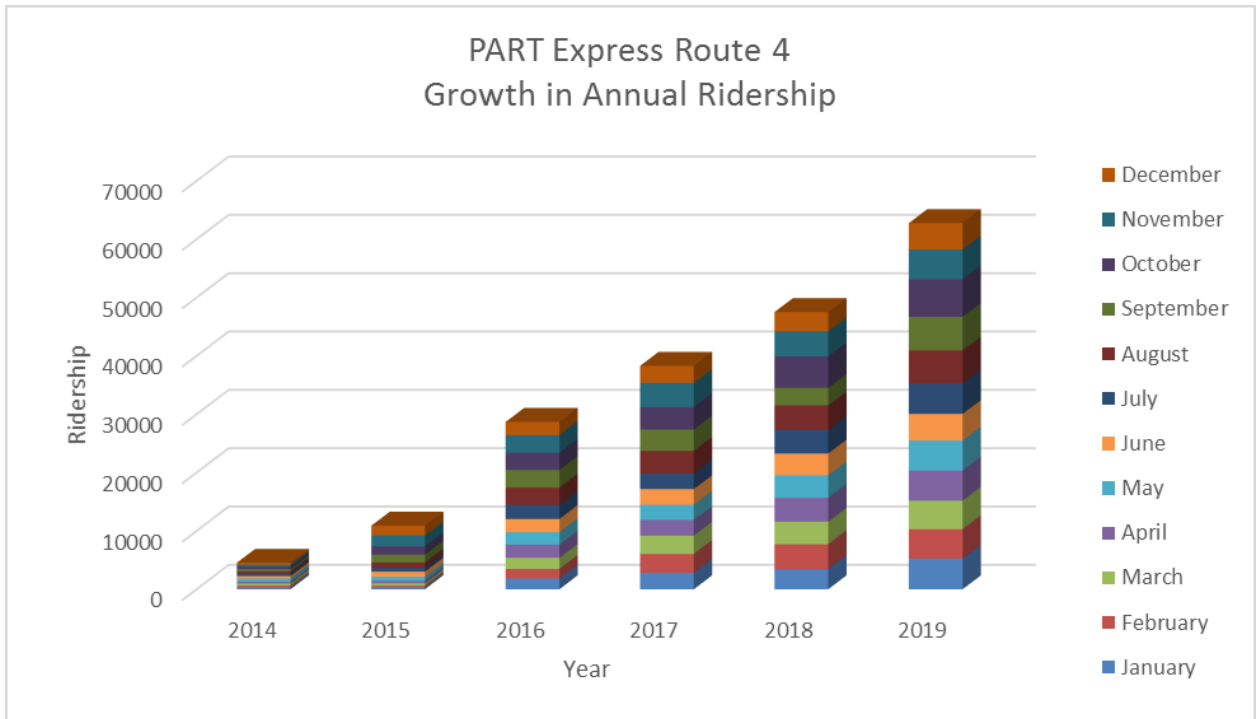


Table 6: PART Route 4 Ridership by Year

Month	2015	2016	2017	2018	2019
Jan	192	1844	2835	3464	5231
Feb	285	1648	3222	4252	5062
Mar	394	1901	3132	3857	4902
Apr	453	2256	2682	4031	5146
May	680	2124	2608	3869	5149
June	867	2284	2694	3731	4563
July	640	2402	2682	4017	5247
Aug	938	2972	3874	4224	
Sept	1346	3028	3656	3008	
Oct	1420	2937	3869	5417	
Nov	1832	4106	4106	4260	
Dec	1703	2939	2936	3314	
Total	12765	32457	40313	49462	37319

Link fixed route public transit service has been established in 2016 and has been growing ridership since the start. Annual trips on fixed routes reached 98,348 unlinked passenger trips in fiscal year 2019.

Table 7: Link Ridership Totals by Year

	FY 2016 (System Started)	FY 2017	FY 2018	FY 2019	FY 2020*part-year data
Fixed Route Trips	9149	80111	85666	98348	28840
Paratransit Trips	66	2348	4527	5091	1422
Total Passenger Trips	9215	82459	90193	103439	30262

Table 8 below summarizes on-demand passenger ridership on Alamance County Transportation Authority (ACTA). The transit agency relies on contracts with agencies and some operating assistance from the state which can limit the number of trips that can be feasibly provided in some years, even if the potential demand from passengers is growing.

Table 8: ACTA On-Demand Transit Ridership, 2015-2019

ACTA Passenger Trips Category	2015	2016	2017	2018	2019
General Public	40,406	59,120	53,325	56,660	45,316
Contract Trips (Medicaid/Other)	21,984	18,897	20,232	19,912	26,905
Total Passenger Trips	62,390	78,017	73,557	76,572	72,221

Table 9 below summarizes average daily boarding and alighting statistics for the Orange County ODX route from 2016 through 2018.

Table 9: Orange County ODX Average Daily Boardings and Alightings by Stop

Stop Location	Average Daily Boarding	Average Daily Alighting
Mebane Cone Health Park and Ride	3.3	31.8
E Washington St at S 5th St (Mebane City Hall)	1.4	4.3
Efland-Cheeks Community Center	0.3	3
Efland-Cheeks Community Center	5.2	0
E Washington St at S 5th St (Mebane City Hall)	7.2	1.9
Mebane Cone Health Park and Ride	34.7	7.2

Access to key community resources via transit was reviewed for the BGMPO region. Community resources included for the purpose of this metric include town halls, parks, community centers, libraries, post offices, K-12 schools, colleges and universities, health centers, and social services offices. There were 161 such community resources, of which 58 (36.0%) were deemed accessible (within ¼-mile of fixed route transit). The breakdown is as follows:

- Hospitals/health clinics – 77.8% (7/9)
 - UNC Primary Care at Mebane and South Graham Medical Center are not accessible within a ¼-mile of transit
- Colleges/universities – 100% (2/2)
- Post Offices – 45.5% (5/11)
- Town Halls – 62.5% (5/8)
- K-12 schools – 29.6% (16/54)
 - Public – 27.5% (11/40)
 - Private – 35.7% (5/14)
- Libraries – 75% (3/4)
- Parks – 23.1% (9/39)
- Community Centers – 66.7% (10/15)
- Social Service Offices – 100% (1/1)

Access to transit for current residential locations was also calculated. Just over 50,000 residents were found to be living within a ¼-mile buffer of fixed route transit service, not including those who reside along the I-40 corridor. This corresponds to 28.5% of the region's 176,711 residents having access to transit according to this metric.¹¹

Current transit service leaves a gap where large portions of Graham, Mebane, and more rural parts of Alamance County are served only by demand-response transit, requiring advanced sign-up and 24-hour reservation for trips. Commuters traveling west toward Greensboro for jobs are likely under-served by the current PART Route 4, since the timing of this route makes it challenging to complete a timely westbound commute in the morning. The Elon University BioBus system provides free transportation to all Elon students, faculty, staff, and community members. It operates six routes throughout the campus and surrounding neighborhoods and commercial districts. The Elon BioBus has less than a 30-minute headway on the Danieley Center Tram and West Line routes. However, during months when the Elon University is on summer break, the BioBus routes do not operate, making it difficult for people with jobs and travel patterns not tied to the University schedule to rely on BioBus for everyday transportation.

¹¹ Population estimates based on 2013 – 2017 ACS. Population included if block group intersected ¼-mile transit buffer

Figure 36: Link Transit Stop on Mebane Street outside a Walmart Store, Burlington

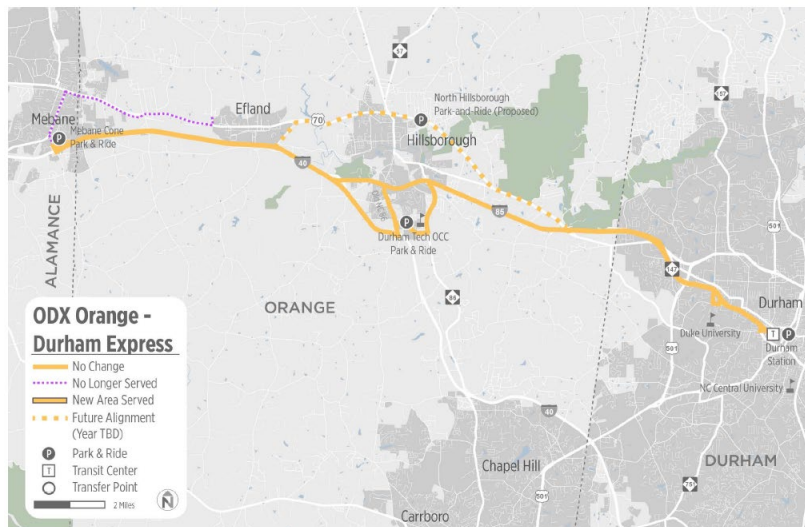


Transit Improvements-MTP 2045 Unfunded List

Through input from transit agency staff and in coordination with input from Steering Committee members and the public, the following additional public transportation projects were identified for inclusion in the unfunded category. While these projects and initiatives would be valuable and would generate additional transit ridership and/or an improvement in the quality of service for transit passengers, they require additional study, new funding streams, and/or policy changes to make them ready for the next steps towards implementation.

PART Route 4 Service Expansion: Increased frequency to improve commuter experience was recommended for additional evaluation and planning; currently the route appears to be better suited for commuters from the BGMPO region traveling east towards Chapel-Hill than for those traveling west towards Greensboro.

Figure 37: Proposed Realignment to ODX Route in Addition to Service Frequency Increase is Expected to Improve Efficiency and Increase Ridership. Source: GoTriangle Short-Range Transit Plan



ODX Orange-Durham Express Route Frequency Increase and Realignment: Frequency increase to every 30 Minutes during Peak was proposed in GoTriangle Short-Range Transit Plan (2018); reverse commute stops would be eliminated and the route would primarily travel along I-40/I-85 corridor without significant deviation (see map below).

Graham Circulator-Implement New Route. The Graham Area Circulator was recommended in the ACTA Community Connectivity Plan. A circulator route in Graham would connect residents to major destinations in the surrounding area. This service could be jointly funded through a combination of Section 5307 funds, fare revenue, funds from the City of Graham and other contractual revenue.

Mebane Circulator-Implement New Route. As part of their Community Connectivity Plan, ACTA recommended two potential fixed routes to be evaluated for circulator route operations in the City of Mebane. Some of ACTA's demand response passengers could be redirected to the Mebane Circulator route since the origins and destinations are within proximity to the circulator. This service could be operated by Link Transit, ACTA or Orange County. This service could be implemented using Section 5307 funds matched by City of Mebane funds and ACTA contractual revenue. Of note, this route would provide access to one of the two major medical centers not currently served by transit in the region – UNC Primary Care at Mebane.

ACC to Mebane Connector-Implement New Route: this route would connect from ACC park and ride lot near I-40/I-85 interchange at Jimmie Kerr Road to Mebane destinations and activity centers including downtown and Mebane Cone Health/Mebane park and ride lot. This route would interconnect with existing Link Transit Orange Route, PART route 4 and ODX Route.

Regional Transit Hub and Transfer Station-Implement a New Regional Transit Facility. A new regional transit hub and transfer facility was proposed in the ACTA Community Connectivity Plan. The Regional Transit Hub and transfer station would be served by local fixed route services (Link) and other future transit service routes that might be set up throughout the county.

Expand Link Fixed Route Transit Service. BGMPO, in coordination with local transit providers, has been developing an updated transit funding allocation plan expected to be finalized May 2020. Link fixed route transit service can be evaluated for expansion, once this additional funding element is clarified through agreements between the MPO, local transit agencies and NCDOT. As Link service area expands and as additional local match funds are identified to serve areas outside of Burlington, it is likely that Link would become the operator for some of the new transit routes considered as part of MTP Plan—Graham Circulator, Mebane Circulator and ACC to Mebane Connector are all potential routes that could be served by either Link or ACTA.

NC 54 Express Bus Route: An NC 54 Express Bus Route would connect from Graham park and ride lot to a transfer point in Orange County near Carrboro. In the preliminary ridership analysis for MTP 2045, this route did not perform as well as some of the other transit expansion options considered. This will likely be a very long-term option.

Mebane Commuter Rail Station and Mebane-Durham-Raleigh Commuter Rail Operations: GoTriangle’s Commuter Rail Feasibility Study provides details on the proposed commuter rail system in Durham and Wake Counties. GoTriangle looked at six different scenarios, one of which included 20 round trips per day on a rail system between Selma and Mebane. See Figure 39 below for reference. The Mebane Commuter Rail including a new Commuter Rail Station will require further study and analysis upon approval of the feasibility study. If the study is approved for implementation, the sections between Durham and Downtown Raleigh are likely to generate the greatest ridership and would be more likely positioned for implementation prior to the Mebane-to-Durham link. If commuter rail service between Mebane and Durham is approved for further study, a potential location for the new commuter train station would need to be identified.

New Express/Commuter Bus Service from Burlington-Graham area to Duke and Downtown Durham (as recommended in North Carolina Statewide Commuter Transit Study). North Carolina Statewide Commuter Transit Study draft recommendations, as shared in a presentation June 11 2020, indicate that there are currently over 450 trips traveling between Burlington and Duke and Downtown Durham on an average weekday morning; those trips are likely to increase in the future and a commuter or express bus service could address the needs of those commuters and help take some of the single occupancy vehicle trips off the highway. Such a commuter/express bus service could be implemented more quickly and inexpensively and could be an interim step while studying the potential for commuter rail service connecting Durham and Mebane.

Expand On-Demand Transit Service. As populations grow and age, and as activity centers evolve or develop, it is important that on-demand services not only continue but expand for those who do not have access to fixed route service. The following service initiatives are recommended for the region to consider and identify funding opportunities to implement:

- **On-Demand Transportation Additional Saturday Service.** ACTA operates Saturday service for individuals that need to get to dialysis appointments. ACTA will add about 1,700 service hours per year to meet the transit needs on Saturdays. No additional vehicle acquisition is necessary for this added service, but it will cost about \$60,000 annually to operate.
- **On-Demand Transportation-Higher Level of Service for Rural Areas in Alamance County.** Results from ACTA passenger surveys and other stakeholder outreach have indicated that there is a significant need for transportations services in rural communities around Alamance County. Currently, ACTA has limited service available to residents of Haw River, Green Level, and other rural areas. If funding becomes available, ACTA can consider this expansion of on-demand service in the future.

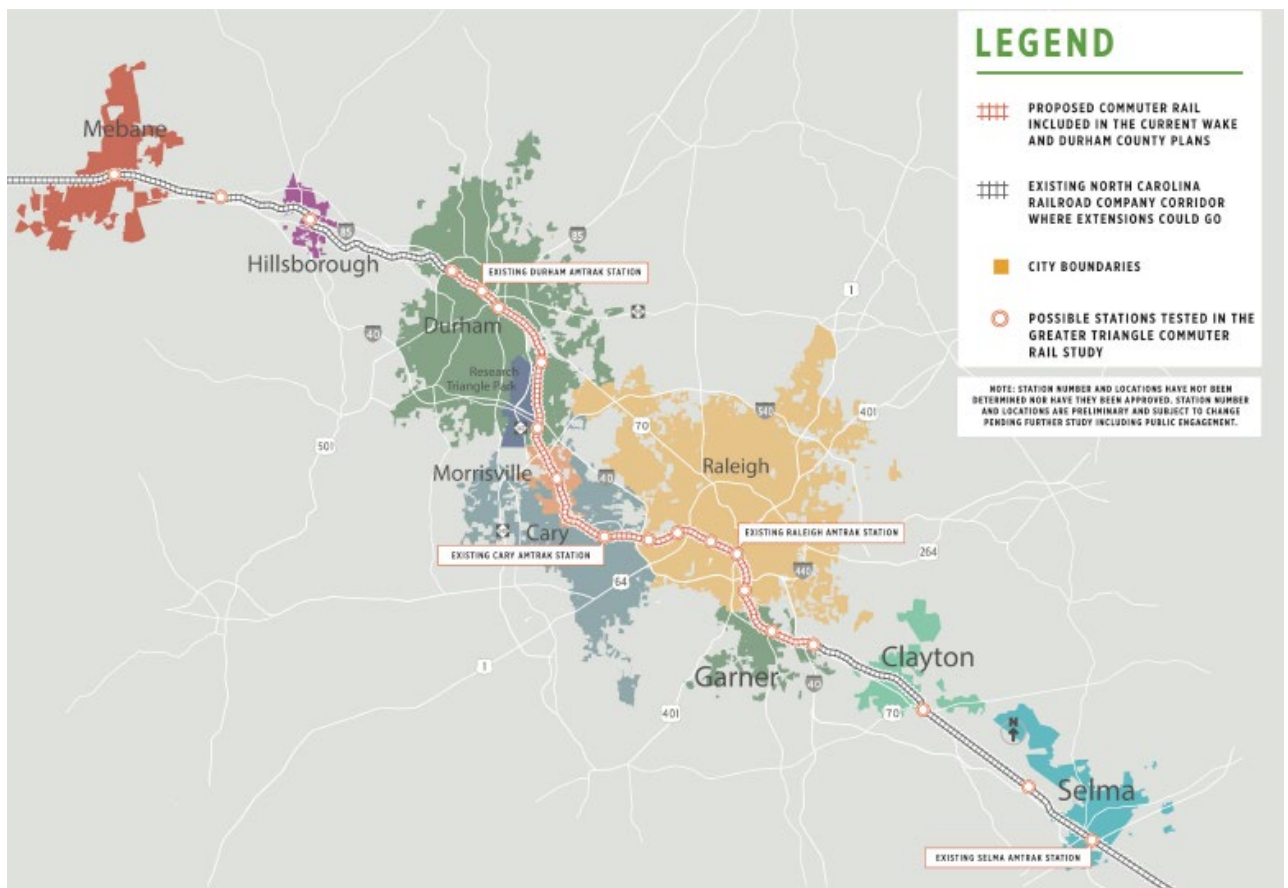
Figure 38: Wilson Transportation Center, Image Courtesy of The Wilson Times



- Pilot Projects to Test Partnerships with Rideshare Providers and Micro-Transit Solutions.**

Some potential transit users might not be able to safely or easily walk to their nearest bus stop, yet their life obligations and scheduling constraints do not fit the typical on-demand transit service model that requires a 24-hour reservation notice. More responsive on-demand public transportation models are being tested across the country. Several agencies in North Carolina and across the Southeast have been experimenting with partnerships with private ridesharing companies such as Uber/Lyft to cover the first part of a transit trip for potential transit riders who cannot easily access their closest fixed route bus stop (For example, CATS in Mecklenburg County). Other agencies are implementing micro-transit pilots to allow more responsive on-demand public transportation with real time on-demand reservation request capabilities (City of Wilson in Wake County, NC; Town of Snellville in Gwinnett County, Georgia). Those innovative public transportation solutions can mean a better quality of service for riders. A pilot for Alamance County is recommended to test one or both approaches. In the long term, additional funding streams are required to make those types of services sustainable beyond a short-term pilot.

Figure 39: Mebane-Durham-Raleigh-Garner-Selma Commuter Rail Potential Corridor Under Consideration.



Source: GoTriangle Commuter Rail Update, February 2020, <https://gotriangle.org/sites/default/files/crt.pdf>

Several of the route changes listed above were evaluated for potential ridership, with PART staff providing support for ridership analysis. The table below summarized expected ridership, costs, and likely feasibility over the next 25-year period. An NC 54 Connector (Express) Route from the Graham park and ride lot to a park and ride lot near Carrboro appears the least likely to have a good return on investment in terms of ridership projections. Route ODX expansion was not evaluated for ridership impacts at this time.

Table 10: Evaluation of BGMPO Transit Expansion Option

BGMPO Transit Routes Expansion Evaluation							
Route Name	Estimated Annual Boardings	Estimated Daily Total Boardings	Estimated Annual Operating Cost	Potential Ridership vs. Operating Costs Score (high, medium, low)	Estimated Capital Cost-Vehicles for the First 10 Years of Operations	Local Agency that Would be Responsible for Local Match	Overall Feasibility of Funding in 2020-2045 Timeframe
PART Alamance Burlington Express (1 Hr. Peak) 4	87,192	346	978,062	Medium	630,000	Alamance County, Orange County, Guilford County	Low
ACC to Mebane Connector Option 1 ■ ●	20,412	81	48,876	Medium	160,000	City of Mebane, Alamance County	Medium
Mebane Circulator Option 1,5 ■	19,152	76	48,863	High	160,000	City of Mebane	Medium
Graham Circulator ■ ●	19,152	76	48,878	high	160,000	City of Graham	Medium-Low
Hwy 54 Graham-Carrboro Connector Route ■ ●	12,096	48	489,012	low	315,000	City of Graham, Town of Carrboro, others?	Low
Route ODX peak period service frequency expansion	Not evaluated for this plan	Not evaluated for this plan	169,129 additional (523,332 total)	Not evaluated for this plan	160,000	Orange County, City of Mebane	Medium-Low
Total	158,004	627	1,782,820		1,585,000		

- 1 - ACC to Mebane Connector Option 1 travels on S 3rd St, Gibson Rd, and Trollingwood Hawfields Rd.
- 2 - ACC to Mebane Connector Option 2 travels on S 5th St and Interstate 40. It does not serve Gibson Rd.
- 3 - PART Alamance/Burlington Express is scheduled to run with a 30 minute headway all day
- 4 - PART Alamance/Burlington Express is scheduled with an hourly headway during peak service and a two hour headway during off-peak service.
- 5 - Mebane Circulator Option 1 operates with an alternating 30 minute loop
- 6 - Mebane Circulator Option 2 operates with a single 60 minute loop
- 7 - The calculations were performed using 252 operating days in a year
- 8 - A direct boarding is the start of a passenger's trip
- 9 - A transfer boarding occurs when a passenger has to change bus routes on their trip
- 10 - Based on GoTriangle Short Range Transit Plan 2018 information
https://gotriangle.org/sites/default/files/att_a_gotriangle_short-range_transit_plan_final_nov_2018.pdf
 - - A connection to [PART Express](#) is possible
 - - A connection to [Link Transit](#) is possible

Public Transportation Policy and Planning Recommendations

Policy, planning, and agency structure changes could have a large impact on the feasibility of future transit improvements in the region. The recommendations listed below are policy- and planning-oriented recommendations that do not have a quantified ridership or cost associated with them at this time. They have been identified as needs or recommended strategies in one of the existing local and regional transit plans, or else have emerged as a recommendation during the MTP process.

- **Fund and undertake a regional transit feasibility study** to explore how to improve regional cooperation and collaboration between existing public transportation providers, while adding greater efficiencies where possible. This study could also consider the urban transit-5307 funding allocation formula for the region and make additional recommendations regarding its use.
- **Establish a task force to define transit needs within the BGMPO area and a sustainable, phased funding plan to support the need** Such a task force could explore existing and possible funding sources, in addition to reviewing transit needs in the region, and come up with recommendations in the next year.
- **Implement steps to make available additional public transportation funding sources in BGMPO Region/ Alamance County.** As part of the MTP plan update, there was a strong preference expressed by stakeholders and members of the public to improve current public transportation service levels. Local ability to match federal grant dollars with local funds for operating expenses is quite limited, even if sufficient federal funding were available to increase fixed route and on-demand transit services funding in the region. Local and state leaders would need to work together to identify and enable additional local public transportation funding sources—such as a sales tax dedicated to transit or other potential revenue streams. Rental vehicle sales tax throughout Alamance County is currently already supporting PART Express bus service; however, absent a major international airport or a large convention center, the rental

vehicle market and associated sales tax funding stream within the BGMPO region is currently limited.

- **Plan for Additional Park and Ride Lots Across the Region**

The current MTP calls out two specific park and ride lot improvements in the fiscally-constrained list of projects. Additional park and ride lot improvements throughout the planning area would be desired and should be considered, especially as additional connector and circulator routes are added in the future. Park and ride lots provide convenient access to regional and commuter buses that travel through Alamance County and beyond. For potential transit users without a vehicle and who cannot access their closest bus stop by walking, park and ride lots could also become a point of connection between rideshare trips and fixed route service (see pilot idea referenced above).

4.3 Pedestrian and Bicycle Transportation

Bicycle and Pedestrian Infrastructure

The Burlington-Graham planning region has a number of older historic downtowns with very walkable, pedestrian-friendly streets where a well-connected network of lower-volume, lower-speed streets makes it easy for people to walk and bicycle. Sidewalks are generally present in Burlington, Graham, Mebane, and Elon downtown areas, although significant gaps remain. Some sections of sidepath and multi-use paths exist throughout the region, for example around Elon. However, most major arterial corridors connecting significant activity centers and destinations lack in safe, convenient, continuous pedestrian and bicycle facilities, including pedestrian crossings. While the current MTP Plan update identifies a variety of stand-alone bicycle and pedestrian projects for implementation as part of this plan, it is equally important to ensure that complete streets elements are considered and implemented as part of modernization and widening projects reflected in the fiscally-constrained roadway project list for MTP 2045.

The N.C. Department of Transportation Complete Streets policy directs the department to consider and incorporate bicycle, pedestrian and transit modes when building new highway projects or making improvements to existing infrastructure. NCDOT initially adopted a Complete Streets Policy in 2009 and updated the Policy in August of 2019. Based on the 2019 update, bicycle, pedestrian and transit improvements that appear in an adopted plan directly or by reference no longer require a local cost share to be implemented as part of a highway project, as indicated in the table below. This places additional importance on communities updating their bicycle, pedestrian and transit plans to ensure that the latest community preferences are documented in adopted plan documents.

Table 11: NCDOT Complete Streets Policy Cost Share for Bicycle, Pedestrian and Transit Improvements to be Implemented as Part of a Highway Project. Source: NCDOT Complete Streets Implementation Guide, 2019 Version ¹²

Complete Street 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

Taking advantage of implementing bicycle, pedestrian, and transit improvements as part of a roadway project means that the local jurisdictions carry a lower cost burden as part of project implementation, while helping ensure that corridors carrying the highest volumes of traffic and connecting the region’s residential neighborhoods and job centers and commercial destinations can also become convenient and safe for transit users, bicyclists, and pedestrians.

Figure 40: Pedestrian Crosswalk in Downtown Burlington



In addition to reviewing existing bicycle and pedestrian planning studies, data on existing and planned pedestrian and bicycle facilities in the region were collected based on PBIN and ATLAS data:

¹² NCDOT Complete Streets Implementation Guide, 2019 Version. Retrieved from <https://connect.ncdot.gov/projects/BikePed/Documents/Complete%20Streets%20Implementation%20Guide%20v1.31.20%20FINAL.pdf>

- All planned/proposed mileage is based on Pedestrian and Bicycle Information Network geodatabase (PBIN; data initially collected by ITRE; updates subject to data submitted by local government staff¹³)
- All existing facilities data have been collected for NCDOT through project ATLAS: Advancing Transportation through Linkages Automation and Screening¹⁴
- Existing on-road bike facilities include roadways with bikeable (wide) shoulders
- Regional Trails data is gathered from stakeholder agencies and shared through NC OneMap

Table 12: Existing and Planned Pedestrian and Bicycle Facilities

Bicycle and Pedestrian Facility Type	Existing, in Miles	Planned or Proposed, in Miles
Sidewalks	431.94	40.77
Shared Use Paths/Greenways/ Regional Trails	13.90	128.25
On-Road Bike Facilities (Including Bikeable Shoulder, Bike Lanes, Signed Bike Routes)	297.93	33.77
Bike Lane	0	1.39
Paved Shoulder	0	0.74
Bike Route	297.93	31.54

Looking at the map of existing and planned pedestrian facilities in the region, Burlington, Graham, Elon, and Mebane account for the bulk of existing sidewalk facilities. A significant presence of on-road bicycle routes (local bicycle route loops connected by State-designated bike routes) has been documented in the region, while very few bicycle lanes have been striped to date. The table above summarizes existing sidewalks, multi-use paths, and on-road bicycle facilities. Note: based on the existing data, sidewalk mileage was counted twice for roadway segments where a sidewalk is present on both sides.

¹³ Additional information about PBIN available at <https://connect.ncdot.gov/projects/BikePed/Pages/PBIN.aspx>

¹⁴ Additional information about ATLAS available at <https://connect.ncdot.gov/resources/Environmental/Project%20ATLAS/Forms/AllItems.aspx>

Figure 41: Existing and Planned Bicycle and Pedestrian Facilities

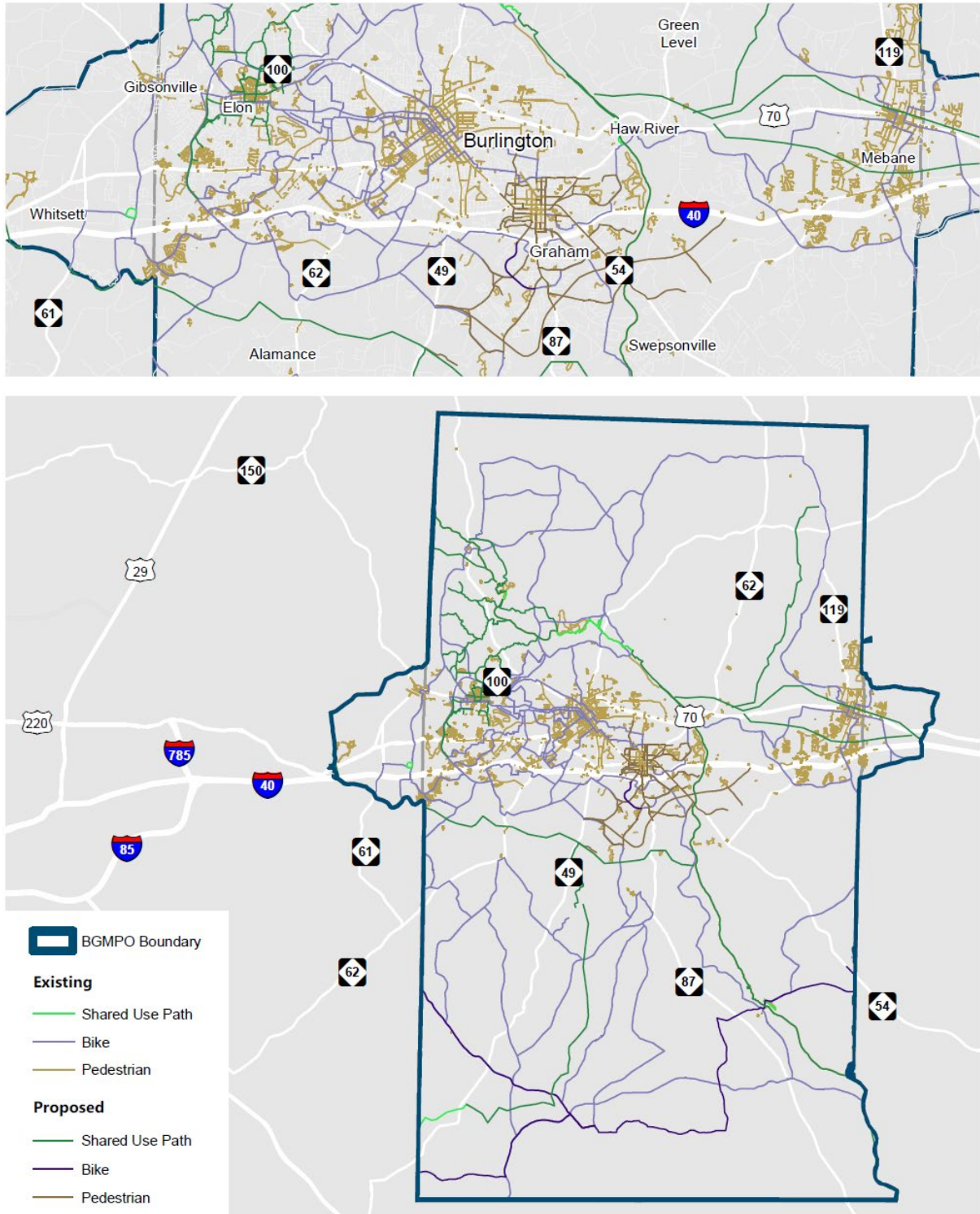


Figure 42: Downtown Mebane Streets Feature Wide Sidewalks and Storefronts that Face the Street for a Welcoming Pedestrian Environment



Walk Friendly Communities, Bicycle Friendly Communities and Percentage of Downtown Areas with WalkScore above 50

No bicycle friendly communities, businesses, or universities were identified within the BGMPO according to Bicycle Friendly America. Greensboro, Winston-Salem, and Durham are all recognized as bronze-level Bicycle Friendly Communities.

No Walk Friendly Communities were identified within the BGMPO according to walkfriendly.org.

Five out of nine (55.6%) member municipalities in the BGMPO had downtowns that scored higher than 50 on the WalkScore:

- Gibsonville – 57 walk / 62 bike
- Elon – 58 walk / 59 bike
- Burlington – 70 walk / 73 bike
- Graham – 65 walk / 71 bike
- Mebane – 68 walk / 72 bike

Tables 13 and 14 below summarize bicycle and pedestrian projects selected for BGMPO MTP 2045 fiscally-constrained list by horizon year. Figure 43 illustrates the location of pedestrian and bicycle projects as well as public transportation projects. In addition to the fiscally-constrained list of bicycle and pedestrian projects, projects from locally-adopted bicycle and pedestrian plans have been mapped, and are considered part of the unfunded MTP 2045 plan, to be considered for inclusion as part of the Comprehensive Transportation Plan update.

Table 13: Bicycle and Pedestrian Projects Included in the Fiscally-Constrained List

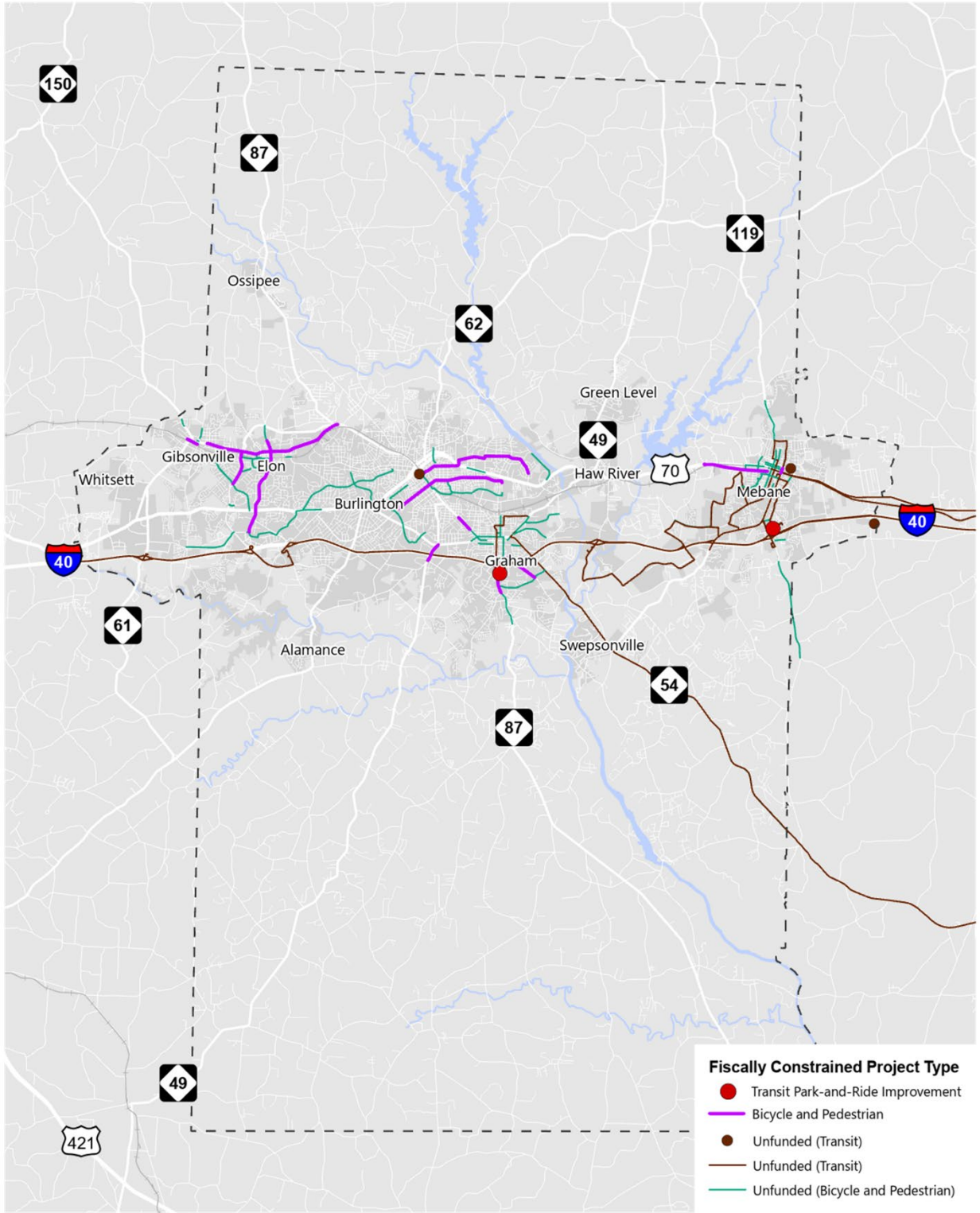
MTP 2045 ID	Project Type	Project Name	Project Municipality if Applicable	Facility	From	To	Miles	Estimated Cost
<i>2035 Horizon Bicycle and Pedestrian Projects</i>								
Bike-003	Bike Facility	Burlington Town and Country bike path	Burlington	Town and Country Bike Path	Webb Ave	Town and Country Nature Preserve; Andrews Elementary	3.33	\$8,632,352
Ped-015	Sidewalk	Graham-Main Street Sidewalks from Rogers to Robin	Graham	Main Street Sidewalk (Graham)	Rogers	Robin	0.94	\$2,550,000
Bike-030	Sidepath	Mebane-Holt Street Shared Use Path	Mebane	Holt Street	Dodson Road	S. First Street	1.69	\$2,494,614
<i>2035 Bicycle and Pedestrian Projects Total</i>							<i>\$13,676,966</i>	

Table 14: Bicycle and Pedestrian Projects Included in the Fiscally-Constrained List, Continued

MTP 2045 ID	Project Type	Project Name	Project Municipality if Applicable	Facility	From	To	Miles	Estimated Cost
<i>2045 Horizon Bicycle and Pedestrian Projects</i>								
Bike-015	Bike Lane	Elon-Williamson Avenue and St. Marks Church Road Bike Lane	Elon	Williamson Ave & St. Marks Church Road	Phoenix Drive	Rural Retreat Road	2.57	\$ 5,860,000
Bike-007	Separate Bike Facility	Burlington-Mebane Street Bikeway	Burlington	Mebane Street	Cummings HS & Broadview MS	City Park	3.05	\$ 11,115,000
Ped-026	Sidewalk	Graham, Gilbreath Rd Sidewalk Improvements from Ivey to Ray	Graham	Gilbreath Rd	Ivey	Ray	0.90	\$ 1,172,200
MTP 2045 ID	Project Type	Project Name	Project Municipality if Applicable	Facility	From	To	Miles	Estimated Cost

Ped-061	Sidewalk	Graham East Elm Street & NC 87 Sidewalk Bundle	Graham	E. Elm St and NC 87			0.41	\$534,002
Bike-011	Sidepath	Elon- University Drive Sidepath (close gaps)	Elon	University Dr			0.93	\$1,372,776
Bike-016	Bike Lane	Elon Haggard Avenue Bike Lane	Elon	Haggard Ave			2.72	\$1,435,000
Ped-043	Sidewalk	Mebane: N. Fifth Street Sidewalk, Pedestrian Crossing and Railroad Crossing Improvements from Washington St to E Ruffin St	Mebane	North Fifth St	Washington St	E. Ruffin St	0.12	\$500,000
Bike-010	Bike Lane	Gibsonville Burlington Avenue Bike Lane	Gibsonville	Burlington Ave	Cook Rd	Chase St	0.95	\$2,015,000
Bike-066	Sidepath	Burlington-NC 49 (Maple Avenue) Sidepath	Burlington	NC 49 (Maple Avenue)	Handford Road	NC 54 Chapel Hill Road	0.5	\$3,380,000
Ped-060	Sidewalk	Gibsonville Main Street Sidewalk	Gibsonville	Main St	Main St at Burke St	Joyner St	0.41	\$795,000
Ped-065	Sidewalk	Burlington-NC 87 (Webb Avenue) Sidewalk	Burlington	NC 87 (Webb Avenue)	Burlington City Limits	Williamson Street	0.43	\$905,000
2045 Bicycle and Pedestrian Projects Total							\$42,760,944	

Figure 43: Pedestrian, Bicycle and Transit Project Recommendations



The following is a short description of bicycle and pedestrian projects that have been prioritized as stand-alone bicycle and pedestrian projects for MTP 2045. It should be noted that bicycle and pedestrian design guidance has been changing very quickly in recent years, and the latest available design guidance should be used when deciding on the preferred facility type when those projects are funded and moving through design to implementation.

Burlington Town and Country Bike Path (Bike-003)

The Burlington Town and Country Bike Path is intended to be a 3.33-mile bicycle facility located in Burlington. The project will create a new safe bicycle route between Webb Avenue and the Town and Country Nature Preserve and Andrews Elementary School. A combination of on-street bicycle lanes and bicycle boulevard facility type is envisioned for this project. The project was originally recommended in the Burlington Greenways and Bikeways Plan. The project probably cost of implementation is estimated at \$8,632,352. The bikeway scores highly at 75, since it closes a critical gap, provides connections to areas of high environmental justice concern, and gives access to numerous points of interest and activity centers. The project is recommended for implementation during the 2035 horizon period.

Graham Main Street Sidewalk Improvements (Ped-015)

Graham Main Street Sidewalk Improvements is a 0.94-mile pedestrian improvements project in Graham. The project travels along Main Street from Rogers Road to Robin Lane. The project was originally recommended in the 2006 Graham Pedestrian Plan and has an estimated construction cost of \$2,550,000. The project scores highly at 75 as it closes a critical gap, connects areas of high environmental justice concern, and provides connections to numerous points of interest and activity centers. The project is recommended for construction during the 2035 horizon period.

Mebane Holt Street Shared Use Path (Bike-030)

The Holt Street Shared Use Path is a 1.69-mile separated bicycle and pedestrian facility located in Mebane. The project runs along Holt Street from Dodson Road to South First Street. The project was originally recommended in the 2040 Mebane CTP and has an estimated construction cost of \$2,494,614. The project scores well at 50 as it closes a critical gap and connects various points of interests and activity centers. The project is recommended for construction during the 2035 horizon period.

Elon Williamson Avenue and St. Marks Church Road Bike Lane (Bike-015)

Williamson Avenue and St. Marks Church Road Bike Lane project would create a 2.57 mile bicycle facility in Elon and would add a safe north-south bicycle connection between Alamance Crossing commercial activity center, US 70 commercial corridor and Elon University. The project termini are from Phoenix Drive to Rural Retreat Road. The bike lane was recommended in the Elon Bicycle, Pedestrian, and Lighting Plan and has an estimated construction cost of \$5,860,000. The project scores a 70 and helps connect a variety of points of interest, multi-family residential housing locations and activity centers. The project is recommended for construction during the 2045 horizon period.

Mebane Street Bikeway (Bike-007)

Mebane Street Bikeway is a 3.05-mile separated bike facility located in Burlington. The project traverses Mebane Street from Cummings High School and Broadview Middle School to City Park. This project was originally recommended in the Burlington Greenways and Bikeways Plan and has an estimated construction cost of \$11,115,000. The project scores very highly at 95, as it parallels US 70 and closes a critical gap, connecting areas of high environmental justice concern and providing access to numerous points of interest and activity centers including downtown Burlington. The project would tie in with bicycle and pedestrian improvements being implemented along Graham-Hopedale Road through stand-alone projects and as part of U-6014 roadway project. This bicycle project is recommended for construction in the 2045 horizon period.

Graham Gilbreath Road Sidewalk Improvements (Ped-026)

The Gilbreath Road Sidewalk is a 0.9-mile pedestrian facility located in Graham. The project will travel along Gilbreath Road from Ivey Road to Ray Street. The project was originally recommended in the 2006 Graham Pedestrian Plan and has an estimated construction cost of \$1,172,200. The sidewalk scores highly at 75 as it closes a critical gap, provides connections to areas of high environmental justice concern, and gives access to numerous points of interest and activity centers. The project is recommended for construction during the 2045 horizon period.

East Elm Street and NC 87 Sidewalk Bundle (Ped-061)

The East Elm Street and NC 87 Sidewalk bundle is a 0.41-mile pedestrian facility located in Graham. The project extends long East Elm Street from Albright Avenue to Parker Street and along NC 87 from West Harden Street to Williamson Street. The project was recommended in the BGMPO SPOT P6.0, with an estimated construction cost of \$534,002. The sidewalk bundle scores a 50, connecting areas of high environmental justice concern and improving access to points of interest and activity centers. This project is recommended for construction during the 2045 horizon period.

Elon University Drive Sidepath (Bike-011)

The University Drive Sidepath is a 0.93-mile bicycle facility project located in Elon. This project is intended to address the existing gaps in provided shared-use facility (sidepath) along the roadway. The project was originally recommended in the Elon Bicycle, Pedestrian, and Lighting Plan and has an estimated construction cost of \$1,372,776. The sidepath scores well at 60. It closes a critical gap and connects numerous points of interest and activity centers. The project is recommended for construction during the 2045 horizon period.

Elon Haggard Avenue Bike Lane (Bike-016)

The Haggard Avenue Bike Lane is 2.72-mile bicycle facility project located in Elon. The project traverses Haggard Avenue between University Drive and West Webb Avenue. Haggard Avenue bike lane was recommended in the Elon Bicycle, Pedestrian, and Lighting Plan and has an estimated construction cost of \$1,435,000. The project scores well with a 60, connecting areas of moderate environmental justice

concern, enhancing safety where crashes are already prevalent, and providing access to a variety of points of interest and activity centers. The project is recommended for construction during the 2045 horizon period.

North Fifth Street Sidewalk (Ped-043)

This project extends along North Fifth Street between Washington Street and East Ruffin Street, and includes a railroad crossing improvement. The sidewalk was recommended in the 2040 Mebane CTP. Additional intersection geometry and pedestrian safety improvements identified in the Mebane Traffic Separation Study are recommended as part of this project (5th Street Crossing #735 472D). These include improving the geometry of the crossing and intersection with US 70; removing the northbound dedicated right turn lane onto US 70 to increase the curve radii for vehicle turning movements; installing an asphalt path/shoulder across the crossing; adding crosswalks at the Washington Street/Fifth Street intersection to connect sidewalks; installing a median with pedestrian refuge on Washington Street (starting at Fifth Street and extending eastward); and adding pedestrian crossing warning signs for crosswalks at the Washington Street intersection. The project scores a 50 as it closes a critical gap and provides access to a variety of points of interest and activity centers. The project is recommended for construction during the 2045 horizon period with an estimated construction cost of \$500,000. Safety or railroad funding could be considered as a potential funding source for parts of this project.

Gibsonville Burlington Avenue Bike Lane (Bike-010)

The Burlington Avenue Bike Lane is a 0.95-mile bicycle lane project located in Gibsonville. The project traverses Burlington Avenue between Cook Road and Chase Street. The bike lane was recommended in the 2014 Gibsonville Comprehensive Pedestrian Plan and has an estimated construction cost of \$2,015,000. The project scores a 45 and helps improve safety and connect a variety of points of interest and activity centers. The project is recommended for construction during the 2045 horizon period.

Burlington NC 49 (Maple Avenue) Sidepath (Bike-066)

The NC 49 (Maple Avenue) Sidepath is a 0.5-miles bicycle facility located in Burlington. The project travels alongside NC 49 (Maple Avenue) between Hanford Road and NC 54 Chapel Hill Road. The sidepath was recommended as part of the BGMPO SPOT P6.0 and has an estimated construction cost of \$3,380,000. The project scores well with an 80, enhancing safety along multi-lane roads, closing a critical gap, connecting areas of high environmental justice concerns, and providing access to a variety of points of interest and activity centers. The project is recommended for construction during the 2045 horizon period. Partial implementation as part of roadway projects (Hwy-159, NC 49 Maple Avenue Realignment and Hwy-157, NC 49 Maple Avenue Widening) might be feasible.

Gibsonville Main Street Sidewalk (Ped-060)

Main Street Sidewalk project in Gibsonville is for a 0.3 mile stretch of sidewalk improvements along the northern side of Main Street from its end near Burke Street to intersection with Joyner Street. This sidewalk improvement would connect through the heart of downtown Gibsonville. The sidewalk was

recommended as part of the BGMPO SPOT P6.0 and has a probable estimated construction cost of \$795,000. The project is recommended for construction during the 2045 horizon period.

Burlington NC 87 (Webb Avenue) Sidewalk (Ped-065)

The NC 87 (Webb Avenue) Sidewalk is a 0.43-mile pedestrian facility located in Burlington. The project extends along NC 87 (Webb Avenue) between the Burlington city limits and Williamson Street. The sidewalk was originally recommended as part of the BGMPO SPOT P6.0 and has an estimated construction cost of \$905,000. The project scores well with a 65, and addresses safety concerns within the area, connects area of high environmental justice concerns, and provides access to a variety of points of interest and activity centers. The project is recommended for construction during the 2045 horizon period.

Bicycle and Pedestrian Policy and Planning Recommendations

Figure 44: Learn to Ride Event for Children, Mecklenburg County

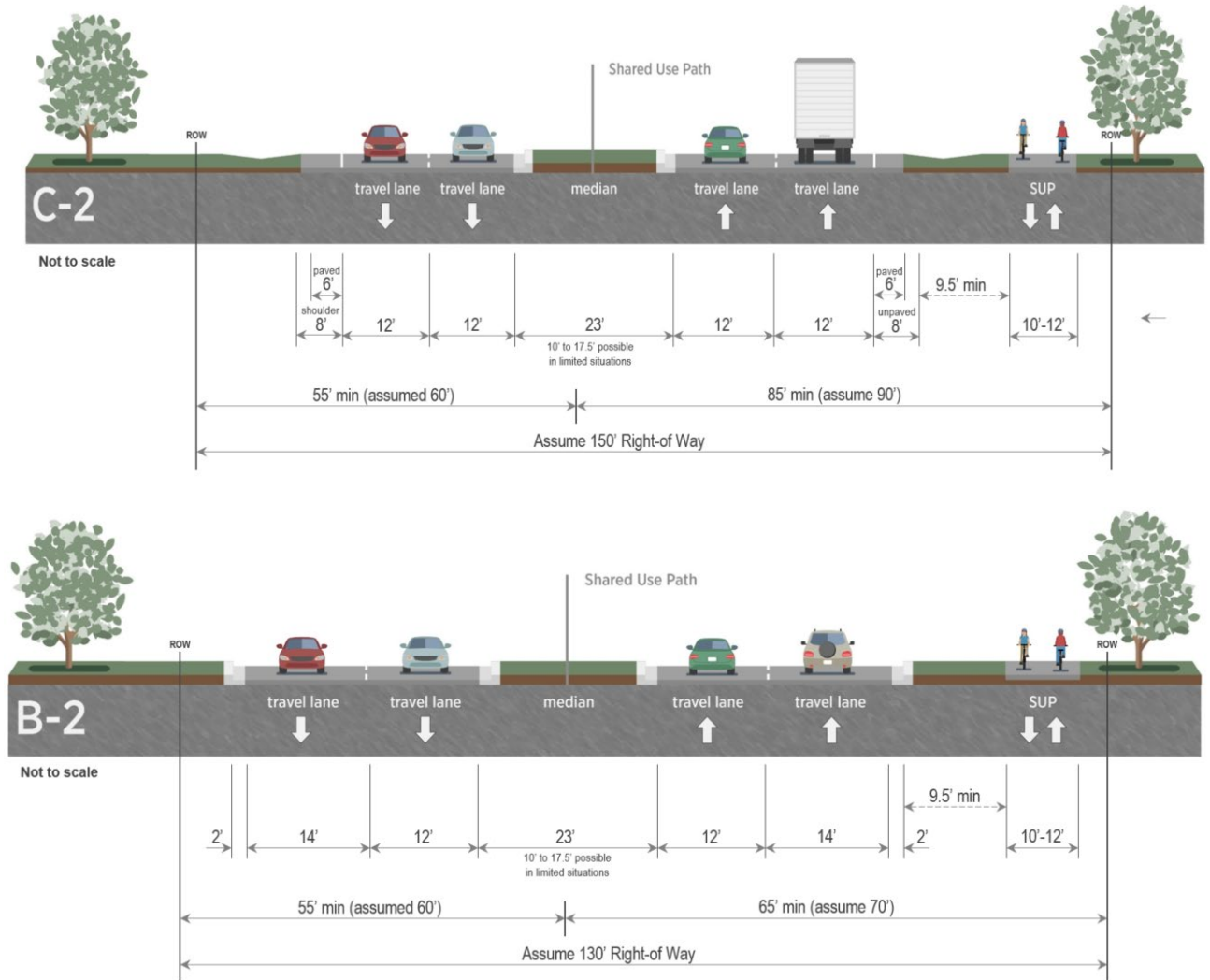


Additional policy and planning initiatives are recommended to ensure that the implementation of complete streets continues and that a safer, well-connected network for pedestrians and bicyclists is complemented with outreach and education strategies to encourage and strengthen the culture of active transportation in the region.

- Work to update local bicycle, pedestrian and greenways plans on at least a 10-year cycle; consider more frequent updates due to design recommendations changing quite rapidly for bicycle and pedestrian infrastructure.
- Coordinate between NCDOT Division 7, MPO staff and local municipalities staff on an annual basis to review the upcoming roadway maintenance list for the next three years and identify opportunities to implement bicycle lanes or other quick and easy bicycle and pedestrian improvements at the time of resurfacing.
- Conduct follow-up railroad pedestrian crossing underpass/overpass feasibility studies for Mebane locations—at First Street and at Second Street

- Work with public health departments and non-profit partners such as AARP to identify several pilot sites for wayfinding signage to encourage walking in and around downtowns and major commercial centers. Simple signs could be installed encouraging people to take a 5-10 minute walk for lunch, or to walk to the bank or the library instead of automatically getting into their cars to drive somewhere.
- Review and evaluate pedestrian access and safety on approach to existing transit stops
- Implement bicycle education events for children similar to bicycle rodeos and "Learn to Ride" events; take advantage of NCDOT bicycle helmet giveaway program to give away helmets to children as part of bicycle rodeos and "Learn to Ride" events.
- Hold walkability and bikeability audits around key community destinations.
- Support local municipalities in their application for bicycle-friendly and walk-friendly status, to review outstanding infrastructure, policy and programming gaps.
- Continue to implement bicycle and pedestrian facilities as part of roadway projects through NCDOT Complete Streets policy--including along and across major arterial corridors. A shared-use path (SUP) or sidepath along an arterial can provide accommodation for both bicyclists and pedestrians, including less-experienced bicyclists who are less likely to feel confident riding in traffic. Figures below illustrate a four-lane median-divided cross-section with a sidepath (shared-use path) separated from the road by a swale vs. a curb and gutter and green buffer zone.

Figure 45: 4-Lane Divided Typical Swale Section with a Sidepath (above, C-2) and 4-Lane Divided Typical Curb-&-Gutter Section with a Sidepath (below, B-2)



In Figure 45 above, the second potential cross-section is a curb-and-gutter version (referred to as B-2). The median and inner travel lane have the same dimensions as the ditch and swale version, but the outer lane is 14 feet wide, with a 2-foot curb and gutter pan. The shared-use path should ideally be at least spaced 9'-6" from the back of curb. This cross-section requires ROW width of about 130 feet (70 feet on the side of the SUP, 60 feet on the other side), but could in some situations fit within 120 feet.

For roadways with speeds above 30 miles per hour and with daily traffic volumes above 6500 vehicles, FHWA Bikeway Selection Guide recommends considering separated bicycle lanes (cycletracks) or shared use paths as a starting point for bicycle facilities appropriate to accommodate an "interested but

concerned” potential bicycle user¹⁵. As the speeds increase, the desired level of separation between vehicular traffic and bicycle and pedestrian traffic increases to ensure comfort and safety.

4.4 Curbside Management along Main Streets

The Burlington-Graham planning region benefits from the presence of vibrant downtowns and main streets with small, locally-owned businesses and restaurants. Whether weekend destinations for visitors or daily destinations for residents, a variety of modes are used to access downtown areas across the region. As these city centers and the overall region continue to grow in population, maintaining traffic flow while providing a range of modal options will become even more crucial in maintaining the economic vitality of these main streets. The 2045 Metropolitan Transportation Plan plans for roadway, transit, bicycle, pedestrian, and other transportation improvements. Competition for curb space among on-street parking, goods delivery, ride-hailing, transit stops, bike lanes, and other elements of complete streets design creates conflicts that must be actively managed. Designs and policies along active main street corridors can have a significant impact on travel behavior and first-mile/last-mile options for passenger trips and deliveries. BGMPO member jurisdictions are encouraged to consider the following curbside management policy ideas and planning strategies in downtown areas:

- **Off-Street Parking and Wayfinding:** On-street and off-street parking serve different needs and can affect traffic demand on the street network. Off-street parking can influence on-street parking usage where higher turnover is desired for customers making short-term trips. Improved wayfinding to off-street parking improves the drivers experience. With higher reliance on cell phone navigation apps, drivers can consider parking options as part of their route planning, rather than after arriving at their destination. Parking lot signage and wayfinding can reduce the congestion caused by vehicles cruising for on-street parking.
- **On-Street Parking Turnover and Pricing:** Most main streets in the BGMPO have free on-street parking. If a jurisdiction desires higher turnover in these spaces, increasing enforcement adherence to time limits or charging a parking fee are two options. Increasing on-street parking turnover ensures adequate parking spaces are available for individuals making short trips or visiting a retail shop or restaurant. Recent technology improvements have made it more affordable for municipalities to acquire parking payment infrastructure such as multi-space meters and parking apps.
- **Loading Zones and Dual Use Zones:** Delivery vehicles of all sizes must navigate the limited spaces within historical downtowns and limited loading zones. Owners of locally owned small businesses often load out of their personal vehicles. Planning for adequate loading zones ensures space is available as deliveries increase. Dual use of zones (such as on-street parking and

¹⁵ FHWA, Bikeway Selection Guide. https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf

commercial loading zones) by time-of-day and day-of-week can also increase loading space capacity. Pedestrian and vehicular conflicts can be reduced by designating dual use space for ride-hailing and taxis during weekends and evenings.

- **Complete Streets at the Curb:** Bicycles, pedestrian, and transit mix at the curb with delivery trucks and on-street parking. Safety considerations such as appropriate spacing between transit stops (such as the potential Graham and Mebane circulator stops) and commercial loading zones, driveways, crosswalks, and intersections are needed to improve visibility. Bicycle facilities such as bike lanes or lane reconfigurations can create space for a variety of street uses. Streetscaping enhancements that widen sidewalks or provide pedestrian bulb outs make space for transit shelters and outdoor dining, yielding a more welcoming and pedestrian-oriented environment. ADA compliance for adequate handicap on-street parking spaces per block and curb cuts improve accessibility and safety for all users.
- **Community Prioritization and Pilot Programs:** Each main street is unique, so understanding local stakeholders' priorities along each block helps determine how curb space should be used and managed. Pilot programs are great ways to test out new strategies before installing them. Dual use zones and bike lanes are suitable pilot projects.

Figure 46: Dual Use Zone Dividing Time between Commercial Loading and Passenger Pick-up/Drop-off



4.5 Transportation Demand Management

Victoria Transport Policy Institute *TDM Encyclopedia* defines Transportation Demand Management (TDM) as a term for various strategies that increase transportation system efficiency and emphasize the movement of people and goods, rather than motor vehicles by giving priority to more efficient modes (such as walking, cycling, ridesharing, public transit and telework), particularly under congestion conditions¹⁶. Transportation Demand Management is known to be a cost-effective solution to reduce congestion and defer roadway capacity expansion. Piedmont Authority for Regional Transportation (PART) operates a vanpooling program for the Triad region, which is one of components of Transportation Demand Management toolbox. PART also provides information on their website regarding park and ride locations and signing up for carpooling through Share the Ride NC, www.sharetheridenc.org/. It is estimated that PART Vanpool and express bus services have removed an estimated 19,871,071 Vehicle Miles Traveled from the road in 2018, reducing congestion, air quality pollution and enhancing safety as a result.

The following recommendations are expected to contribute to enhanced TDM options and reduced congestion during peak period, and overlap with public transportation and bicycle and pedestrian recommendations:

- Improve existing park and ride lot locations and plan for additional park and ride lot locations in the region
- Increase frequency on existing PART Route 4 to provide a more convenient commuter experience for commuters traveling outside of BGMPO region
- Add new express/commuter service from Burlington-Graham area to Duke and Downtown Durham, similar to PART Route 4 service to UNC-Chapel Hill (as recommended in NCDOT Statewide Commuter Public Transportation Study)
- Work with major employers to encourage additional teleworking options for employees who can easily continue to work from home at least some of the time; in the aftermath of COVID-19 social distancing many companies are reconsidering the need to have employees in the office on an everyday basis
- Consider additional public transportation funding sources, as discussed in Public Transportation section
- Review and evaluate pedestrian access and safety on approach to existing fixed route transit stops

¹⁶ Why Manage Transportation Demand? *TDM Encyclopedia*, Updated July 18, 2017. Victoria Transport Policy Institute, <https://www.vtpi.org/tdm/tdm51.htm>









4.6 Intelligent Transportation Systems (ITS)

Intelligent Transportation Systems (ITS) solutions can allow for a more efficient use of existing transportation infrastructure and provide improved travel time reliability. Over the period of spring 2018 to late spring 2020, the Triad Region undertook an ITS planning effort resulting in the Triad Regional ITS Strategic Deployment Plan (final plan released as of June 2020). NCDOT staff and local agency staff across the Triad Region met during the study process and formulated regional ITS goals:

- Enhance Mobility
- Enable Safer Vehicles and Roadways
- Limit Environmental Impacts
- Support Transportation System Information Sharing
- Promote Innovation

The table on the following page illustrates the ITS strategies that were considered as part of Triad Regional ITS Strategic Deployment Plan.

Table 14: ITS Strategies. Source: Triad Regional ITS Strategic Deployment Plan

	<p>En-Route Traveler Information Improvements Real time updates broadcast to the vehicle (e.g. Dynamic Message Signs (DMS), X2V communications).</p>
	<p>Advanced Signal Technology Optimized coordination for signal operations (e.g. ATSPM, adaptive signals).</p>
	<p>Bus on Shoulder Use of the shoulder as a travel lane by buses when mainline travel speeds drop below specific thresholds.</p>
	<p>Hard Shoulder Running Use of the shoulder as a travel lane by all vehicles during specific scenarios such as peak periods or during a major incident.</p>
	<p>Ramp Metering Traffic signals operated at freeway on-ramps to control the rate and impact of vehicles entering mainline traffic.</p>
	<p>Transit Signal Priority Operational improvements that can extend the green time of a traffic signal when transit vehicles are behind schedule.</p>
	<p>Enhanced Surveillance Increased surveillance coverage to provide continuous monitoring capabilities on a roadway. Includes both blind spot and new corridor coverage.</p>
	<p>Integrated Corridor Management Management of a corridor as a system rather than as individual transportation networks.</p>
	<p>Communication Upgrades Improved communication for resiliency and redundancy through either additional connections or expanded bandwidth.</p>

The following projects were recommended for Burlington region as part of the Triad Regional ITS Strategic Deployment Plan.

Table 15: ITS Projects Recommended for Burlington and Status in the 2045 MTP Plan

Project Number	Route	Length	Treatments Recommended	Total Project Cost	Included in MTP Fiscally-Constrained Project List
ITS-B1-A	I-40	16 mi	Enhanced surveillance (cameras), Bus on Shoulder, Ramp Metering	\$2,159,300	Yes, MTP ID ITS-B1-A (2045 horizon)
ITS-B1-B	I-40	16 mi	Enhanced surveillance, Hard Shoulder Running, Ramp Metering	\$3,906,884	MTP unfunded project list/recommended for CTP inclusion
ITS-B2	US 70	16 mi	Advanced Signal Technology, Enhanced Surveillance (cameras)	\$2,546,377	MTP unfunded project list/recommended for CTP inclusion
ITS-ICM2	US 70/I-40	16 mi	Integrated Corridor Management on US 70 and I-40	\$778,880	MTP unfunded project list/recommended for CTP inclusion

4.7 Freight

In November 2017, NCDOT completed the first North Carolina Statewide Multimodal Freight Plan. The plan identifies freight investments that can lead to economic growth, support NCDOT’s 25-year vision, and address the criteria in the Strategic Transportation Investments (STI) prioritization process. NCDOT developed a vision, and defined goals and objectives to meet the vision. The goals of the freight plan are:

- Enhance economic development opportunities and competitiveness
- Improve freight system efficiency, reliability, and resiliency

- Enhance freight transportation safety and security
- Support adoption and deployment of new freight technologies
- Improve freight infrastructure conditions and preservation
- Protect and enhance the natural environment
- Foster public-private partnerships and collaboration with freight stakeholders
- Ensure good fiscal management and sustainable funding for the State’s freight network

As North Carolina adapts to the changing demands of its freight infrastructure, the Freight Plan addresses current and future challenges and opportunities and provides a variety of recommended freight investments.

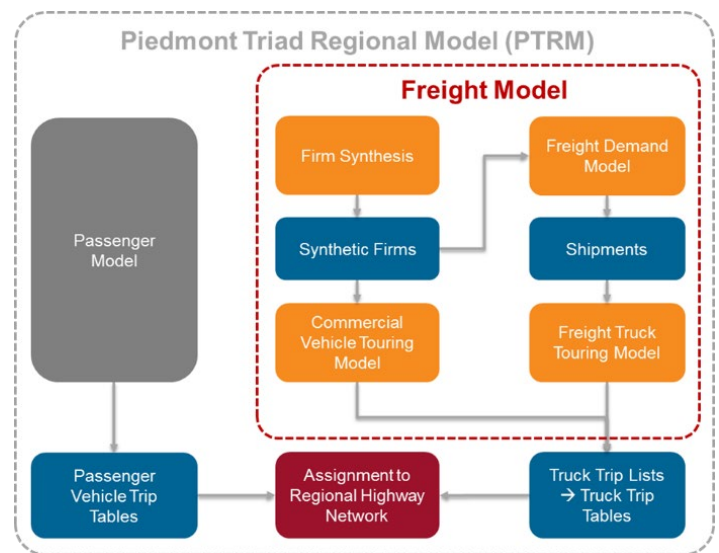
In recognition of the importance of freight in the Triad, PART, NCDOT, and the Triad Metropolitan Planning Organizations (Burlington-Graham, Greensboro, High Point, and Winston-Salem) embarked on a three-phased approach to develop an enhanced freight component for the Piedmont Triad Regional Travel Demand Model (RTDM). The goals are to provide a safe freight transportation system, support the region's economic well-being, and achieve efficiency in operations and investment in the freight transportation system.

It is expected that creating better data and models will enable state, regional, and local planners to better predict freight movement trends, and make better informed project investment decisions. Utilization of a tour-based freight model will be used to inform land use and transportation planning efforts, and aid in SPOT project prioritization.

Phase I of the freight model development included 158 freight and distribution establishment interviews, a 969 record Freight Node Database, 139 distribution centers identified. This data provided a snapshot of existing conditions and enabled the development of a region-specific model. Phase 2 included the development of the regional tour-based freight model and an external user interface to view scenario results.

Phase 3 of the Triad freight model development involves the collection of local driver diaries that sample actual truck movements by vehicle type, trip type and commodities carried. One-third of the driver diary samples have been collected. The projected has been extended in 2021 during to COVID-19. The goal will be to collect the remaining samples when driving patterns return to some level of normalcy.

Figure 47: Freight Model Subcomponent as part of the Piedmont Triad Regional Model (PTRM)



I-40/I-85 corridor remains a priority for freight movement across the state and through the BGMPO region, recognized as part of Primary Highway Freight System (PHFS) in the North Carolina Statewide Multimodal Freight Plan. Interchange improvements as well as major arterial improvements connecting to interchanges will help support movement of goods within and across the BGMPO region. Generally running parallel to I-40, US 70 also serves as a key east-west freight corridor through the region. Additional recommendations to support the flow of goods within and across the region include the following:

- Address outstanding posted bridge locations to ensure that heavier vehicles can continue to utilize those key corridors
- Address the safety of at-grade railroad crossings (see additional information in the next section) and consider grade-separation where warranted and feasible to decrease delay
- After implementation of the tour-based freight model, support the development of a Piedmont Triad Freight Mobility Plan.

4.8 Rail

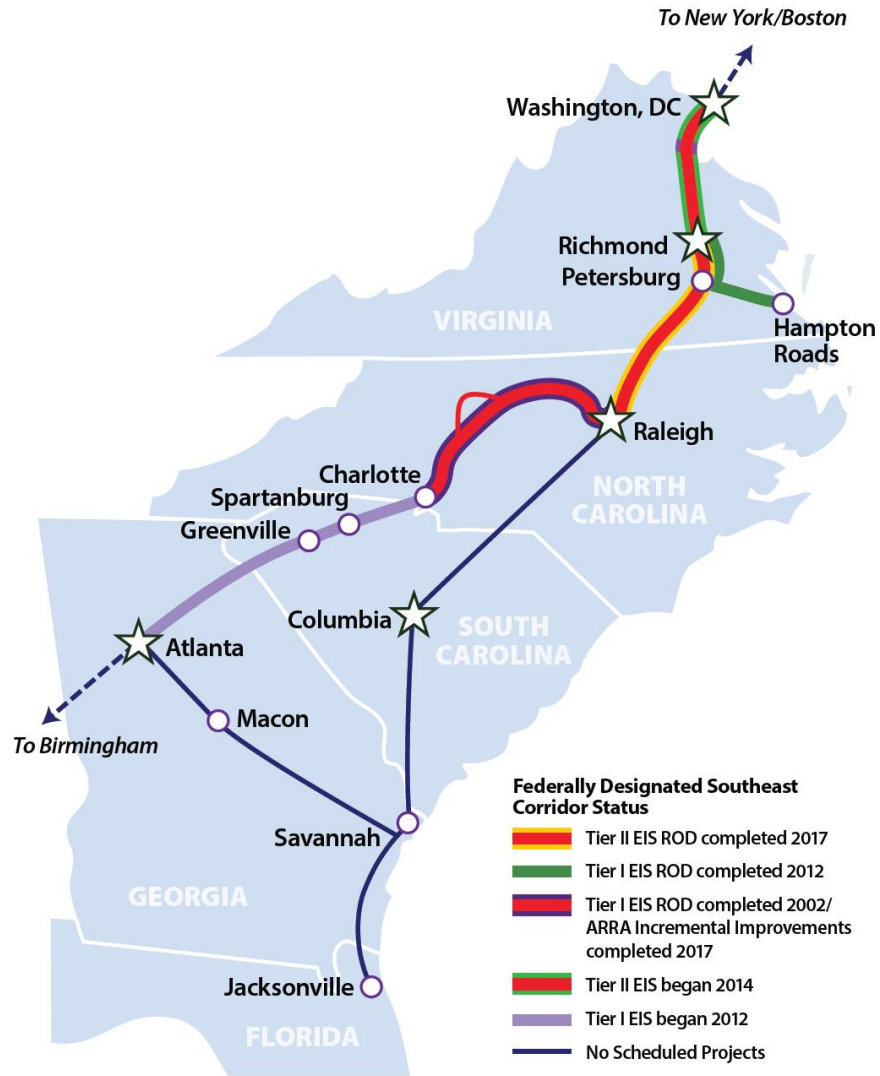
North Carolina Railroad corridor through Burlington sees both freight and passenger train traffic. On the passenger train service side, the Burlington Amtrak station opened in 2003 and is served by eight trains daily. The number of trains is expected to go up to ten in the near future. Amtrak does not provide ticketing or baggage services at this station. The station building is sited in the former engine house of the North Carolina Railroad (NCR), the only remnant of a railroad maintenance facility built in the 1850s.

The Charlotte to Raleigh passenger rail corridor is part of the larger Southeast High-Speed Rail corridor. No major improvements are currently planned for the railroad corridor around Burlington. Two railroad projects funded by the American Recovery and Reinvestment Act (ARRA) stimulus were completed in BGMPO area in 2016-2017:

- P-5205 Haw River Passing Siding and Curve Realignment, Division 7; Alamance County: 2-mile passing siding to break up a 22-mile stretch of single track. Half-mile 30-foot deep cut on new location. Completed Fall 2016.
- Stations and Facilities Renovations at existing stations including Burlington, NC

Freight rail service along the corridor is provided by Norfolk Southern.

Figure 48: Southeast High Speed Rail Corridor, Source: NCDOT

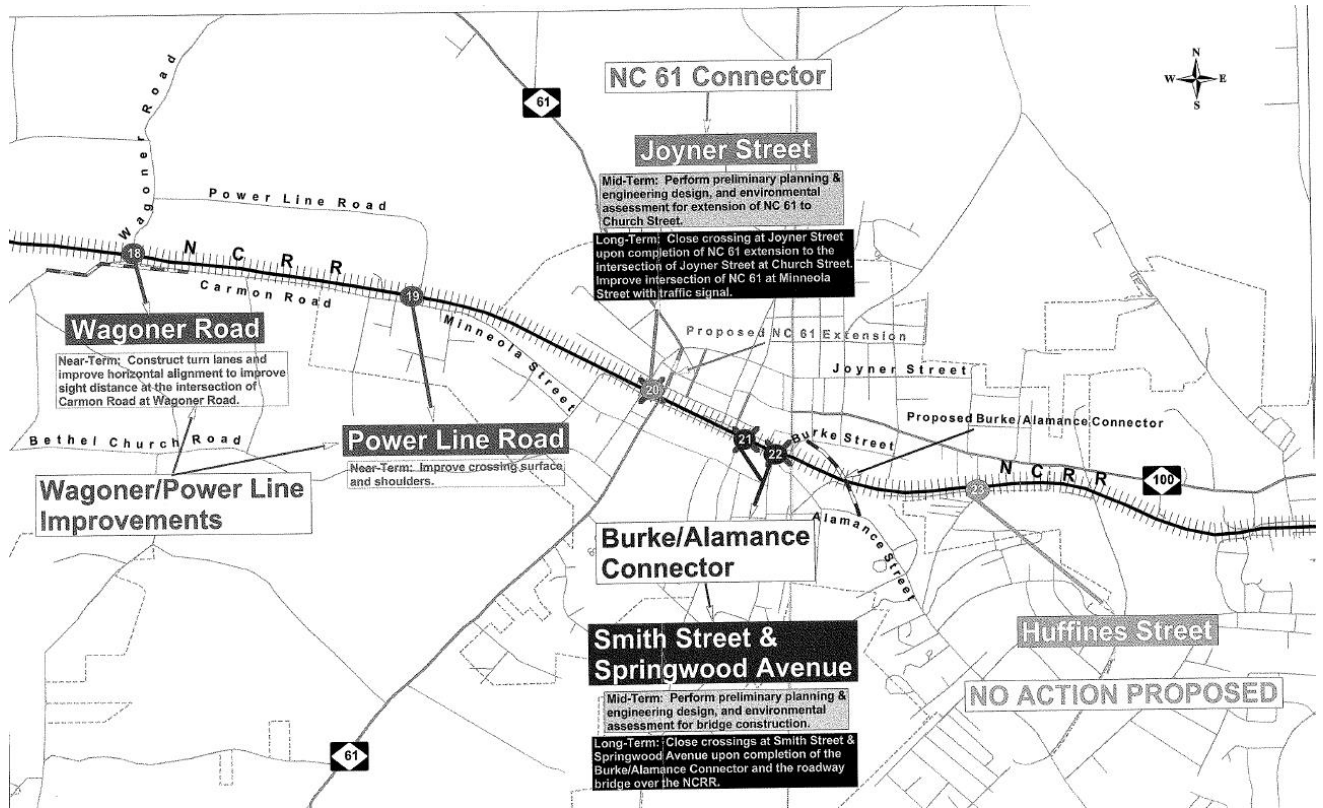


No railroad improvement projects were submitted for BGMPO during the Strategic Prioritization (STI/SPOT) process 5.0.

Two prior grade separation studies that include portions of the BGMPO area have been completed:

- East Guilford County Traffic Separation Study, 2004 (included Gibsonville)
- Mebane Traffic Separation Study, 2017

Figure 49: East Guilford County Traffic Separation Study 2004-Gibsonville Recommendations



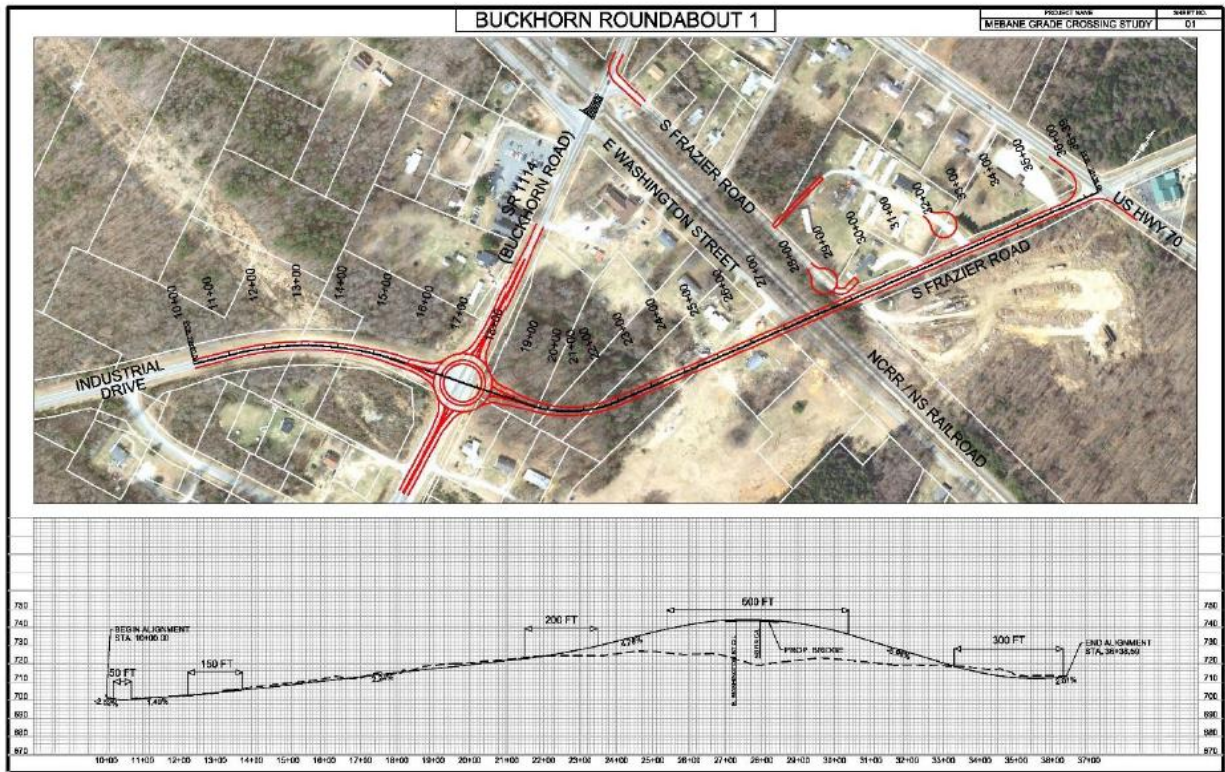
As shown in the figure above, the East Guilford County Traffic Separation Study recommended the following improvements for Gibsonville area:

- Wagoner Road and Power Line Road Improvements: construct turn lanes and improve horizontal alignment to increase sight distances at the intersection of Carmon Road at Wagoner Road; improve crossing surface and shoulders on Power Line Road approach
- Joyner Street Improvements: construct NC 61 Connector which would extend NC 61 to the intersection of Joyner Street at Church Street; Joyner railroad crossing could be considered for closure once NC 61 extension is complete; improve intersection of NC 61 at Minneola Street with traffic signal (mid-term recommendation in the plan; not yet implemented)
- Smith Street and Springwood Avenue improvements: after construction of Burke/Alamance Connector and roadway bridge over the NCR, close crossings at Smith Street and Springwood Avenue (mid-term recommendation, Smith Street crossing closure implemented; residential development on Cypress Court completed around 2005 might make the Burke/Alamance connector less palatable due to likely residential property impacts)
- Burke/Alamance Connector: recommended for a feasibility study; residential development on Cypress Court completed around 2005 might make the Burke/Alamance connector less palatable due to likely residential property impacts

The Mebane Traffic Separation Study noted 27 crashes involving train/vehicle or train/pedestrian collisions in the study area, including several pedestrian fatalities based on crash records from 1978-2016. The following recommendations were included in Mebane study:

- SR 1940 Gibson Road (Crossing # 735 464L): install median barriers (bollards) and widen crossing shoulders to reduce vehicles driving around railroad gates and to better accommodate truck traffic (estimated cost \$43,000-\$55,000)
- Lake Latham Road (Crossing #735 465T): no short-term recommendations; long-term closure recommended after NC 119 Bypass is completed
- SR 1965 Moore Road (Crossing #735 468N): install median barriers and widen crossing shoulders to reduce vehicles driving around gates and to better accommodate a safe pedestrian connection across the railroad corridor (estimated cost \$42,000-\$69,000)
- 4th Street (Crossing #735 471W): continue to operate existing at-grade crossing if the 5th Street crossing improvements are constructed; or close if 5th Street improvements not made (estimated cost \$23,000-\$30,000)
- 5th Street (Crossing #735 472D): improve the geometry of the crossing and intersection with US 70; remove the northbound dedicated right turn lane onto US 70 to increase the curve radii for vehicle turning movements; install an asphalt path/shoulder across crossing and crosswalks at Washington Street and Fifth Street intersection to connect sidewalks to improve pedestrian connectivity; install a median with pedestrian refuge on Washington Street starting at Fifth Street and going east; add pedestrian crossing warning signs for crosswalks at Washington Street intersection (estimated cost \$74,000-\$94,000; eight crashes and two fatalities noted for this crossing location).
- Buckhorn Road Crossing (#735 141R): long-term recommendation to build a new grade-separated bridge over the railroad that would connect Buckhorn Road and Industrial Drive to US 70; three grade separation options to be carried forward in future design evaluations *this recommendation is addressed in the form of roadway project Hwy-113 including in MTP 2045 Horizon funded project list.
- Pedestrian Crossing Underpass at First Street: create a pedestrian connection between the north side and the south side of Mebane due to the historic fatalities in this area (cost estimate \$2.7 million-\$3.4 million); a follow-up feasibility study is recommended in the MTP
- Pedestrian Crossing Overpass at Second Street: create a pedestrian connection between the north side and the south side of Mebane area (cost estimate \$3.7 million-\$4.7 million); a follow-up feasibility study is recommended in the MTP

Figure 50: Mebane Traffic Separation Study 2017- Buckhorn Grade Separation and Roundabout, One of Potential Alternatives



During the BGMPO MTP Update Rail and Aviation Subcommittee discussion in June 2019, the following comment was recorded:

- There is the potential for freight growth in the region and the long-range plan should anticipate rail line expansion within the existing right-of-way.

With the discontinuation of Durham-Chapel Hill Light Rail project, both Durham and Orange Counties are planning transit plan updates, which might include consideration of a Durham to Mebane Commuter Rail service. A commuter rail station in or near Mebane has been brought up in preliminary conversations but does not currently have a specified location or an identified funding source. Additional track capacity would be required to support existing freight and passenger train service along the corridor, and to add commuter rail service. See **Transit** section for additional information about the Mebane-Durham-Raleigh-Garner potential commuter rail line.

4.9 Aviation

Three airports serve the needs of Burlington-Graham region residents and visitors, including two large commercial, international airports, and a local general aviation airport. Of those three, only one airport, Burlington Alamance Regional Airport, is located inside the Burlington Graham MPO Planning Area. In terms of commercial service provided, Raleigh-Durham International and Piedmont Triad International Airports are the second and third largest airports in the state, behind Charlotte Douglas International. In addition to providing transportation for passengers and freight, the airports generate a significant amount of economic activity and value. LabCorp, which is based in Burlington, uses aircraft to transport samples about 2.6 million miles each year. The three airports are described below.

Burlington-Alamance Regional Airport

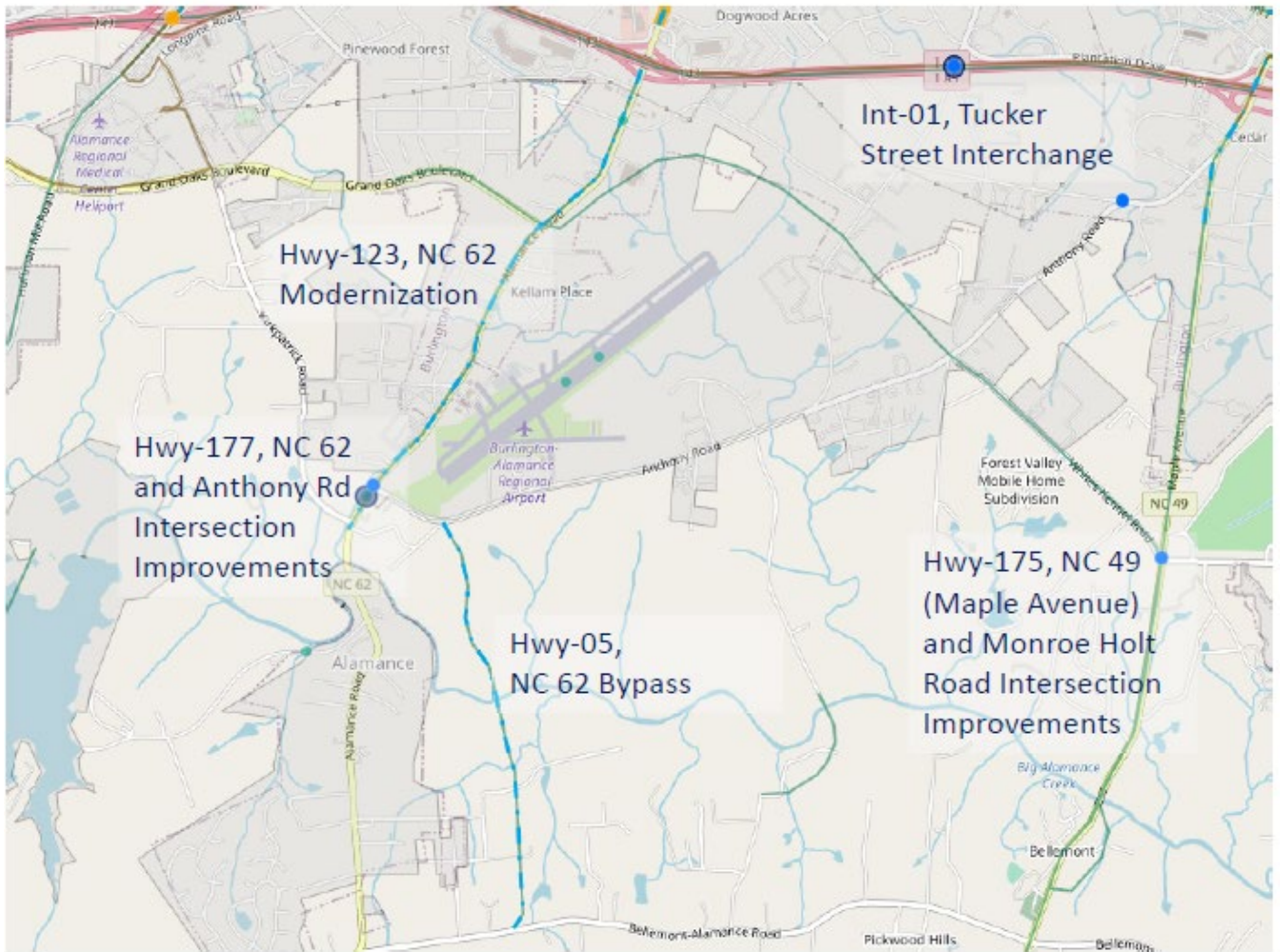
Burlington-Alamance Regional Airport (BUY) is a general aviation airport located just south of Burlington, with easy access to I-40. Burlington-Alamance provides a variety of general aviation services, including fuel, hangar sites, and pilot services. It has a 6,400-foot runway which serves over 74,000 operations (take-offs and landings) per year. According to the 2019 NC State of Aviation report's general aviation airport impact analysis, Burlington-Alamance supports over 1,000 jobs, generates \$5,859,000 in state and local taxes, and has an overall economic output of \$158,850,000 annually.

Burlington-Alamance Regional Airport main entrance is located off NC 62 Alamance Road south of I-40/I-85 corridor. Ensuring that both passenger vehicle and freight traffic can access Burlington-Alamance Regional Airport is of great importance for the economic growth of the region. The following recommended highway projects, further detailed in the Fiscally-Constrained Recommendations chapter, are likely to be supportive of Burlington-Alamance Regional Airport remaining accessible to freight deliveries and business travelers in the future:

- Hwy-123, NC 62 from I-40/I-85 to Hickory Hill Road, modernization, intersection improvements and complete streets
- Hwy-177, NC 62 and Anthony Road Intersection Improvements
- Int-01, Tucker Street Interchange—New I-40/I-85 Interchange
- Hwy-05, NC 62 Bypass from Belmont-Alamance Rod to Kirkpatrick Rd
- Hwy-175, NC 49 (Maple Ave) and Monroe Holt Rd Intersection Improvements

The map in Figure 51 below illustrates the projects included in the MTP 2045 fiscally-constrained list in proximity to the airport.

Figure 51: Recommended Roadway Improvement Projects in Proximity to Burlington-Alamance Regional Airport



Piedmont Triad International Airport

Piedmont Triad International Airport (GSO) is located west of Greensboro, between I-40 and I-73. It provides commercial service on five airlines, serving over 1.7 million passengers annually. The airport also moves more air freight cargo than any NC airport, at over 300,000 tons annually. The NC State University Institute for Transportation Research and Education’s (ITRE) most recent public airport economic analysis estimates that the airport supports over 25,000 jobs, generating over \$190 million in state and local taxes, with an overall economic output of nearly \$6 billion. Rental vehicle sales tax generated at the Piedmont Triad International Airport also support PART Route 4 operations, which serves the BGMPO region.

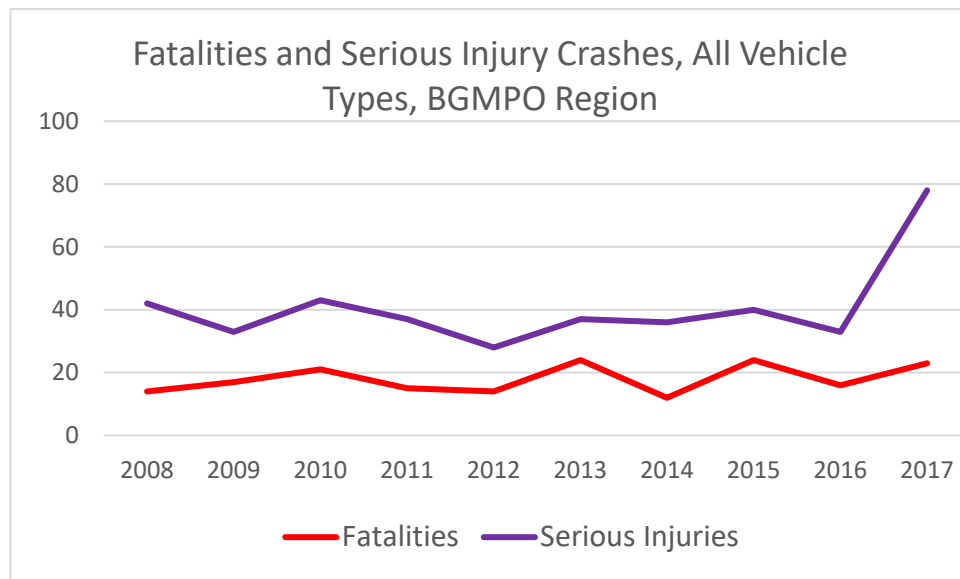
Raleigh-Durham International Airport

Raleigh-Durham International Airport (RDU) is situated along I-40, about halfway between Raleigh and Durham. RDU provides commercial service on ten airlines, serving around 11.6 million passengers annually. The airport comes third in the state in terms of cargo moved at just over 250,000 tons annually. According to the ITRE airport economic analysis, Raleigh-Durham supports close to 87,000 jobs, generates more than \$450 million in state and local taxes, and has an overall economic output of over \$12.5 billion.

4.10 Safety

Two primary types of data were considered when determining existing safety conditions: safety section scores from NCDOT, and total crash frequency by intersection. The safety section score compares roadway segments with similar-type roadways across the state in terms of the frequency and severity of crashes. Figure 52 below suggests that serious injury crashes have seen an increase between 2016-2017, but more data would be needed to see a longer trend over time. Figure 54 depicts the distribution of segment ratings across the region. The worst-rated roadway sections (above 66 on the safety section score) are somewhat uniformly distributed across the MPO planning area. When looking at the density of crashes by intersection depicted in Figure 53, the more urbanized core of the region has more pronounced safety concerns along key corridors such as I-40/I-85, US 70, NC 54, NC 87/NC 100 (Webb Avenue), NC 62 Alamance Road, Huffman Mill Road, NC 49 Maple Avenue and others.

Figure 52: Fatalities and Serious Injuries for All Crash and Vehicle Types in the BGMPO Region

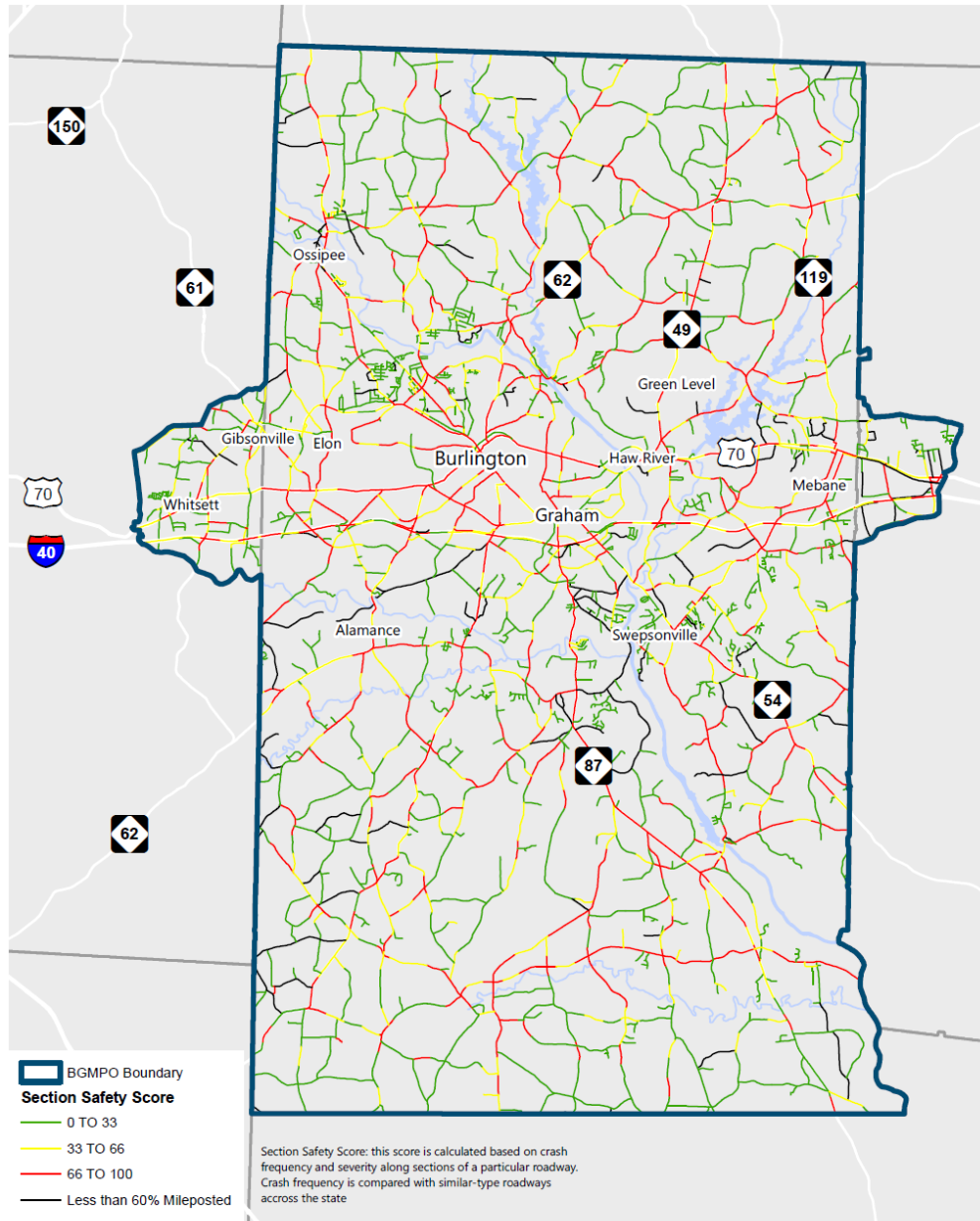


Top ten most dangerous intersections in the BGMPO have been identified based on the number of crashes -see table 16 below. Four of them fall along US 70 Church Street, two fall along University Drive (SR 1226), and two fall along Huffman Mill Road (SR 1158).

Table 16: Top 10 Intersections based on Highest Number of Crashes, 2014-2018

Rank	Intersection	Total Crashes (2014-2018)	Fatality & Type A Injury Crashes (2014 - 2018)
1	I 40 at University Dr (SR 1226)	180	0
2	US 70 S Church St at University Dr (SR 1226)	142	2
3	University Dr (SR 1226) at Boone Station Dr (SR 1301)	122	1
4	I 40 at NC 87 S Main St	112	1
5	Huffman Mill Rd (SR 1158) at Garden Rd (SR 1308)	105	0
6	US 70 N Church St at N/S Graham Hopedale Rd (SR 1716)	104	2
7	US 70 N/S Church St at NC 87 E/W Webb Ave	103	3
8	I 40 at Mebane Oaks Rd (SR 1007)	101	1
9	Huffman Mill Rd (SR 1158) at Forestdale Dr	94	0
10	US 70 S Church St at S Williamson Ave/St. Marks Church Rd (SR 1301)	88	1

Figure 53: Total Crash Frequency by Intersection

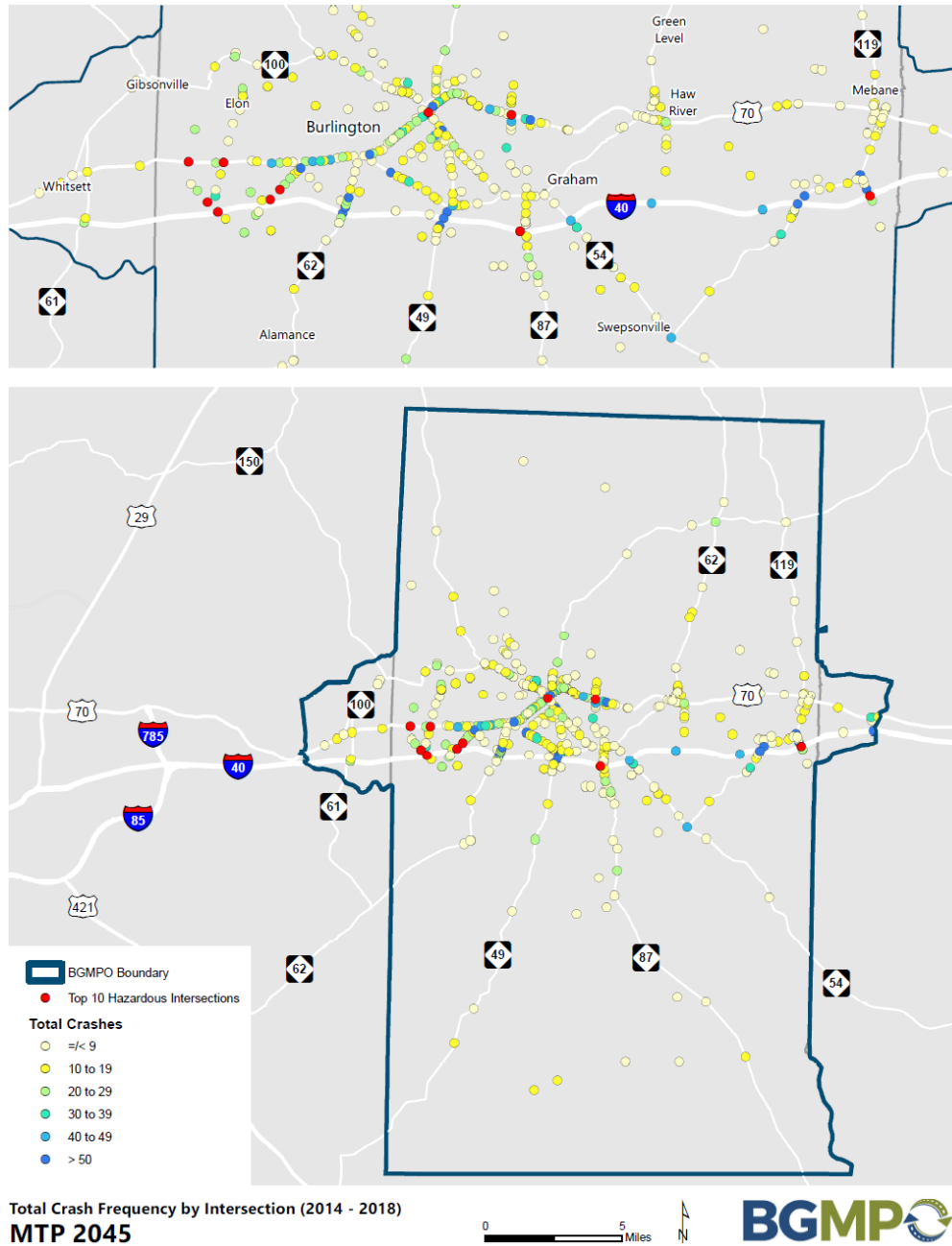


Section Safety Scores (2014 - 2018)
MTP 2045

0 5 Miles

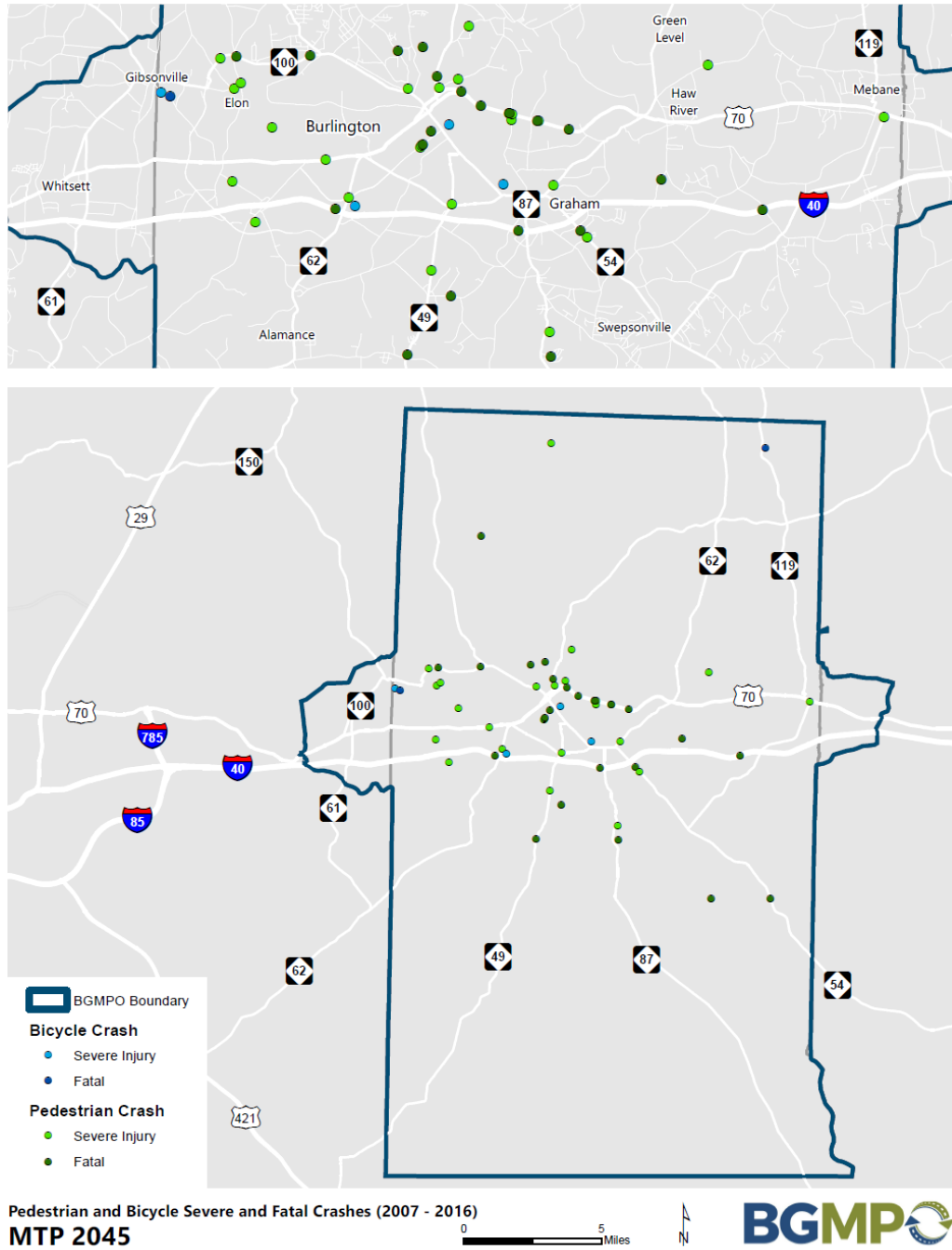


Figure 54: Section Safety Scores



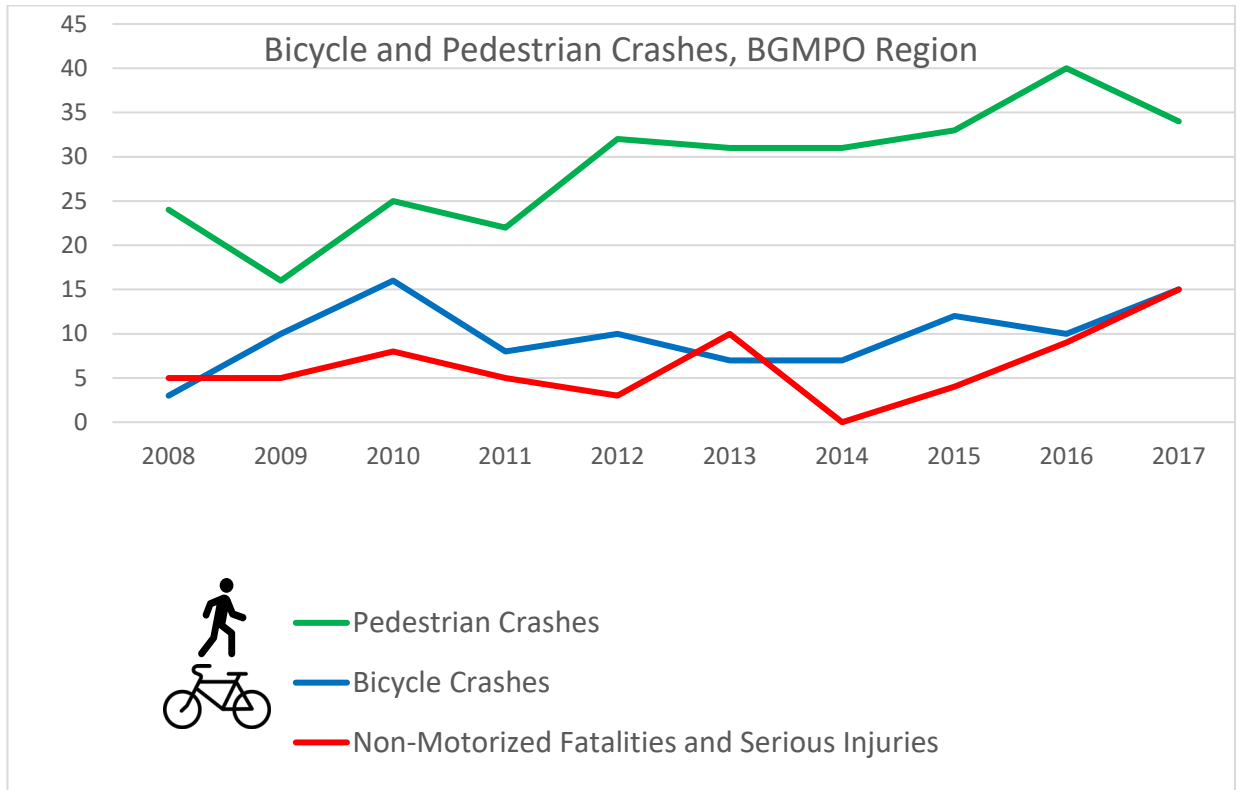
Taking all types of vehicular crashes into account, a total of 4,720 crashes was recorded in Burlington-Graham region in 2017, an increase from 3,517 in 2008. This increase in crashes mirrors national patterns that saw the number of vehicular crashes climb back up after the recovery from the recession fully took hold. Of the total vehicular crashes, the fatal and serious injury crashes represent a small but significant percentage.

Figure 55: Bicycle and Pedestrian Severe and Fatal Crashes



When considering bicycle and pedestrian crashes over time, the trend has been going up although there is a fair amount of fluctuation from year to year. Major arterials including US 70, NC 54, NC 87 and NC 100 through the urban core of the region appear to see a disproportionate concentration of pedestrian crashes resulting in fatalities and serious injuries.

Figure 56: Bicycle and Pedestrian Crashes, Fatalities and Serious Injuries, 2008-2016



Public Transportation and Safety

Public transportation is considered to be a relatively safe mode. Littman notes that transit passengers have one-tenth the fatality rate as compared with passenger vehicle occupants, and overall total deaths per passenger-mile for transit is half that of vehicular travel¹⁷. As the region expands and improves public transportation services and more people can choose taking a bus over driving, safety is expected to improve. However, it should be noted that when implementing new routes, particular attention should be given to bus stops at mid-block locations and accommodations for safe pedestrian crossings.

Potential Funding Sources for Safety Improvements

There are several federal safety improvement funding sources that are available for safety-specific projects. Typically MPOs are not directly involved in selecting projects for those funding categories. However, MPOs can help identify locations and problem areas where additional investment is needed to help address problematic intersections, corridors and railroad crossing improvements needed.

¹⁷ Littman, Todd. Evaluating Public Transit Benefits and Costs: Best Practices Guidebook. June 5, 2020. Victoria Transport Policy Institute. Retrieved from <https://www.vtpi.org/tranben.pdf>

The Highway Safety Improvement Program (HSIP) is a core federal funding program with the goal of achieving a reduction in traffic fatalities and serious injuries. The HSIP includes the Strategic Highway Safety Plan (SHSP), State HSIP (program of highway safety improvement projects) and the Railway-Highway Crossing Program (RHCP). RCHP provides funding for the elimination of hazardous railroad crossings. Within the North Carolina context, identifying projects for funding under the HSIP includes the following steps¹⁸:

- Locations that meet warrant criteria are identified as potentially hazardous
- Detailed crash analysis is performed for those locations with the more severe crashes
- The Regional Traffic Engineering staff performs engineering field investigations
- The Regional Traffic Engineering staff apply benefit-cost analysis and other tools to develop safety recommendations
- Those recommendations are further coordinated with Division maintenance to see if some smaller adjustments or repairs can be made; stand-alone Spot Safety projects and Hazard Elimination projects can also be identified and included in the STIP
- Some of the resulting projects are evaluated for effectiveness of treatment

The state of North Carolina provides 10% matching funds for the Hazard Elimination Projects, with 90% coming from federal funds¹⁹.

Safety Policy and Planning Recommendations

While a small number of improvements can be funded in the Transportation Improvement Program with safety-specific federal and state dollars, a comprehensive approach to safety in transportation project planning and design could have a much more significant impact. North Carolina's Strategic Highway Safety Plan highlights pedestrians and bicyclists as an emphasis area. Many of the following policy and planning recommendations for the region align with strategies found in the Statewide Plan.

- Implement a Vision Zero plan for the largest municipalities (Burlington, Graham, and Mebane) to identify safety hot spots and prioritize locations for improvement.
- The region's municipalities could apply to join NCDOT "Watch for Me NC" Program as partners to highlight the importance of bicycle and pedestrian safety. The "Watch for Me NC" program incorporates public education, community engagement, and high visibility law enforcement to reduce pedestrian and bicycle injuries and deaths through a comprehensive, targeted approach.
- Ensure NCDOT Complete Streets policy is being adhered to as part of roadway project implementation and safe pedestrian crossing facilities are included in addition to linear pedestrian and bicycle facilities-especially along corridors with transit service.

¹⁸ NCDOT, Highway Safety Programs and Projects. Retrieved from <https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx>

¹⁹ Ibid.

- Select several corridors with top safety concerns for a roadway safety audit (RSA) or a pedestrian safety audit (PSA) to be performed with a stakeholder group representing various agencies and backgrounds; such a an RSA or PSA could be done on a relatively quick timeframe and identify both relatively quick and easy solutions as well as those requiring additional study and funding for implementation.
- Consider road diets and conversion of 5-lane two-way left-turn lane facilities to 4-lane median-divided facilities. This can reduce the number of conflicts and decrease the frequency of crashes on major arterials.
- Within municipalities and activity centers with a mix of uses, consider implementing a lower speed limit and adopting traffic calming measures as appropriate
- When planning for new or expanded transit routes, consider pedestrian facilities and mid-block pedestrian crossings where needed.
- Consider adding more lighting in dense, mixed-use activity centers and around commercial centers served by transit, making pedestrians crossing major arterials more visible to drivers at night.

Fiscally Constrained Recommendations

Region Characteristics

Burlington-Graham region has numerous of outdoor recreation opportunities and cultural and historic resources. The region provides a great quality of life for its residents and offers a variety of things to see and do. Access to a well-functioning transportation network including roadways is critically-important to ensuring the long-term economic success of the region, to support access to jobs as well as freight access. Based on stakeholder and public input received, there is a desire to see an improved transit service and a better-connected network of bicycle and pedestrian links to allow the opportunity for residents and visitors to take advantage of other modes.

Figure 57: Roadway Improvements under Construction in Mebane



3-C Transportation Planning Process

Metropolitan transportation planning is guided by the requirement for a 3-C process, which means the transportation planning process is expected to be continuous, comprehensive and cooperative. The requirement for urban transportation planning process to be continuous, comprehensive and cooperative dates back to the Federal-Aid Highway Act of 1962. Metropolitan Planning Organizations were

designated as the entities responsible for a 3-C urban transportation planning process and came into being partially as a response to the construction of the Interstate Highway System and some of the early issues around the lack of coordination with local officials. Today the Metropolitan Planning Organizations serve an important role of providing the local forum for transportation decision-making, reflecting the local area needs and priorities and strengthening the opportunity for public input in the process.

Travel Demand Model

As part of 2045 Metropolitan Transportation Plan, an evaluation of existing and likely future roadway deficiencies was performed. The Piedmont Triad Regional Travel Demand Model (PTRM) results were reviewed for committed projects funded in the 2020-2029 State Transportation Improvement Program for construction by 2026, along with socioeconomic data (population and employment projections) for 2045. The study team reviewed PTRM outputs to identify anticipated roadway network deficiencies in the region.

A travel demand model is a standard tool used as part of long range transportation planning process to review existing and future expected deficiencies of the transportation system. The latest Piedmont Triad regional travel demand model (PTRM) was developed by the Piedmont Authority for Regional Transportation (PART) in cooperation with the four Triad MPOs: Greensboro, Burlington-Graham, High Point and Winston-Salem Urban Area MPO. The MPOs across the Triad region adopted a socio-economic data forecast (population, houses, and employment) for years 2025, 2035 and 2045 as part of the model development. The latest updated version of the regional model was released in October 2019 for use in the 2045 MTP update.

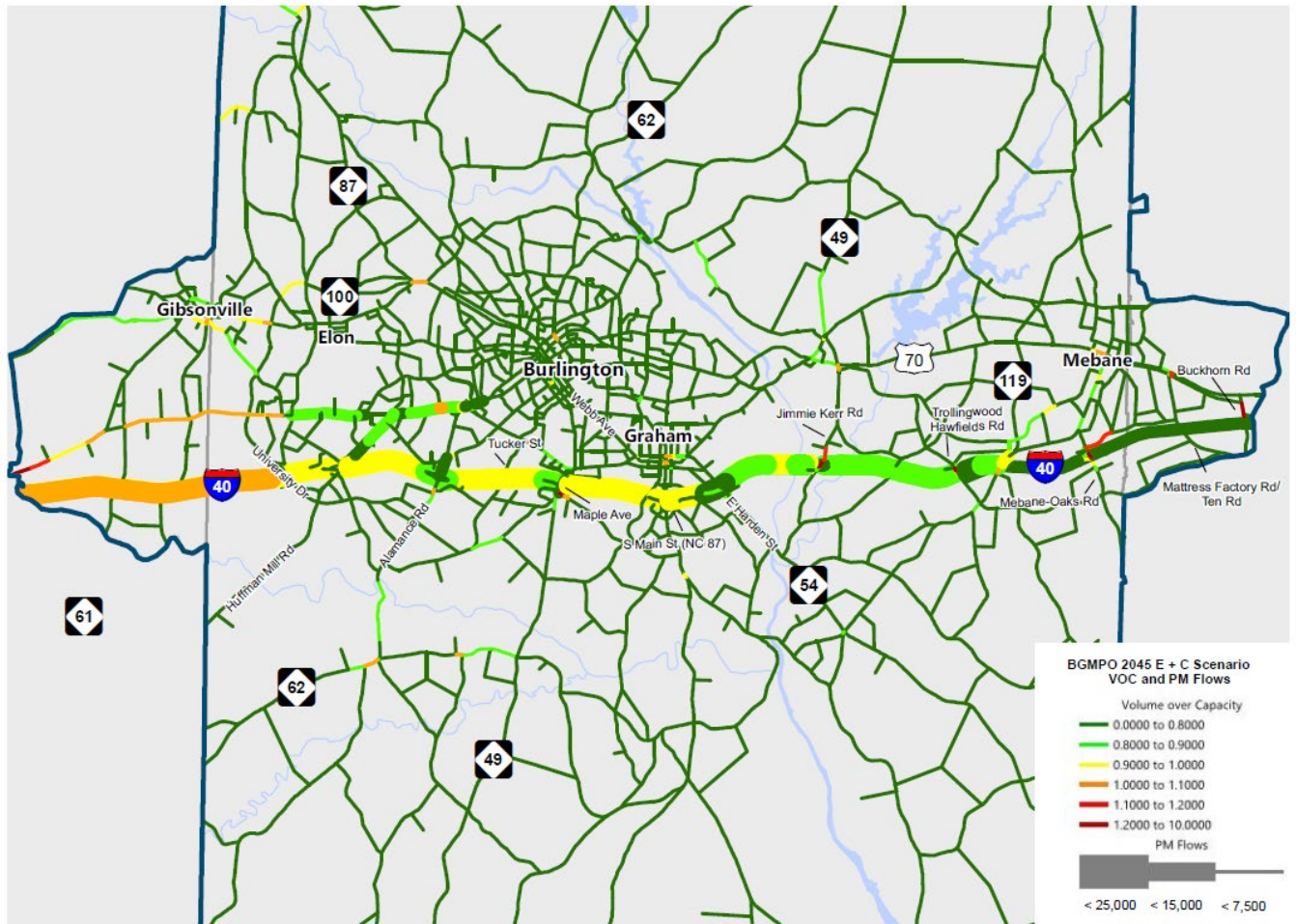
Figure 58: Members of the Public and Stakeholders Reviewing Existing Conditions Data and Maps during July 2019 MTP Public Input Meeting



The updated travel model estimates traffic flows for base year and future horizon years 2025, 2035, and 2045. PTRM is based on the four-step modeling process: trip generation, trip distribution, mode choice, and trip assignment. The PTRM area is made up of three full counties and parts of six additional counties. With 1,718 transportation analysis zones (TAZs) and four Metropolitan Planning Organizations included,

the PTRM covers a large and complex region. The PTRM is multi-modal and designed to support detailed analyses for air quality conformity, travel forecasts, long-range transportation planning, multi-modal alternatives analysis, comprehensive transportation plan development, and additional regional sub-area analysis as needed for local MPOs and jurisdictions. A brief overview of the model is available online from the Piedmont Area Transit Authority²⁰; full documentation on the travel model can be found in Piedmont Triad Regional Model Version 5.1 Model User Guide.

Figure 59: E+C 2045 Scenario Travel Demand Model Output Map (includes Future Year Flows and V/C, PM Peak Period)



The PTRM output highlights future congestion problems along I-40/I-85 corridor, as well as along US 70. Several interchanges are also congested in the “Existing plus Committed Infrastructure with 2045 Population and Employment” scenario, also referred to “2045 E+C scenario”. Some parts of the region that appear to experience some congestion issues during afternoon peak periods are not reflected in the PTRM output—for example, roadways around Mebane. It is possible that some of the today’s congestion

²⁰ Piedmont Area Regional Transit Authority. Regional Travel Demand Model. <https://www.partnc.org/228/Regional-Travel-Demand-Model>

issues are being under-represented in the eastern part of the region because of limitations associated with its proximity to the eastern edge of the model, and difficulties with accounting for travel to/from the Triangle region via external input stations. The treatment of arterials in the model may also be somewhat less sensitive to congestion, especially at signalized intersections.

Project Selection Methodology

The Study Team worked closely with the Steering Committee to craft a Vision for the MTP process, supported by an integrated, comprehensive set of Goals and Objectives that informed the project scoring methodology. The project selection methodology for roadway projects was based on the scoring criteria summarized in the table below:

Table 17: Project Scoring Methodology for Roadway Projects

Roadway Scoring Component	Description of Scoring Component	Points Assignment (out of 100 Total)
Congestion	Projects were ranked based on future Volume to Capacity (utilizing Travel Demand Model output); projects where Volume to Capacity in the Travel Demand Model put them at a low congestion score, but where the associated STI Prioritization submittal projects were receiving a high congestion score in the STI Prioritization had their congestion score adjusted (increased)	20 points for top 10 projects based on congestion; 10 points for the next top 10 projects (11-20); 5 points for the 21-30 th projects; 0 below 30 th project based on congestion ranking
Cost-Benefit Analysis	Qualitative measure intended to reflect a reduction in congestion vs. relative cost of a project. Measured on a standardized continuous scale (0-10) based on cost per mile with a congestion reduction multiplier	Point range from 0.28 – 12.33 for lines and 1.57 – 20.01 for points. Cost standardization formula: $[1/(\text{PerMileCost}/\text{MedianCost})] * \text{Bounding Multiplier}$ Multiply standardized cost by 2 for top 10 projects based on congestion; 1.5 for next top 10 projects (11-20); 1.25 for the 21-30 th projects; 1 for projects below 30 th based on congestion ranking

Economic Development	Roadway projects connecting to or crossing a TAZ that is in the top tier for expected employment growth numbers out to 2045	20 points for projects connecting to TAZ that are in the top 10 for the region for # of expected job growth in 2017-2045; 10 points for connections to TAZ(s) that are in the top 20 in the region for the # of expected job growth; 5 points for connections to TAZs that have existing or future employment of 500+
Safety: Railroad Crossing Safety component, Potentially Hazardous Intersections component, Potentially Hazardous Section /HSIP component	<ul style="list-style-type: none"> • Railroad Crossing Safety: for corridor projects or intersection improvements expected to bring improvements in safety to at-grade crossing quantified based on # of trains per day and AADT on roadway corridor or have seen at least one known fatality in the last 10 years • Intersection or corridor projects overlapping with NCDOT-identified Potentially Hazardous Intersection Locations (by County, NCDOT data) for 2019 Cycle • Intersection or corridor projects overlapping with NCDOT-identified Potentially Hazardous Section Locations (by County, NCDOT data) for 2019 Cycle 	10 possible points for projects overlapping with top 10 locations for railroad crossing exposure ranked by AADT*Number of trains per day; up to 5 possible points for projects overlapping with 11-20 th top locations for railroad crossing exposure ranked by AADT & number of trains per day or at least 1 fatality in the last 10 years; 10 possible points for intersection or corridor projects overlapping with NCDOT-identified Potentially Hazardous Intersection Locations NCDOT-identified Potentially or NCDOT-identified Hazardous Section Locations (by County, NCDOT data) for 2019
Multi-Modal Score for Roadway Projects	Prioritizing roadway projects with bicycle, pedestrian and transit elements that are located within proximity of key community destinations (STI Prioritization Points of Interest: Government buildings; Fire/EMS; Transit routes; Schools (K-12, public/private), universities, colleges; Parks (national, state, local); Tourist destinations (historic districts, major sports); Medical; Places of worship; and others	20 points for roadway projects with specified multi-modal elements that connect to 20+ key community destinations (STI Prioritization Points of Interest); 10 points for roadway projects with multi-modal elements that connect to 10-20 Points of Interest; 5 points for roadway projects with multi-modal elements that connect to 5-10 Points of Interest
Total Roadway Projects Score		Out of 100

Apart from addressing congestion and scoring projects based on the methodology referenced above, the roadway projects selected for BGMPO MTP 2045 were compared against the following target criteria:

1. Improve access to the interstate—a combination of interchange improvements, new interchanges and improvements on north-south corridors connecting to interchanges
2. US 70 as a major connector across the Region — US 70, especially along sections west of Burlington, sees higher congestion during the PM peak and is utilized as an alternate to I-40
3. Modernize roadways in the region’s urban core to improve traffic flow and update roadways to modern standards, including complete streets elements—a variety of existing arterials in the core of urban area generally composed of Elon, Burlington and Graham were built to accommodate high volumes of traffic; under today’s guidance and standard practices those corridors could often benefit from access management, operations/intersection improvements and complete streets elements to upgrade them to modern standards and provide a safer experience for all modes
4. Support implementation of projects recommended in corridor studies and recently-adopted plans. The NC 54 Corridor Study and NC 49 Maple Avenue Corridor Study are two examples of recent corridor studies that have identified specific roadway improvements needed in the region
5. Consider geographic equity
6. Consider feasibility of funding over the next twenty-five years under performance-based programming approach utilized in North Carolina

After reviewing existing deficiencies based on Existing plus Committed 2045 Scenario Model Run, two alternative scenarios were developed for 2045 MTP plan consideration: Scenario 1, more heavily focused on widening-type projects and new roadway links, and Scenario 2, which allowed some roadway widenings but included a greater emphasis on operations, safety, access management and intersection improvement projects. After the two alternative scenarios were reviewed for congestion impacts based on Travel Demand Model runs, Scenario 2 focused on operations, safety and intersection improvement projects was selected as the preferred scenario. Scenario 2 allowed a greater geographic equity with smaller projects dispersed across a wider footprint and was expected to be a more cost-effective strategy overall to include a larger number of lower-cost projects to target specific congestion, delay and safety challenges. Jimmie Kerr Road widening was added to this updated Scenario 2 to reflect the Travel Demand Model output suggested congestion concerns north of I-40. Further, US 70 widening from NC 61 to Springwood Church Rd (Project ID Hwy-195) was split off from the longer modernization and intersection improvements project for US 70 to address the projected increase in travel demand and congestion based on Travel Demand Model run for two alternative scenarios. Fiscal constraint was applied to remove the lowest-scoring projects from the recommended projects list. Transit service expansion projects reviewed but not included in the preferred fiscally-constrained project list due to the

lack of local funding match were included as part of 2045 Metropolitan Transportation Plan unfunded project list, expected to be carried forward as part of Comprehensive Transportation Plan update for future study and evaluation.

Figures 60 and 61 below illustrate the Travel Demand Model output (with volume to capacity and traffic flows for PM Peak) for Scenario 2 Operations and Scenario 1 Capacity. Scenario 2 Operations became the basis for preferred fiscally constrained scenario for 2045 Metropolitan Transportation Plan.

Figure 60: Scenario 2 Operations 2045 Output Map (includes Future Year Flows and V/C for PM Peak Period)

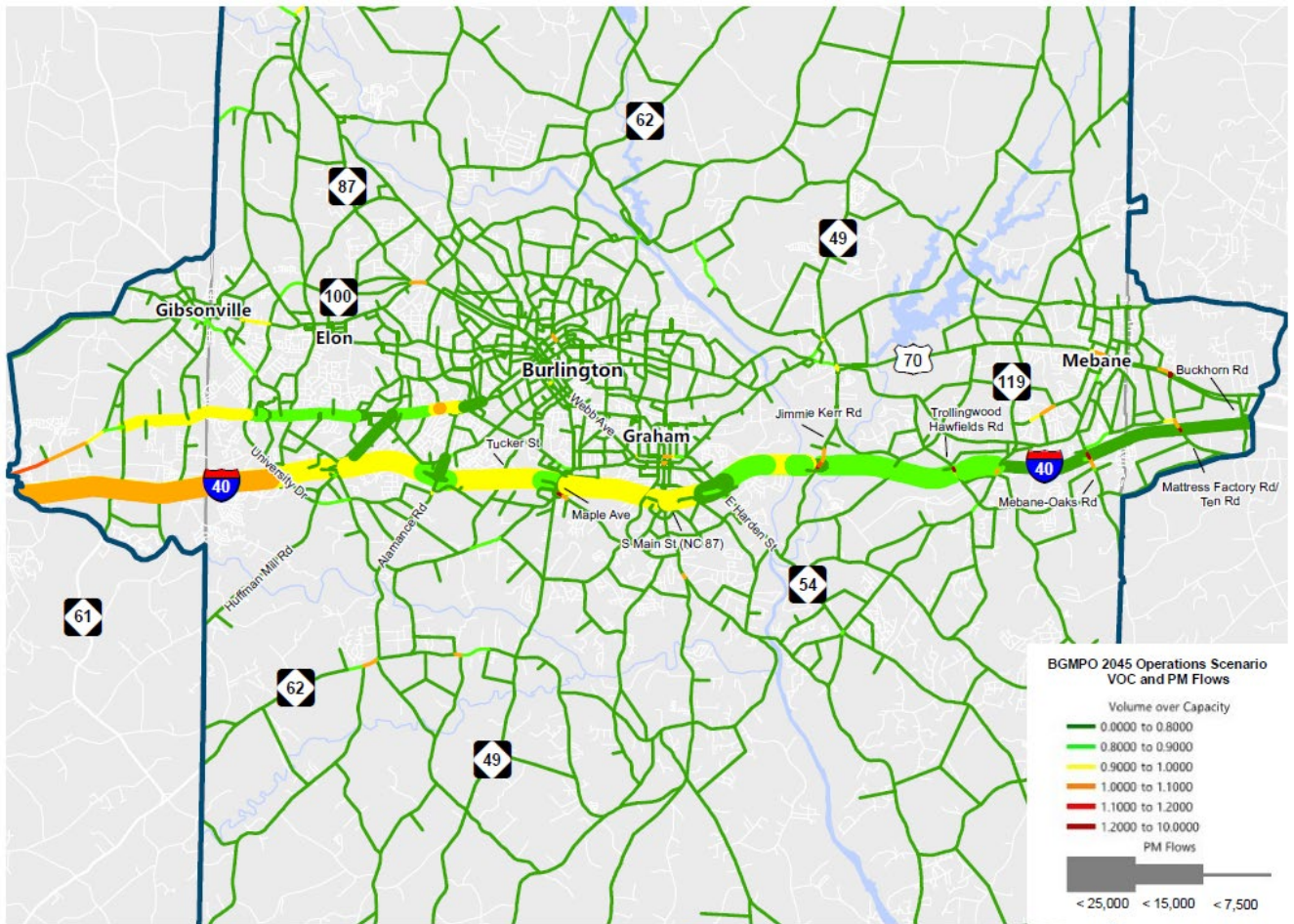
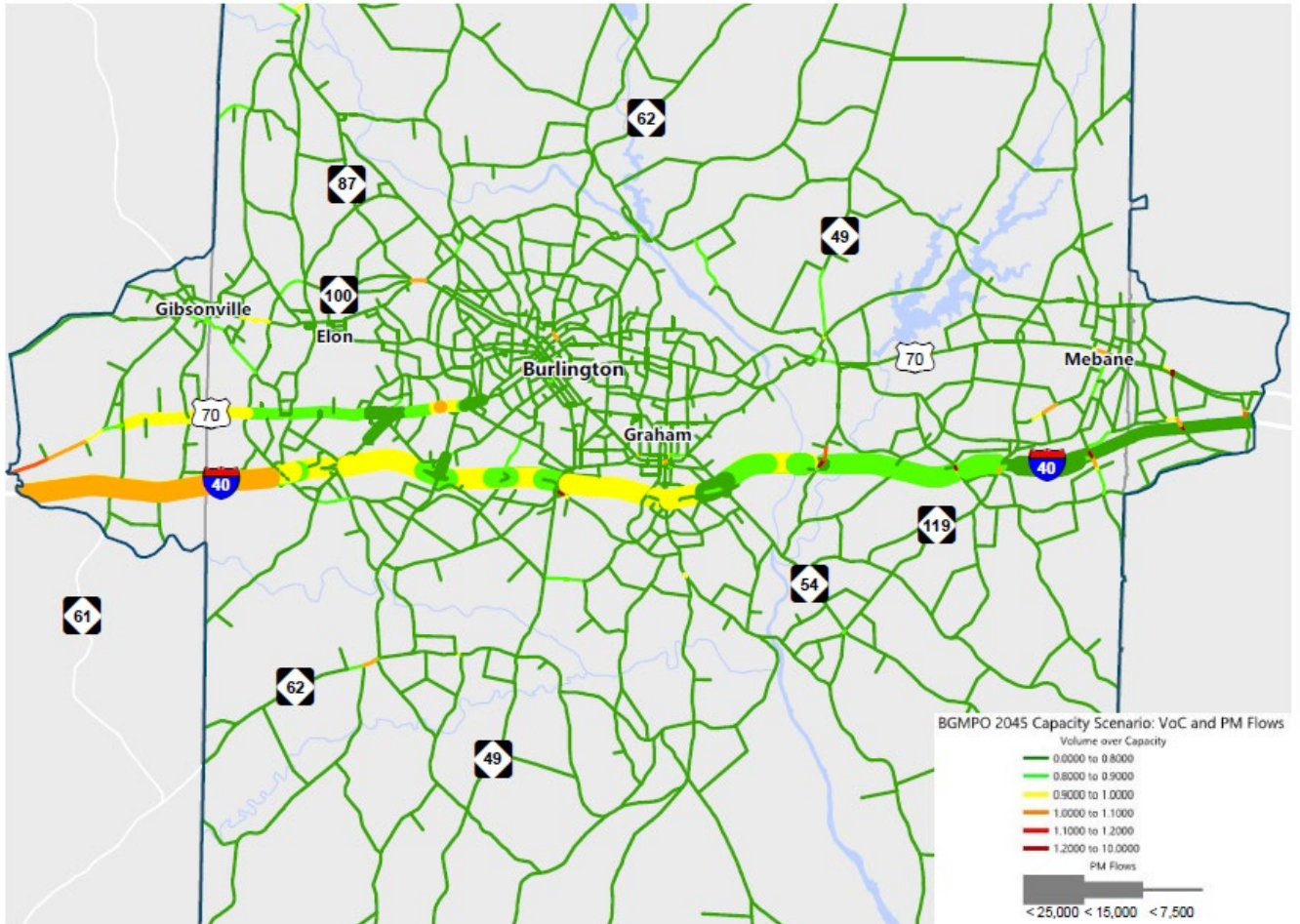


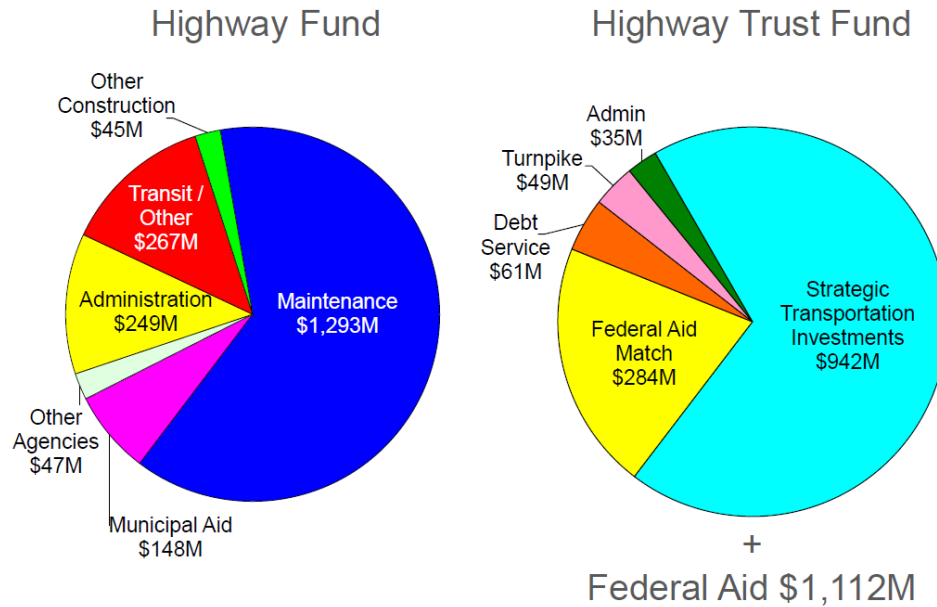
Figure 61: Scenario 1 Capacity 2045 Output Map (includes Future Year Flows and V/C for PM Peak Period)



Funding Forecast and Strategic Prioritization Process in North Carolina

State funding for transportation plays a particularly important role in North Carolina. County funding for transportation supports public transportation, economic development-related roadway improvements; and greenway and sidewalk projects. Figure 62 below illustrates how state funding for transportation in North Carolina is divided between the “Highway Fund”, primarily dedicated to maintenance, and the “HighwayTrust Fund”; the latter contributes the bulk of state funding for major new transportation improvements.

Figure 62: North Carolina Transportation Funding by Category from the Highway Fund and Highway Trust Fund Gas Tax. Source: NCDOT Division of Planning and Programming



The Strategic Prioritization process (also referred to as STI Prioritization process or “SPOT”) is a statewide approach led by NCDOT with input and coordination from MPOs, RPOs, and NCDOT Divisions. The process utilizes a data-driven approach to select the best projects. The Strategic Prioritization process includes three funding tiers (Statewide Mobility, Regional Impact, and Division Needs) where the recognized modes of transportation in North Carolina compete for funding (highway, ferry, rail, public transportation, bicycle and pedestrian, and aviation). The outcome of the Strategic Prioritization process serves as input to the Draft State Transportation Improvement Program. BGMPO’s role in Strategic Prioritization includes the following two key actions:

- BGMPO selects projects from the Metropolitan Transportation Plan, Comprehensive Transportation Plan and other relevant local and regional adopted plans to submit for Strategic Prioritization process for scoring across a variety of modes
- The MPO next assigns local input points which increase the final project score for Regional Impact and Division Needs categories. Metropolitan Planning Organizations, Rural Planning Organizations (RPOs) and NCDOT Division offices all assign local input points for projects.

When developing a fiscal forecast for 2045 Metropolitan Transportation Plan, continuity of the Strategic Prioritization process and past funding trends was built into the forecast.

The table below summarizes projected funding for the BGMPO region for 2035 and 2045 horizons. Funds are in current dollars, with the expectation that both future years funding amounts and project costs will increase at similar rates. The funding categories in Table 18 below do not reflect all funding categories.

Table 19 on the following page provides additional information regarding expected funding levels for ongoing funding programs such as routine maintenance, bridge replacement, HSIP safety funds, and federal public transportation funds allocated by formula. Powell Bill maintenance funds allocated to municipalities and local Capital Improvement Program funds potentially used for transportation projects are not reflected in those funding tables.

Table 18: Fiscal Forecast for BGMPO MTP by Horizon Year, in Millions, 2019 Values

BGMPO Fiscal Forecast by Funding Category, \$ Millions				
STATEWIDE MOBILITY		2025-2034 Funding, Millions	2035-2045 Funding, Millions	Total, 2025-2045, Millions
	Total Available	\$10,147.5	\$12,641.0	\$22,788.5
	BGMPO	\$171.555	\$213.7	\$385.3
REGIONAL IMPACT		2025-2034 Funding, Millions	2035-2045 Funding, Millions	Total, 2025-2045, Millions
	Total Available	\$7,610.6	\$9,480.7	\$17,091.4
	Regional Available	\$1,263.6	\$1,574.1	\$2,837.8
	BGMPO	\$128.7	\$160.3	\$288.9
DIVISION NEEDS		2025-2034 Funding, Millions	2035-2045 Funding, Millions	Total, 2025-2045, Millions
	Total Available	\$7,610.6	\$9,480.7	\$17,091.4
	Division 7 Available	\$543.6	\$677.2	\$1,220.8
	BGMPO	\$100.1	\$124.7	\$224.8

Table 19: Fiscal Forecast for BGMPO MTP by Horizon Year, Other Funding Categories, in Millions, 2019 Values

BGMPO Fiscal Forecast by Funding Category, \$ Millions, Other Funding Categories not Allocated through STI Prioritization Process				
Funding Category	2020-2024 Funding, Millions	2025-2034 Funding, Millions	2035-2045 Funding, Millions	Total, 2020-2045 Funding, Millions
HSIP/Safety	\$8.6	\$18.7		\$53.7
Bridge Replacement & Maintenance	\$20.9	\$50.0	\$50.0	\$157.5
Interstate Maintenance	\$20.4	\$50.0	\$50.0	\$156.4
Other Roadway Maintenance	\$38.8	\$71.4		\$204.5
BGMPO Urban Transit Funding (5307)	\$11.1	\$24.1	29.8	\$69.1
BGMPO Rural Transit Funding (5311)- Planning, Capital and Operating Assistance (with State and Local match)	\$1.78	\$3.56	\$3.56	\$9.97

Performance-Based Planning and Programming

The current Federal transportation legislation, Fixing America’s Surface Transportation Act (FAST Act) requires State Departments of Transportation, Metropolitan Planning Organizations and transit operators to conduct performance-based planning and programming through taking the following steps:

- Tracking performance measures
- Setting data-driven targets for the measures
- Selecting projects to help meet those targets
- Developing plans
- Monitoring, evaluating, and reporting progress

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) have established a Transportation Performance Management (TPM) framework, which sets up seven national goals under which performance measures will be tracked by transportation agencies across the country. Those national Federal-aid Highway Program performance goals are as follows:

- **Safety** - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- **Infrastructure Condition** - To maintain the highway infrastructure asset system in a state of good repair
- **Congestion Reduction** - To achieve a significant reduction in congestion on the National Highway System
- **System Reliability** - To improve the efficiency of the surface transportation system
- **Freight Movement and Economic Vitality** - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- **Environmental Sustainability** - To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- **Reduced Project Delivery Delays** - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices

It is expected that the fiscally-constrained project list adopted as part of BGMPO Metropolitan Transportation Plan will help advance the region towards achieving the performance measures targets set under those seven goals. See Chapter 6 for additional information about performance measures targets.

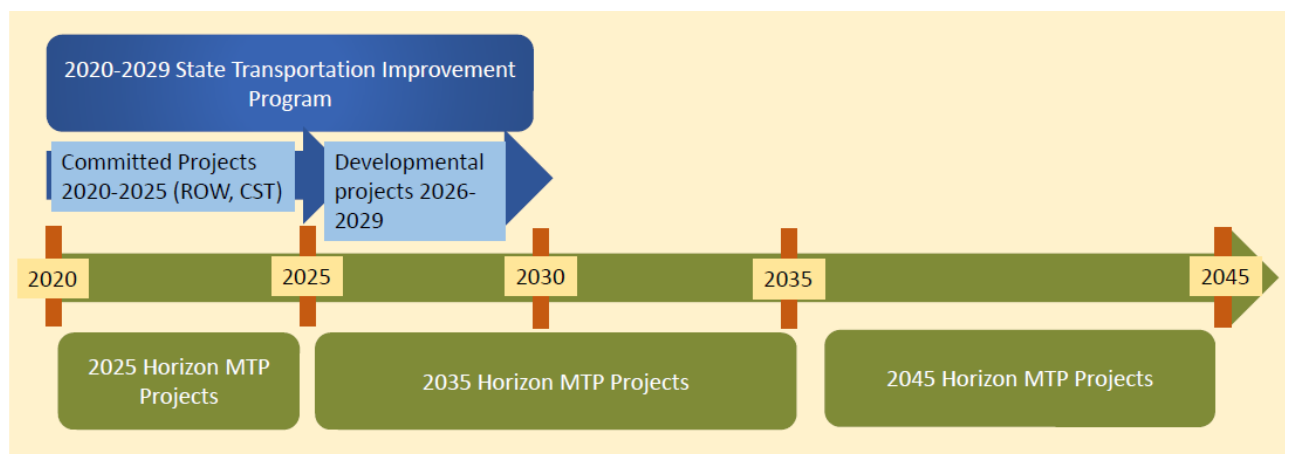
Fiscally-Constrained Project List

Potential roadway projects in the BGMPO region were derived from a review of prior transportation plans and studies including MTP 2040, BGMPO Comprehensive Transportation Plan, corridor studies and other relevant local and regional studies and plans. The draft project list being considered for Strategic Prioritization process P6.0 was also taken into account. In addition to project scoring methodology, the review and selection process included feedback from the study Steering Committee and public input. Two scenarios, "Operations and Safety" and "Capacity" were considered with additional travel demand model analysis performed for both scenarios. "Capacity" scenario focused on roadway capacity (roadway widening and new alignment roadway projects) to a larger extent, whereas "Operations and Safety" scenario had a greater number of operational and intersection improvements included throughout the region. The resulting preferred scenario that was chosen was an updated "Operations and Safety" scenario which included some roadway widening and capacity projects but placed more emphasis on modernization. The lowest-scoring projects were eliminated from the funded project list but will remain in the unfunded project list which is expected to become the foundation for the updated Comprehensive Transportation Plan for the BGMPO.

The roadway projects selected for the MTP preferred scenario were organized by horizon year 2025, 2035 and 2045. In addition to horizon year, some of the projects were designated as committed for funding in the 2020-2029 STIP and part of “Existing plus Committed” network for the purposes of Travel Demand Modeling. Projects are considered committed for funding in the State Transportation Improvement if they were programmed for Right-of-Way or Construction in the first 6 years (2020-2025) in the Final 2020-2029 STIP. Committed projects will continue to move forward through development toward construction and are not subject to re-evaluation in Strategic Prioritization process P6.0.

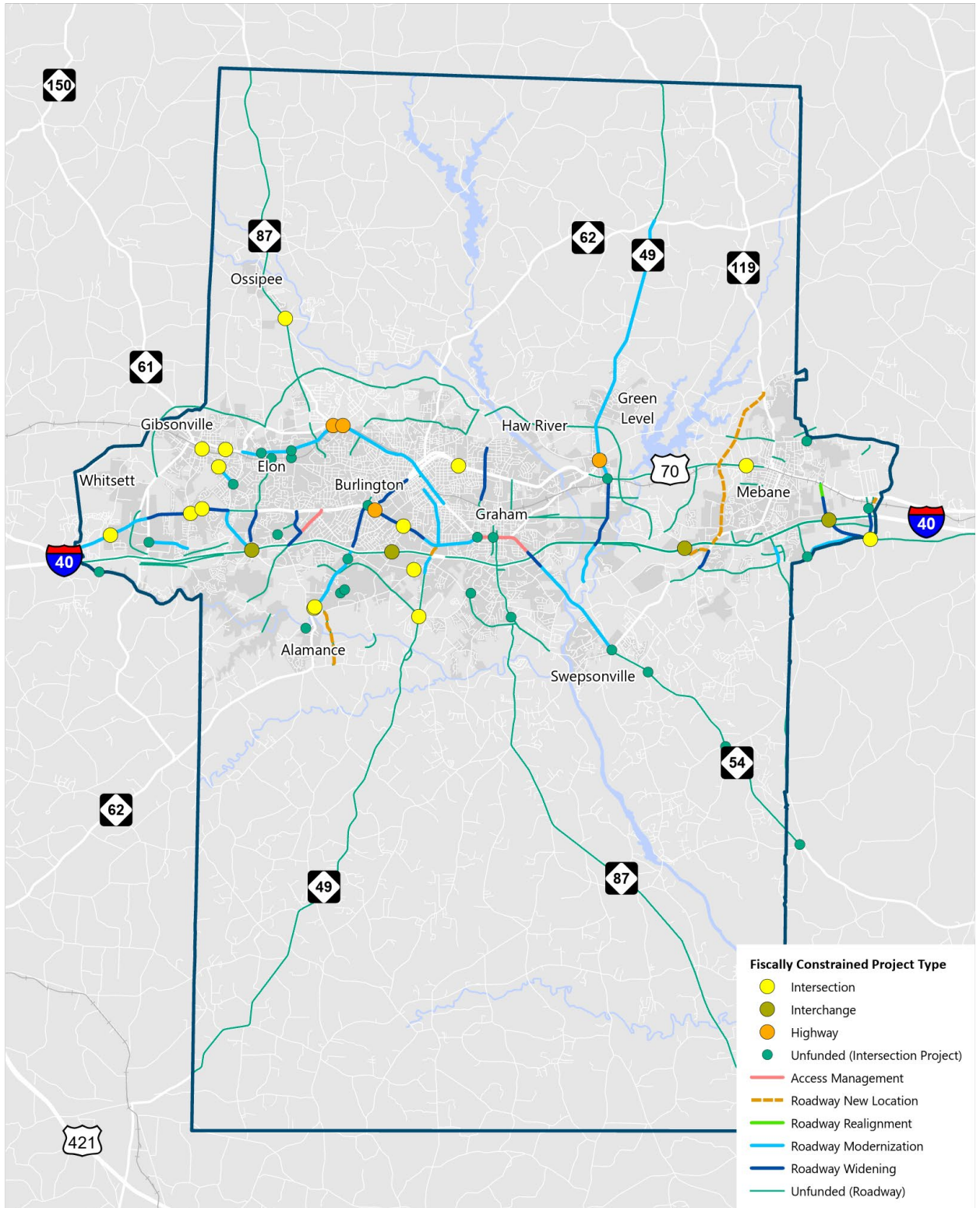
The projects in the 2025 horizon are primarily those projects already funded in the Transportation Improvement Program 2020-2029 (TIP), and some of those projects are currently listed as already under construction. Within the 2035 horizon year, some projects currently included in the 2020-2029 TIP are included, as well as some new projects not yet included in the TIP. Projects within the 2035 horizon year are committed (and part of 2045 E+C scenario) if funded in the 2020-2029 TIP for construction by 2026 or sooner. Other projects included in developmental section of the TIP are not considered committed, but are included within the horizon year 2035 listing for BGMPO MTP 2045. Figure 63 below illustrates the overlapping timelines of projects included in the 2020-2029 STIP and MTP 2045 Horizon Years.

Figure 63: 2020-2029 STIP and 2045 Metropolitan Transportation Plan Projects by Horizon Years Combined Timeline



The map in Figure 64 below illustrates both fiscally-constrained projects selected for 2045 Metropolitan Transportation Plan, as well as unfunded roadway projects which will become part of the future Comprehensive Transportation Plan update.

Figure 64: MTP 2045 Roadway Projects, Fiscally Constrained and Unfunded Categories



Tables 20, and 21 and 22 below includes a list of roadway and transit projects included in the fiscally-constrained 2045 Metropolitan Transportation Plan, as well as a brief summary of cost of bicycle and pedestrian projects included in the MTP. A more detailed listing of bicycle and pedestrian projects recommended for the fiscally-constrained list may be found in Chapter 4 under Pedestrian and Bicycle Transportation.

Table 20: Projects by Horizon: Under Construction and 2025

2025 Horizon STIP Projects- Under Construction						
MTP 2045 Assigned ID or STIP ID	Project Type	Project Name	Facility	From	To	Estimated Cost
Roadway Projects						
U-5752	Intersection Improvements	US 70 Church St at St. Marks Church Rd, Intersection Improvements	US 70			\$4,278,000
U-5843	Intersection Improvements	US 70 Church St at Graham Hopedale Rd, Intersection Improvements	US 70			\$3,998,000
U-5538	New Route	Trollingwood-Hawfields Road to Industrial Site. Construct Two-Lane Road				\$3,740,000
U-3109	Roadway New Location	NC119 Bypass	NC 119 Bypass	I-40/85	South of Mrs. White Rd	\$164,482,000
U-6015	Signal Improvements	Burlington/Graham. Upgrade Signal System.				\$15,075,000
2025 Horizon STIP Projects						
MTP 2045 Assigned ID or STIP ID	Project Type	Project Name	Facility	From	To	Estimated Cost
Bicycle and Pedestrian Projects						
R-5787	ADA Upgrades	Division 7 ADA Upgrades	Systemwide			\$3,089,000
EB-5882	Sidewalks	Burlington, Graham-Hopedale Rd from W. Hanover Road to N. Mebane Street, Sidewalks	Graham-Hopedale Rd			\$147,960
EB-5884	Sidewalks	Graham, NC 87 (S. Main St) from Ivey Road to East Gilbreath Street, Sidewalks	NC 87 (S. Main St)			\$582,120
EB-5885	Sidewalks	Burlington, US 70 from Beaumont Avenue to Graham-Hopedale Road, Sidewalks	US 70 from Beaumont			\$129,600
EB-5887	Sidewalks	Graham, NC 49/NC 54 (Harden St) from W. Pine Street to N. Marshall Street, Sidewalks	NC 49/NC 54 (Harden St)			\$189,000

Roadway Projects						
I-5711	Interchange Improvements	Mebane Oaks Road Interchange Improvements	I-85/I-40	I-85/I-40	Mebane Oaks Rd	\$18,191,000
U-5844-subset /Hwy-10	Intersection	NC 54 Intersection	US 70 Church St	US70 / Church St.	NC 54	\$ -
U-6010	Intersection	Intersection Improvements and Widening of US 70 to Maintain Consistent cross-section with project U-5752	US 70 Church St	University Ave		\$4,900,000
U-6011	Intersection	Huffman Mill Rd. Intersection	US 70 Church St	Huffman Mill Rd		\$1,800,000
U-5752	Intersection	St.Marks @ Church St Intersection	US 70 Church St	St. Marks Church Rd	Church St.	\$4,278,000
U-6017	Intersection	NC 54 (W Harden St) at NC 49 (East Elm St) in Graham, intersection improvements	NC 54 (W Harden St)	NC 49 (East Elm St)		\$1,696,000
U-5843	Roadway	Graham Hopedale Rd. @ Church St Int.	US 70 Church St	Graham Hopedale Rd	Church St	\$1,163,000
U-6014	Roadway	SR 1716 Graham-Hopedale Rd from SR 1720 (W Hanover Rd) to Morningside Dr, widen to multilanes with bicycle/pedestrian accommodations	SR 1716 Graham-Hopedale Rd			\$15,900,000
U-5844	Roadway Widening	NC 62 / Alamance Road widening	NC 62	Ramada Rd	Church St	\$11,400,000
U-6009	Roadway Widening	US 70 (S. Church St) Tarleton Ave to Fifth St. Widen with Center Turn Lane.	US 70	Tarleton Ave	Fifth St	\$11,969,000
U-6013	Roadway Widening	SR 1981 (Trollingwood-Hawfields Rd) from SR 2126 (Old Hillsborough Rd) to Lowes Blvd in Mebane. Widen to Multilanes	NC 119	Trollingwood-Hawfields Rd	Lowes Blvd	\$9,500,000
2025 Horizon Year Estimated Project Cost					Projects Funded	\$276,507,680

Table 21: 2035 Horizon Projects

2035 Horizon Projects							
Safety and Maintenance Projects not Subject to STI Prioritization							
MTP2045 Assigned ID or STIP ID	Project Type	Project Name Facility	Estimated Cost				
Saf-01	Safety	HSIP/Safety projects in the BGMPO, 2026-2035	\$18,695,057				
Bridge-01	Bridge	Bridge replacement/maintenance in the BGMPO, 2026-2035	\$50,000,000				
InterMaint-01	Interstate Maintenance	Interstate Maintenance in the BGMPO, 2026-2035	\$50,000,000				
GenMaint-01	Other Roadway Maintenance	Other Roadway Maintenance in the BGMPO, 2026-2035	\$71,433,000				
MTP2045 Assigned ID or STIP ID	Project Type	Project Name	Facility	From	To	Estimated Cost-Statewide Funding Category	Estimated Cost-Regional or Division
Bicycle and Pedestrian Projects							
Various Bicycle and Pedestrian Projects	Bicycle and Pedestrian	Various					\$13,676,966
Transit Projects							
Tran-001B	Transit Capital	PART Route 4-replacement express bus capital purchase					\$500,000
Tran-003	Transit Capital	Mebane Park and Ride New Site or Expansion					\$2,000,000
MTP2045 ID or STIP ID	Project Type	Project Name	Facility	From	To	Transit Formula Funds	
Tran-018	Transit Capital	BGMPO Urban Transit Funding (5307)-Routine Capital and Vehicle Replacement				\$4,813,157	
Tran-019	Transit Operations	BGMPO Urban Transit Funding (5307)-Support for Ongoing Operating Expenses of Existing Transit Agencies				\$19,252,628	
Tran-020	Transit Planning, Capital and Operating Assistance	BGMPO Rural Transit Funding (5311)-Planning, Capital and Operating Assistance (including expected state and local match)				\$3,560,000	

Roadway Projects							
I-6004	Interchange Improvements	I-40/I-85 at Rock Creek Dairy Road, upgrade interchange	I-40/I-85	Rock Creek Dairy Road		\$5,510,000	
I-6009	Interchange Improvements	I-40/85 at Huffman Mill Road Interchange Improvements. Construct additional turn lane on I-40 WB ramp and improve operations at SR 1308 (Garden Rd) inters.	I-85/I-40	Huffman Mill Road		\$1,533,000	
U-6115	Intersection	NC 54 Intersection Improvements and Upgrade Culvert, Riverbend Road to Whittemore Road	NC 54	Riverbend Road	Whittemore Road		\$6,960,000
U-6131	Intersection	NC 54 Intersection Improvements at Maple Ave	NC 54	Maple Ave			\$1,600,000
U-6132	Intersection	N. Main Street W. Parker Street Intersection Improvements	N. Main Street	W. Parker Street			\$3,000,000
EB-5988	Sidewalks	Lee Ave from West Lebanon Ave to SR 1454 (W Haggard Ave) in Elon, sidewalks	Lee Ave	W Lebanon Ave	W Haggard Ave		\$265,680
Int-03	Interchange Improvements	I-40/I-85 at University Drive interchange improvements	I-40/I-85	University Ave		\$12,400,000	
Hwy-172	Intersection	Garden Road at Boone Station Dr Intersection Improvements	Garden Rd at Boone Station Drive				\$4,428,000
Hwy-174	Intersection	Anthony Road Intersection Improvement at Industry Dr	Anthony Road	Industry Drive			\$4,428,000
Hwy-175	Intersection	NC 49 (Maple Avenue) Intersection Improvement at Monroe Holt Rd	NC 49	Monroe Holt Road			\$2,100,000
Hwy-177	Intersection	Realign Anthony Road to connect to Kirkpatrick Road at NC 62.	NC 62 at Anthony Rd/ Kirkpatrick Rd				\$14,338,000
Hwy-194 Phase 1	Intersection	US 70 from NC 61 to Rock Creek Dairy. Modernization and Intersection Improvements. Phase 1: Preliminary Engineering and ROW.	US 70	Springwood Dr	Rock Creek Rd		\$4,428,000

MTP2045 Assigned ID or STIP ID	Project Type	Project Name	Facility	From	To	Estimated Cost- Statewide	Estimated Cost-Regional or Division
I-6059	Intersection	I-40/85 at Trollingwood-Hawfields Rd. Interchange Improvements	I-40/I-85	Trollingwood-Hawfields Road		12,400,000	
U-6183	Intersection	SR 1928 (Wilkins Rd) and SR 1927 (Bason Rd). Upgrade K-Type Intersection	SR 1928 (Wilkins Rd)				\$2,700,000
U-6184	Intersection	NC 54 at South O'Neal Street, intersection improvements	NC 54	SR 1445 (South O'Neal St)			\$1,900,000
U-6214	Intersection	E. Haggard W. Webb at University Drive Improve Intersection	E. Haggard	W. Webb at University Drive			\$13,100,000
Int-01	New Interchange	Tucker Street Interchange	I-85/I-40	Tucker St		16,200,000	
Int-02	New Interchange	Mattress Factory Road Interchange-new interchange	I-85/I-40	Mattress Factory Rd		16,200,000	
U-6182	New Traffic Signal/Turn Lanes	NC 87 Flora Avenue New Traffic Signal/Turn Lanes	NC 87	Flora Avenue			\$1,300,000
Hwy-151	Roadway Modernization	NC 54 Access Management	NC 54	W Elm St	Woody Dr		16,089,940
Hwy-29B	Roadway Modernization	Huffman Mill Rd operational improvements, access management, signal timing and complete streets elements from US 70 to Forestdale Rd	Huffman Mill Rd	US 70	Forestdale Rd		\$5,257,315
Hwy-29A	Roadway Widening	Huffman Mill Rd widening and intersection improvements, complete streets elements from Forestdale Rd to I-85	Huffman Mill Rd	Forestdale Rd.	I-85		\$6,639,595
Hwy-169	Intersection	Lebanon Road Intersection Improvements, Stagecoach Road to N. Frazier Rd	Lebanon Road	Stagecoach Rd.	N. Frazier Rd.		\$4,428,000

MTP2045 Assigned ID or STIP ID	Project Type	Project Name	Facility	From	To	Estimated Cost-Statewide Funding Category	Estimated Cost-Regional or Division
Hwy-170	Intersection	Westbrooke Avenue Intersection Improvements, University Drive to Ellen Drive	Westbrooke Avenue	University Drive	Ellen Drive		\$4,796,110
Hwy-178	Intersection	N. Main Street/US 70 Intersection Improvements	N. Main Street at US 70 Intersection				\$4,428,000
Hwy-181	Intersection	US 70 / Woodlawn Road/Moore Street Intersection-address safety, alignment, ped safety	US 70	Woodlawn Road/Moore Street			\$6,142,000
Hwy-183	Intersection	Huffine Street North and Burlington Avenue Intersection Improvement	Huffine Street / Burlington Avenue Intersection				\$4,428,000
Hwy-184	Intersection	Huffine Street South and Alamance St Intersection Improvement	Huffine Street / Alamance Street Intersection				\$4,428,000
Hwy-185	Intersection	Railroad Avenue	Alamance St./E. Railroad Ave./ Springwood Ave./Burke				\$4,428,000
Hwy-04	Roadway Modernization	University Ave Operational Improvements, signal timing and complete streets	University Dr	I-85/I-40	US 70		\$15,011,399
Hwy-157	Roadway Modernization	NC 49 (Maple Ave)	NC 49	Henry Road	I-85/I-40 West ramps		\$5,440,000
Hwy-159	Roadway New Location	NC 49 (Maple Ave) roadway realignment with complete streets and operations improvements	NC 49	I-85/I-40 Westbound ramps	NC 54 (Harden Rd)		\$16,840,000
Hwy-202	Roadway Widening & interchange improvements	Jimmie Kerr Corridor Widening from I-40/I-85 to US 70, to include interchange improvements	Jimmie Kerr	I-40/I-85	US 70		\$45,093,759

2035 Horizon Year Estimated Project Cost, Except for Maintenance, Safety and Transit Formula Projects, Subject to STI Prioritization	Projects Funded	\$62,710,000	\$228,753,765
2035 Fiscal Forecast (Funding Available), Except for Maintenance, Safety and Transit Formula Projects, Subject to STI Prioritization	Funding Available	\$171,555,100	\$228,753,765
HSIP/Safety Projects in the BGMPO, 2026-2035, not Subject to STI Prioritization	Funding Available	\$18,695,057	
Bridge and Roadway Maintenance Projects in the BGMPO, 2026-2035, not Subject to STI Prioritization	Funding Available	\$171,400,000	
BGMPO Urban Transit Funding (5307)-Support for Routine Capital Projects, not Subject to STI Prioritization	Funding Available	\$4,813,157	
BGMPO Urban Transit Funding (5307)-Support for Ongoing Operating Expenses of Existing Transit Agencies, not Subject to STI Prioritization	Funding Available	\$19,252,628	
BGMPO Rural Transit Funding (5311)-Planning, Capital and Operating Assistance (including expected state and local match), not Subject to STI Prioritization	Funding Available	\$3,560,000	

Table 22: 2045 Horizon Projects

2045 Horizon Projects							
MTP2045 Assigned ID or STIP ID	Project Type	Project Name	Facility	From	To	Estimated Cost-Statewide Funding Category	Estimated Cost-Regional or Division
Safety, Bridge and Maintenance Projects not Subject to STI Prioritization							
MTP2045 Assigned ID or STIP ID	Project Type	Project Name Facility		Estimated Cost			
Saf-01	Safety	HSIP/Safety projects in the BGMPO, 2036-2045		\$23,118,293			
Bridge-01	Bridge	Bridge replacement/maintenance in the BGMPO, 2036-2045		\$50,000,000			
InterMaint-01	Interstate Maintenance	Interstate Maintenance in the BGMPO, 2036-2045		\$50,000,000			
GenMaint-01	Other Roadway Maintenance	Other Roadway Maintenance in the BGMPO, 2036-2045		\$80,300,000			

MTP2045 Assigned ID or STIP ID	Project Type	Project Name	Facility	From	To	Estimated Cost-Statewide Funding Category	Estimated Cost-Regional or Division
Bicycle and Pedestrian Projects							
Bicycle and Pedestrian Projects		Various Bike/Ped projects, Implementation of Bike Ped Plans					\$29,083,978
Transit Projects							
Tran-004		Graham Park and Ride Lot Expansion					\$2,000,000
Tran-009		ACTA Additional Rural Areas Service-Expansion Vehicles					\$120,000
Tran-018	Transit Routine Capital	BGMPO Urban Transit Funding (5307)- Routine Capital and Vehicle Replacement				\$5,951,946	
Tran-019	Transit Operations	BGMPO Urban Transit Funding (5307)- Support for Ongoing Operating Expenses of Existing Transit Agencies				\$23,807,784	
Tran-020	Rural Transit- Planning, Capital and Operating Assistance	BGMPO Rural Transit Funding (5311)- Planning, Capital and Operating Assistance (including expected state and local match)				\$3,916,000	
ITS Projects							
MTP2045 Assigned ID or STIP ID	Project Type	Project Name	Facility	From	To	Estimated Cost-Statewide	Estimated Cost-Regional or Division
ITS-B1-A	ITS	Implement Bus on Shoulder, Enhanced Surveillance Cameras, Ramp Metering and additional supportive ITS strategies along I-40, BGMPO (Triad Regional ITS Strategic Deployment Plan)	I-40/I-85			\$2,159,300	

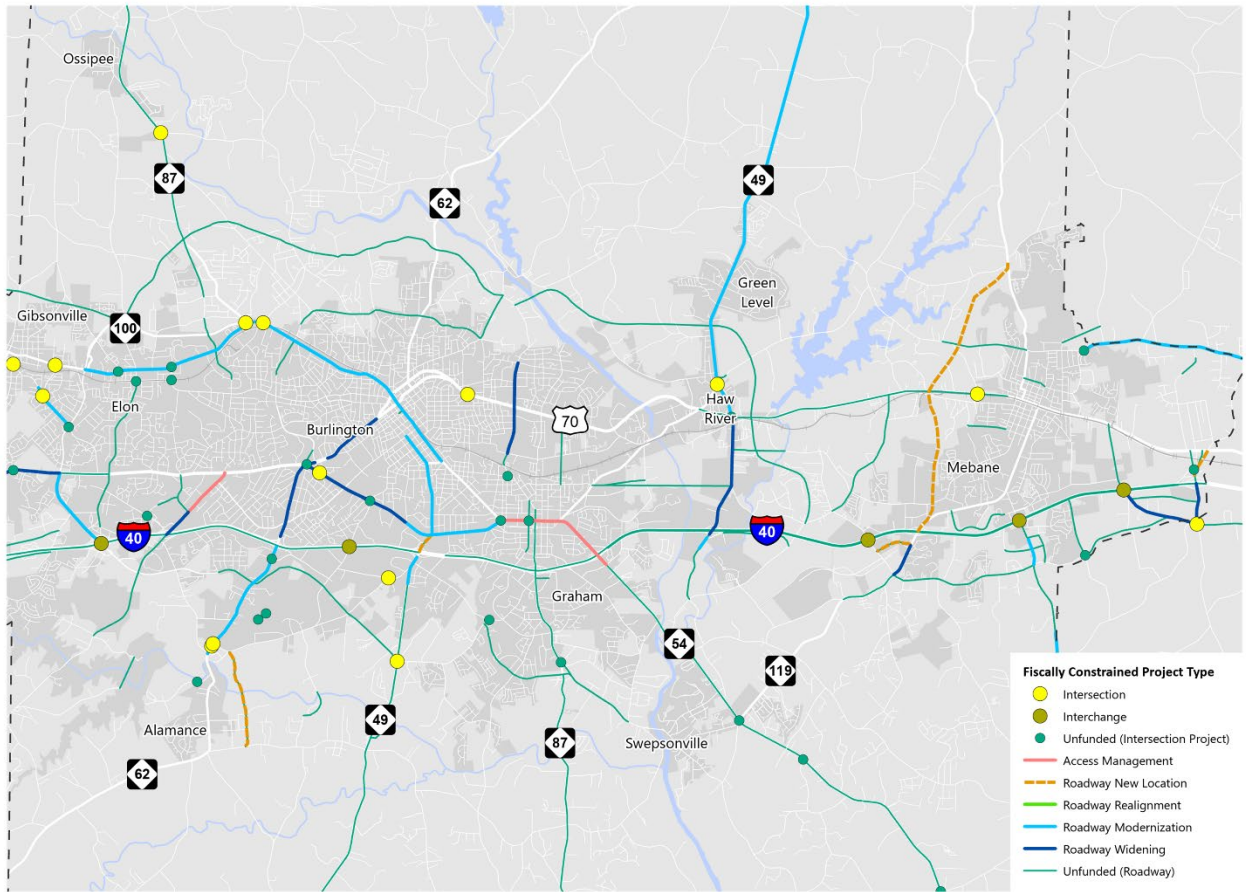
MTP2045 Assigned ID or STIP ID	Project Type	Project Name	Facility	From	To	Estimated Cost- Statewide Funding Category	Estimated Cost- Regional or Division
Roadway Projects							
Hwy-22	Roadway Widening	NC 54 from US 70 to Kilby St	NC 54	US 70	Kilby St.		\$5,636,552
Hwy-05	Roadway New Location	NC 62 Bypass	NC 62 Bypass	Bellmont - Alamance Rd	Kirkpatrick Rd		\$16,844,852
Hwy-150	Roadway Modernization	NC 54 Chapel Hill Rd/Harden St Modernization from Kilby St to NC 87 West Elm St	NC 54 from Kilby St to NC 87 West Elm St	Kilby St.	NC 87		\$13,219,876
Hwy-142	Roadway Modernization	NC 49 Maple Ave from NC 54 to Mebane St	NC 49 Maple Ave	NC 54	Mebane St		\$22,040,000
Hwy-156	Roadway Modernization	US 70	US 70	NC 62	Oneal Street		\$640,248
Hwy-166	Roadway Modernization	Mebane Oaks Road modernization, I-40/I-85 to Old Hillsborough Road	Mebane Oaks Road	I-40/I-85	Old Hillsborough Road		\$2,548,198
Hwy-28	Roadway Modernization	NC 87 NC 100 modernization with complete streets from Anthony St to N. Fisher St. Coordinate with Bike-069.	NC 87/NC 100	Anthony St	N. Fisher St.		\$12,137,259
Hwy-46	Roadway Modernization	E. Haggard Avenue	E. Haggard Avenue	N. Williamson Ave	NC87/100		\$12,035,336
Hwy-107	Roadway Widening	Buckhorn Road widening to multi-lane divided facility including I-40/I-85 Interchange Improvements	Buckhorn Road	W Ten Road	Just north of I-40/I-85 Interchange	\$12,604,992	
Hwy-113	Roadway New Location	Buckhorn Road widening and new location with above-grade crossing of RR to connect to US 70	Buckhorn Road	Frazier Rd and US 70	Just north of I-40/I-85 Interchange		\$8,056,673
Hwy-162	Roadway Modernization	Whitsett Park Road Modernization, NC 61 to Springwood Church Rd	Whitsett Park Road	NC 61	Springwood Church Road		\$12,146,628

MTP2045 Assigned ID or STIP ID	Project Type	Project Name	Facility	From	To	Estimated Cost-Statewide Funding Category	Estimated Cost-Regional or Division
Hwy-123	Roadway Modernization	NC 62 from I-40/I-85 to Hickory Hill Rd, modernization, intersection improvements and complete streets	NC 62	I-40/I-85	Hickory Hill Rd.		\$12,461,784
Hwy-154	Roadway Widening	US 70 Widening from W of University Dr to NC-61	US 70	West of University Drive	NC-61		\$14,722,580
Hwy-193	Roadway Modernization	NC 49 Roadway Modernization from Green Level Church Rd to NC 62	NC 49	Green Level Church Rd	NC 62		\$35,048,768
Hwy-108	Roadway New Location	Lowes Boulevard	Lowes Boulevard	NC 119	Trollingwood Hawfields Rd		\$6,302,496
Hwy-203	Roadway Modernization	Jimmie Kerr Corridor modernization from US 70 to Green Leven Church Rd	Jimmie Kerr	US 70	Green Level Church Road		\$7,427,000
Hwy-45	Roadway Modernization	Haggard Ave Modernization, University Dr to Williamson Ave	W. Haggard Ave	University Dr	Williamson Ave		\$8,516,002
Hwy-194 Phase 2	Intersection Improvements	US 70 from NC 61 to Rock Creek Dairy, Intersection Improvements and Modernization. Phase 2: Construction.	US 70	NC 61	Rock Creek Dairy Rd		\$24,858,663
Hwy-195	Roadway Widening	US 70 from NC 61 to Springwood Church Rd	US 70	NC 61	Springwood Church Rd		\$14,241,666
Hwy-155	Roadway Modernization	NC 87 (Webb Avenue) modernization from N Fisher St to E Haggard Ave to improve safety, include MUP and complete streets	NC 87 (Webb Avenue)	N Fisher St	East Haggard Avenue		\$15,382,515
Hwy-187	Intersection Improvements	Intersection improvements at Highway 87 North and Geringer Mill Road	NC 87	Geringer Mill Rd			\$2,904,000
Hwy-186	Roadway Modernization	Jimmie Kerr Road intersection improvements at the entrances to ACC and Bakatsias Ln	Jimmie Kerr Rd	ACC Driveway	Bakatsias Ln		\$1,298,103

Hwy-205	Roadway Modernization, Safety, Bicycle and Pedestrian	Implementation of additional intersection improvements, small operational and safety improvements and bicycle and pedestrian improvements identified in local and regional plans and safety analysis		\$ 5,291,350
2035 Horizon Year Estimated Project Cost, Except for Maintenance, Safety and Transit Formula Projects , Subject to STI Prioritization			Projects Funded	\$14,764,292
2035 Fiscal Forecast (Funding Available), Except for Maintenance, Safety and Transit Formula Projects, Subject to STI Prioritization			Funding Available	\$284,964,527
			Balance	\$213,710,569
				\$198,946,367
HSIP/Safety Projects in the BGMPO, 2026-2035, not Subject to STI Prioritization			Funding Available	\$284,964,527
Bridge and Roadway Maintenance Projects in the BGMPO, 2036-2045, not Subject to STI Prioritization			Funding Available	\$23,118,293
BGMPO Urban Transit Funding (5307)-Support for Routine Capital Projects, 2036-2045 not Subject to STI Prioritization			Funding Available	\$180,300,000
BGMPO Urban Transit Funding (5307)-Support for Ongoing Operating Expenses of Existing Transit Agencies, 2036-2045 not Subject to STI Prioritization			Funding Available	\$5,951,946
BGMPO Rural Transit Funding (5311)-Planning, Capital and Operating Assistance (including expected state and local match), 2036-2045			Funding Available	\$23,807,7840
				\$3,916,000

The map in Figure 65 below illustrates a zoomed-in version of roadway fiscally-constrained projects selected for 2045 Metropolitan Transportation Plan, as well as unfunded roadway projects which will become part of the future Comprehensive Transportation Plan update.

Figure 65: 2020-2045 Interstate Access Roadway Projects



Air Quality Conformity

Transportation conformity is required to ensure that Federal funding and approval goes to transportation activities that are consistent with air quality goals and applies to transportation plans, transportation improvement programs (TIPs), and projects funded or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) in areas that do not meet or previously have not met air quality standards for ozone, carbon monoxide, particulate matter, or nitrogen dioxide. These areas are known as "non-attainment areas" or "maintenance areas," respectively. A conformity determination demonstrates that the total emissions projected for a plan or program are within the emissions limits ("budgets") established by the air quality plan or State Implementation Plan (SIP). The requirement for transportation conformity is established in the United States Code of Federal Regulations (40 CFR 93.104).

U.S. EPA lists Orange County as maintenance for 8-Hour Ozone (1997) NAAQS-Revoked Standard²¹. On February 16, 2018, the United States Court of Appeals for the District of Columbia Circuit in *South Coast Air Quality Mgmt. District v. EPA* (“South Coast II,” 882 F.3d 1138) held that transportation conformity determinations must be made in areas that were either nonattainment or maintenance for the 1997 ozone national ambient air quality standard (NAAQS) and attainment for the 2008 ozone NAAQS when the 1997 ozone NAAQS was revoked. These conformity determinations are required in these areas after February 16, 2019. The Research Triangle Region was “maintenance” at the time of the 1997 ozone NAAQS revocation on April 6, 2015 and was also designated attainment for the 2008 ozone NAAQS on May 21, 2012. Therefore, per the South Coast II decision, this conformity determination would be required for the 1997 ozone NAAQS on the MTP. This conformity determination has to be consistent with CAA requirements, existing associated regulations at 40 CFR Parts 51.390 and 93, and the South Coast II decision, according to EPA’s Transportation Conformity Guidance for the South Coast II Court Decision issued on November 29, 2018.

Transportation projects in the Burlington Graham Metropolitan Transportation Plan could potentially impact air quality conformity determination for Orange County, with part of Orange County included in the BGMPO Planning Area. As part of the transportation planning processes, the BGMPO, the North Carolina Capital Area Metropolitan Planning Organization (CAMPO), the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO), and the North Carolina Department of Transportation (NCDOT) typically coordinate with regards to the transportation conformity process for amendments to the MTP and TIP for the respective MPOs (DCHC MPO, CAMPO, BGMPO). The following is a listing of key steps that are expected to take place after the MTP plan adoption by the BGMPO:

- BGMPO adoption the 2045 Metropolitan Transportation Plan (took place on June 16, 2020)
- Initial conformity partner consultation - request comment on schedule & report format
- BGMPO to provide tables of 2045 MTP projects to partner agencies
- Draft Conformity Determination Report complete and sent to MPOs and agency partners for review and comment
- MPO authorization to release draft conformity report for public comment and target date for receipt of all FHWA, FTA, EPA and DAQ comments established
- Updated draft of Conformity Determination Report with agency comments and responses released
- NCDOT Conformity finding for the donut areas
- Public hearing and action on Conformity Determination to be scheduled for each individual MPO
- Federal action (USDOT determination and letter to State/MPO); Conformity process complete

²¹ U.S. Environmental Protection Agency, North Carolina Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Data as of May 31, 2020.
https://www3.epa.gov/airquality/greenbook/anayo_nc.html

Appendix F to the plan includes the BGMPO 2045 MTP Preferred Scenario Travel Demand Model outputs which could be utilized as part of background documentation to support the Air Quality Conformity determination for Orange County.

Metropolitan Transportation Plan System Performance Report

6.1 Background

Pursuant to the Moving Ahead for Progress in the 21st Century Act (MAP-21) Act enacted in 2012 and the Fixing America's Surface Transportation Act (FAST Act) enacted in 2015, state Departments of Transportation (DOT), Metropolitan Planning Organizations (MPO), and public transportation providers must apply a transportation performance management approach in carrying out their federally-required transportation planning and programming activities. The process requires the establishment and use of a coordinated performance-based approach to transportation decision-making to support national goals for the federal-aid highway and public transportation programs.

On May 27, 2016, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) issued the Statewide and Nonmetropolitan Transportation Planning; Metropolitan Transportation Planning Final Rule (The Planning Rule).²² This regulation implements the transportation planning and transportation performance management provisions of MAP-21 and the FAST Act.

²² 23 CFR 450.314

In accordance with 23 CFR 450.324(f)(3)-(4)(i)(ii) of the Planning Rule, and the North Carolina Performance Management Agreement between the North Carolina Department of Transportation (NCDOT), the BGMPO and public transportation providers, NCDOT and each North Carolina MPO must include a description of the applicable performance measures and targets and a System Performance Report for the performance measures in their respective statewide and metropolitan transportation plans. The System Performance Report presents the condition and performance of the transportation system with respect to required performance measures and approved performance targets, and reports on progress achieved in meeting the targets in comparison with previous reports and the baseline. The Planning Rule specifies the following timeframes for when a state or MPO must include the System Performance Report:

- Highway Safety/PM1 - In any statewide or metropolitan transportation plan amended or adopted on or after May 27, 2018;
- Pavement and Bridge Condition/PM2 - In any statewide or metropolitan transportation plan amended or adopted on or after May 20, 2019;
- System Performance, Freight, and Congestion Mitigation and Air Quality/PM3 - In any statewide or metropolitan transportation plan amended or adopted on or after May 20, 2019;
- Transit Assets - In any statewide or metropolitan transportation plan amended or adopted on or after October 1, 2018;
- Transit Safety Measures - In any statewide or metropolitan transportation plan amended or adopted on or after July 20, 2021.

The BGMPO 2045 Metropolitan Transportation Plan (MTP) was adopted on June 16, 2020. Per the Planning Rule and the North Carolina Performance Management Agreement, the System Performance Report for the BGMPO MTP is included here for the required performance Measures.

The BGMPO recognizes the importance of linking goals, objectives, and investment priorities to stated performance objectives, and that establishing this link is critical to the achievement of national transportation goals and statewide and regional performance targets. As such, the BGMPO planning process directly reflects the goals, objectives, performance measures, and targets as they are available and described in other State and public transportation plans and processes; specifically, the North Carolina Strategic Highway Safety Plan, (SHSP), the HSIP, the Transportation Asset Management Plan (TAMP), the North Carolina Multimodal Statewide Freight Plan, the NCDOT Group Transit Asset Management Plan, and the current 2040 North Carolina Statewide Long Range Transportation Plan (SLRTP).

- The 2040 SLRTP provides a 30-year transportation blueprint for the state. The Plan summarizes the state's highest priorities for ensuring safety and preserving the existing transportation systems and focusing on services and facilities with statewide significance. Investment strategies identified in the 2040 SLRTP are intended to meet the mobility needs, ensuring safety

and promote economic growth for the state, and reflect optimal performance impacts across each investment program given anticipated transportation revenues.

- The North Carolina SHSP is intended to articulate the way forward to achieve Vision Zero, where even one fatality is too many on North Carolina roads. The SHSP's vision, mission, and goals guide the development and implementation of strategies and actions to achieve Vision Zero for the MPOs and other safety partners in addressing safety and defines a framework for implementation activities to be carried out across North Carolina.
- The HSIP annual report provide for a continuous and systematic process that identifies and reviews traffic safety issues across the state to identify locations with potential for improvement. The goal of the HSIP process is to reduce the number of crashes, injuries and fatalities by eliminating certain predominant types of crashes through the implementation of engineering solutions.
- MAP-21 requires States to develop a TAMP for all NHS pavements and bridges within the state. North Carolina's TAMP includes investment strategies leading to a program of projects that would make progress toward achievement of a State's pavement and bridge condition targets.
- The North Carolina Multimodal Statewide Freight Plan defines the conditions and performance of the state freight system and identifies the policies and investments that will enhance highway freight mobility well into the future. The Plan identifies freight needs and the criteria used to determine investments in freight, and prioritizes freight investments across modes.

6.2 Moving the Region towards Achieving Performance Measures Targets

Table 22 on the next page illustrates the federally-required performance measures and the latest performance measures targets adopted by the BGMPO, including PM1, PM2 and PM3 as well as Transit Asset Management targets. Baseline data was included based on the latest available data. The table provide information with regards to how the projects included in the 2045 Metropolitan Transportation Plan are advancing the region towards achieving those performance measures targets.

Table 22 BGMP 2045 Performance Measures Targets and Baseline Reporting

FHWA GOAL	Performance Measure	Definition	1-Year Targets	2-Year Target	4-Year Target	Target Setting Frequency	Baseline Performance based on 2019 NCDOT HSP (1) and 2018 NCDOT Report (2)	How MTP projects impact this performance measure
PM1-SAFETY	Number of fatalities	The total number of persons suffering fatal injuries in a motor vehicle crash during a calendar year (5-year average), 2020 Targets	1227.8			Annual	1291.4	2045 MTP carries forward HSP and safety improvements projects funding based on past funding trends and fiscal forecast; as part of MTP preferred scenario development an emphasis was made on roadway project targeting intersection improvements, operations and access management improvements-those improvements are expected to improve safety on the region's highways and streets; implementing bicycle and pedestrian improvements as part of NCDOT complete streets policy as well as investment in stand-alone bicycle and pedestrian projects is expected to improve safety for active transportation users
	Fatality Rate (per 100 million vehicle miles traveled)	The ratio of total number of fatalities to the number of vehicles miles traveled (VMT, in 100 Million VMT) in a calendar year (5-year average), 2020 Targets	1.084			Annual	1.24	
	Number of serious injuries	The total number of persons suffering at least one serious injury in a motor vehicle crash during a calendar year (5-year average), 2020 Targets	2812.8	N/A		Annual	5363.2	
	Serious Injury Rate (per 100 million vehicle miles traveled)	The ratio of total number of serious injuries to the number of VMT (in 100 Million VMT) in a calendar year (5-year average), 2020 Targets	2.462			Annual	5.12	
	Number of non-motorized fatalities and non-motorized serious injuries	The combined total number of non-motorized fatalities and non-motorized serious injuries involving a motor vehicle during a calendar year (5-year average), 2020 Targets	426.6			Annual	494.6 (2014-2018 average)	
PM2-PAVEMENT/ BRIDGE	Interstate	Percentage of pavements on the interstate in good condition	N/A	N/A	37.0%		63.63%	MTP fiscally-constrained recommended projects list includes ongoing maintenance funding for bridge maintenance, interstate maintenance and general roadway maintenance; this funding is expected to contribute to achieving and maintaining a required percentage of pavements on the region's roadways in good condition
		Percentage of pavements on the interstate in poor condition	N/A	N/A	2.2%		0.15%	
	Non-interstate	Percentage of pavements on the non-interstate in good condition	N/A	27%	21.0%	2- and/or 4-year	36.07%	
		Percentage of pavements in poor condition	N/A	4.20%	4.7%		1.20%	
	NHS Bridges	Percent of NHS bridges in good condition	N/A	33%	30.0%		38.10%	
PM3-SYSTEM PERFORMANCE	Performance of the National Highway System	Percent of person miles traveled on the Interstate system that are reliable	N/A	80.00%	75.0%		87.9%	Currently not applicable
		Percent of person miles traveled on the non-Interstate NHS that are reliable	N/A	N/A	70.0%	2- and/or 4-year	88.4%	
	Freight reliability	Interstate Truck Travel Time Reliability		1.65	1.70		1.46	
	Congestion reduction	Annual hours of peak-hour excessive delay per capita						
	Total Emissions Reduction	Percent of non-single-occupant vehicle travel (including travel avoided by telecommuting)						
	Sum of 2- and 4-year totals of emissions reductions of applicable criteria pollutant and precursor, in kilograms per day, for all projects funded with CMAQ funds		N/A					

FTA GOAL	Performance Measure	Definition	2019 PART TAM Targets	2019 NCDOT TAM Targets	Target Setting Frequency	Baseline Performance Report- PART (3)	Baseline Performance Report- Agencies under Statewide Plan	How MTP projects impact this performance measure
TRANSIT ASSETS	Rolling Stock*	Percentage of revenue vehicles (by type) that have met or exceeded their useful life (ULB)-14 year for bus; 10 years for cutaway bus; 8 years for minivan; 8 years for van	Bus: 4%; Cutaway bus: 25%; minivan: 89%; van: 21%	20.0%	Annual for transit agency; MPOs at TIP or MTP update	To be updated as baseline data is shared by NCDOT and transit providers	MTP fiscally-constrained recommended list of projects includes ongoing funding for routine capital to ensure routine maintenance, vehicles and facilities upkeep	
	Equipment*	Percentage of non-revenue service vehicles (by type) that have met or exceeded their useful life benchmark (ULB)-8 years for non-revenue auto; 8 years for trucks and other rubber tire vehicles	Custom 1.0%; Custom 2.0%; Custom 3.0%	20.0%				
	Facilities*	Percentage of facilities (by group) that are rated less than 3.0 on the transit economic requirements model (TERM) scale (includes administrative, maintenance, passenger facilities, storage)	Administration 0%; Maintenance 0%; Parking Structures 0%; Passenger Facilities 0%	20.0%				
PUBLIC TRANSPORTATION SAFETY	Fatalities	Total number of reportable fatalities and rate per total vehicle revenue miles by mode			Targets to be updated annually as part of transit agency Safety Plan; MPOs at TIP or MTP update	bus: 0; vanpool: 0	Data not yet available; to be updated upon initial target adoption by NCDOT and the BGMPPO	
	Injuries	Total number of reportable injuries and rate per total vehicle revenue miles by mode						
	Safety Events	Total number of reportable events and rate per total vehicle revenue miles by mode	Initial targets are due to FTA by July 20,2020; MPOs have 180 days after providers set and share their initial targets to establish their own targets	bus: 54/bus events per Million VRM: 38.4; vanpool: 0				
	System Reliability	Mean distance between major mechanical failures by mode		bus: 43,300; vanpool: 140,477 vehicle revenue miles between failures				

Notes

- (1) NCDOT Highway Safety Improvement Program 2019 Annual Report, 2019 <https://safety.fhwa.dot.gov/hsp/reports/pdf/2019/nc.pdf>
 - (2) NCDOT Baseline Performance Report, 2018 http://crtpo.org/PDFs/PerformanceBasedPlanning/NCDOT_Baseline_Performance_Period_Report.pdf
 - (3) Piedmont Authority for Regional Transportation 2020 Public Transportation Agency Safety Plan
- Safety performance targets as referenced the 2020 BGMPPO Safety Performance Targets Adoption Resolution, January 30, 2020
- Other performance measure targets as reported in Target Summary Table provided by NCDOT TPB
- *Agencies under the statewide transit asset management plan: Alamance County Transportation Authority (ACTA), Link Transit (City of Burlington), Orange County
- **Agencies with their own Transit Asset Management plan: the Piedmont Authority for Regional Transportation (PART) and GoTriangle

7.

Environmental Justice

7.1 Environmental Justice Overview

Transportation improvements can have negative impacts even as benefits are shared by the larger region. In the history of interstate highway system construction, too often low-income and minority neighborhoods bore the brunt of interstate construction. Major roadway projects often decimated and divided successful, vibrant minority communities²³. The BGMPO adopted a Title VI Program Plan on August 20, 2019. It is the policy of the BGMPO to ensure that no person shall, on the ground of race, color, national origin, Limited English Proficiency, sex, age, or disability, (and low-income, where applicable), be excluded from participation in, denied the benefits of, or subjected to any form of discrimination under any of the MPO's programs and activities, in compliance with all federal and state authorities requiring nondiscrimination. BGMPO's Title VI Program Plan can be reviewed in Appendix C.

Environmental Justice is a component of Title VI. A 1994 Presidential Executive Order (Executive Order 12898 of February 11, 1994, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*) directed federal agencies to incorporate environmental justice into their mission, and to identify and address the effects of their policies and activities on minority and low-income communities.

Environmental Justice (EJ), in the Federal Highway Administration definition, means "identifying and addressing disproportionately high and adverse effects of the agency's programs, policies, and activities on minority populations and low-income populations to achieve an equitable distribution of benefits and burdens"²⁴.

The US Department of Transportation (USDOT) promotes environmental justice as an integral part of various transportation planning stages—from the long-range planning and MTP update process through individual project development.

²³ Karas, D. (2015). *Highway to Inequity: The Disparate Impact of the Interstate Highway System on Poor and Minority Communities in American Cities*. New Visions for Public Affairs, Vol. 7, April 2015. Retrieved from

https://www.nashville.gov/Portals/0/SiteContent/Planning/docs/trans/EveryPlaceCounts/1_Highway%20to%20Inequity.pdf

²⁴ FHWA, Environmental Justice. https://www.fhwa.dot.gov/Environment/environmental_justice/

7.2 Degree of Impact Analysis

The 2045 Metropolitan Transportation Plan incorporates environmental justice by adhering to the following fundamental principles developed by USDOT:

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

The Degree of Impact (DOI) analysis utilized for 2045 Metropolitan Transportation Plan is based on the need to appropriately identify populations and geographic areas where residents have traditionally not been involved in the planning process or might have been disproportionately impacted negatively by transportation decisions. These populations have commonly been identified as environmental justice (EJ) populations. This Degree of Impact analysis highlights where it may be necessary to conduct enhanced follow-up studies of either the proposed transportation network or specific projects, should disproportionate negative impact be deemed likely. The DOI analysis is expected to be the first step in additional analysis and planning to refine recommendations on plans, programs, and projects.

The Degree of Impact analysis utilized for 2045 Metropolitan Transportation Plan involved identifying four transportation disadvantaged populations within the BGMPO planning boundary. These special populations considered were as follows:

- Minority populations
- Households in poverty
- Limited English Proficiency (LEP)
- Households with no vehicle

American Community Survey data were analyzed at the Census Block Group level and used to establish MPO planning area averages. Block Groups with EJ populations exceeding the planning area average were identified and a four-level DOI assessment scale is applied:

- Tracts with 0 EJ groups exceeding area averages denote No Concentration
- Tracts with 1-2 EJ groups exceeding area averages denote Moderate Concentration
- Tracts with 3-4 EJ groups exceeding area averages denote High Concentration

Proposed roadway, transit and bicycle and pedestrian improvements were mapped over the Environmental Justice map to help illustrate for decision makers where it may be necessary to conduct

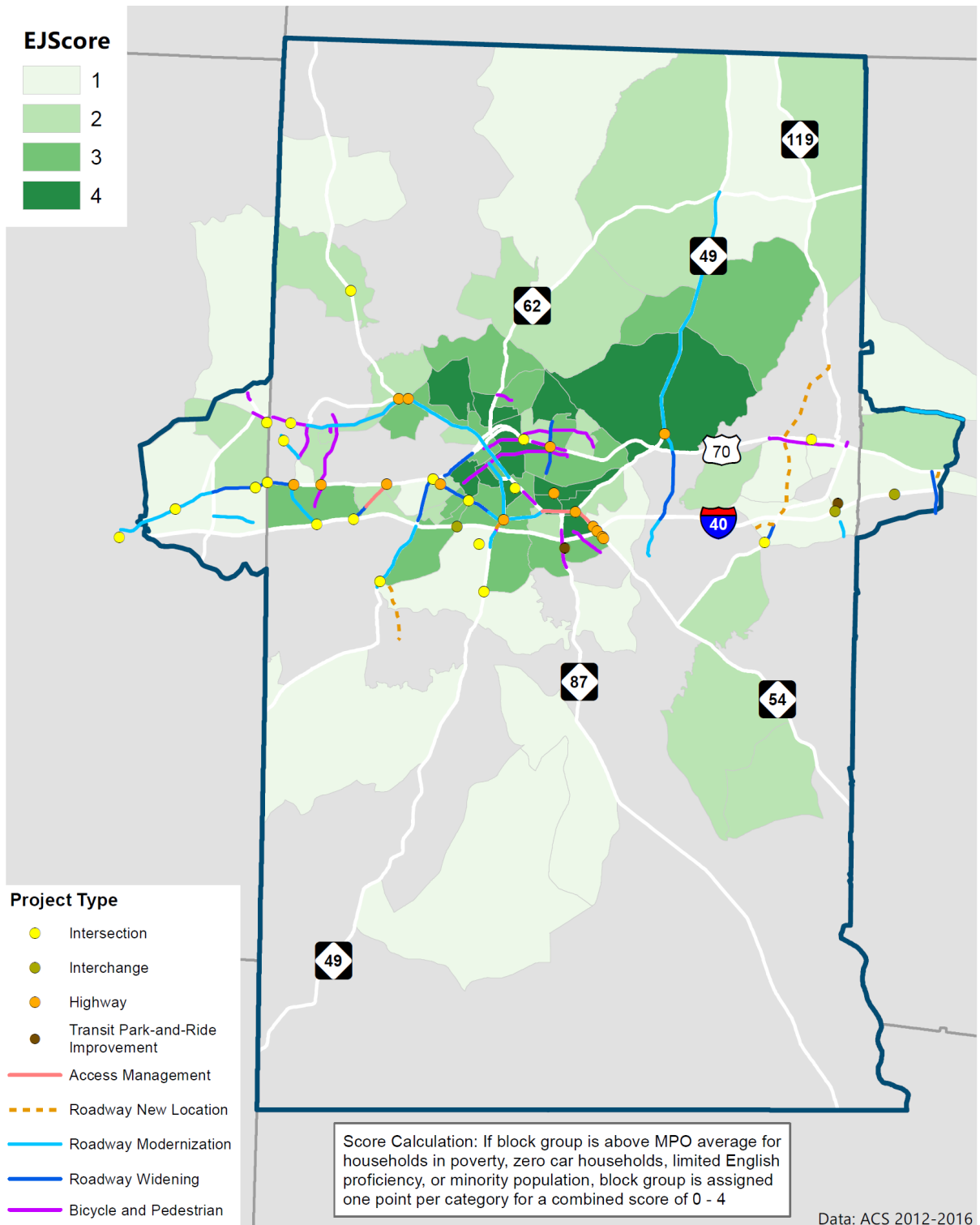
enhanced study of either the proposed transportation network, or specific projects. Table 23 below documents the breakdown of projects in the fiscally-constrained list by impact on block groups with a moderate or high EJ score. Note that row percentages for moderate EJ score and high EJ score within the same project type column do not add up to 100 percent due to the fact that the same projects is likely to have an impact on numerous block groups with a variety of scores.

Table 23: BGMPO Fiscally-Constrained Scenario Projects by Type, by EJ Score of Block Groups Potentially Impacted

EJ Level	Roadway New Location	Roadway Widening	Roadway Modernization	Interchange/ Intersection	Access Management	Bicycle	Pedestrian	Transit
At Least Some EJ Concern (any score >0)	100%	93%	88%	87%	100%	88%	93%	100%
Moderate EJ Score (1/2)	75%	67%	75%	59%	50%	75%	64%	50%
High EJ Score (3/4)	25%	53%	63%	31%	50%	50%	79%	50%

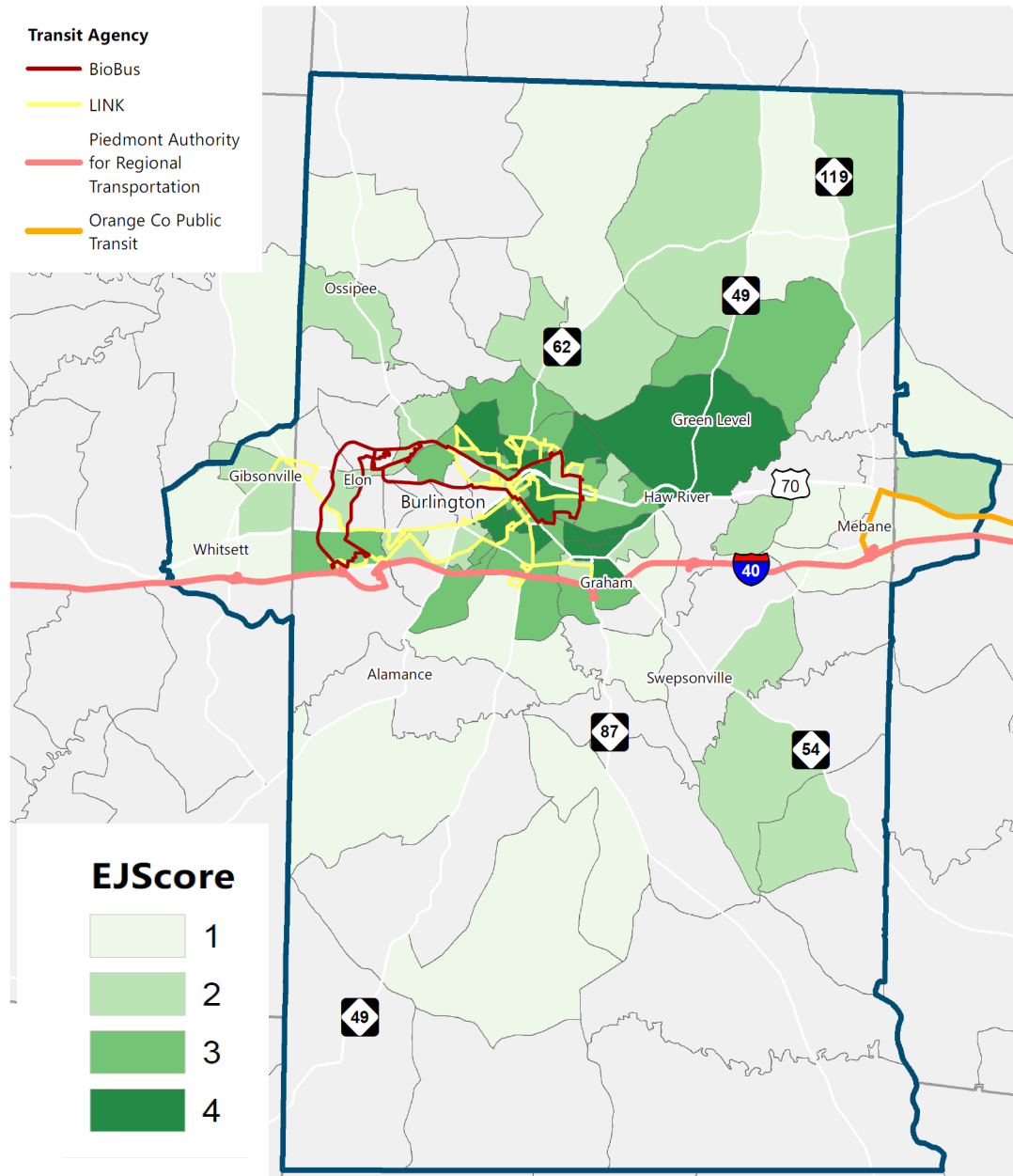
Figure 66 below overlays the fiscally-constrained Roadway Projects with Environmental Justice score by block group.

Figure 66: Fiscally-Constrained Projects and EJ Populations



An additional analysis of existing public transit routes was performed to review where public transportation might currently be underserving transportation-disadvantaged communities-see Figure 67 below. Parts of the region with an EJ score of 3 or 4 (high EJ concern) that appear to have limited connection to existing fixed route service include portions of Graham, and some of the areas in and around Haw River and Green Level, in between Burlington and Mebane, and north of the US 70 corridor.

Figure 67: Environmental Justice Score and Existing Transit Routes



The fiscally-constrained list of recommended public transportation projects does not include projects that would address the lack of service to those communities. Several service expansion projects included

on the unfunded list, in particular Graham Circulator, would improve access to public transportation for some of the Environmental Justice communities of concern. Expanding on-demand public transportation services throughout the County, including a potential pilot project to test micro-transit with same-day reservation option would be one key way the region could improve access to needed transportation and services for the transportation-disadvantaged populations.

Appendix A:

Transportation Acronyms

Term/Acronym	Definition
AADT	Annual Average Daily Traffic
ACTA	Alamance County Transportation Authority
ADA	Americans with Disabilities Act of 1990
ARRA	American Recovery and Reinvestment Act
ATLAS	Advancing Transportation through Linkages, Automation, and Screening
BGMPO	Burlington-Graham Metropolitan Planning Organization
BUY	Burlington-Alamance Regional Airport
CTP	Comprehensive Transportation Plan
DOI	Degree of Impact
E+C	Existing Roads plus Committed Projects
EJ	Environmental Justice
Environmental Justice	Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development and implementation of particular plans and investment programs. In the context of transportation projects planning and delivery, environmental justice seeks to identify and address disproportionately high and adverse effects of proposed decisions on transportation-disadvantaged populations including low-income populations and minority populations as well as potentially disadvantaged groups based on color, national origin, sex, age, disability, and limited English proficiency.
FAST Act	Fixing America's Surface Transportation (FAST) Act was signed into law on December 4, 2015. The FAST Act was the first multi-year federal transportation funding law in over a decade and authorized \$305 billion over fiscal years 2016 through 2020 for highway, safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs.
FHWA	Federal Highway Administration
Fiscally-Constrained	Funding sources are reasonably available over the life of the plan to cover the capital and operating cost of the proposed improvement
FTA	Federal Transit Administration
HERE	Real-time cell phone data
HSIP	Highway Safety Improvement Plan
ICM	Integrated Corridor Management
ITRE	Institute for Transportation Research and Education
ITS	Intelligent Transportation Systems
LEP	Limited English Proficiency

Link Transit	Link Transit is the local fixed route transit service provider for the City of Burlington and surrounding area, with five bus routes serving Burlington, Gibsonville and Alamance Community College.
LTV	Light Transit Vehicle
MAP-21	Moving Ahead for Progress in the 21st Century, MAP-21 is the federal transportation bill signed into law July 6, 2012. MAP-21 outlined funding for surface transportation programs for fiscal years 2013 and 2014.
MIS	Major Investment Study
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
NCDOT	North Carolina Department of Transportation
NCRR	North Carolina Railroad
OPT	Orange County Public Transportation
PART	Piedmont Authority for Regional Transportation
PBIN	Pedestrian and Bicycle Infrastructure Network
PE	Preliminary Engineering
PIP	Public Involvement Plan
POP	Program of Projects
Powell Bill Funds	State of North Carolina funds to build and maintain major city streets
PSA	Pedestrian Safety Audit
PTRM	Piedmont Triad Regional Travel Demand Model
ROW	Right-Of-Way
RPO	Rural Planning Organization
RSA	Roadway Safety Audit
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, SAFETEA-LU was the federal legislation authorizing U.S. highway and transit programs signed into law on August 10, 2005. SAFETEA-LU provided \$244.1 billion in funds over a five-year period through 2009. Numerous extensions to the SAFETEA-LU were adopted prior to the adoption of MAP-21 in 2012..
SPOT	Strategic Planning Office of Transportation (NCDOT)
STBG-DA	Surface Transportation Block Group – Direct Attributable
STI	Strategic Investments
STIP	State Transportation Improvement Program
SUP	Shared Use Path, also known as Multi-Use Path
TAC	Transportation Advisory Committee
TAZ	Traffic Analysis Zone
TIP	Transportation Improvement Plan
Title VI	Part of the Civil Rights Act of 1964, prohibits discrimination in any program receiving federal assistance
TMA	Transportation Management Area
TOD	Transit Oriented Development
TPM	Transportation Performance Management
TTI	Travel Time Index
UPWP	Unified Planning Work Program
USDOT	United States Department of Transportation
V/C	Volume-to-Capacity Ratio