Wake County Transit Plan MIS

System Transportation Problem Identification: BRT Corridors

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OVERVIEW

There are three overarching challenges that either now or in the future will affect mobility and accessibility within the BRT corridors defined in the Wake County Transit Plan. Implementation of BRT is intended to address these challenges. This document describes these three challenges and documents specific issues within each of the four corridors.

Challenge 1: Address existing and projected future roadway capacity issues

As documented in the existing conditions report, Wake County is set to experience rapid growth in population and employment in the coming years. By 2045, the county's population is expected to grow by 72%, or from less than 1 million in 2013 to more than 1.6 million in 2045. County employment is expected to grow by 43% by 2045 (from 2013 figures), with nearly 300,000 more jobs in the county by 2045. Much of this population and job growth will occur within the immediate vicinity of the BRT corridors or in the adjacent communities that make up the larger catchment areas for these transit investments. This growth will generate a significant amount of travel demand as new residents and employees go about their daily activities.

The corridors identified for BRT service already experience capacity issues which will continue to deteriorate without significant additional investment in infrastructure and services. The corridors are generally high-capacity arterials with few access restrictions, causing backups due to intersection delay and turning conflicts. All four BRT corridors terminate in downtown Raleigh, one of the highest density job centers in the region. The BRT corridors also include many other areas with high concentrations of jobs and/or population. Segments of all four BRT corridors are either already above capacity or are projected to be by 2045.

Challenge 2: Improve transit service

While transit service exists in all four corridors and most existing routes serving these corridors are well used, improvements are needed to create a competitive alternative to the automobile. Improvements to transit service quality will help retain and increase satisfaction of existing riders and provide choice and opportunities to attract new users. Improvements can be made in many aspects of transit service that can be offered by an investment in BRT infrastructure. These include transit supply (capacity, frequency, span); speed and reliability; efficiency and cost effectiveness; and improved passenger amenities.

Improvements to transit supply can be in the form of capacity, frequency, and span of service. Existing transit service in the BRT corridors may be hindered by lack of vehicle capacity at specific times of day, insufficient frequency to provide the type of flexibility customers need, or the unavailability of transit service at the times that people need it.

Two aspects of speed are important to transit service. First, transit speeds must be *predictable*. When speed is unpredictable, on-time performance suffers and customers are not able to rely on transit to get them where they need to go in the amount of time expected. Second, it is important for transit service to maintain *adequate* speeds to get people where they need to go in a reasonable amount of time. Transit will rarely travel as fast as an automobile given the same roadway conditions because transit vehicles make stops to pick up passengers. Transit service adds to this disadvantage when stops are spaced too closely and when transit vehicles are stuck in the same traffic as other vehicles and travelers.

Inadequate accessibility and piecemeal provision of passenger amenities can lead to decreased passenger access, comfort, and in some cases, safety issues. Lack of amenities such as benches, shelters, signage, lighting and technology items like real-time arrival information can increase perceived wait times and detract from customer satisfaction.

Challenge 3: Support local planning efforts to preserve and enhance the quality of life in Wake County

Cities and towns, universities, Metropolitan Planning Organizations (MPOs), counties, the state, and other organizations across the region are all planning for projected growth within the Triangle region and Wake County. Recognizing the limitations of finite space and resources, these local, regional, and state plans depend on transit investments to help realize their desired outcomes.

These plans are built around priorities such as economic development and social equity, focusing growth in specific areas, conserving resources, protecting the environment, increasing affordable housing, and improving access to opportunities for all.

Connect 2045, the Metropolitan Transportation Plan for the Capital Area and Durham-Chapel Hill-Carrboro MPOs, envisions a region with a transportation system that is:

> "a seamlessly integrated set of transportation services that provide travel choices to support economic development and that:
>
> - are compatible with the character and development of our communities,
> - are sensitive to the environment,
> - improve quality of life, and
> - are safe and accessible for all."

A county-wide issue that the BRT corridors aim to address is the lack of affordable housing, and the associated issue of access to jobs. Rapid population growth has placed upward pressure on the cost of housing, and this is expected to continue. With more of household incomes being dedicated to housing costs, less is available for transportation, which often makes up the second highest proportion of a low-income household's budget. The availability of affordable, reliable transit service can decrease a household's transportation spending significantly, allowing them more flexibility in housing options. High quality transit, such as BRT, expands the employment, medical, and retail access for affordable housing.

A second and related issue that BRT service will address, and that is a goal of many local and regional plans, is the lack of reliable and affordable transportation connections across Wake

County, with the particular desire to provide multi-modal access to jobs. The BRT corridors serve some of the highest density job centers in the county, including downtown Raleigh, North Carolina State University, and WakeMed, and connect the communities of Cary, Garner, and Raleigh. The BRT corridors of the Wake County Transit Plan provide an affordable, reliable travel option to these communities, with connections to even more residential areas and jobs through the high-frequency network included in the plan.

The next four sections describe in greater detail these three challenges as they relate specifically to each of the four BRT corridors.

CAPITAL BOULEVARD CORRIDOR

The Capital Boulevard BRT Corridor is broadly defined in the Wake County Transit Plan as Capital Boulevard from downtown Raleigh to the interchange with Wake Forest Road.

Existing and projected future roadway capacity issues

As one of the most heavily traveled corridors in Raleigh, Capital Boulevard serves as a gateway to downtown Raleigh from the north. The BRT corridor proposed for Capital Boulevard is envisioned to facilitate both existing and future bus routes into downtown Raleigh, allowing transit vehicles to bypass congestion in the corridor.

The Capital Boulevard infrastructure area is expected to add more than 14,000 residents and 19,000 jobs by 2045 (from base year 2013). These new residents and jobs will generate a significant amount of demand for travel that will be challenged by existing and projected future roadway capacity issues.

Triangle Regional Model volume to capacity (v/c) analyses revealed that in the 2010 base year, the segment of Capital Boulevard between downtown and Wake Forest Road (the BRT corridor identified in the Wake County Transit Plan) is above capacity, and by 2040, Capital Boulevard will be above capacity all the way to I-540. In 2040, Dawson and McDowell Streets, which form a one-way couplet through downtown Raleigh from the southern terminus of Capital Boulevard, are projected to be above capacity as well.

Transit service quality

Not only is Capital Boulevard one of the city's most highly traveled and congested corridors, it is also the corridor through which some of GoRaleigh's most productive transit service passes. Route 1 (Capital Blvd) is the highest ridership route in the GoRaleigh network (currently using a roadway parallel to the Capital Boulevard BRT corridor) and operates every 15-60 minutes, and Route 2 (Falls of Neuse), which uses a portion of the proposed Capital Boulevard BRT corridor, is also one of the top ridership routes, operating every 30-60 minutes. Given their strong ridership, an increase in service span and frequency from current levels would help to accommodate future ridership demand and ease potential overcrowding. Creating infrastructure that allows these routes to bypass major congestion chokepoints will improve the attractiveness of the service and facilitate ridership growth.

Additional service operated by GoTriangle and future planned transit service is slated for use of Capital Boulevard after implementation of BRT infrastructure that will improve transit speed and

reliability and the pedestrian environment. As described in the existing conditions report, the Capital Boulevard BRT corridor does not have high quality pedestrian facilities or transit amenities. Although the infrastructure area of the Capital Boulevard BRT corridor is expected to experience job and residential growth, it currently lacks the necessary pedestrian and transit stop infrastructure to support the use of transit to serve existing and future population and jobs.

Local planning efforts

Capital Boulevard, both within the extent of the BRT corridor and beyond, has been the subject of many planning studies and efforts. Recognizing the strategic importance of this corridor, these studies seek to implement roadway and land use improvements to boost economic development and ensure the continued success of the corridor well into the future.

- The 2015 Downtown Raleigh Plan calls for improved transit wayfinding, real-time information, enhanced bus stop amenities, transit-supportive intersection improvements, and TOD near or within the Capital Boulevard BRT corridor.
- The 2012 Capital Boulevard Corridor Study recommends intersection and other improvements to enhance safety, economic development, and pedestrian and bicycle access to the Capital Boulevard BRT corridor and beyond.
- Raleigh Union Station is a multi-modal transportation hub located in Raleigh's Warehouse District (just southwest of downtown Raleigh). Phase I, which constructs a new inter-city train station, commercial and public spaces, will be complete in 2018. The Raleigh Union Station bus transfer facility is currently in the design phase. The bus facility will provide a secondary downtown transfer location adjacent to Raleigh Union Station to accommodate transfers between local and regional bus service, BRT, and intercity and commuter rail service.

NEW BERN AVENUE CORRIDOR

The New Bern Avenue BRT corridor is broadly defined in the Wake County Transit Plan as New Bern Avenue from downtown Raleigh east to approximately the WakeMed Medical Center and I-440.

Existing and projected future roadway capacity issues

New Bern Avenue is central Raleigh's eastern gateway. The BRT corridor connects two major employment centers: downtown and WakeMed Medical Center, with several historic districts and varied uses in between.

The New Bern Avenue BRT infrastructure area is projected to grow by approximately 14,000 people and 25,000 jobs between 2013 and 2045.

The Triangle Regional Model v/c analyses showed that in 2010, New Bern Avenue was above capacity between Raleigh Boulevard and I-440 and that by 2040, New Bern Avenue will be above capacity between Raleigh Boulevard and I-540 and at capacity between Raleigh Boulevard and downtown Raleigh.

As with the Capital Boulevard corridor, existing and projected future capacity issues will present a challenge for the current infrastructure in accommodating the added travel demand generated by new residents and jobs.

Transit service quality

The New Bern Avenue BRT corridor has existing transit service in Route 15 (WakeMed), one of GoRaleigh's highest ridership routes and operates every 15-60 minutes. In addition, Route 18 (Worthdale) shares a portion of this service corridor, and it is also one of the higher ridership routes. Route 18 currently operates every 30-60 minutes. Given strong ridership on these two routes, an increase in service span and frequency from current levels would help to accommodate future ridership demand and ease potential overcrowding. GoTriangle Routes KRX and ZWX also operate in this service corridor. Creating infrastructure that allows these routes to bypass major congestion chokepoints will improve the attractiveness of the service and facilitate ridership growth.

In the western-most portion of the corridor closest to downtown, pedestrian facilities are present, but as the corridor widens and posted speeds increase, pedestrian facilities such as sidewalks are inconsistent or not available. Investments that improve pedestrian access and comfort will make travel by transit in this corridor a more competitive alternative to the automobile.

Local planning efforts

The 2012 New Bern Avenue Corridor Study, led by the City of Raleigh, recognized the historic and cultural significance of this corridor, as well as its key role as the eastern gateway into Raleigh. The study's purpose was to identify specific issues along the corridor and opportunities to enhance its appearance and function. The study recommended increased density, street and intersection improvements, urban design guidelines, multimodal improvements, and enhanced transit amenities in much of the New Bern BRT corridor.

The City of Raleigh will soon implement plans to improve sidewalks on New Bern Avenue from Tarboro Road to Sunnybrook (the western portion of the BRT corridor). Construction is set to begin in late 2018 to early 2019 and completion expected fall of 2019.

SOUTH WILMINGTON STREET CORRIDOR

The South Wilmington Street BRT corridor is broadly defined in the Wake County Transit Plan as South Wilmington Street from downtown Raleigh to South Saunders Street and then proceeding to the intersection of US 401 and US 70 business.

Existing and projected future roadway capacity issues

The South Wilmington Street BRT infrastructure area is expected to see the highest percentage growth rate of all four BRT corridors, with population and employment projected to more than double between 2013 and 2045. Population is expected to grow by about 18,000 residents (a 159% increase) and employment is expected to grow by more than 24,000 jobs (a 174%

increase). This level of growth will have significant impacts on existing transportation infrastructure.

The Triangle Regional Model v/c analyses indicated that between 2010 and 2040, congestion between Garner and downtown Raleigh is expected to grow so that S. Saunders will be above capacity.

Transit service quality

GoRaleigh Route 7 (South Saunders) is a high frequency, high ridership route that currently serves South Saunders Street, which is parallel and proximate to the South Wilmington BRT corridor. Service on Route 7 is provided every 15-60 minutes. GoRaleigh Route 40x provides service every 30 minutes between downtown Raleigh and Wake Tech Community College on weekdays, with reduced schedules during semester breaks and holidays. GoTriangle also provides service between Garner and downtown Raleigh in a parallel corridor (Route 102) and between Fuquay-Varina and downtown Raleigh using the Wilmington corridor (Route FRX). Creating a consistent, high frequency corridor serving many of these markets would enhance system legibility and usefulness, improving service for existing riders and attracting new customers.

Similar to the New Bern corridor, the portions of the corridor closer to downtown Raleigh have sidewalks but pedestrian facilities and amenities are inconsistent or do not exist as the corridor progresses south. Along with increasing congestion that will continue to degrade transit travel times and reliability, lack of consistent pedestrian infrastructure impedes transit's ability to attract new riders and maintain high quality service for current customers.

Local planning efforts

The 2017 Southern Gateway Corridor Study evaluated the three-mile corridor comprising South Saunders and South Wilmington Streets between downtown Raleigh and Tryon Road. In addition to identifying development opportunities and strategies to capitalize on the corridor's excellent location, the study recommends transforming South Wilmington Street into a complete street with dedicated transit lanes for BRT and other improvements. It envisions South Wilmington Street as a walkable, transit-oriented spine that will support mixed-use development and better serve the adjacent neighborhoods and business districts, which have suffered from lack of investment and focus on getting people through, not to, the area. Critical safety and connectivity improvements are also recommended to enhance pedestrian and bicycle safety and access.

The Garner Forward Comprehensive Plan identified development opportunities and strategies around North Garner Station, which serves the existing GoRaleigh Route 7. The Garner Forward Transportation Plan also evaluated a potential circulator route to provide connections from Garner to BRT infrastructure.

The Raleigh Downtown Plan (2015) recommended several improvements to enhance future BRT service in the Wilmington Street corridor. These included bike lanes on Wilmington and Salisbury Streets, which have already been implemented; intersection redesigns to enhance pedestrian safety; and a study to determine whether two-way traffic should be reinstated on Wilmington Street through downtown Raleigh.

WESTERN CORRIDOR

The Western Boulevard BRT corridor is broadly defined in the Wake County Transit Plan as Martin Luther King, Jr. Boulevard from downtown Raleigh to Western Boulevard proceeding to downtown Cary.

Existing and projected future roadway capacity issues

The Western Boulevard BRT corridor, the longest of the four BRT study corridors, stretches from downtown Raleigh in the east, past North Carolina State University's three Raleigh campuses (Main, Centennial, and Centennial Biomedical) and west into the heart of Cary. Unsurprisingly, since the area has the largest land area, this corridor's infrastructure area has the largest anticipated growth in population and jobs, with about 53,000 new residents and 78,000 new jobs expected by 2045 (base year 2013).

Adding tens of thousands of new jobs and residents will have a significant impact on the area's transportation infrastructure and services. According to the Triangle Regional Model v/c estimates, in 2010, Western was above capacity between I-440 and Avent Ferry Road. By 2040, it is expected to be above capacity from I-440 and downtown Raleigh.

Transit service quality

GoRaleigh Route 11 (Avent Ferry) serves a portion of the Western Boulevard BRT corridor, as do seven Wolfline (North Carolina State University's transit system) routes. Regional service along this route is provided by GoTriangle's 300-series routes (300, 301, and 305) between Raleigh and Cary. These routes operate at relatively long headways, with service to the full corridor every 30-60 minutes. These routes are also faced with long and sometimes unpredictable or unreliable travel times within the corridor due to varying traffic levels and corridor length. In order for transit agencies to provide an attractive alternative to automobile transit, travel times need to be faster and more predictable than they are at present.

GoTriangle also operates four routes on Hillsborough Street between I-440 and downtown Raleigh. Hillsborough Street is congested, has a large number of signals, and a 25 mph speed limit, which all combine into slow travel times. BRT infrastructure on Western Boulevard could speed regional service between downtown Raleigh and Chapel Hill, Durham, and RTP if these routes shift alignments to Western Boulevard.

The pedestrian and transit amenity environment along the Western Boulevard BRT corridor is, like the other three corridors, inconsistent and lacking in some areas. The corridor fluctuates significantly in character and right-of-way width, making navigation difficult for anyone on foot or bicycle.

Local planning efforts

This corridor passes through multiple jurisdictions and areas and has been the subject of study by multiple entities.

- The Raleigh Downtown Plan (2015) recommended an intersection redesign on Martin Luther King, Jr. Boulevard in downtown Raleigh to enhance pedestrian safety.

- The 2013 Western Boulevard Crossing Study conducted jointly by NCSU, City of Raleigh, CAMPO, and NCDOT, focused on safety and mobility of users of the section of Western Boulevard that passes by NCSU Main Campus. The study recommended various improvements, including a grade-separated pedestrian crossing of Western Boulevard at Avent Ferry Road.
- The Cary Community Plan 2040 recommends redeveloping older commercial properties and realigning new development to create consistent street frontage along a segment of the Western Boulevard BRT corridor near downtown Cary (Cary Towne Boulevard). Two special planning areas in the Cary Community Plan support high-capacity transit investment in the corridor:
    - In the Eastern Cary Gateway Special Planning Area along Cary Towne Boulevard, the Cary Community Plan calls for employment- and commercial-based mixed use centers, as well as multi-family housing and civic uses to line the corridor and to collectively function as a high-density gateway to Cary from Raleigh. Along the Chatham Street corridor, the plan calls for mixed-use, multi-family and business center transit-oriented development.
    - In the Downtown Cary Special Planning Area along both corridors, the plan calls for higher density mixed use development that would support high-capacity transit infrastructure and service.
- Two ongoing studies in the corridor may provide additional recommendations: a Corridor Study for Avent Ferry Road, a corridor that intersects Western Boulevard and connects to NCSU's campuses, and a master planning process for Dorothea Dix Park, which is adjacent to the Western Boulevard Corridor west of downtown Raleigh.

In addition to municipal and university plans, additional development is anticipated along the Western Boulevard BRT corridor. Enhanced transit service can support the continued growth of NCSU's Centennial Campus, the Dorothea Dix Park redevelopment, and the Spring Hill property.

CONCLUSION

This document has summarized the challenges that the BRT corridors included in the Wake County Transit Plan are intended to address. Wake County's population is growing at a rapid pace, and is projected to continue growing rapidly decades into the future. While this growth will bring innovation and new opportunities into the area, the county must strategically plan for this growth to preserve and enhance the quality of life for current and future residents. The BRT investments called for in the Wake County Transit Plan are part of this larger strategic planning effort, aiming to provide affordable, reliable transportation solutions that will ease congestion, connect communities in Wake County, help to keep housing affordable, and provide access to jobs.