Wake County Transit Plan MIS

Existing Conditions Report

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1 Introduction

This Existing Conditions and Constraints Report is part of a series of reports initiating the Wake Transit Plan Bus Rapid Transit (BRT) Major Investment Study (MIS). Implementing a BRT system was one of the key elements of enhancing urban mobility identified in the Wake Transit Plan, approved in 2016. This report summarizes the travel market analysis and existing conditions along the BRT corridors identified in the Wake County Transit Plan. The information in this report provides a baseline that will help define the Purpose and Need for the project and ultimately guide the evaluation and selection of a Locally Preferred Alternative for the corridors.

This report is divided into the following sections:

- Section 2 documents previous BRT-related planning that has happened in the corridors;
- Section 3 describes the existing and future population and employment projections, travel market demand analyses and findings;
- Section 4 describes the existing transportation network, including transit, roadways, and non-motorized facilities;
- Section 5 outlines the existing traffic levels and the existing levels of congestion at key intersections; and
- Section 6 gives a high-level overview of environmental and social features in the four BRT corridors.

WAKE COUNTY TRANSIT HISTORY

The Triangle region is one of the fastest growing regions in the nation. Wake County is home to an economically, socially, and demographically diverse population. The goals and needs of residents and employees in the County are equally varied. The current Wake County population of more than 1 million grows by 63 people per day, or roughly 23,000 per year. This growth brings new jobs and opportunities, but also more traffic on already congested roadways. The existing transit service in Wake County is difficult to rely on, with infrequent bus service and areas with no transit options.

Expanding the transit system is a strategy that offers long-term benefits. High quality transit services encourage people who value transit to locate near good transit services. Over time, this increases the “fit” between the transit system and the population, leading to increased ridership growth and housing, offices, and retail environments that provide the full range of lifestyle options the market demands. Enhanced transit can also help Wake County remain competitive in a global economy by making it easier for employees to get to their jobs, thus helping businesses attract and retain talent.

The Wake County Transit Plan, approved in November 2016, includes an investment of $2.3 billion in the first 10 years of implementation to improve local transit options. A combination of local, regional, state and federal funding as well as farebox revenue will be needed to help pay for the improvements recommended in the Wake County Transit Plan. The primary funding will come from a voter-approved half-cent sales tax advisory referendum, also approved in November 2016. Other local funding will include increased county and regional vehicle registration taxes. The recommendations of the Wake County Transit Plan give everyone options to get around our vibrant community, expand access and opportunities, and help connect more people to jobs, schools and entertainment.

Big Moves of Wake Transit Plan

The Wake Transit Plan[1] envisioned four "big moves" to connect the region across county lines, connect all Wake County communities to the transit network, provide frequent, reliable urban mobility to the densifying areas of the County, and give enhanced access to transit across Wake County. The Plan recommended the following to make these big moves possible:

a. Increasing bus service
b. Implementing Bus Rapid Transit (BRT)
c. Implementing Commuter Rail Transit (CRT)
d. Funding local service
e. Expanding Rural On-Demand service

BRT CORRIDORS

Bus Rapid Transit (BRT) is a high-quality bus-based transit system that delivers fast, comfortable, and cost-effective service. The system can include many different speed and reliability improvements, including exclusive busways in many locations as well as priority treatment at traffic signals and fixed stations with off-board fare collection to speed boarding. The Federal Transit Administration (FTA) typically requires that at least 50 percent of the BRT route is in its own dedicated guideway (and not mixed with vehicle traffic) to fund a project. BRT typically costs much less to implement than light rail. It is quicker than conventional bus service when operated in exclusive guideways, and provides the ability to move large numbers of people in urban areas. While light rail is a viable option in highly populated areas, BRT can be implemented effectively in medium-sized or lower density urban areas because of its lower costs and reduced barriers to implementation. BRT is currently not offered in any of the metro areas in North Carolina.

The Wake Transit Plan identified four potential BRT corridors (see Figure 1 below), at a minimum, including:

[1] Wake Transit Plan: A Wake County Transit Investment Strategy Report, November 2016.

a. Capital Boulevard Corridor: 3 miles along US 70/US 401 (Capital Boulevard) from the Wake Forest Road/Capital Boulevard interchange to North Dawson Street and North McDowell Street

b. New Bern Corridor: 4 miles along New Bern Avenue between WakeMed Campus and Blount Street

c. Wilmington Street Corridor: 4 miles along South Wilmington Street from Western Boulevard/Martin Luther King Jr. Boulevard to Purser Drive/Pinewinds Drive in Garner

d. Western Boulevard Corridor: 9 miles along Western Boulevard and/or Hillsborough Street between Person Street, Raleigh and Academy Street, Cary.

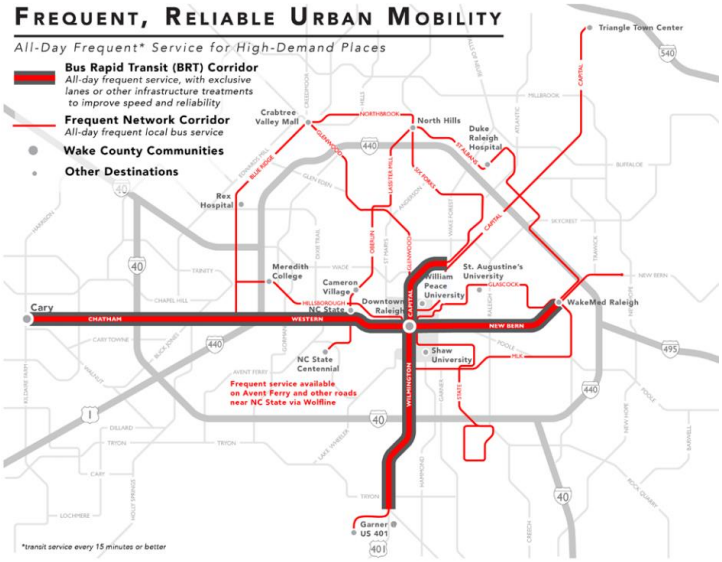
The four BRT corridors represent over 20 miles of major arterials in Wake County and are considered the four gateways to downtown Raleigh (see Figure 2 below). Each of the corridors include a significant number of signalized intersections and interchanges.

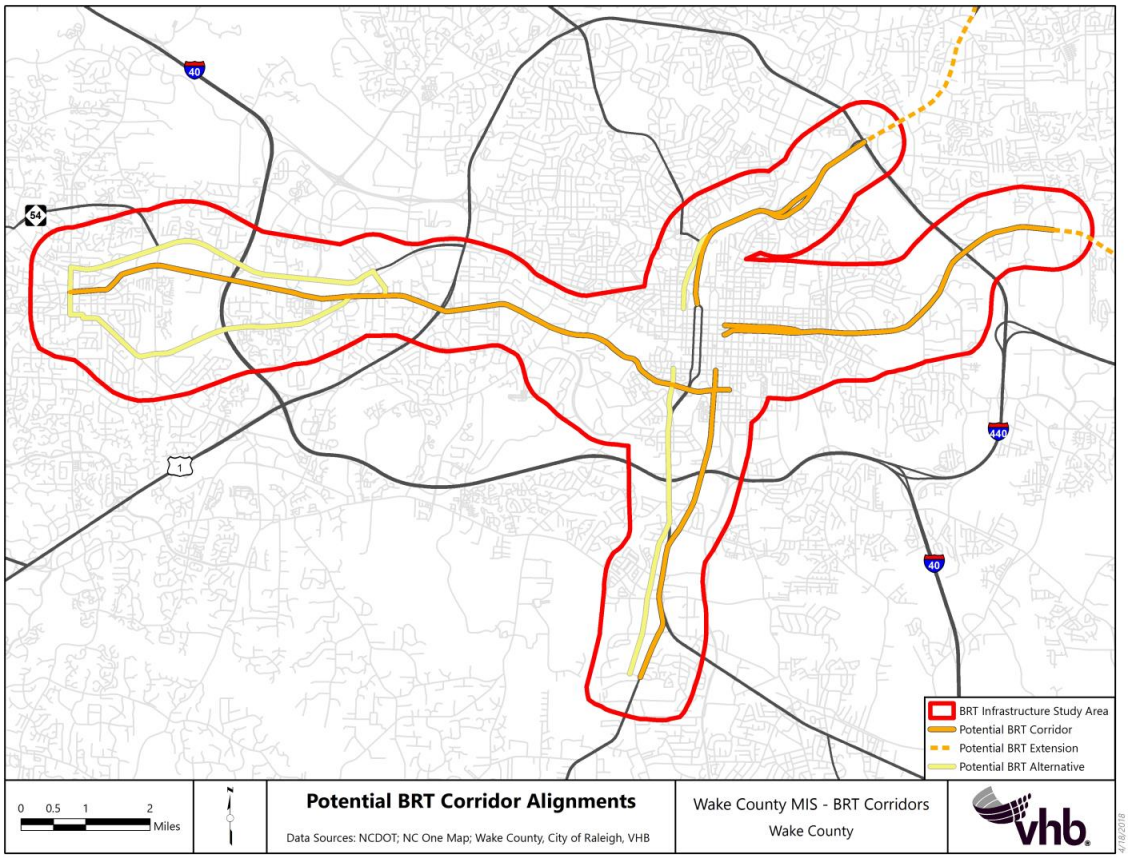
For the purposes of this study, the study area for each of the four corridors is divided into infrastructure and service areas. The infrastructure area represents the spatial areas in which transit stops and stations typically have the greatest impact on land use and development and from which there is high potential to generate transit ridership. The Capital and New Bern corridors (Figure 2) have been extended beyond the limits of the corridors shown in Figure 1 to provide for the analysis of logical termini of each corridor's infrastructure. For study purposes, the Capital corridor has been extended to I-440 and the New Bern corridor has been extended to New Hope Road.

The service area is a larger transit influence area that extends outside the infrastructure area and includes areas that will be affected by the BRT service in the corridor. Based on the market analyses findings, bus enhancements may be recommended in the service area to provide feeder service to the BRT corridor. Refer to Figure 4 and table in Appendix 3-A for details and locations of these districts.

The infrastructure study areas do not include the Central Business District (CBD) of downtown Raleigh and Cary. Transit infrastructure in downtown Raleigh will be addressed by a separate study being done by the City of Raleigh and in downtown Cary by a separate study being done by Town of Cary. This study will coordinate with the City of Raleigh CBD study and Town of Cary downtown multimodal study.

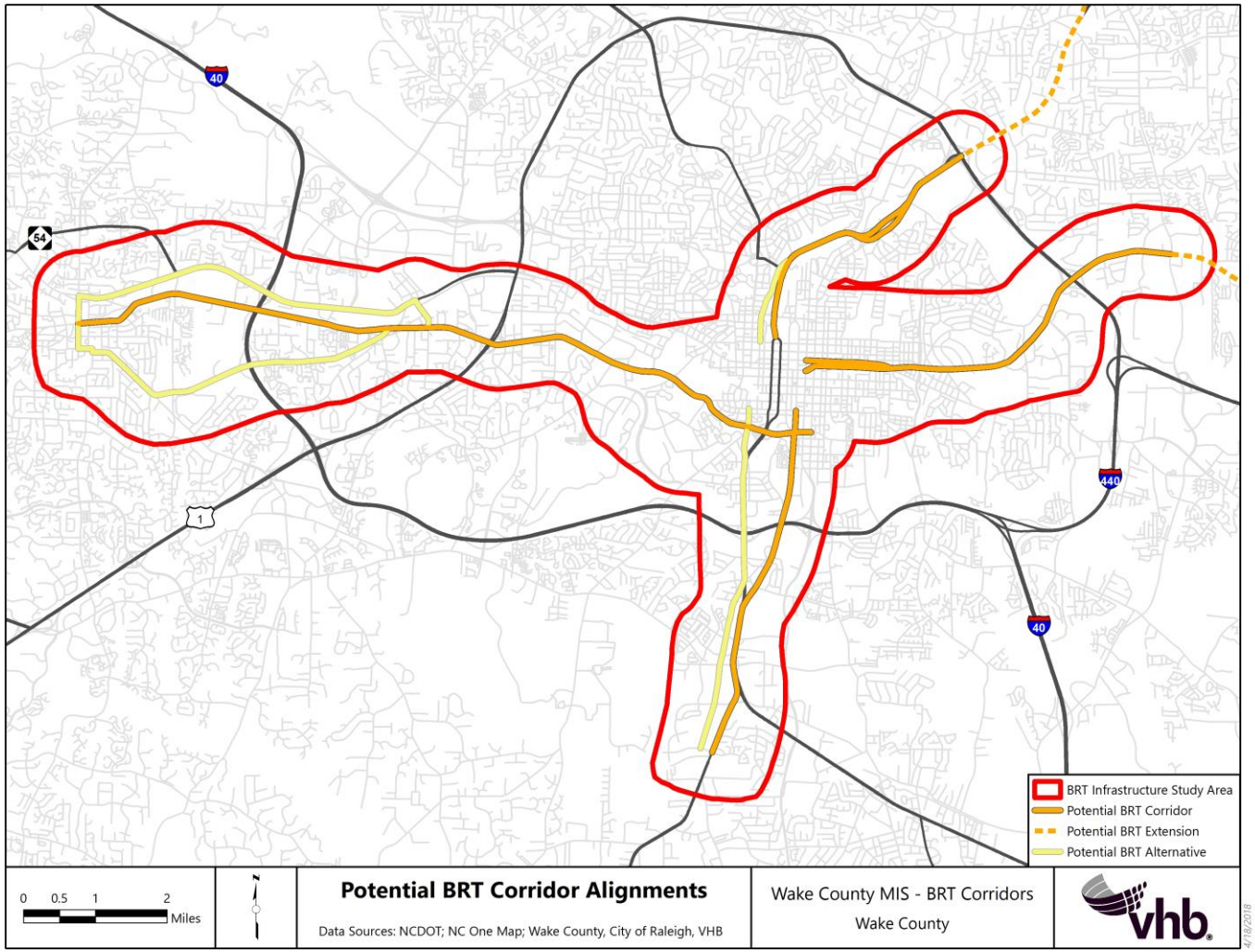
Figure 1: Frequent and Reliable Urban Mobility





Source: Wake County Transit Plan

Figure 2: Wake Transit Plan Proposed BRT Corridors



Capital Boulevard Corridor

The Capital Boulevard corridor includes areas along US 70/US 401 (Capital Boulevard) between North Dawson Street and North McDowell Street to I-440 in the north. Based on the recommendations in the Wake Transit Plan, the actual BRT infrastructure of the Capital Boulevard corridor will only extend through the interchange of Capital Boulevard with Wake Forest Road. The larger infrastructure area to I-440 is included to assist in the logical termini of the actual infrastructure improvements. This corridor, from I-440 to downtown Raleigh, is one of the most visible and important transportation corridors in the City. It is one of the most heavily travelled and most complex gateways into downtown Raleigh.[2] One of the key visions of the Capital Boulevard corridor study (June 2012) was to improve transit access within the corridor by providing new routes for bus services, improving the pedestrian realm, and capitalizing on future rail investments.

Infrastructure Area

The infrastructure area covers a ½-mile buffer on either side of the possible corridor alignment alternative. Infrastructure conditions such as traffic conditions, environmental and social characteristics, and roadway geometrics are analyzed within this area. This is the area where infrastructure improvements will be recommended for the Capital Boulevard corridor. Based on the traffic analysis zone (TAZ) boundaries identified in the Triangle Regional Model (TRMv6), the infrastructure area is divided into four (4) districts by aggregating the TAZs. The districts are divided based on the geographic location and any physical boundary that may prevent movement of traffic.

The infrastructure area for this corridor is primarily a mix of commercial, industrial, single-family, and high-density residential uses. Single-family residential uses are located towards the fringe of the infrastructure area. Poor access to adjacent land uses and a substandard image have kept away the type of retail, service, office, and multifamily developments that are typically attracted to high-volume arterial roadways. However, the 3-mile corridor has four distinctive districts due to land use, parcel size, building façade, streetscape and demographic characteristics. The infrastructure districts for this corridor includes areas of Five Points, East Mordecai, Belvedere Park and Atlantic Ave. Figure 3 shows the locations of the infrastructure area and associated districts.

[2] Capital Boulevard corridor study report, June 2012

Service Area

The service area is a larger transit influence area that extends outside the infrastructure area and includes areas that will be affected by the BRT service in the Capital Boulevard corridor. The purpose of this extended area is to study the potential travel market for BRT (i.e., the population that may use the BRT corridor). Based on the TAZ boundaries identified in the TRMv6, the service area is divided into eight (8) districts by aggregating the TAZs. Service districts extend to the north and northeast of the infrastructure area and include the area as far north as I-540. Land use in the service area is mostly single-family residential. Service areas for this corridor include Hi-Mount/Forest Acres, Brentwood, East Raleigh, North Raleigh, Northeast Raleigh, Rolesville, Spring Valley and North Hills. Figure 4 shows the locations of the service area and associated districts.

Figure 3: Capital Boulevard BRT Corridor Infrastructure Area

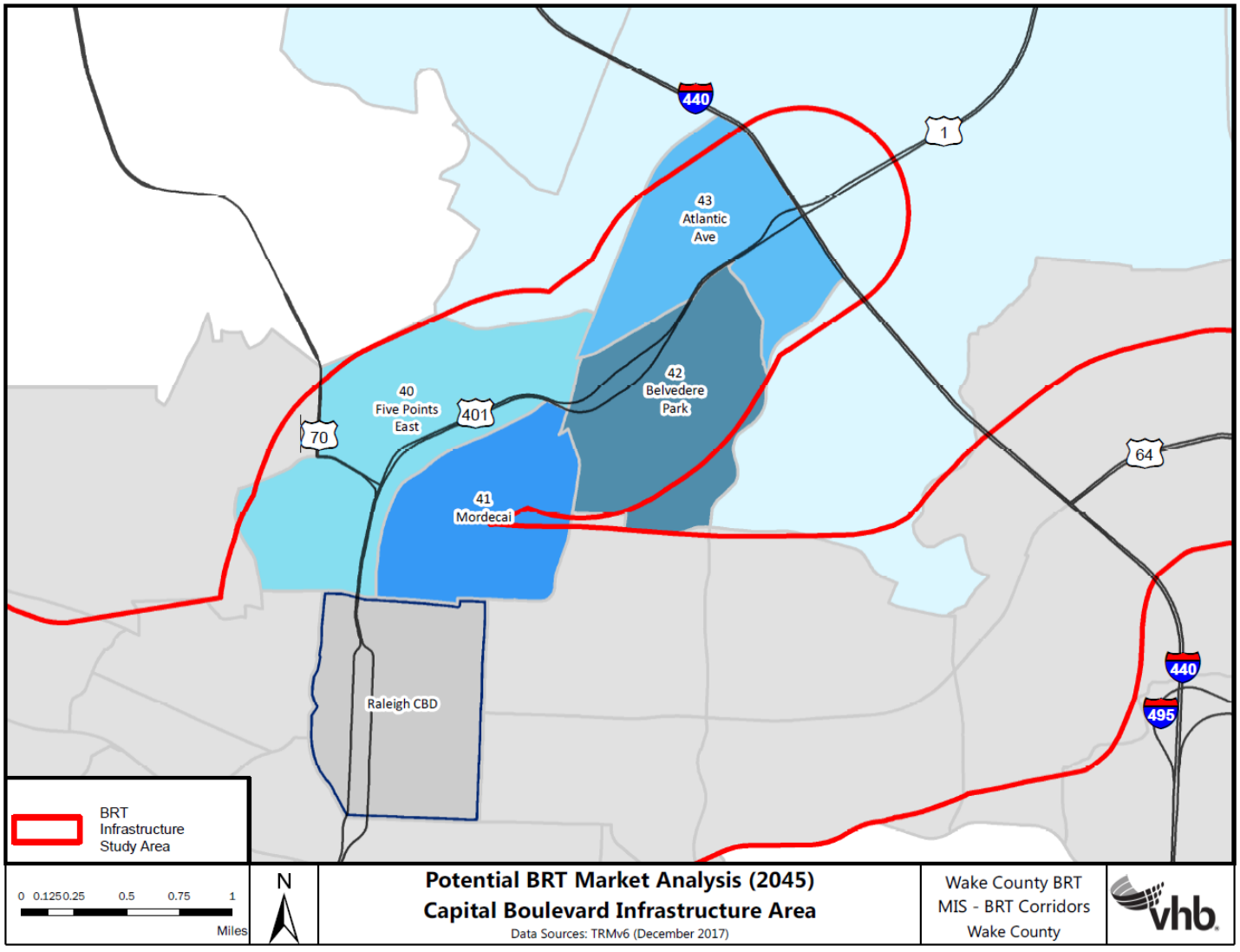
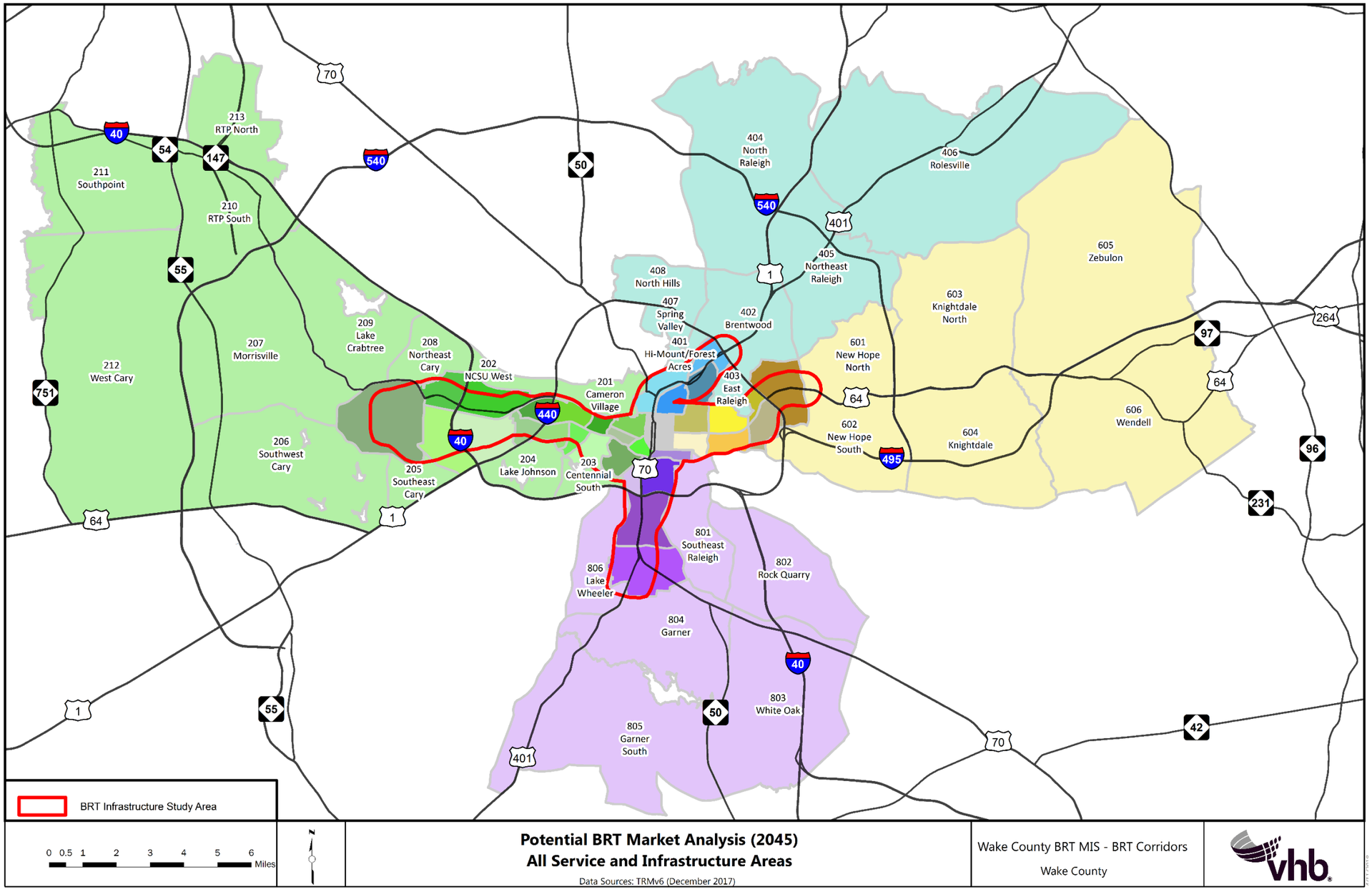


Figure 4: BRT Corridors Service Area



New Bern Corridor

The New Bern Avenue corridor includes areas along New Bern Avenue and E Edenton Street starting at N Tarboro Street and going east. It continues eastbound along New Bern Avenue, turns northwest near WakeMed Campus, and continues eastbound to New Hope Road. The Wake Transit Plan's eastern terminus is at WakeMed Campus – the extension to New Hope Road is for study purposes. This corridor is considered a cultural corridor and the eastern gateway into downtown Raleigh[3].

Infrastructure Area

The infrastructure area covers a ½-mile buffer and is the area where infrastructure improvements are recommended by the Wake Transit Plan for the New Bern Avenue BRT corridor. Based on the traffic analysis zone (TAZ) boundaries identified in the Triangle Regional Model (TRMv6), the infrastructure area is divided into seven (7) districts by aggregating the TAZs.

The infrastructure area for this corridor is primarily a mix of single-family residential uses, medical district, historic district and some commercial uses. However, the 6-mile corridor has seven (7) distinctive districts due to land use, parcel size, building façade, streetscape and demographic characteristics. Over time, the eastern gateway into Raleigh has weakened due to aging infrastructure, and declining economic conditions. The infrastructure districts for this corridor include areas of Oakwood, East Raleigh, Washington Heights, Poole Road, WakeMed, Marsh Creek and Trawick. Figure 5 shows the locations of the infrastructure area and associated districts.

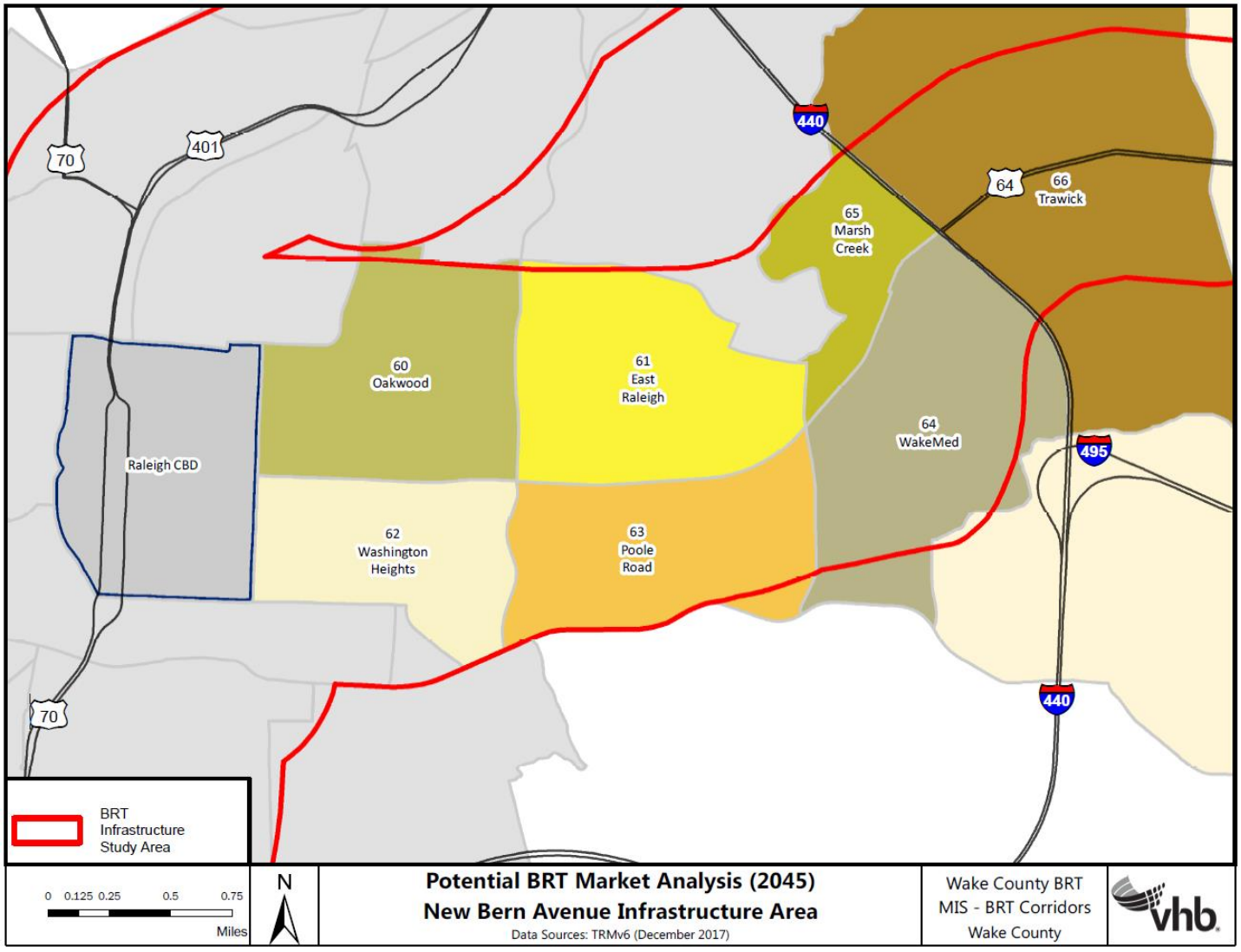
Service Area

The service area is a larger transit influence area that extends outside the infrastructure area and includes areas that will be affected by the BRT service in the New Bern Avenue corridor. Based on the TAZ boundaries identified in the TRMv6, the service area is divided into six (6) districts by aggregating the TAZs. Service districts extend to the east and south of the infrastructure area and include the area as far east as future I-540 and toward I-485 and Wake County Boundary on the south side. Land use in the service area is mostly single-family

[3] New Bern Avenue Corridor Study: Raleigh's Cultural Corridor. June 2012

residential. The service areas for this corridor include New Hope North, New Hope South, Knightdale North, Knightdale, Zebulon and Wendell. Based on the market analyses findings, bus enhancements may be recommended in this area to provide feeder service to the BRT corridor. Figure 4 shows the locations of the service area and associated districts.

Figure 5: New Bern Avenue BRT Corridor Infrastructure Area



S. Wilmington Street Corridor

The S. Wilmington Street corridor study area includes S. Wilmington Street starting at W Lenoir Street south of downtown Raleigh near the convention center and continues along US 70/US 401 (Fayetteville Road) south of Tryon Street until Purser Drive in Garner. An alternative to this corridor is S Saunders Street from W Lenoir Street until US 70/US 401 and continues along US 70/US 401. This corridor is called the Southern Gateway to downtown Raleigh.

Infrastructure Area

The infrastructure area (½-mile buffer on either side of S. Wilmington Street) is where infrastructure improvements will be recommended for the S Wilmington Street BRT corridor.

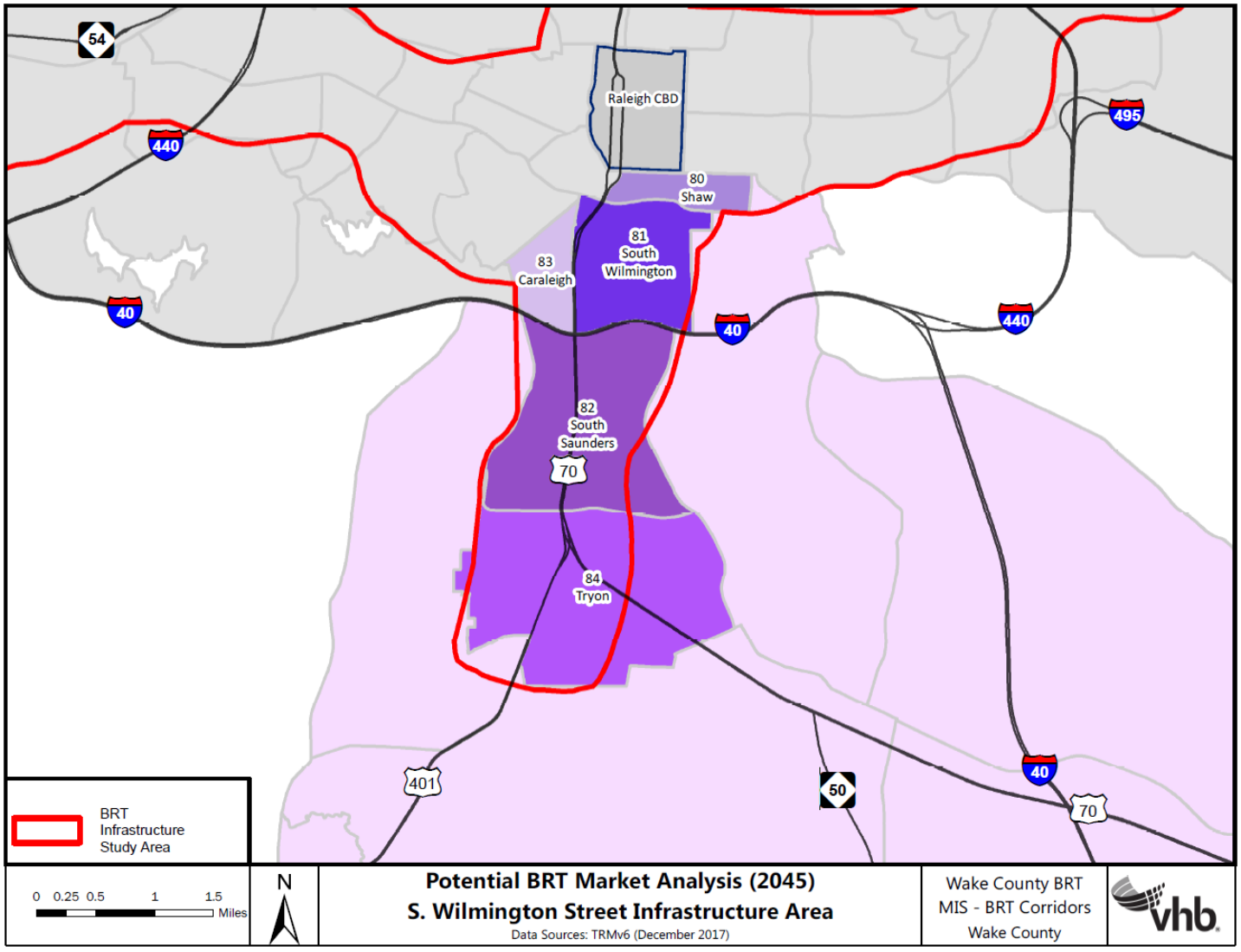
Based on the traffic analysis zone (TAZ) boundaries identified in the Triangle Regional Model (TRMv6), the infrastructure area is divided into five (5) districts by aggregating the TAZs. The infrastructure area for this corridor is primarily a mix of commuter-oriented, strip-style commercial, industrial, historic neighborhoods, single-family and newly developed high-density residential uses. There are also many underutilized or undeveloped parcels, resulting from years of little investment and limited market demand[4]. Physical barriers (rail, roadways, and floodplain), blight, and perceptions of crime depress market interest in the corridor. However, the 2-mile corridor has five (5) distinctive districts due to land use, parcel size, building façade, streetscape and demographic characteristics. The infrastructure districts for this corridor include areas of Shaw, South Wilmington, South Saunders, Caraleigh and Tryon. Figure 6 shows the locations of the infrastructure area and associated districts.

Service Area

Based on the TAZ boundaries identified in the TRMv6, the service area is divided into six (6) districts by aggregating the TAZs. The service districts extend to the south and southeast of the infrastructure area and include the area as far south as the proposed NC 540 toll road, Lake Wheeler Road on the west, and I-40 on the east. Land use in the service area is mostly single-family residential. The service area for this corridor includes Southeast Raleigh, Rock Quarry, White Oak, Garner, Garner South and Lake Wheeler. Figure 4 shows the locations of the service area and associated districts.

[4] Southern Gateway Corridor Study, Raleigh NC adopted in February 2017.

Figure 6: S. Wilmington Street BRT Corridor Infrastructure Area



Western Boulevard Corridor

The Western Boulevard corridor study area includes the area along Western Boulevard, between S Wilmington Street in downtown Raleigh to N Harrison Avenue on the west in Cary. West of I-440 there are two additional options for the BRT corridor: one towards the north on Hillsborough Street, and second on the south along Cary Towne Boulevard. Western Boulevard is a major arterial roadway that bisects the North Carolina State University (NCSU) campus. This corridor serves as a gateway into the core of downtown Raleigh from the western part of the County and as the spine of NCSU. This is the longest BRT corridor proposed in the Wake Transit Plan.

Infrastructure Area

The infrastructure area (1/2-mile buffer on either side of Western Boulevard) represents the spatial areas in which transit stops and stations typically have the greatest impact on land use and development, and from which there is high potential to generate transit ridership. This is the area where infrastructure improvements will be recommended for the Western Boulevard BRT corridor. Based on the traffic analysis zone (TAZ) boundaries identified in the Triangle Regional Model (TRMv6), the infrastructure area is divided into sixteen (16) districts by aggregating the TAZs.

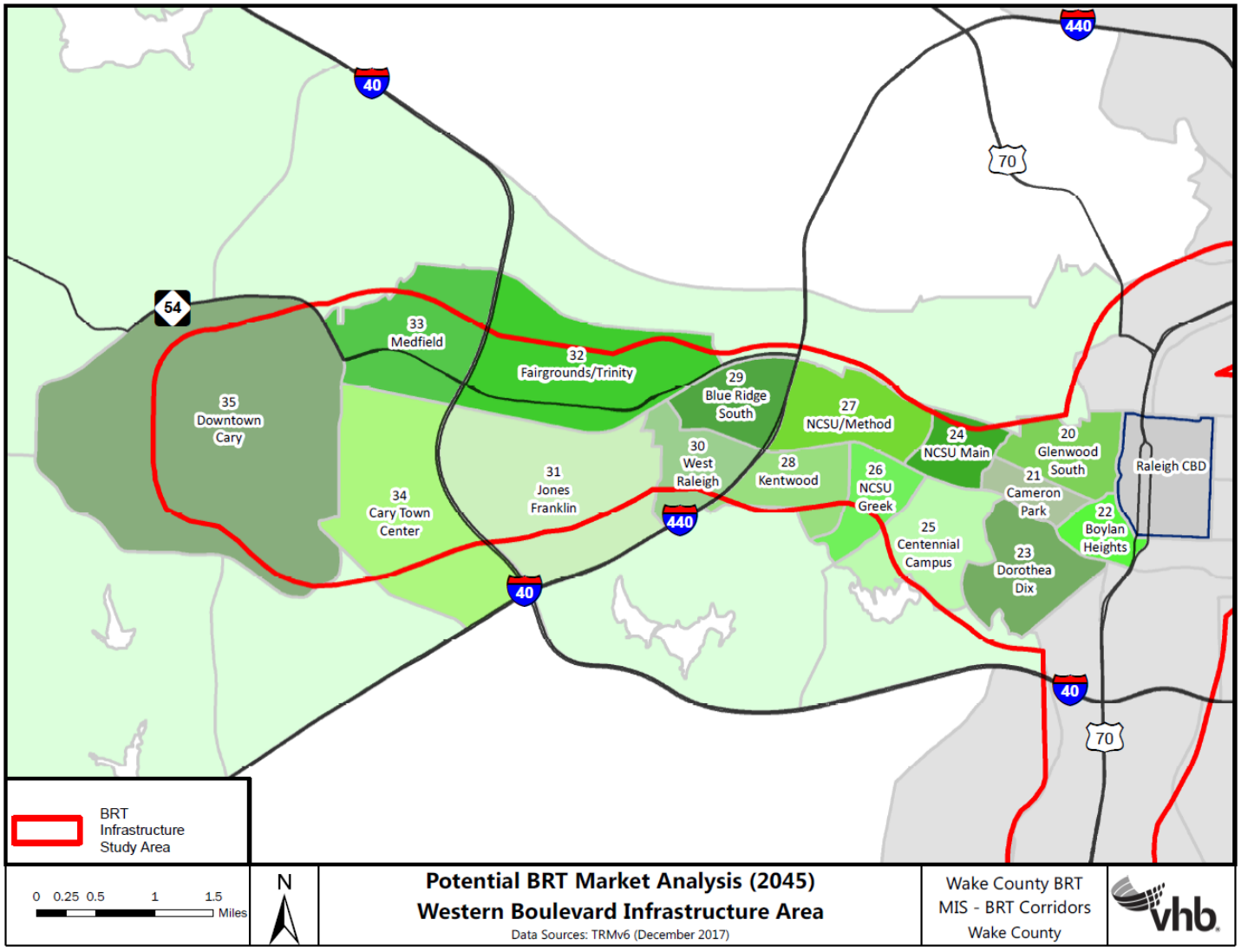
The infrastructure area for this corridor is primarily a mix of commercial, institutional, state park, historic district and single-family residential uses. The eastern end of the corridor includes Boylan Heights Historic District and Central Prison on the north, and Dorothea Dix State Park on the south side of Western Boulevard. However, the 9-mile corridor has sixteen (16) distinctive districts due to land use, parcel size, building façade, streetscape and demographic characteristics. The infrastructure districts for this corridor include areas of Glenwood South, Cameron Park, Boylan Heights, Dorothea Dix, NCSU Main, Centennial Campus, NCSU Greek, NCSU/Method, Kentwood, Blue Ridge South, West Raleigh, Jones Franklin, Fairgrounds/Trinity, Medfield, Cary Town Center, and Downtown Cary.

Due to the number and size of these districts, they are further aggregated based on the transportation infrastructure limitation into: Inside the Beltline, Outside the Beltline, east of I-40, and Cary Downtown. These aggregated districts are used for the market analyses. Figure 7 shows the locations of infrastructure area and associated districts.

Service Area

The service area is a larger transit influence area that extends outside the infrastructure area and includes areas that will be affected by the BRT service in the Western Boulevard corridor. Based on the TAZ boundaries identified in the TRMv6, the service area is divided into districts by aggregating the TAZs. Service districts extend to the west and northwest of the infrastructure area. The study area is bound by NC 751 on the west, I-40 on the north, and US 64 on the south. Land use in the service area is mostly single-family residential. The service area for this corridor includes areas of Cameron Village, NCSU West, Centennial South, Lake Johnson, Southeast Cary, Southwest Cary, Morrisville, Northeast Cary, Lake Crabtree, RTP South, Southpoint, West Cary and RTP North. Based on the market analyses findings, bus enhancements may be recommended in this area to provide feeder service to the BRT corridor. Figure 4 shows the locations of the service area and associated districts.

Figure 7: Western Boulevard BRT Corridor Infrastructure Area



2 Review Past Studies and Findings

This chapter summarizes relevant planning studies and other initiatives from Raleigh and surrounding municipalities related to transportation planning. These documents are critical to understanding the future development and transportation needs for the Triangle region and how they relate to proposed high capacity transit investments.

Summary of Findings

- Many plans emphasize the importance of developing partnerships with neighboring transit agencies to improve regional connectivity between Raleigh and surrounding communities.
- NC State supports improvements to Western Boulevard, such as a grade-separated crossing at Western Boulevard and Avent Ferry Road, to improve active transportation uses in the corridor.
- GoTriangle is calling for improved coordination with area stakeholders by establishing joint service/performance standards and convening transit agencies to coordinate operating practices and policies.
- Recommendations in the Raleigh Downtown Plan have several implications on the implementation of bus rapid transit (BRT). Recommendations include the installation of bike lanes, high quality transit amenities, improved wayfinding and passenger information, redesigning intersections for pedestrian safety, and rethinking open spaces around community assets.
- The Southern Gateway Corridor Study proposes a transformation of South Saunders and South Wilmington Streets to incorporate mixed-use development, accommodate high capacity transit, and enhance accessibility and connectivity to surrounding neighborhoods.
- The New Bern Avenue Corridor Study proposes modifications of land uses to increase density, realigning streets to intersect with the corridor, establishing street frontage typologies, redesigning roadways for multimodal use, and installing pedestrian amenities.
- The future Western Boulevard BRT corridor may run through the Central Chatham subarea, which is referred to as the “heart and soul” of Downtown Cary. The Area Plan recommends redeveloping older commercial properties and realigning new development to create consistent street frontage along the corridor. The plan also recommends converting West Chatham Street to two travel lanes, just west of the terminus of the future BRT corridor.

CITY OF RALEIGH

City of Raleigh 2017 Transportation Bond Proposal

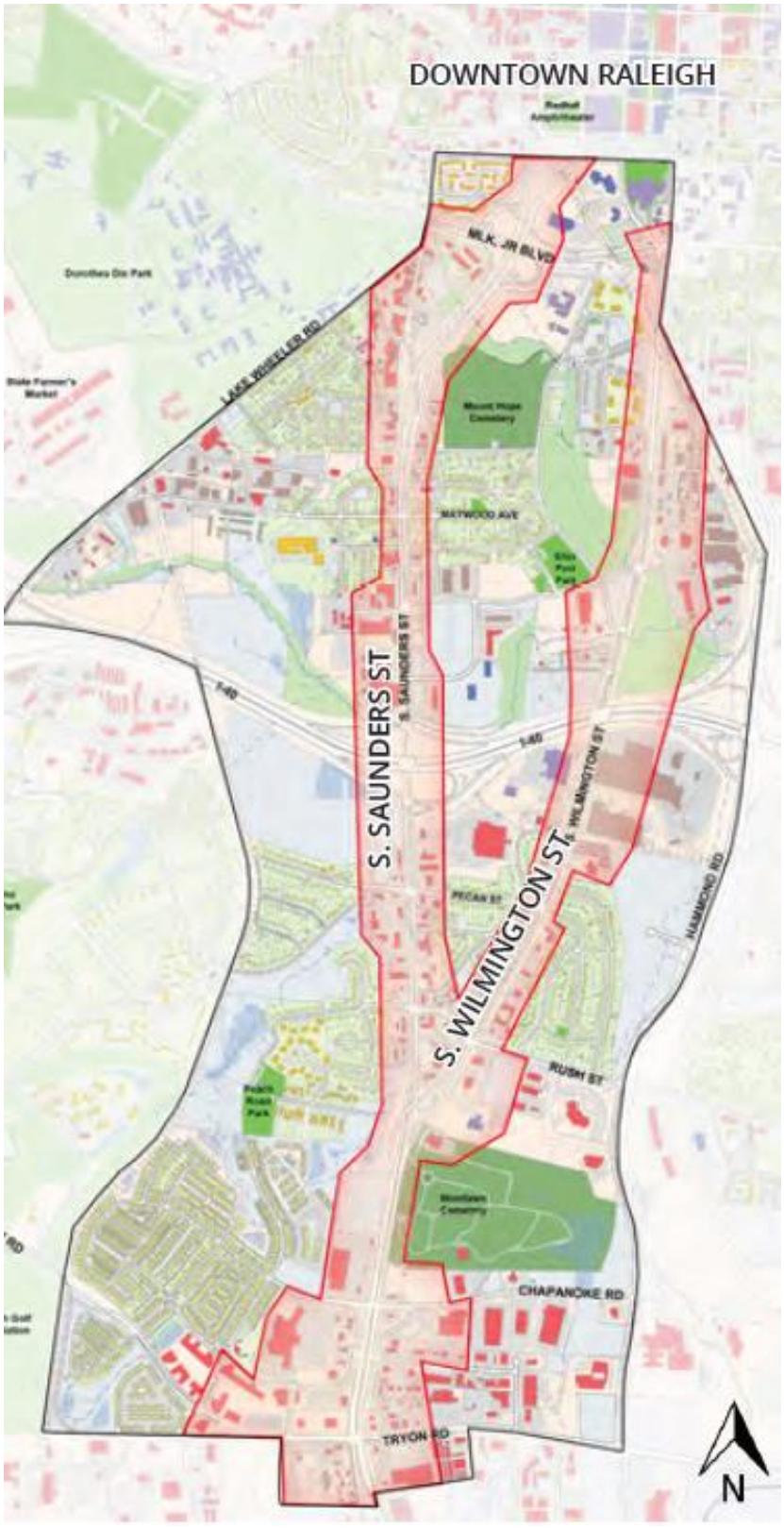
In October 2017, Raleigh City Council authorized a referendum for a $206.7 million transportation bond to improve city streets. Part of this bond includes $6 million for the Wake Transit Plan Project Participation and another $1 million for Transit Supporting Projects. Funds generated by the bonds will allow the city to move forward with new transit capital projects and to improve access and services along existing transit corridors.

Southern Gateway Corridor Study (2017)

The Southern Gateway Corridor Study identifies strategic infrastructure investments for a three-mile stretch of South Saunders and South Wilmington Streets, often referred to as "Raleigh's Southern Gateway." The project study area extends from downtown Raleigh at Martin Luther King, Jr. (MLK) Boulevard to the intersection of South Wilmington and Tryon Road, and from Lake Wheeler Road east to Hammond Road (Figure 8). Recommendations for the Southern Gateway include:

- Creating mixed-use centers at key locations to capitalize on infrastructure investments
- Continuing to develop areas near Renaissance Park and the commercial zone along Tryon Road
- Establishing a new transit-oriented neighborhood in the South Wilmington/Rush Street Focus Area
- Transforming South Wilmington Street into a walkable and bikeable transit-oriented district, with dedicated transit lanes for BRT
- Transforming the South Wilmington Street flyover to accommodate transit connections to Tryon Road
- Enhancing connections to the southern edge of downtown Raleigh by urbanizing the interchanges along MLK Boulevard and providing better bicycle and pedestrian connectivity to downtown

Figure 8: Southern Gateway Corridor Study Area



Raleigh Downtown Plan (2015)

The Raleigh Downtown Plan establishes a vision for the growth and development of downtown Raleigh with the following themes in mind: Breathe (creating public open spaces), Move (creating active transportation connections), Stay (revitalizing and redeveloping downtown), and Link (establishing partnerships). The Plan focuses on investing in transportation improvements that make walking, biking, and transit the preferred ways to travel in downtown Raleigh.

The Raleigh Downtown Plan has several implications on the implementation of BRT, as all four future BRT corridors run through the area. The following action items are particularly relevant:

- Increase bike lanes throughout downtown, notably along Wilmington and Salisbury Streets *(completed)*
- Conduct follow-up study to Wake County Transit Investment Strategy to refine and finalize transit operation and infrastructure investment in downtown Raleigh *(underway)*
- Provide high quality transit amenities such as shelters, seating, and system information at all downtown transit stops *(underway)*
- Amplify the use of technology through signage that shows bus arrival times *(underway)*
- Identify and direct transit users to transit network nodes with enhanced amenities and increased wayfinding and passenger information *(underway)*
- Implement a high-quality renovation of the Moore Square Transit Center *(completed – name changed to GoRaleigh Station)*
- Redesign intersections at South Dawson (Capital BRT corridor), South Wilmington Streets (BRT corridor), and MLK Boulevard (Western BRT corridor) to improve pedestrian safety and reduce barriers to north-south travel
- Study Wilmington Street to consider restoration of two-way traffic
- Capitalize on Raleigh Union Station with transit-oriented development in the Warehouse District. *(currently underway*)
- Create a bold, urban design plan for the district that encompasses the Convention Center, Red Hat Amphitheater, and the Duke Center for the Performing Arts *(within walking distance to all four future BRT corridors)*
- Transform Red Hat Amphitheater to a long-term open space and entertainment asset in the existing location or in a new location
- Develop a public-private partnership and plan for the mega-block between Martin Luther King Jr. Boulevard (*near Western BRT corridor*) and South Street.

The future BRT corridors lie within walking distance to all five of the designated "Catalytic Project Areas." These areas serve as an example of how the actions in the Plan translate into physical form.

New Bern Avenue Corridor Study (2012)

New Bern Avenue is known as Raleigh's "cultural corridor" because of the cultural, institutional, and the architectural history along the corridor. It serves as an eastern gateway into Raleigh and

is one of four ceremonial roadways from the State Capitol Building. One of the future BRT corridors will run along New Bern Avenue from downtown Raleigh to the east.

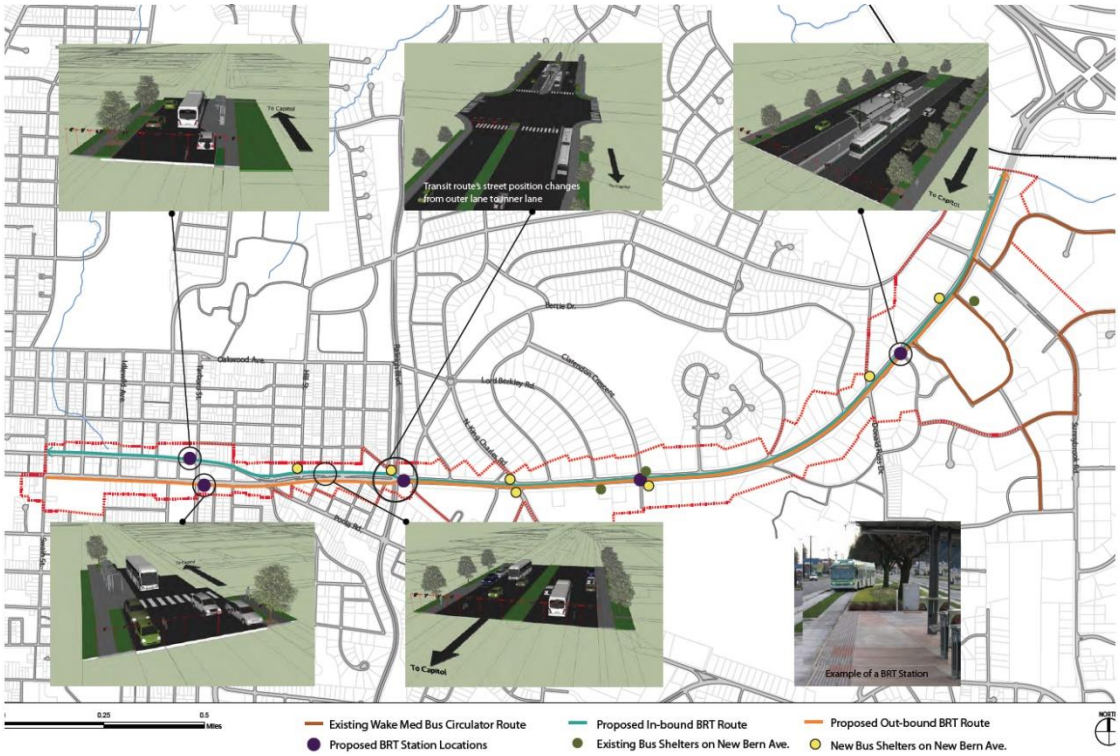
The goal of this study is to identify issues along the corridor and opportunities to enhance the appearance and function of the corridor. The study presents specific actions needed to implement improvements that will transform New Bern Avenue into a more attractive and functional gateway to the city. The study area consists of a 3.5-mile segment of New Bern Avenue from Swain Street to Crabtree Creek and the adjacent I-440 interchange, which encompasses most of the future BRT corridor.

The study involved an extensive public outreach effort, including three public meetings and stakeholder interviews. Recommendations include:

- Modify land use to increase density (see Figure 9)
- Realign streets to intersect with New Bern Avenue
- Establish frontage typologies for the space between the public right-of-way and building facades
- Redesign roadways to incorporate multimodal features (see Figure 10)
- Install pedestrian amenities such as sidewalks, crosswalks, and lighting, which also support transit use
- Real-time bus arrival at certain stops

Figure 9: New Bern Avenue: Proposed Land Use Changes

Figure 10: New Bern Avenue: Multimodal Improvements



Capital Boulevard Corridor Study Implementation (2012)

Capital Boulevard is one of the most traveled gateways into downtown Raleigh and will be the future site of a BRT corridor. The corridor study presents a vision to transform the boulevard into a multimodal corridor with green infrastructure. The study area includes Capital Boulevard from downtown Raleigh to the I-440 Beltline.

The Capital Boulevard Corridor Study assumed that light rail would be available in the corridor. It has not been updated to reflect the Wake County Transit Plan's BRT corridor.

Recommendations for the boulevard include freeway interchange improvements, street extensions, street realignments, a potential roundabout, and the identification of areas ripe for economic development (Figure 11). Most of the areas identified for economic development are slightly north of the future BRT corridor. A conceptual map of the study's recommendations is shown in Figure 12. Specific roadway improvements include:

- Intersection redesign at Peace Street and Wade Avenue
- Intersection removal at the West Street extension and Fairview Road
- Landscaped median installation on Capital Boulevard leading to downtown Raleigh
- Installation of a super street intersection at the midpoint of Capital Boulevard between Wake Forest Road and Fairview Road. Super streets provide access while avoiding traditional left turn movements. These intersections can accommodate pedestrian movement and improve transit accessibility for developments on the east side of Capital Boulevard.

Figure 11: Potential Redevelopment Sites

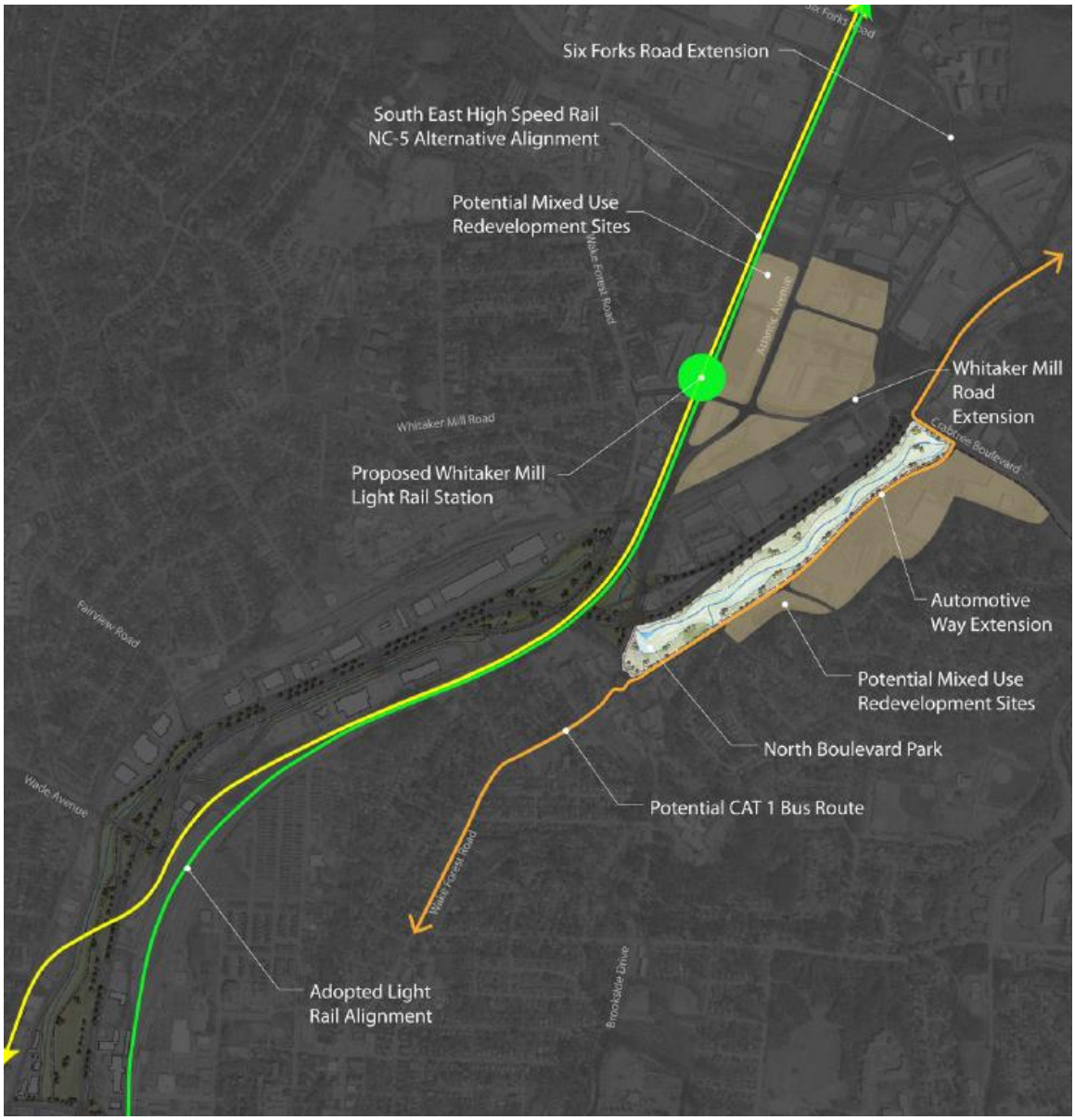
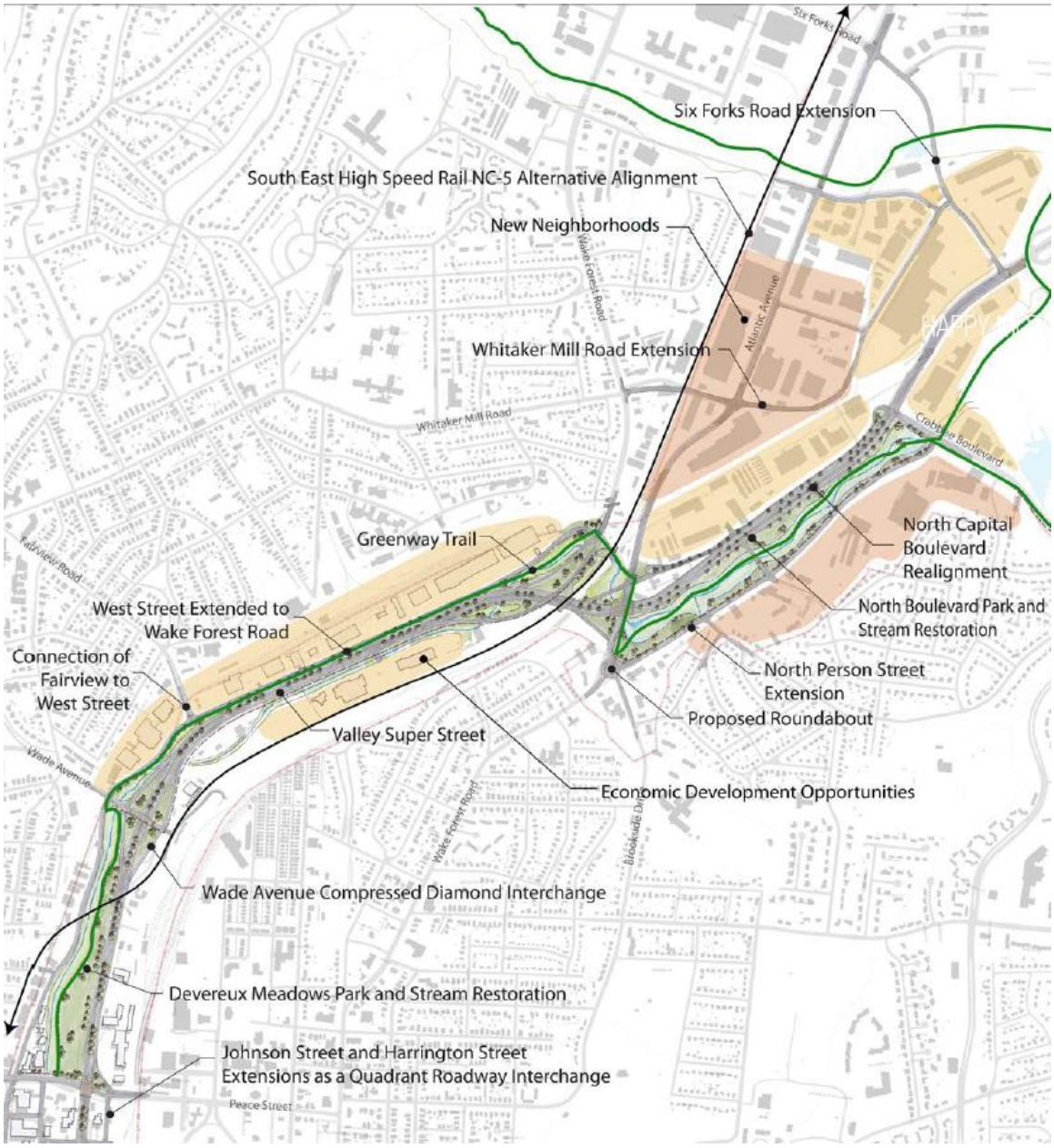


Figure 12: Capital Boulevard Corridor Concept

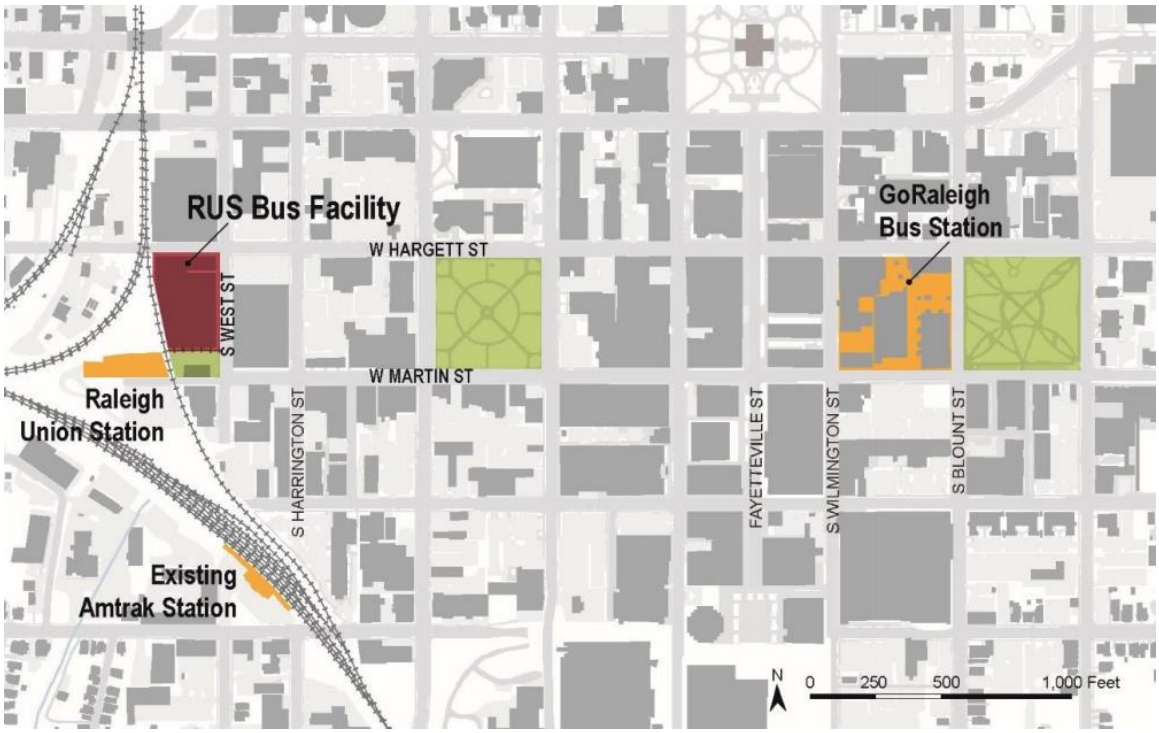


Raleigh Union Station

Raleigh Union Station (RUS) is a transportation hub currently under construction in downtown Raleigh's Warehouse District. The new facility, set to open in early 2018, will be located southeast of Boylan Avenue and Hargett Street, near the southern terminus of the Capital Boulevard BRT corridor and walking distance from the western terminus of the New Bern corridor. When completed, RUS will serve as an Amtrak and commuter rail station with bus service and additional space for retail, offices, and events.

RUS construction consists of two phases. Phase I construction includes the main RUS facility with new commercial spaces, a public plaza, and improved amenities for travelers. Phase II includes construction of the separate RUS Bus Facility, located southwest of Hargett and West streets (Figure 13). The new bus facility will contain six to eight bus bays and is intended to serve as the primary layover location for GoTriangle's Eastern Wake routes, Chapel Hill and Durham Express routes, Route 100, and Route 105. It may also serve the future BRT lines and select GoRaleigh routes.[5]

Figure 13: RUS Bus Facility



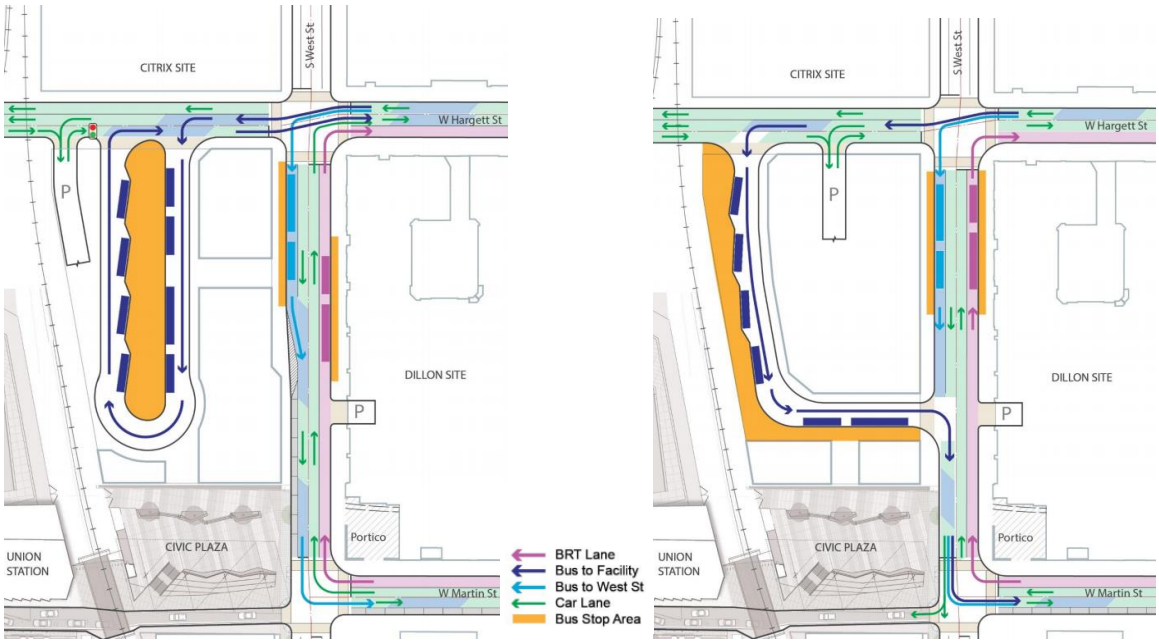
[5] BRT alignments in Downtown Raleigh have not been finalized.

Two concept designs are proposed for the bus facility, as shown in Figure 14. In both concepts, the proposed BRT routing travels west on Martin Street and east on Hargett Street. A BRT stop/station and layover is proposed on West Street.

Figure 14: Bus Facility Concept Design

(A) U-Shape Plan

(B) L-Shape Plan



Raleigh Capital Improvement Program (FY 2018-2022)

The CIP is a five-year plan that allocates funds to high priority needs. It is the primary mechanism for implementing the Raleigh's long-term vision and strategic plan. The transportation element within the CIP includes major street construction, street improvements, pedestrian and bicycle projects, parking improvements, and transit projects. Total funding for the five-year program is $121.3M with $37.8M planned for FY2018. All projects incorporate Complete Streets principles, integrating bicycle, pedestrian, and transit system elements.

NORTH CAROLINA STATE UNIVERSITY

North Carolina State University Campus Mobility Plan (2012)

The 2012 Campus Mobility Plan calls for improvements to the university bus system and highlights surrounding improvements affecting mobility and circulation in and around campus. As part of an effort to establish bus priority corridors, North Carolina State (NCSU) is considering closing Dan Allen Drive to general vehicle traffic for most of the day, while allowing buses and other authorized vehicles to pass. Dan Allen Drive runs perpendicular to Western Boulevard, which is one of Raleigh's future BRT corridors.

Western Boulevard Crossing Study (2013)

The Western Boulevard Crossing Study was a collaborative process between NCSU, CAMPO, the City of Raleigh, North Carolina Department of Transportation, Wake County, and other interest groups, to evaluate existing conditions, needs, and opportunities to improve mobility along the corridor. The study area includes a portion of Western Boulevard from Varsity Drive to Pullen Road, which runs between NCSU's main and Centennial campuses (Figure 15). Focusing on the safety and mobility of users on this corridor, this study develops improvements to redirect the majority of pedestrian-bicycle movement across Western Boulevard. The recommended improvements include a grade-separated crossing at Western Boulevard and Avent Ferry for cyclists and pedestrians (perhaps accommodating transit vehicles in the future), as well as smaller-scale improvements to improve active transportation uses throughout the corridor (Figure 16).

Outreach efforts for this study included printed media, radio, and internet advertisements, intercept surveys, and multiple public workshops. Survey results showed that users are supportive of a crossing at Western Boulevard and Avent Ferry Road. Avent Ferry was rated the "least safe" intersection along the corridor.

Figure 15: Study Area for Western Boulevard Crossing Study

Figure 16: Recommended Improvements along Western Boulevard

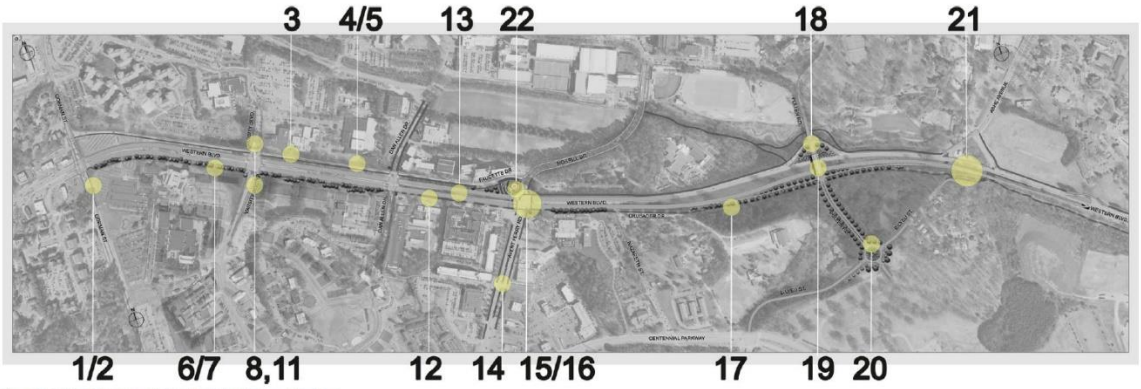


Figure 9. Location of Recommendations in Western Boulevard Corridor

1	Gorman Street: Complete Gaps in Sidewalk
2	Gorman Street: Buffered Bicycle Lane
3	Faucette Drive: Improve Transit Stop (Shelter/Bicycle Rack)
4	Faucette Drive: Complete Gaps in Sidewalk
5	Faucette Drive: Create Two-Way Cycle Track
6	East of Gorman/Southside: Resurface and Widen Greenway/Sidepath
7	East of Gorman/Southside: Pedestrian-Scale Lighting
8	Varsity Drive/Northside: Sharrows
9*	Various Intersections: High Visibility Crosswalks
10*	Various Intersections: Red pavement markings at conflict points / intersection approaches
11	Varsity Drive/Southside: Bicycle Lane
12	East of Dan Allen/Southside: Improve Transit Stop (Bench/Shelter)
13	Dan Allen to Avent Ferry: Install Median Fencing / Replace Landscaping
14	Avent Ferry/Southside: Mid-Block Crossing
15	Avent Ferry: Pork Chop Island / Turn Lane Rerouting
16	Avent Ferry: Textured/High Visibility Crosswalks
17	East of Crusader Drive/Southside: Pedestrian-Scale Lighting
18	Pullen Road: Bulb-Out Extension
19	Pullen Road Bridge: Sidewalks and Bicycle Lanes
20	Pullen Road Extension / Roundabout: Adjacent Sidepath
21	Closure of Bilyeu Street at Western Boulevard; Re-Design of Ashe Avenue access
22	Avent Ferry/Morrill Drive: Bicycle and Pedestrian Tunnel Under Western Boulevard

WAKE COUNTY

Wake County Transit Plan (2016)

The Wake County Transit Plan calls for major improvements in four key areas, which are defined as the “Four Big Moves”:

1. Connecting regionally
2. Connecting all Wake County communities
3. Providing frequent, reliable urban mobility
4. Enhanced access to transit

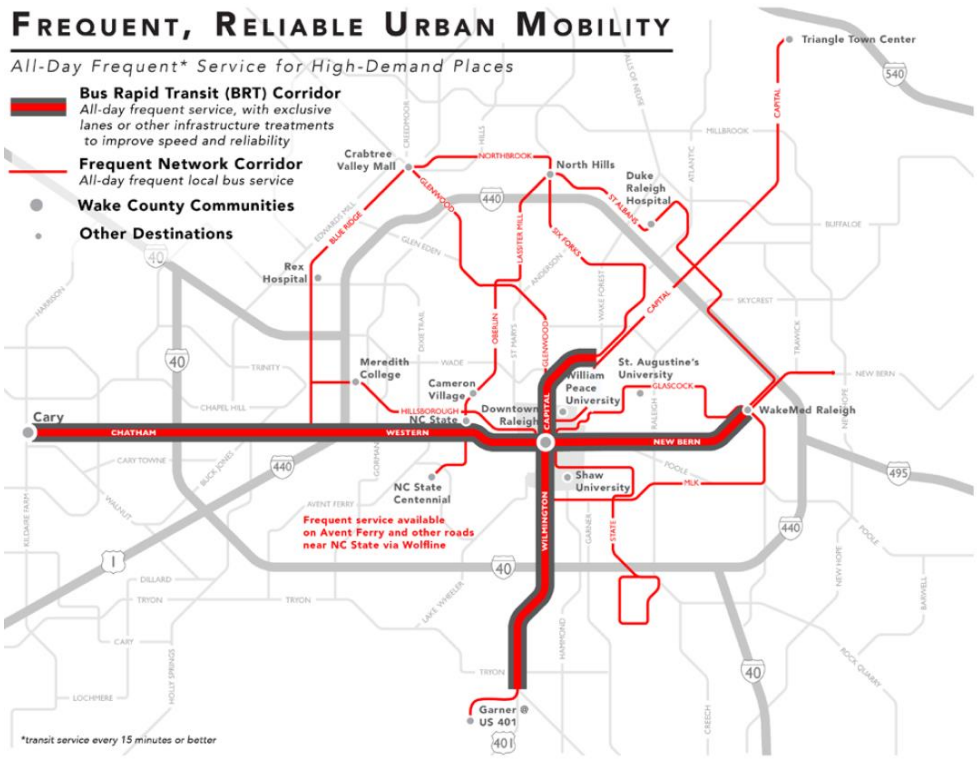
The proposed plan will connect twelve municipalities and other major destinations, as shown in Figure 17. The Plan includes efforts to increase bus service by expanding existing frequent bus service from 17 to 83 miles, with service at least every 15 minutes.

BRT is a key element in the Plan (Figure 18). Over 20 miles of BRT infrastructure are identified along Western Boulevard, Capital Boulevard, New Bern Avenue, and South Wilmington Street (these are the focal points of the Major Investment Study). A combination of improvements will be made, based on a segment-by-segment analysis of each BRT corridor with the goal of achieving the greatest possible reduction in bus delay at the lowest cost.

The entire Plan is estimated to cost about $2.3 billion over the first 10 years, using a combination of local, state, and federal dollars. The main funding source is the local half-cent sales tax Wake County voters approved in November 2016.

Figure 17: Wake County Transit Plan Overview

Figure 18: Wake County Transit Plan Bus Improvements



BRT capital expenditures for the four BRT corridors total $347 million between 2018 and 2023. Funds will be spent on the planning and design phases, construction, and acquisition of vehicles for the corridors.

Wake County Transit Technologies (2015)

The Wake County Transit Choices Report includes a description of high-capacity transit technologies. The modes described include rapid bus without exclusive right-of-way, streetcar, BRT, commuter rail, light rail, heavy rail, driverless rapid transit, and personal rapid transit (i.e. a fixed guideway served by a large volume of driverless pod-like vehicles that can be programmed to skip other stations).

Decisions to deploy a particular technology are driven by these key questions:

- Is the additional capacity a critical need (i.e. is transit overcrowded for a significant period of time)?
- Is there a case for exclusive right-of-way?
- Is rail justified and supported for its greater capacity, ability to take advantage of existing corridors, or other reasons related to perceptions of safety, comfort, and economic development?

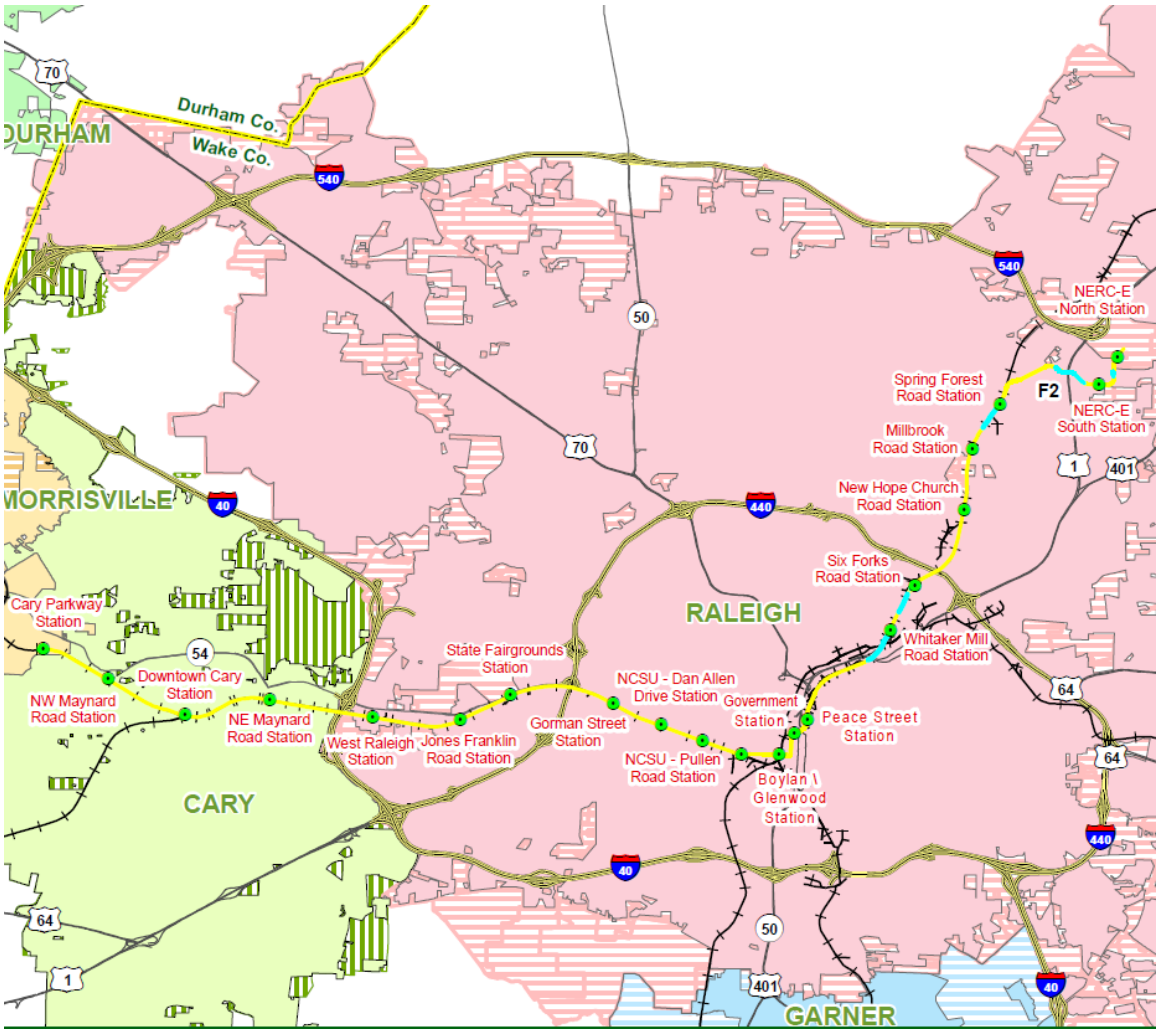
Wake County Corridor Alternatives Analysis (2011)

The Wake County Corridor Alternatives Analysis evaluates a light rail alternative that follows existing North Carolina Railroad (NCRR) and CSX railroad rights-of-way between Cary Parkway and I-540. Based on the evaluation, the Morgan Street alignment (Alternative D6) through downtown Raleigh was selected as part of the Locally Preferred Alternative (LPA). The ridership projected for this alignment is 14,500 daily boardings, with an end-to-end travel time of 35 minutes. It is consistent with Union Station's redevelopment plans and serves high population and employment concentrations.

In the Northeast Regional Center (NERC), the alignment running through Triangle Town Center (Alternative F2) was selected to continue forward as part of the LPA. Ridership projections for this alignment are an estimated 14,600 daily boardings, with an end-to-end travel time of 37 minutes. It is centrally located near a major employment center, where there is high potential to support redevelopment efforts.

Both alignments are displayed as the recommended LPA in in Figure 19.

Figure 19: Wake Corridor LPA Recommendation

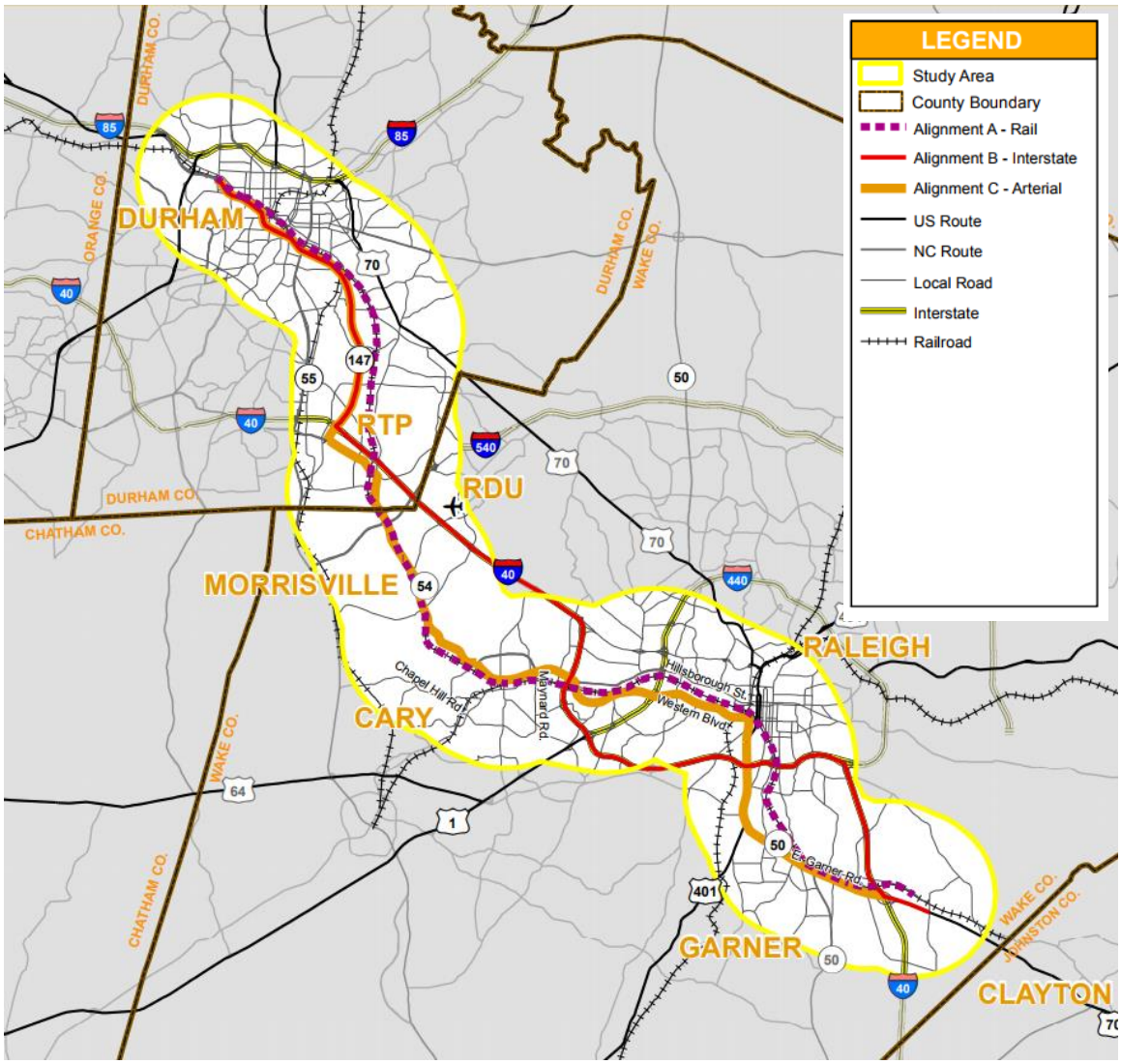


Durham-Wake County Corridor Alternatives Analysis (2011)

The Durham-Wake County Corridor Alternatives Analysis evaluates the feasibility of commuter rail against other fixed-guideway alternatives to connect Durham and Wake counties. One of the proposed alignments is a 37-mile segment of the North Carolina Railroad (NCRR) corridor from Duke Medical Center in Durham through Research Triangle Park, Cary, Raleigh, and Garner to the Wake-Johnston County Line. Other proposed alignments utilize a combination of interstate and arterial roadway segments to connect Durham and Garner. A map of the alignments is provided in Figure 20.

The viability of BRT, light rail transit (LRT), and commuter rail transit (CRT) were evaluated for each alignment. CRT along the NCRR corridor alignment was chosen to advance as the Build Alternative for further evaluation. This finding is consistent with recommendations from previous studies to use the NCRR alignment for regional transit service.

Figure 20: Durham-Wake County Conceptual Alignments

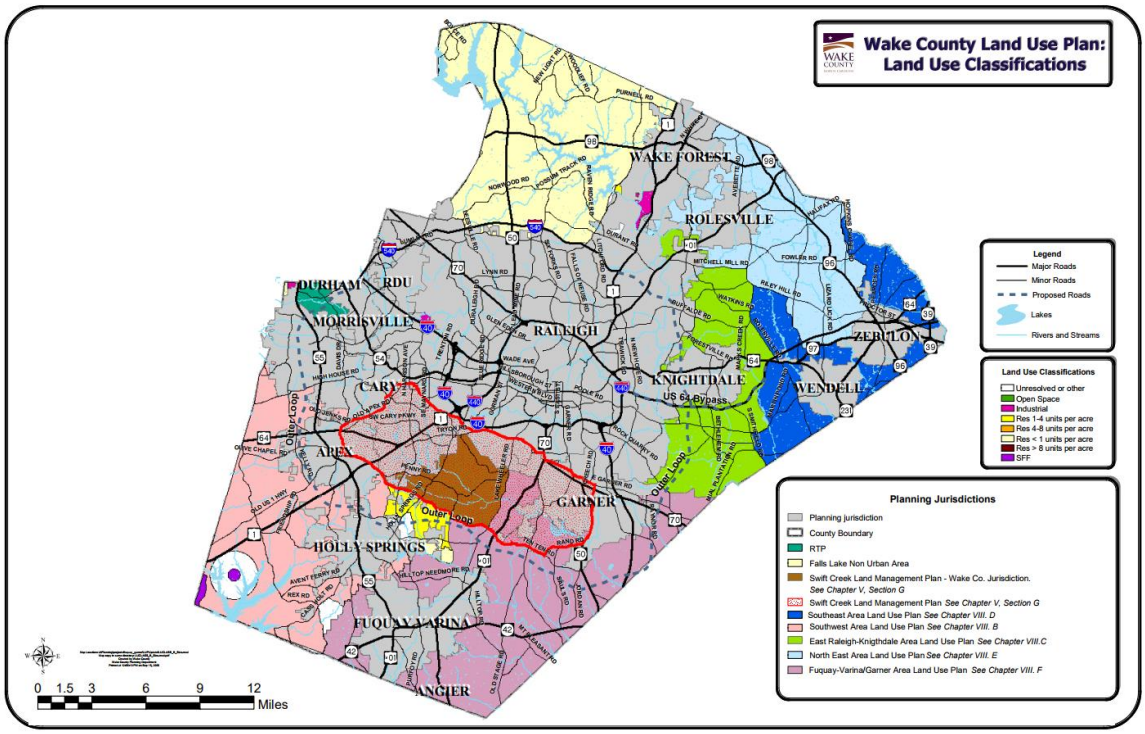


Wake County Land Use Plan

The Wake County Land Use Plan emphasizes property rights and focuses on maintaining water quality protection policies in watersheds for unincorporated areas of Wake County. It focuses on actions such as coordinating with the water and sewer plan and revising regulations to encourage development.

As seen in Figure 21, portions of Raleigh, Cary, and Garner lie within the Swift Creek Land Management Plan. Session Law 1998-192 prohibits Wake County from adopting any development ordinance or granting a development permit that is inconsistent with the standards set forth by the Swift Creek Land Management Plan. This may affect potential development along two of the BRT corridors.

Figure 21: Wake County Transit Plan Bus Improvements



DURHAM COUNTY

Durham County Transit Plan (2017)

The Durham County Transit Plan is an update to the 2011 Bus and Rail Investment Plan and establishes a framework for transit improvements through 2045. The 2017 Plan continues funding for expanded bus service, including more frequent regional service between Durham and Raleigh. The Plan identifies a set of GoTriangle service enhancements, including an upgrade to the Durham-Raleigh Express (Route DRX). This upgrade consists of increased service between Durham and Raleigh to provide service every 30 minutes during AM and PM peak periods. Route

Current frequencies vary between 30 and 45 minutes because of traffic congestion. Service changes are anticipated to begin between 2018 and 2020.

The Durham County Transit Plan also discusses the Wake-Durham Commuter Rail plan. It outlines the funding assumptions, specifically the level of state funding, that was assumed for the Durham portion of the line. The Plan refers to changes to available state funding and makes a commitment to work with regional partners to develop a full funding plan.

GOTRIANGLE

GoTriangle Strategic Plan (FY2017-2021)

The GoTriangle Strategic Plan serves as a guide for policy, service and investment decisions for staff, executive management and the Board of Directors between 2017 and 2021. It is the primary tool for communicating GoTriangle's priorities and it will play an integral role in driving funding decisions.

GoTriangle developed strategic approaches and initiatives to achieve their goals of improving mobility in the region, assuring high-quality customer service, and encouraging sound growth patterns. Of particular relevance to Wake County are the following strategic approaches and initiatives:

- **Approach: Develop positive partnerships with all stakeholders to deliver services and projects contained in the county transit plans (to start in FY2018)**
  - Initiative: Establish joint service standards/performance standards with transit agencies across the region (continues into FY2019)
  - Initiative: Establish the Better Bus Stop initiative to provide clean, safe, and attractive waiting environments at transit stops (continues into FY2019)
  - Initiative: Convene transit agencies for coordination of operating practices and policies (continues into FY2019)
  - Initiative: Work with partners to maintain and expand measures that give priority to buses, carpools, and vanpools on regional highways and arterials (continues annually)
- **Approach: Encourage the inclusion of transit in land-use planning**
  - Initiative: Raleigh Union Station Bus Terminal Joint Development Project (continues into FY2020)
  - Initiative: Support adoption of municipal transit-oriented development (TOD) zoning and development ordinances (begins in FY2017 and continues annually)
  - Initiative: Establish partnerships with cities, towns, and counties to formalize notices and comments about transit and land-use decisions (continues into FY2020)
  - Initiative: Encourage prioritization of development near core, with frequent transit service (begins in FY2019; continues annually)

Annual Bus Performance Report (FY2016)

GoTriangle's Annual Bus Performance Report summarizes Triangle Transit's regional bus service performance during FY2016 and illustrates trends in performance from FY2015 and prior years. Key findings include:

- Ridership on the GoTriangle system decreased by 3% in FY2016 from FY2015
- GoTriangle met the agency goal for on-time performance with 87% of trips arriving on-time to end-of-line timepoints
- Productivity for all services decreased by 9% (14.3 boardings per hour to 13.0 boardings per hour)
- The most significant decrease in productivity was for trips traveling to Raleigh in the morning and from Raleigh in the evening

GoTriangle Annual Report (FY2016)

The GoTriangle Annual Report presents statistics on ridership, total revenue, total expenditures, and highlights transit improvements for Durham, Orange County, and Wake County. The report provides a brief summary of the Wake County Transit Plan and the planned investments in BRT and commuter rail coming to Garner, downtown Raleigh, NCSU, Cary, Morrisville, Research Triangle Park, and downtown Durham.

Triangle Region 7-Year Long Range TDM Plan (2007)

According to the Triangle Region 7-Year Long Range Transportation Demand Management (TDM) Plan, many of the region's TDM initiatives are effective in encouraging alternative transportation use. The final recommendations are designed to maximize the efficiency of existing programs and to encourage users to shift to alternative transportation modes. These recommendations include:

- Enhancing GoTriangle.org for regional marketing initiatives and as a one-stop information source for transportation
- Defining regional and local marketing and outreach roles and responsibilities
- Implementing a competitive call for projects
- Establishing an evaluating and monitoring program
- Increasing levels and sources of funding

Wake Forest to Raleigh Commuter Rail Conceptual Infrastructure Analysis (2017)

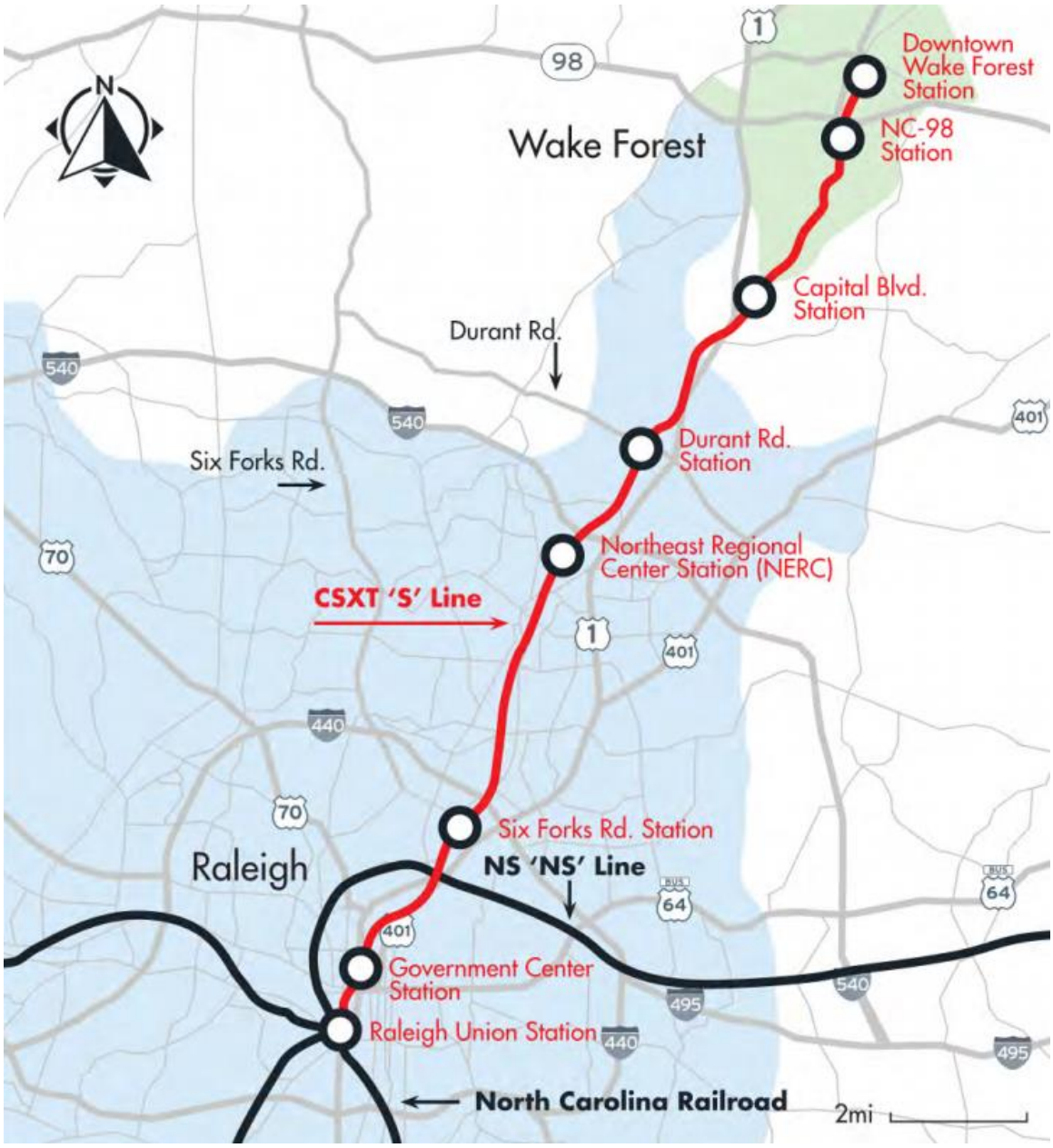
The Wake Forest to Raleigh Commuter Rail Conceptual Infrastructure Analysis determines the potential scope and cost of infrastructure improvements that could support a commuter rail service on an existing rail line between Wake Forest and Raleigh. While the rail line is owned and operated by CSX Transportation, GoTriangle currently owns property along a portion of the east side of the corridor.

Two commuter train service scenarios are evaluated in this study. One scenario includes 20 daily round trips and the other includes 10 daily round trips. Between downtown Wake Forest and Raleigh Union Station, the estimated scheduled travel time is 34 minutes traveling southbound and 35 minutes traveling northbound. The potential station locations are shown in Figure 22.

This study proposes that the commuter tracks follow CSX tracks through the CSX Raleigh Yard rather than building a new elevated rail corridor into downtown Raleigh, as proposed under a previous study.

The study concludes that a commuter rail service between Wake Forest and Raleigh on the CSXT rail line is possible but will require a significant amount of new infrastructure to operate reliably. The estimated cost of infrastructure improvements ranges from $373.4 million to $435.7 million. Recommended next steps include additional studies to refine station locations, confirm feasibility, scope, and the cost of service.

Figure 22: Potential Station Locations



CAMPO

Regional Transit Vision Plan (2008)

The Regional Transit Vision Plan was initiated by CAMPO and the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization to provide a framework for future investments. Recommendations are grouped into three major categories: (1) Enhanced region-wide bus network, (2) circulators, and (3) rail investments.

Expanded regional bus service will connect communities and increase access to the regional transit network. Circulators will provide flexible travel options within major activity centers. They are anticipated to be buses, with a potential to shift to modern streetcars or trolleys depending on local conditions and costs. Circulators are recommended in the downtown areas of Raleigh, Durham, and Cary. Rail service will serve as the anchor of the regional system. Proposed rail investments will connect Durham, Cary, downtown Raleigh, north Raleigh, and Research Triangle Park.

The Plan also proposes improvements to local bus networks. These improvements include:

- High frequency express service to the Raleigh-Durham International Airport from downtown Durham, downtown Raleigh, and the Cary train station park-and-ride
- Rush hour only service to outlying communities
- Enhanced bus service in core areas to support rail and circulator investments
- Transit access to park-and-ride lots
- Enhanced transit access for pedestrians and bicyclists around park-and-ride lots and bus stops

Congestion Management Process Plan (CMP) / Travel Demand Management (TDM)

The Capital Area Metropolitan Planning Organization (CAMPO) Congestion Management Plan (CMP) outlines guidelines to encourage the reduction of congestion to improve the region's quality of life and to promote sustainable mobility strategies. The Plan is intended to measure and manage congestion of the current and future transportation system through data collection, travel demand modeling, transit analysis, and highway performance analysis.

The Plan identifies two objectives and three goals for public transportation:

1. Objective: Improve Mobility
    - Goal: Increase ridership opportunities
2. Objective: Reliability and Sustainability
    - Goal: Adherence to Schedule
    - Goal: Maintain Operations and Maintenance

The Transportation Demand Management (TDM) section within the CMP recognizes that the most effective TDM strategies target sites where employment is concentrated, including places where transit services are available and/or parking is inconvenient or costly, such as downtown or university campuses.

Capital Area Bus Transit Development Plan

The Capital Area Bus Transit Development Plan provides a framework for long-range transit service and capital improvements to improve mobility options for the Capital Area region. The Plan encourages the development of an enhanced bus system that complements a potential rail system to increase regional connectivity, create new jobs and employment centers, and

ultimately reduce traffic congestion impacts. By providing enhancements to the existing bus service system, the region will reduce environmental impacts and ensure regional economic vitality. The long-range mobility recommendations address the following objectives:

- Establish minimum frequencies and span of service for all routes
- Fill in gaps of existing service coverage based upon propensity and density results
- Add routes to address unmet travel patterns
- Identify heavily used corridors for more intensive transit service
- Increase general public services in the outlying areas of the region by increasing demand response and selectively offering neighborhood circulator services
- Connect outlying municipalities to downtown Raleigh through premium commuter services
- Add weekend services where warranted
- Provide more passenger amenities (transit centers, park-and-ride lots, information systems, sidewalks, bus shelters, etc.) throughout the CAMPO region

TOWN OF CARY

Cary Community Plan 2040

The Cary Community Plan consolidates several individual plans that have guided Cary's growth and establishes a long-term vision through the year 2040. The Plan contains a Transit Element, which provides recommendations for additional service on existing routes and proposes new destinations for service. Service improvements include increasing all routes to a minimum 30-minute weekday and Saturday service frequency, Sunday service with 60-minute frequency, and an expansion of daily service to 20 hours of service per day.

The Town of Cary remains committed to its existing suburban pattern while also encouraging a greater intensity of land uses at strategic locations. These strategic locations include areas near transit, as TOD is a policy objective introduced in the Plan. The Plan advocates for more high-quality housing--particularly near transit--that can accommodate a wide variety of lifestyles, from aging seniors to young professionals.

The Plan supports the development of new commercial, mixed-use centers that will contain Cary's highest densities and intensities of mixed-use development. These developments will be transit supportive and have the greatest potential to serve as high-quality destinations.

The Plan contains a separate Downtown Cary Area Plan, which highlights the future vision for the area and provides recommendations. The redevelopment of Downtown Cary will be an important step in creating a local and regional destination to anchor the western terminus of the future Western Boulevard BRT corridor. Recent public investments in Downtown Cary have modernized street infrastructure, revitalized historic buildings, and enhanced civic space in the area.

One BRT corridor alignment under study may run through the Central Chatham subarea, which is mentioned in the Downtown Cary Area Plan as being the "heart and soul" of Downtown Cary.

Opportunities exist to redevelop Chatham Street, the primary commercial street in downtown. The Area Plan recommends redeveloping older commercial properties and realigning new development to create consistent street frontage along the corridor. The plan also recommends converting West Chatham Street to two travel lanes, just west of the terminus of the future BRT corridor.

Another potential BRT corridor alignment runs through the South Academy sub-area of downtown Cary. The South Academy sub-area is considered Cary's cultural and historic center. Opportunities exist near the western terminus of the potential BRT corridor to enhance the streetscape along South Academy Street, revamp Downtown Park, and develop land adjacent to Downtown Park. These opportunities, along with plans for a new Wake County Regional Library near Downtown Park and future infill development, will make the park a new focal point for downtown Cary.

All of the Western Boulevard alternative alignments under study interact with the area known as the Eastern Cary Gateway, which lies between the eastern edge of Maynard Loop and the Cary Town limits. This area serves as the gateway into Cary from the east and is bounded by Chapel Hill Road to the north, Maynard Road to the west, Walnut Street to the south, and I-40 to the east. The Plan envisions Eastern Cary Gateway as a new economic center with an array of sports facilities, greenway trails, and transit-oriented development. Connectivity between areas in the Gateway is key and emphasis will be placed on walkability. Adjacent to Cary Towne Boulevard, the Plan calls for an employment-based "Mixed-Use Center." This area will contain high density and intensive employment uses, with supportive commercial and residential uses.

TOWN OF MORRISVILLE

The 2009 updates of the Morrisville Transportation Plan and Land Use Plan were developed simultaneously due to the inextricable relationship between land use and transportation. TOD is a key component of both plans due to a desire to develop land uses that are complementary to bus and rail services. The process included extensive public outreach through public workshops, Plan Advisory Committee meetings, focus groups, a public survey, and a phone hotline for citizens to leave comments or ask questions to project staff.

Morrisville Transportation Plan (2009)

The purpose of the 2009 Transportation Plan is to guide transportation policies and projects until 2035 and create a transportation system that accommodates travel and enhances adjacent land uses. The Plan seeks to address traffic congestion on Morrisville's roadways by prioritizing connectivity between origins and destinations and decreasing automobile dependence by supporting transit, bike, and walk trips.

Key recommendations include:

- Widen NC 54 (the backbone of Morrisville's transportation system) to accommodate high traffic volumes as well as bicycle and pedestrian facilities
- Configure many of Morrisville's future roadways to be four lanes with a landscaped median, 8-foot bidirectional multi-use paths, and 4-foot bike lanes

- Continue to work with Triangle Transit (GoTriangle) and other regional partners to develop a circulator route between Durham, Research Triangle Park, and Raleigh-Durham International Airport
- Implement standards and policies to support and enhance recommended improvements, such as policies for sidewalks, bike parking, and access management

Update Overview

Due to shifts in population and employment, new developments, completed transportation improvements, and modified transportation policies, an update to the 2009 Plan is currently underway. The update is expected to be adopted in spring 2018 and will reevaluate the vision, goals, objectives, and strategies set forth in the 2009 Plan. The update will also prioritize necessary roadway improvement projects and funding sources, update proposed transit routes in coordination with the Wake County Transit Investment Strategy, and update bicycle, pedestrian, and greenway recommendations.

Morrisville Land Use Plan (2009)

The 2009 Land Use Plan seeks to guide development and economic growth in Morrisville while balancing the desire for low-density residential development. To achieve this balance, the plan recommends creating mixed-use activity centers in areas with greater access to transportation infrastructure, and allowing the remainder of the Town to be master-planned or developed for low density residential.

Transportation is integrated into the Plan by linking land uses with appropriate transportation facilities that offer opportunities for walking, biking, or driving. The Plan also created a floating TOD land use category, which allows property owners to establish a TOD floating district to take advantage of planned transit routes in Morrisville. Land use and transportation recommendations vary by different Community Areas in Morrisville.

Update Overview

The Town of Morrisville is currently reviewing proposals for an update to the 2009 Plan. Since the 2009 Plan, the population has grown from 16,000 to 27,042 residents. Due to this rapid growth and the adoption of small plans and regulations, several action items identified in the previous plan have been completed or are no longer desired. The update will revise all sections of the 2009 Plan and include a fiscal/economic impact analysis. The update will also focus on key opportunity areas for transit supportive development in the McCrimmon Parkway Extension Area, Town Center Area, and the area south of the Wake Tech RTP Campus.

McCrimmon Transit Small Area Plan (2013)

In 2011, the Morrisville Town Council passed a resolution strongly supporting a transit station and TOD at McCrimmon Parkway and NC 54 due to the Town's lack of transit service, central location, proximity to job centers, and growing population. Following the resolution, the Town of Morrisville adopted the McCrimmon Transit Small Area Plan, which establishes a policy framework for how TOD should occur around the proposed station. The document describes a

community vision for a vibrant activity center in northern Morrisville linked to high-quality transit service and safe pedestrian connections to surrounding neighborhoods and businesses.

The Plan includes a market analysis, a workforce housing study, development suitability analysis, conceptual design for a commuter rail station and TOD, and transportation analysis. Outreach efforts included three public workshops, printed media, digital media, and online stakeholder surveys. The document also includes an action plan, which identifies key steps and likely stakeholders and agencies to implement the McCrimmon TOD vision.

Town Center Plan (2007)

The Town Center Plan establishes a vision for a town center in Morrisville that creates a distinct and inviting environment for the community. The project area is located at the intersection of Church Street and Morrisville-Carpenter Road and includes a rail line, parks, and civic facilities such as the Morrisville Town Hall.

Key elements include:

- Protect the historic structures around Church Street
- Create a community gathering place lined with small businesses and anchored by a civic/cultural facility
- Establish a Civil War park and a rural heritage park
- Link the parks and other destinations with a network of sidewalks and greenways
- Invest in a variety of transportation improvements, including reworking Chapel Hill Road (NC 54) into separate northbound and southbound segments in the Town Center area, improving the intersection of Morrisville-Carpenter Road and Chapel Hill Road, and installing roundabouts at selected locations to mark the transition into the Town Center

3 Travel Market Analysis

This chapter provides an overview of current and projected demographic and travel characteristics within the infrastructure and service areas of each BRT corridor. It focuses on how the communities along the corridor are expected to evolve over the next several decades and the implications that existing and future trends will have on transportation demand and mobility.

Understanding both existing and projected future travel demand is essential for planning and designing major transit investments that are appropriately matched to the demand potential. The future travel demand in each of the BRT corridors is reviewed and analyzed in this chapter. One of the most important factors in selecting corridors for major transit investments is the travel demand market served by the corridor. Existing traffic volumes and transit ridership in each corridor, along with the demand presented by the Triangle Regional Travel Demand Model (TRMv6), is used to identify the potential for transit demand.

The Triangle Region continues to experience rapid population growth combined with sustained regional employment growth. Figure 23 represents the population and employment for the Triangle Region and Wake County for 2013 and 2045[6]. Home to 1.7 million people in 2013, the Triangle Region is expected to reach just over 3 million in 2045. As noted in the 2045 draft MTP[7], this growth trend is consistent with a larger national trend, where two-thirds of all population growth is predicted to occur in “megaregions”, of which the fastest growing are in sunbelt areas like the Triangle.

Compared to the regional growth, population in Wake County is projected to grow much faster - 72% between 2013 and 2045 (from less than 1 million in 2013 to over 1.6 million in 2045). Reasons for this growth include the area’s strong economic base driven by Research Triangle Park; the higher educational institutions (such as North Carolina State University, Meredith, Peace, Shaw, and St. Augustine’s) in Raleigh; proximity to the Raleigh-Durham International Airport; a diversity of residential settings that offer high quality of life; and revitalization of downtown Raleigh.

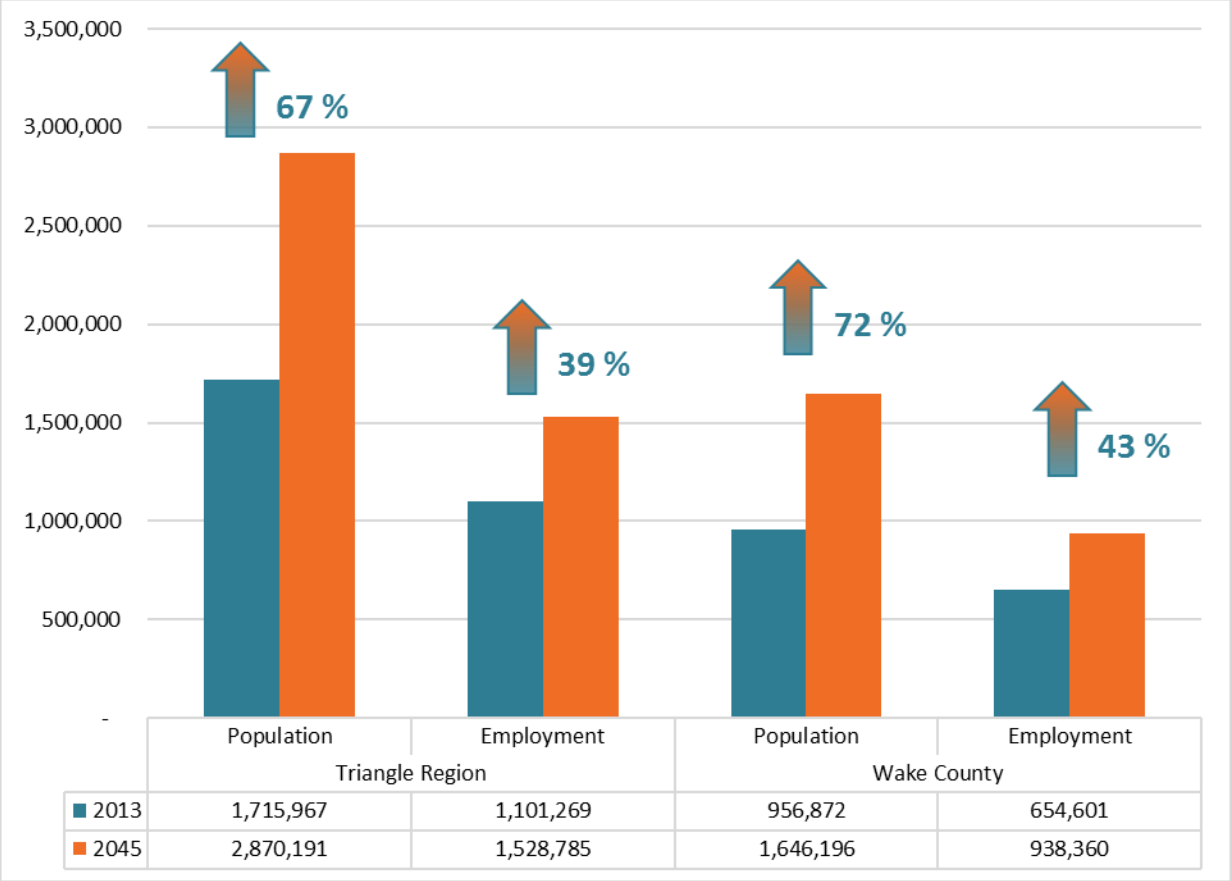
The Triangle Region’s economy is backed by major universities and their associated medical centers, Research Triangle Park, and the North Carolina State Government. As noted in the 2045 draft MTP, despite the challenging economic climate, the Region’s economy has proven resilient and the size of the Region’s economy is substantial. The Region’s economic position is forecasted to remain robust through 2045 with the addition of approximately 430,000 jobs. The

[6] TRMv6 -Model base year is 2013 and forecast year is 2045.

[7] 2045 draft Metropolitan Transportation Plan, CAMPO and DCHC-MPO.

fastest job growth is expected to occur in the Wake County area, adding 283,759 jobs (i.e., 67% of the Region's total employment growth).

Figure 23: Socio-Economic Data from TRMv6



	Triangle Region		Wake County	
	Population	Employment	Population	Employment
2013	1,715,967	1,101,269	956,872	654,601
2045	2,870,191	1,528,785	1,646,196	938,360

Source: TRMv6 socio-economic data (December 2017)

METHODOLOGY

TRMv6 was used to identify the potential for transit demand, but not specific ridership estimates. In future tasks, estimates of future ridership will be built off the planned frequent service network. While the existing traffic volume counts provide an order of magnitude to the total volume in the corridor, they do not illuminate the length of the trips or the trip purposes, which is important in assessing the transit demand, which will be studied later. The recently completed Triangle Regional Model Household Travel Survey results were also reviewed as an input to this analysis.

This section provides a summary of both the existing and projected population and employment along with the future demand in both the infrastructure and service areas of the four BRT corridors. A set of travel districts for each corridor described in the previous section were used to aggregate the travel behavior in the corridors as contained in the TRMv6. Socio-economic data for 2013 and 2045 were extracted from the TRMv6 for Traffic Analysis Zones (TAZ) comprising the infrastructure and service areas, which are depicted in Figures 30, 32, 35, and 37.

The TRMv6 was used to obtain 2045 total daily person trip data (single occupancy vehicle and carpool trips, all transit trips) for the Region, Wake County, and the Infrastructure and Service areas. Daily person trips from the travel demand model were used to analyze the potential market demand from the various service areas to each infrastructure area and downtown Raleigh, and between each infrastructure area. Population and employment data were aggregated by the infrastructure and service area districts to illustrate the magnitude of the activities in the corridors and the amount of growth that is forecasted in the area influencing the corridors.

This information will be important in the selection of major stop or station locations on the BRT.

The demand between the districts is determined by the locations of productions and attractions of trips in the Study Area. Productions are typically associated with households and attractions with employment.

FINDINGS BY BRT CORRIDORS

Central Business District

While the Central Business District (CBD) is not a separate corridor similar to the other four BRT corridors, it is a critical component of all four corridors. The CBD is a major generator of trips that will be an important factor in the success of the BRT system for all or any of the corridors. Therefore, the CBD is included in this section in order to understand the BRT travel markets to their full extent.

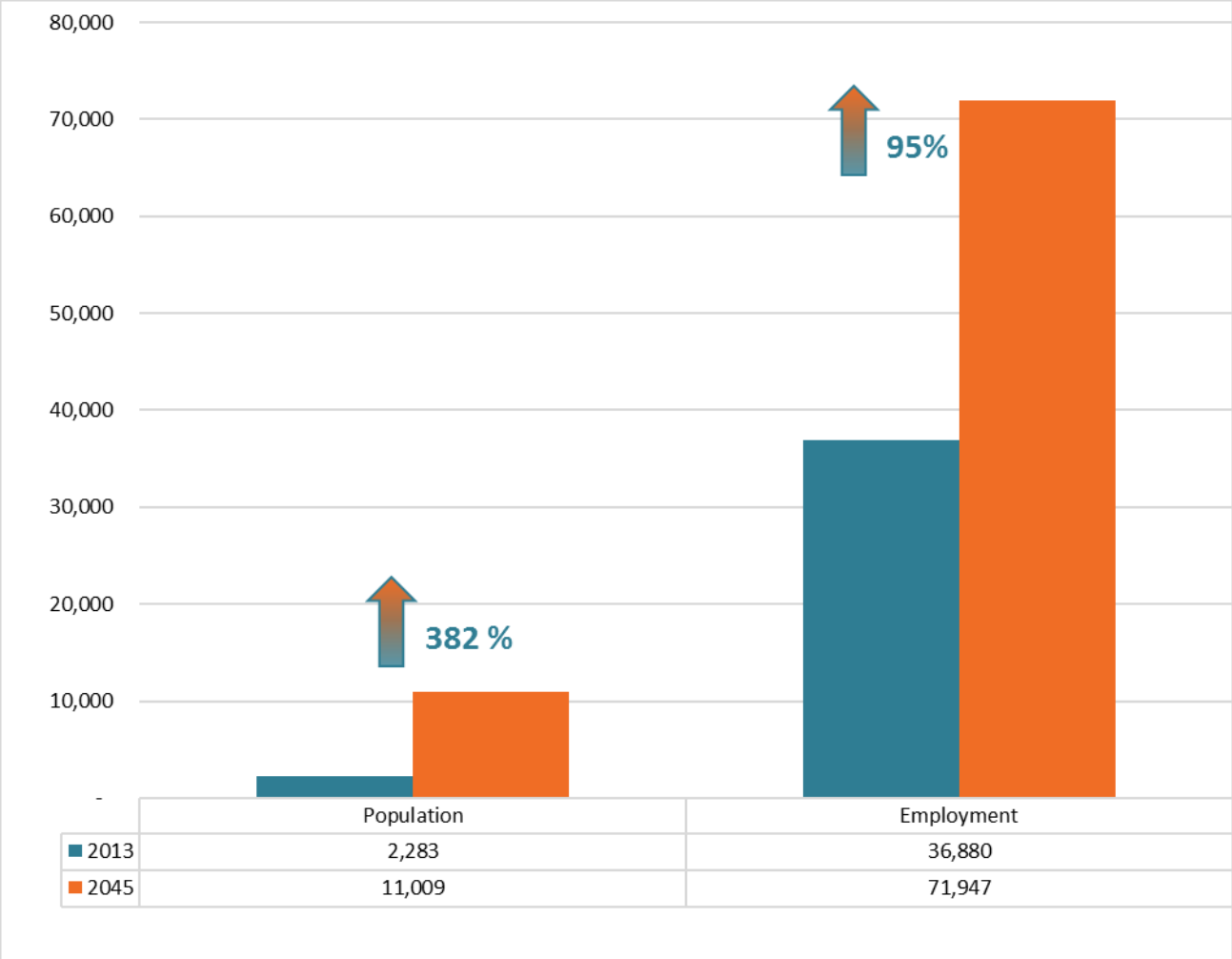
Population and Employment

The Raleigh Central Business District (CBD) consisted of 0.25% of the total Wake County population, and 6% of total employment in 2013. The percentage of CBD population compared to Wake County in 2045 increases to 0.70%, and employment increases to approximately 8%.

Population in the CBD is projected to increase 392% from 2,283 in 2013 to 11,009 in 2045. No student population is anticipated in the CBD. Existing and forecasted employment growth in the CBD illustrates the transit ridership potential of employment centers. Employment in the CBD is projected to increase 95% from 36,880 in 2013 to 71,947 in 2045.

The City of Raleigh will conduct an analysis of the CBD's infrastructure needs to support the four BRT Corridors. Refer to Figure 24 and maps in Appendix 3-B for details of land use changes in the CBD.

Figure 24: Population and Employment Changes in CBD



Potential Travel Market

Travel patterns to the CBD are presented as productions and attractions to demonstrate the directional characteristics of trips. As shown in Figures 25 through 27 below, the CBD produces 110,000 trips that are attracted to the four-corridor infrastructure and service areas and attracts 205,100 trips from these areas. Only 9% of the trips produced in the CBD stay within the CBD. A large proportion, 19,500 (18%) of total trips produced within the CBD have destinations in the Western Boulevard infrastructure area districts and 23,400 (21%) in the Capital Boulevard service area.

Figure 25: Potential Travel Market to Central Business District from All Infrastructure Areas

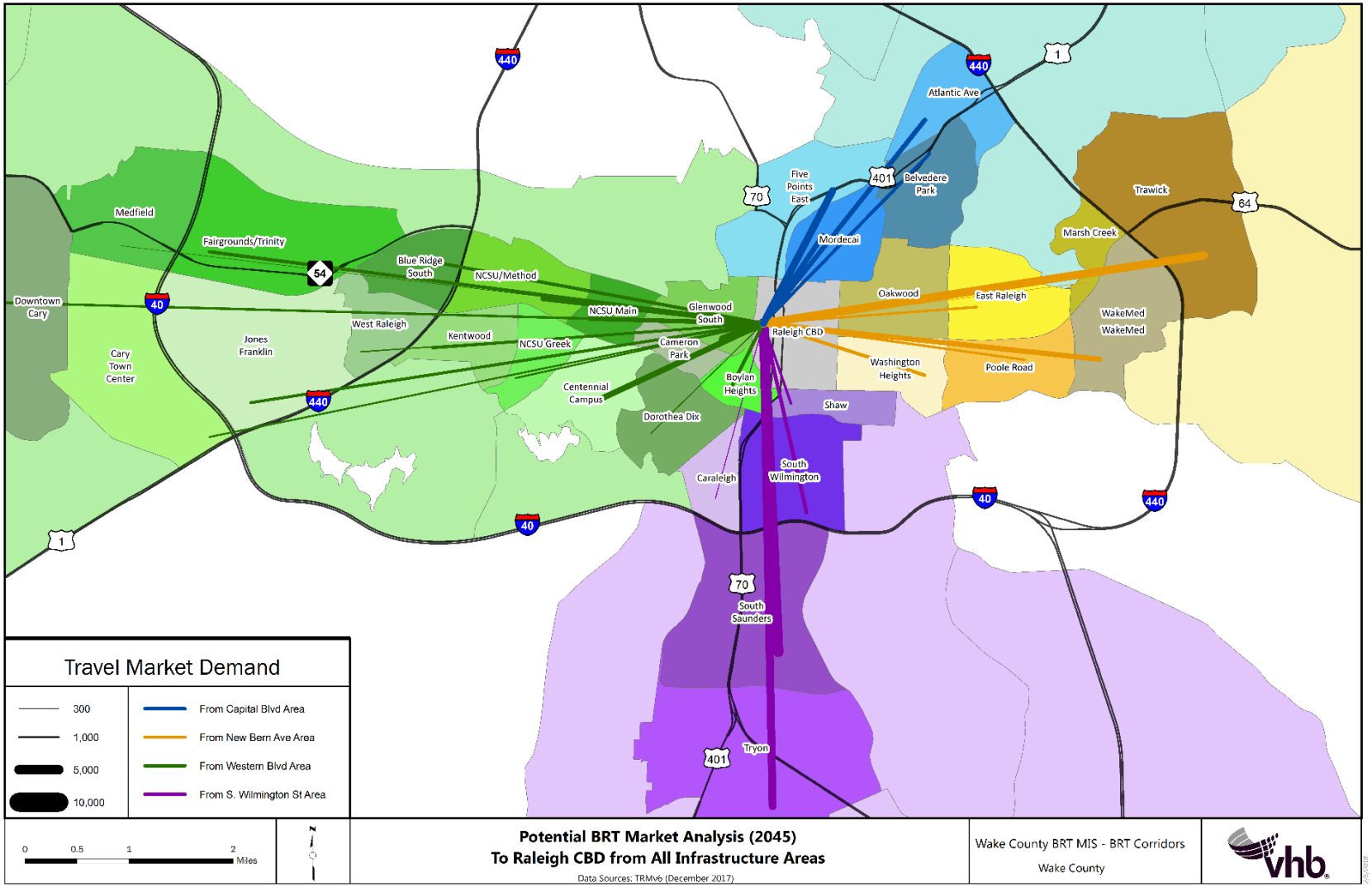


Figure 26: Potential Travel Market to Central Business District from All Service Areas

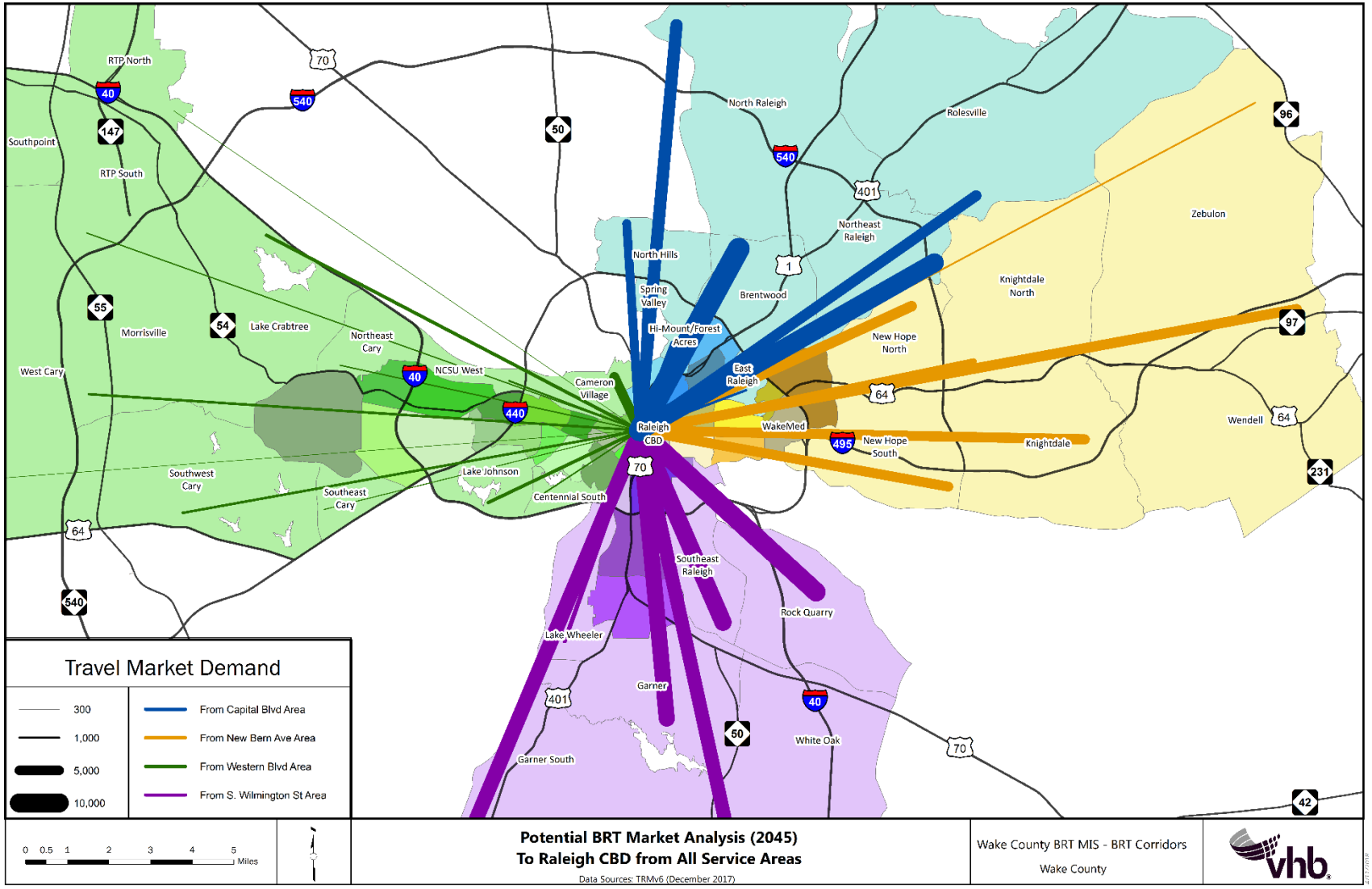


Figure 27: Potential Daily Trips Produced by Infrastructure and Service Districts

Districts / Districts			Attracted To								Total
			Raleigh CBD	Infrastructure Area				Service Area				
				Capital Blvd.	New Bern Ave.	Wilmington St.	Western Blvd.	Capital Blvd.	New Bern Ave.	Wilmington St.	Western Blvd.	
Produced By	Raleigh CBD		9,700	9,800	10,100	14,600	19,500	23,400	4,000	10,500	8,400	*110,000*
	Infrastructure Area	Capital Blvd.	11,000	10,400	7,500	5,800	14,900	25,400	2,700	3,700	7,000	*88,400*
		New Bern Ave.	13,600	9,700	20,800	7,100	13,600	31,700	11,900	7,500	5,300	*121,200*
		Wilmington St.	13,400	6,100	5,800	26,000	20,000	6,800	2,100	21,300	7,900	*109,400*
		Western Blvd.	26,100	14,900	9,900	22,300	213,600	27,300	3,200	13,400	117,200	*447,900*
	Service Area	Capital Blvd.	44,400	49,500	53,600	10,500	48,700	499,900	40,700	9,000	33,400	*789,700*
		New Bern Ave.	25,600	20,900	66,600	10,200	21,500	130,800	162,800	14,700	12,300	*465,400*
		Wilmington St.	45,100	15,900	27,100	71,600	56,700	18,500	8,500	152,100	27,000	*422,500*
		Western Blvd.	16,200	9,100	5,200	10,700	170,400	19,900	1,900	6,900	562,200	*802,500*
Total			*205,100*	*146,300*	*206,600*	*178,800*	*578,900*	*783,700*	*237,800*	*239,100*	*780,700*	***3,357,000***

Figure 28: Percent Potential Daily Trips Produced by Infrastructure and Service Districts

Districts / Districts			Attracted To								Total
			Raleigh CBD	Infrastructure Area				Service Area			
				Capital Blvd.	New Bern Ave.	Wilmington St.	Western Blvd.	Capital Blvd.	New Bern Ave.	Wilmington St.	Western Blvd.	
Produced By	Raleigh CBD		9%	9%	9%	13%	18%	21%	4%	10%	8%	*100%*
	Infrastructure Area	Capital Blvd.	12%	12%	9%	7%	17%	29%	3%	4%	8%	*100%*
		New Bern Ave.	11%	8%	17%	6%	11%	26%	10%	6%	4%	*100%*
		Wilmington St.	12%	6%	5%	24%	18%	6%	2%	19%	7%	*100%*
		Western Blvd.	6%	3%	2%	5%	48%	6%	1%	3%	26%	*100%*
	Service Area	Capital Blvd.	6%	6%	7%	1%	6%	63%	5%	1%	4%	*100%*
		New Bern Ave.	5%	4%	14%	2%	5%	28%	35%	3%	3%	*100%*
		Wilmington St.	11%	4%	6%	17%	13%	4%	2%	36%	6%	*100%*
		Western Blvd.	2%	1%	1%	1%	21%	2%	0%	1%	70%	*100%*

Figure 29: Percent Potential Daily Trips Attracted to Infrastructure and Service Districts

Districts / Districts			Attracted To								
			Raleigh CBD	Infrastructure Area				Service Area			
				Capital Blvd.	New Bern Ave.	Wilmington St.	Western Blvd.	Capital Blvd.	New Bern Ave.	Wilmington St.	Western Blvd.
Produced By		Raleigh CBD	5%	7%	5%	8%	3%	3%	2%	4%	1%
	Infrastructure Area	Capital Blvd.	5%	7%	4%	3%	3%	3%	1%	2%	1%
		New Bern Ave.	7%	7%	10%	4%	2%	4%	5%	3%	1%
		Wilmington St.	7%	4%	3%	15%	3%	1%	1%	9%	1%
		Western Blvd.	13%	10%	5%	12%	37%	3%	1%	6%	15%
	Service Area	Capital Blvd.	22%	34%	26%	6%	8%	64%	17%	4%	4%
		New Bern Ave.	12%	14%	32%	6%	4%	17%	68%	6%	2%
		Wilmington St.	22%	11%	13%	40%	10%	2%	4%	64%	3%
		Western Blvd.	8%	6%	3%	6%	29%	3%	1%	3%	72%
			100%	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*

Only 5% of the trips attracted to the CBD are produced within the area. A total of 64,100 (31%) of the trips attracted to the CBD are from all four infrastructure areas. Of all the trips attracted to the CBD that are produced in any of the infrastructure area districts, the majority (26,100 or 13%) of the trips are produced in the Western Boulevard infrastructure area districts. Most of these trips are produced towards the eastern end of the Western Boulevard corridor near the NCSU/Method, Centennial Campus, and Glenwood South districts. A total of 45,100 (22%) of the trips produced in any of the four service areas are produced in the S Wilmington service area. Most of these trips emanate from the Garner, Rock Quarry and Southeast Raleigh Districts, likely due to the CBD's employment opportunities. This trip pattern shows that most of the demand in this corridor is from the service areas outside of the CBD area. Refer to Figures 28 and 29 for details of trips produced by and attracted to the CBD. Appendix 3-C shows the detailed matrix of productions and attractions between the CBD and each district in the infrastructure and service areas.

Capital Boulevard BRT Corridor

Population and Employment

The Capital Boulevard infrastructure area consisted of 1% of the total Wake County population and employment in 2013. While the percentage of infrastructure area population compared to Wake County in 2045 stays at 1%, employment increases to 3% in 2045 of the total Wake County employment. The service area population represented 15% of Wake County in 2013 and is projected to stay at 16% in 2045. The employment in the service area was 12% of Wake County employment in 2013 and is projected to increase to 17% of the total Wake County employment in 2045.

Population in the Capital Boulevard Infrastructure area is projected to increase 170% by 2045 from 8,478 in 2013 to 22,926 in 2045. Most of this growth will be concentrated in Atlantic Avenue and Belvedere Park districts. There is some student population in Mordecai district, which will grow at a steady rate. Population in the Capital Boulevard service area is projected to increase at a slower pace compared to the infrastructure area (i.e., 74%, from 147,326 in 2013 to 256,620 in 2045). Most of this growth will be concentrated in the Brentwood and Northeast Raleigh districts.

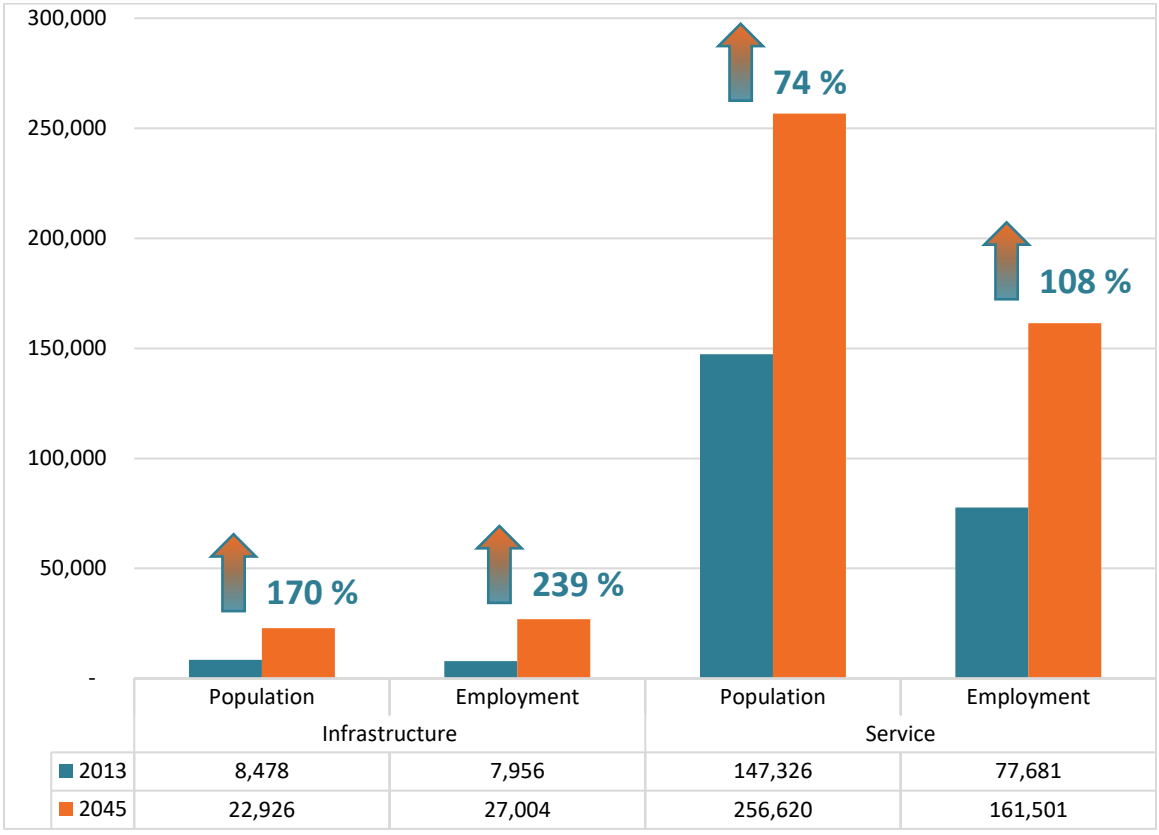
Existing and forecasted employment growth in the infrastructure and service areas illustrates the transit ridership potential of employment centers. Employment in the infrastructure area is projected to increase by 239% from 7,956 in 2013 to 27,004 in 2045. Employment growth in this corridor is equally spread out in all of the four infrastructure districts, but growth is slightly more towards the downtown. Employment in the service area is projected to increase by 108% from 77,681 in 2013 to 161,501 in 2045. Employment growth in this corridor is concentrated in the North Hills, Spring Valley, Hi-Mount/Forest Acres and Northeast districts.

This continued growth will quickly outstrip the transportation network's ability to keep pace with transportation demand. Projected population growth will increase travel demand through the corridor and commuter trips between the residential areas in the service area and commercial and office areas within the infrastructure area. The current transportation choices available to the public are limited. The automobile is the only available mode of travel for most trips, particularly between residential and employment centers. GoRaleigh has existing bus

service on Capital Boulevard between downtown Raleigh and Triangle Towne Center, which runs from 4:30am to 12:00am during the weekday at a 15-minute frequency in the peak hours and at 15-60-minute frequencies in the off-peak hours and weekends. There are no greenways around this area that can be used for commuting.

Refer to Figure 30 and maps in Appendix 3-B for details of land use changes in this corridor area.

Figure 30: Population and Employment Changes - Capital Boulevard Corridor

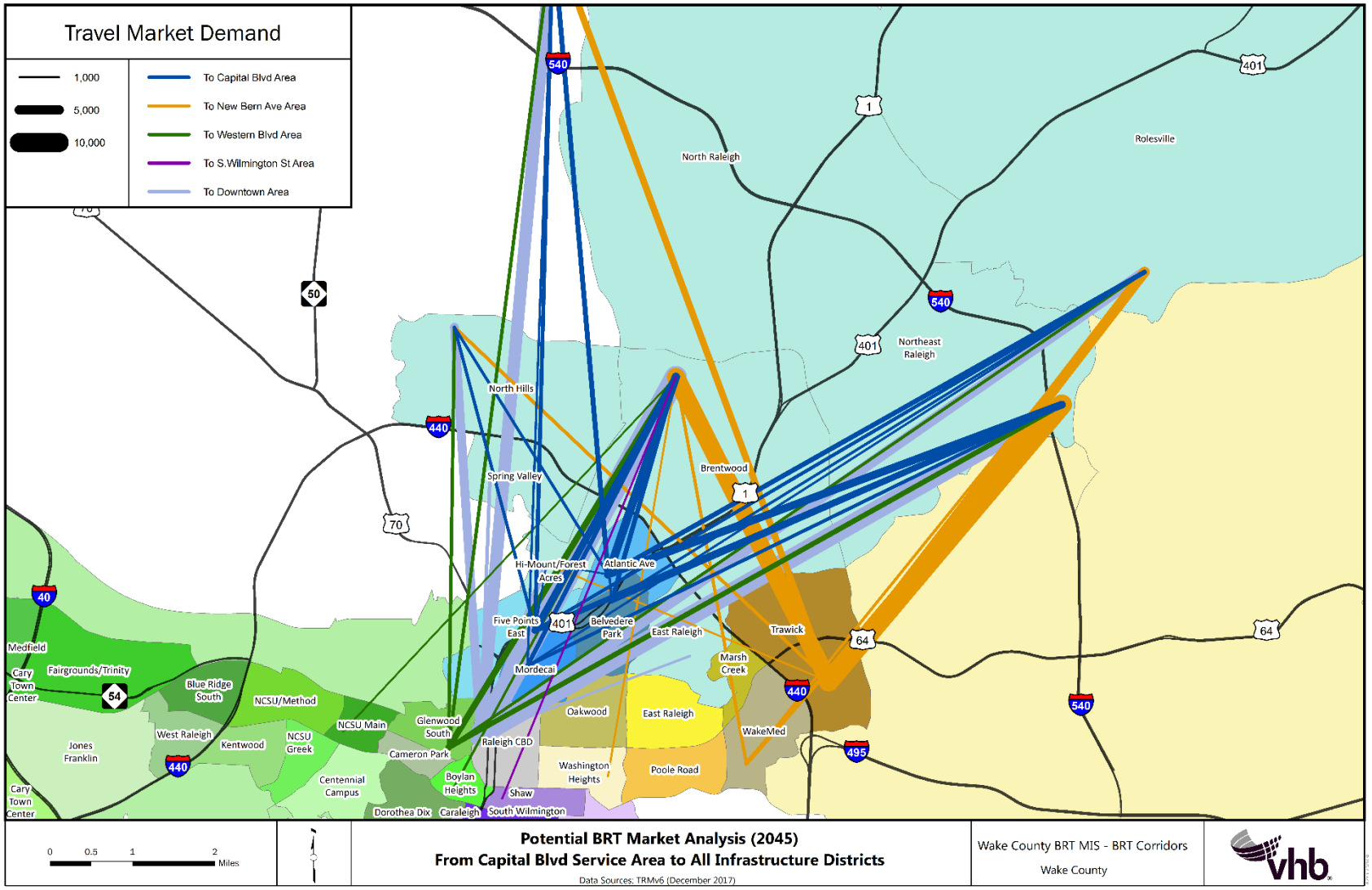


	Infrastructure		Service	
	Population	Employment	Population	Employment
2013	8,478	7,956	147,326	77,681
2045	22,926	27,004	256,620	161,501

Potential Travel Market

Travel patterns in the Capital Boulevard corridor infrastructure and service areas are presented as a productions and attractions to demonstrate the directional characteristics of trips. As shown in Figures 27, 28, and 29 above, this infrastructure area produces 88,400 trips and attracts 146,300 trips. Only 12% of the trips produced in the Capital Boulevard infrastructure area stay within the area. A large percentage (17%) of total trips produced within the Capital Boulevard Infrastructure area have destinations in the Western Boulevard infrastructure area districts. Most of these trips are attracted towards the eastern end of the Western Boulevard corridor near NCSU. Of the trips produced in the Capital Boulevard infrastructure area, 12% (11,400 trips) have destinations in the Raleigh Central Business District (CBD). This trip pattern is expected as the Raleigh CBD and Western Boulevard area include many activity centers (i.e., huge employment demand in downtown Raleigh, NCSU Main, and Centennial Campus). A total of 25,400 or 29% of the trips produced in this infrastructure area are attracted to the Capital Boulevard service area.

Figure 31: Potential Travel Market from Capital Boulevard Service Area to Other Infrastructure Areas



A total of 95,400 (65%) of the trips attracted to the Capital Boulevard infrastructure area are from all four service areas, with the highest percentage of trips (34% or 49,500) coming from the Capital Boulevard service area. This trip pattern shows that there is not much demand in this corridor from the infrastructure and service area within the Capital Boulevard study corridors.[8] Within the Capital Boulevard infrastructure area, most of the trips are attracted to either the Five Points East or Atlantic Avenue districts.

The Capital Boulevard service area produces 789,700 trips and 499,900 (63%) of these trips stay within the area, with 53,600 (7%) trips attracted to the New Bern Avenue infrastructure area. Refer to Figure 31 for details of the trips produced in the Capital Boulevard service area and attracted to all infrastructure areas. Of all the trips (206,700) produced in the Capital Boulevard service area and attracted to four infrastructure areas and CBD, the majority are attracted to Trawick district (33,060) or Raleigh CBD (44,360). Appendix 3-C shows the detailed matrix of productions and attractions between each district in the infrastructure and service areas.

New Bern Avenue BRT Corridor

Population and Employment

The New Bern Avenue infrastructure area consisted of 2% of the total Wake County population, and 3% of the employment in 2013. Whereas, the percentage of infrastructure area population compared to Wake County in 2045 stays at 2%, employment increases to 5% of the total Wake County employment. The service area population was 8% of Wake County in 2013 and is projected to increase to 11% in 2045. The employment in service area was 5% of Wake County employment in 2013 and is projected to increase to 8% of Wake County's total employment in 2045.

Population in the New Bern Avenue infrastructure area is projected to increase 81% from 17,652 in 2013 to 31,878 in 2045. Most of this growth will be concentrated in the Poole Road, Trawick and East Raleigh districts. There is some student population in the Oakwood District, which will grow at a steady rate. Population in the New Bern Avenue service area is projected to increase at a much faster rate compared to the infrastructure area at 132% (from 77,141 in 2013 to 179,284 in 2045). Most of this growth will be concentrated in the Wendell, Knightdale and Knightdale North districts.

Existing and forecasted employment growth in the infrastructure and service areas illustrates the transit ridership potential of employment centers. Employment in the infrastructure area is projected to increase 135% from 18,517 in 2013 to 43,451 in 2045. Employment growth in this corridor is concentrated in the Wake Med and Washington Heights districts. Employment in the service area is projected to increase at approximately the same rate as the infrastructure area (i.e., 122% from 34,211 in 2013 to 75,909 in 2045). Employment growth in this corridor is equally spread out between all districts except Zebulon, which does not show much employment growth.

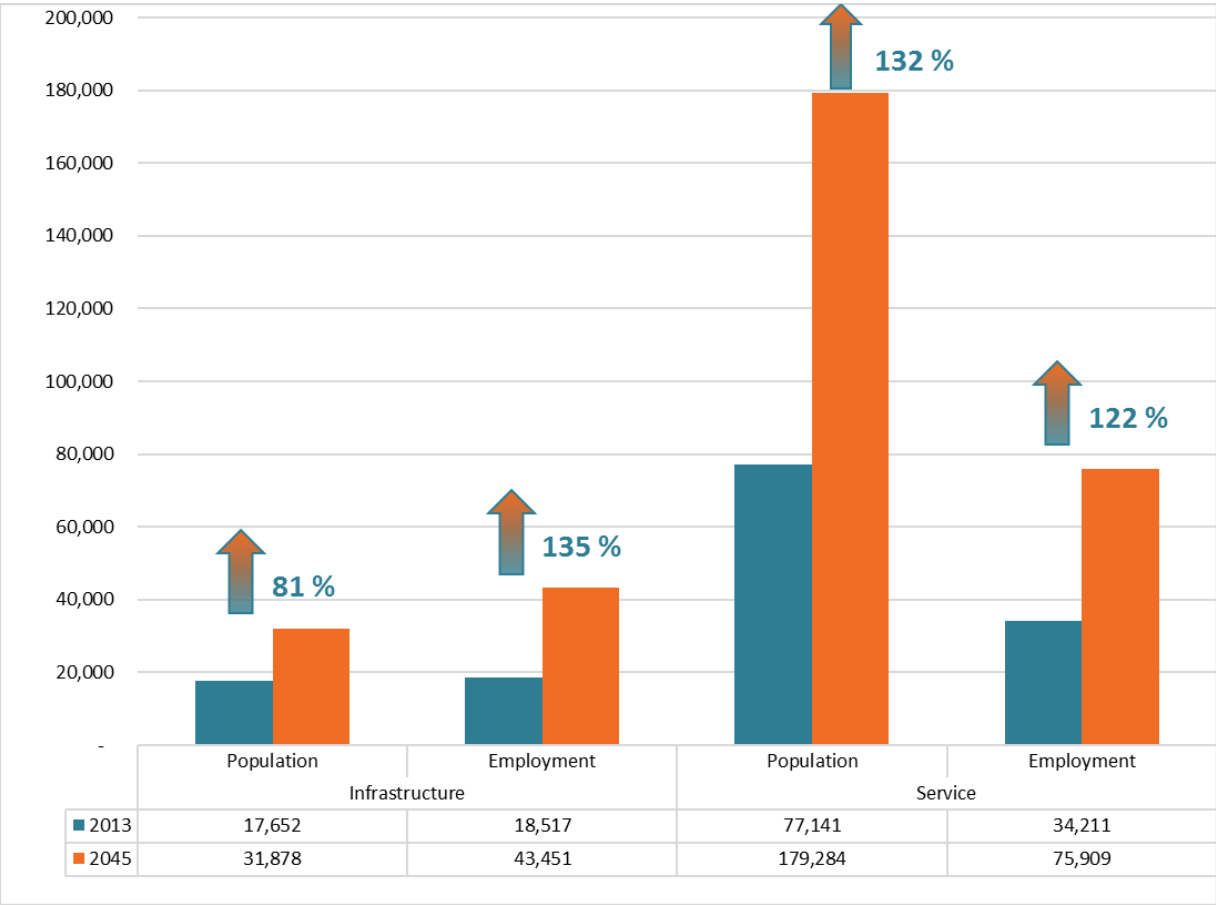
The continued growth will quickly outstrip the transportation network's ability to keep pace with transportation demand. Projected population growth will increase travel demand through

[8] There is a large area from the TRMv6 that is not included in this analysis, which has a potential travel market to this corridor. This area will be analyzed during ridership analysis.

the corridor and commuter trips between the residential areas in the service area and commercial and office areas within the infrastructure area. The current transportation choices available to the public are limited. The automobile is the only available mode of travel for most trips, particularly between residential and employment centers. GoRaleigh has an existing bus service on New Bern Avenue between downtown Raleigh and New Hope Commons Shopping Center which runs from 5:30am to 11:40pm during the weekday at a 15-minute frequency in the peak hours and at 15-60-minute frequencies during off-peak hours and weekends. GoTriangle also runs an express route along this corridor, which provides service to Knightdale, Wendell and Zebulon. There are no greenways around this area that can be used for commuting.

Refer to Figure 32 and maps in Appendix 3-B for details of land use changes in this corridor area.

Figure 32: Population and Employment Changes in New Bern Avenue Area



Potential Travel Market

Travel patterns in the New Bern Avenue corridor infrastructure and service areas are presented as productions and attractions to demonstrate the directional characteristics of trips. As shown in Figures 27, 28, and 29 above, this infrastructure area produces 64,800 trips and attracts 54,100 trips. A total of 20,800 or 17% of the trips produced in this infrastructure area stay within the area. A large percentage (13,600 or 11%) of total trips produced within the New Bern Avenue infrastructure area have destinations in the Raleigh CBD and Western Boulevard

infrastructure area districts. Most of these trips are attracted towards the eastern end of the Western Boulevard corridor near NCSU. This trip pattern is expected as the Raleigh CBD and Western Boulevard areas include many activity centers (e.g., huge employment demand in downtown Raleigh, NCSU Main, and Centennial Campus).

A total of 10% of total trips are attracted within the New Bern Avenue infrastructure area. A total of 10,100 or 5% of the trips attracted to the New Bern Avenue infrastructure area are produced in the Raleigh CBD. The biggest attracter of trips in the New Bern infrastructure area is Trawick district, which attracts 110,400 trips from all infrastructure and service areas. Wake Med is the main employment center in the New Bern Avenue infrastructure area. A total of 31,000 trips are attracted to Wake Med district from all infrastructure and service areas. Refer to Figure 16 for details of market demand to Wake Med district.

A total of 152,500 (74%) of the trips attracted to the New Bern Avenue infrastructure area are from all four service areas, with the highest percentage of trips (32% or 66,600) coming from the New Bern Avenue service area. Most of these trips are attracted to the WakeMed and Trawick districts as expected with large employment centers (see Figure 34). This trip pattern shows that most of the demand in this corridor is from the infrastructure and service areas within the study corridor[9].

The New Bern Avenue service area produces 465,400 trips and only 162,800 (35%) of these trips stay within the New Bern Avenue service area; 66,600 (14%) are attracted to the New Bern Avenue infrastructure area; 25,600 (5%) to the Raleigh CBD and 21,500 (5%) to the Western Boulevard infrastructure area. Approximately 35% of the total trips are attracted to New Bern Avenue service area and 28% to the Capital Boulevard service area. As shown in Figure 33 and Figure 28, the majority of the trips attracted to the New Bern Avenue infrastructure area are from the New Bern Avenue and Capital Boulevard service area. Appendix 3-C shows the detailed matrix of productions and attractions between each district in the infrastructure and service areas.

[9] There is a large area from the TRMv6 that is not included in this analysis, which has a potential travel market to this corridor. This area will be analyzed during ridership analysis.

Figure 33: Potential Travel Market from New Bern Avenue Service Area to Other Infrastructure Areas

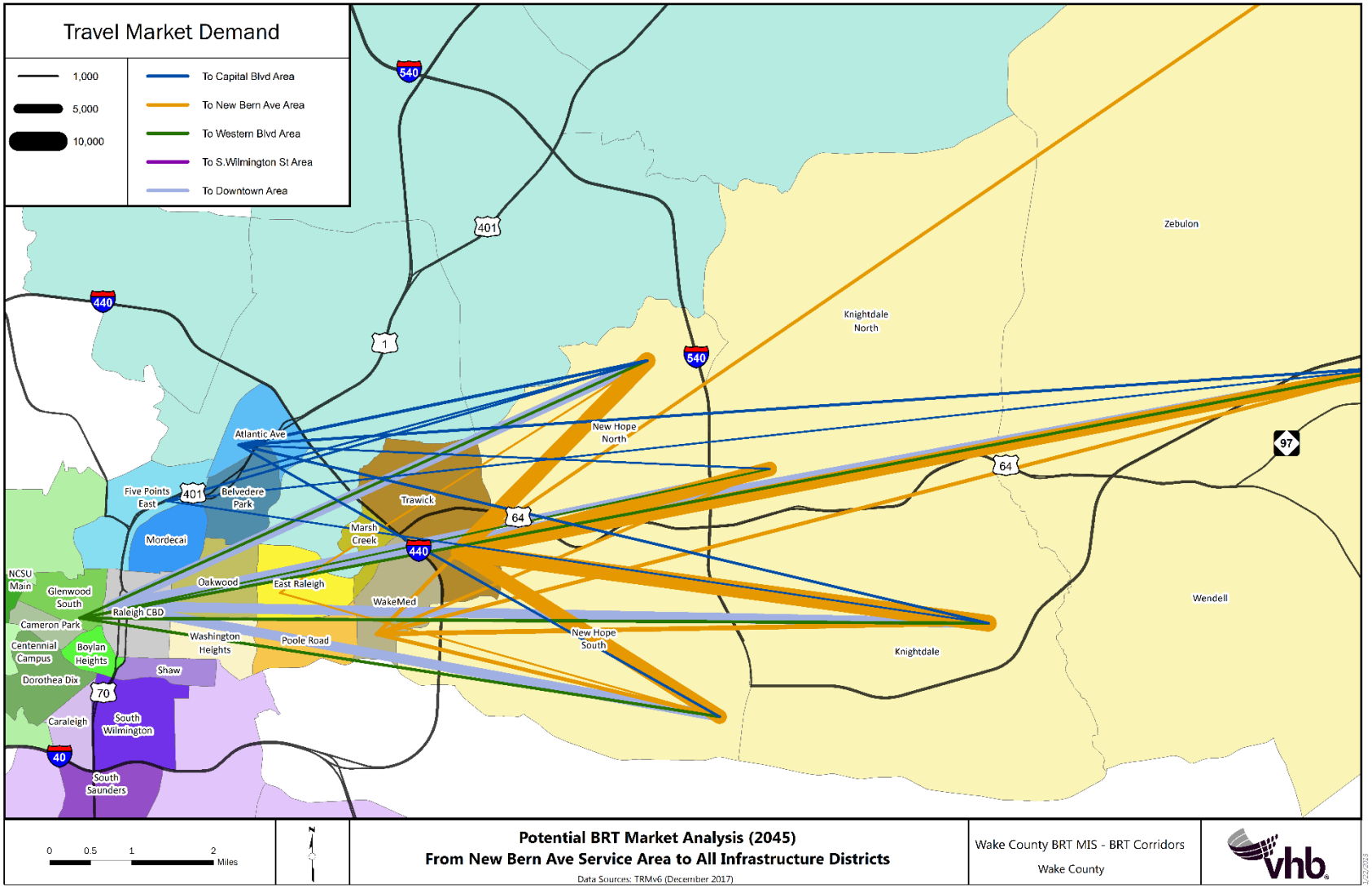
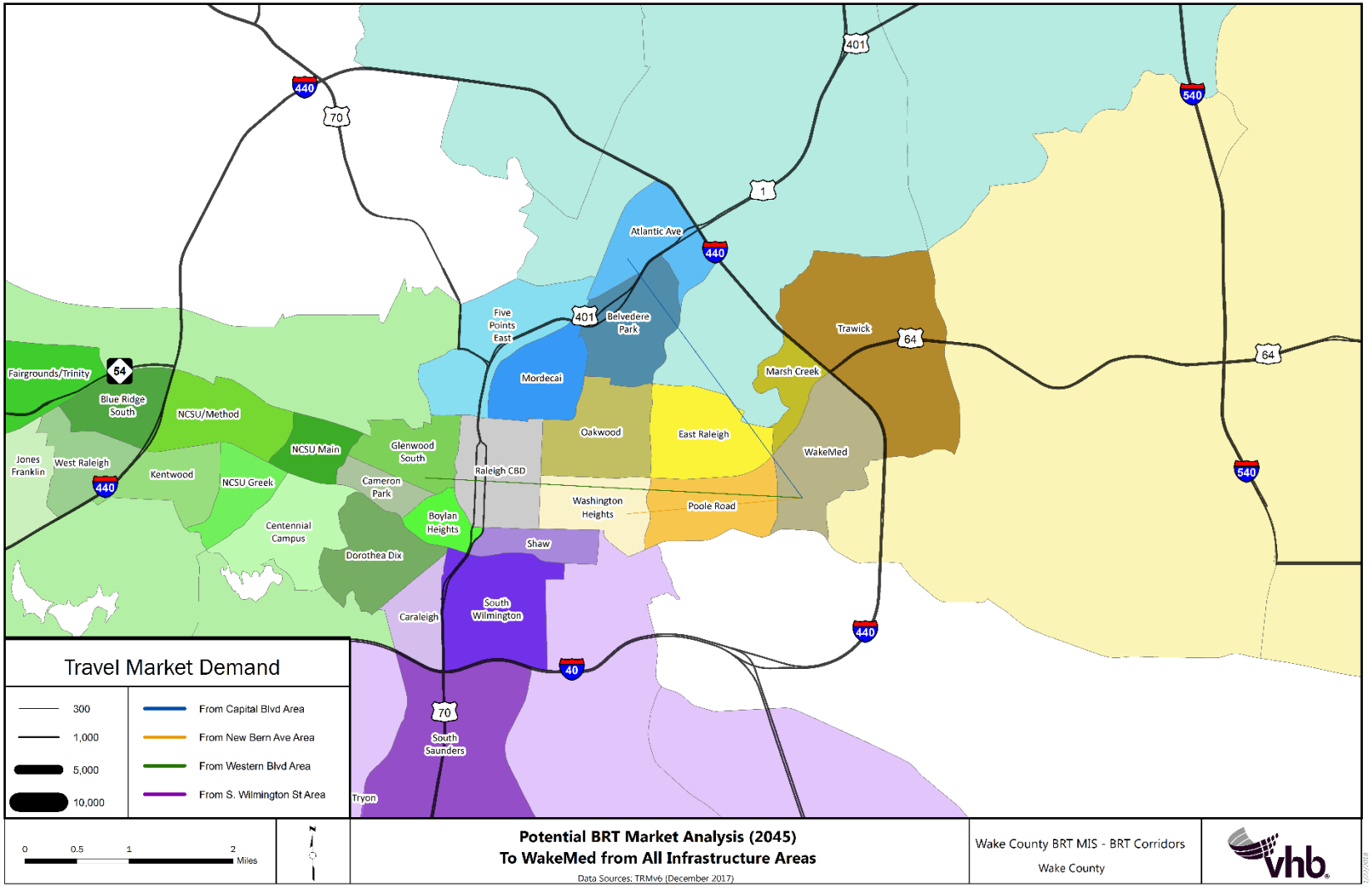


Figure 34: Potential Travel Market to WakeMed from Other Infrastructure Areas



S. Wilmington Street BRT Corridor

Population and Employment

The S Wilmington Street infrastructure area consisted of 1% of the total Wake County population, and 2% of Wake County employment in 2013. The percentage of infrastructure area population compared to Wake County in 2045 increases to 2% and employment increases to 4%. The service area population was 8% of Wake County in 2013 and is projected to increase to 10% in 2045. The employment in the service area was 5% of Wake County's employment in 2013 and is projected to increase to 9% of Wake County's total employment in 2045.

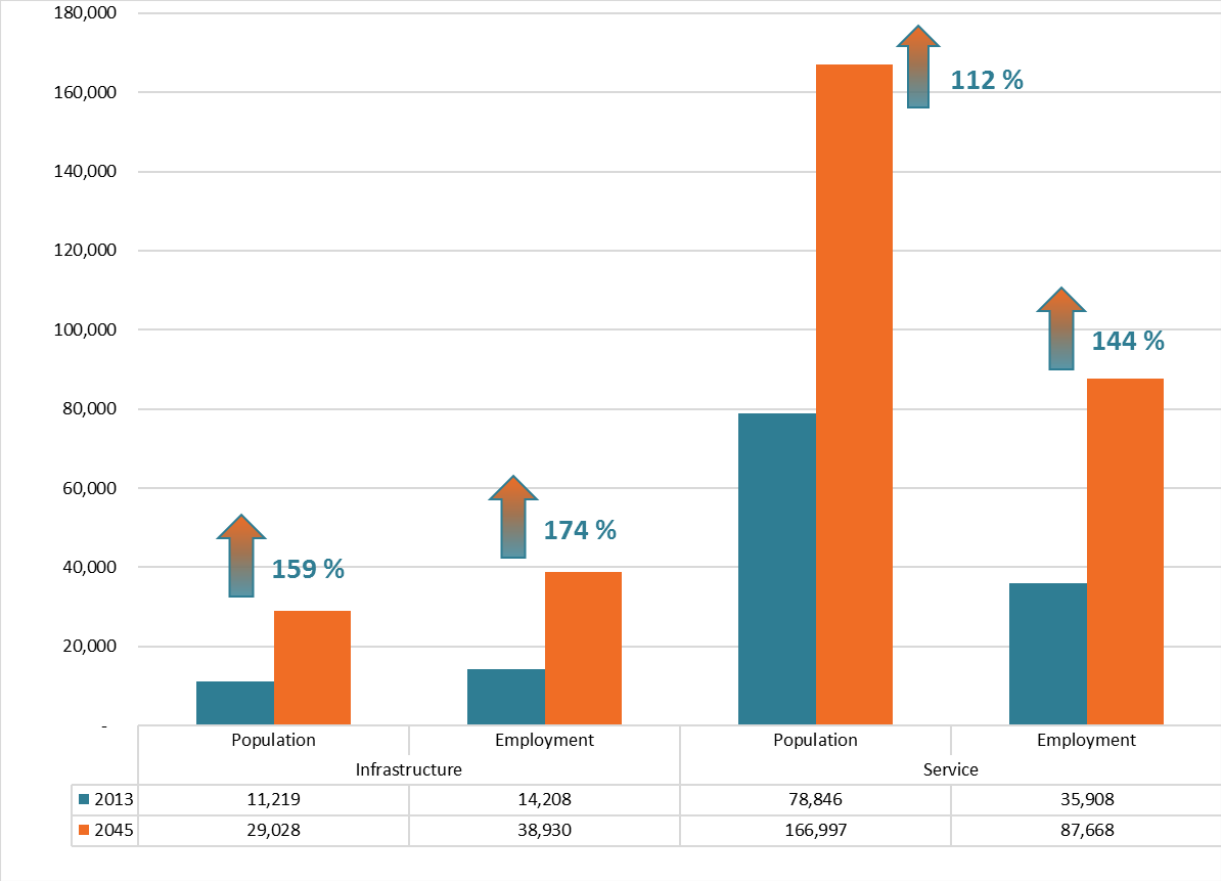
Population in the S Wilmington infrastructure area is projected to increase 159% from 11,219 in 2013 to 29,028 in 2045. Most of this growth will be concentrated in the Tryon, South Saunders and South Wilmington districts. There is some student population in the Shaw District, which will grow at a steady rate. Population in the S Wilmington Street service area is projected to increase at a much slower rate compared to the infrastructure area (i.e., 112% from 78,846 in 2013 to 166,997 in 2045). Most of this growth will be evenly dispersed between the Southeast Raleigh, Rock Quarry, Garner, White Oak and Garner South districts.

Existing and forecasted employment growth in the infrastructure and service areas illustrates the transit ridership potential of employment centers. Employment in the infrastructure area is projected to increase 174% from 14,208 in 2013 to 38,930 in 2045. Employment growth in this corridor is concentrated in the South Wilmington and South Saunders districts. Employment in the service area is projected to increase at a slower rate compared to the infrastructure area (i.e., 144% from 35,908 in 2013 to 87,668 in 2045). Employment growth in this corridor is concentrated in the Southeast Raleigh, Rock Quarry, and White Oak districts.

The continued growth will quickly outstrip the transportation network's ability to keep pace with transportation demand. The projected population growth will increase travel demand through the corridor and commuter trips between the residential areas in the service area and commercial and office areas within the infrastructure areas. The current transportation choices available to the public are limited. The automobile is the only available mode of travel for most trips, particularly between residential and employment centers. GoRaleigh has an existing bus service on S. Saunders Street/S. Wilmington Street between downtown Raleigh and the Stations Shopping Center on Purser Road, which runs from 5:45am to 11:00pm during the weekday at a 15-minute frequency in the peak hours and at a 30-60-minute frequencies during the off-peak hours and weekends. GoTriangle also runs an express route along this corridor, which provides service to Wake Technical College. There are no greenways around this area that can be used for commuting.

Refer to Figure 35 and maps in Appendix 3-B for details of land use changes in this corridor.

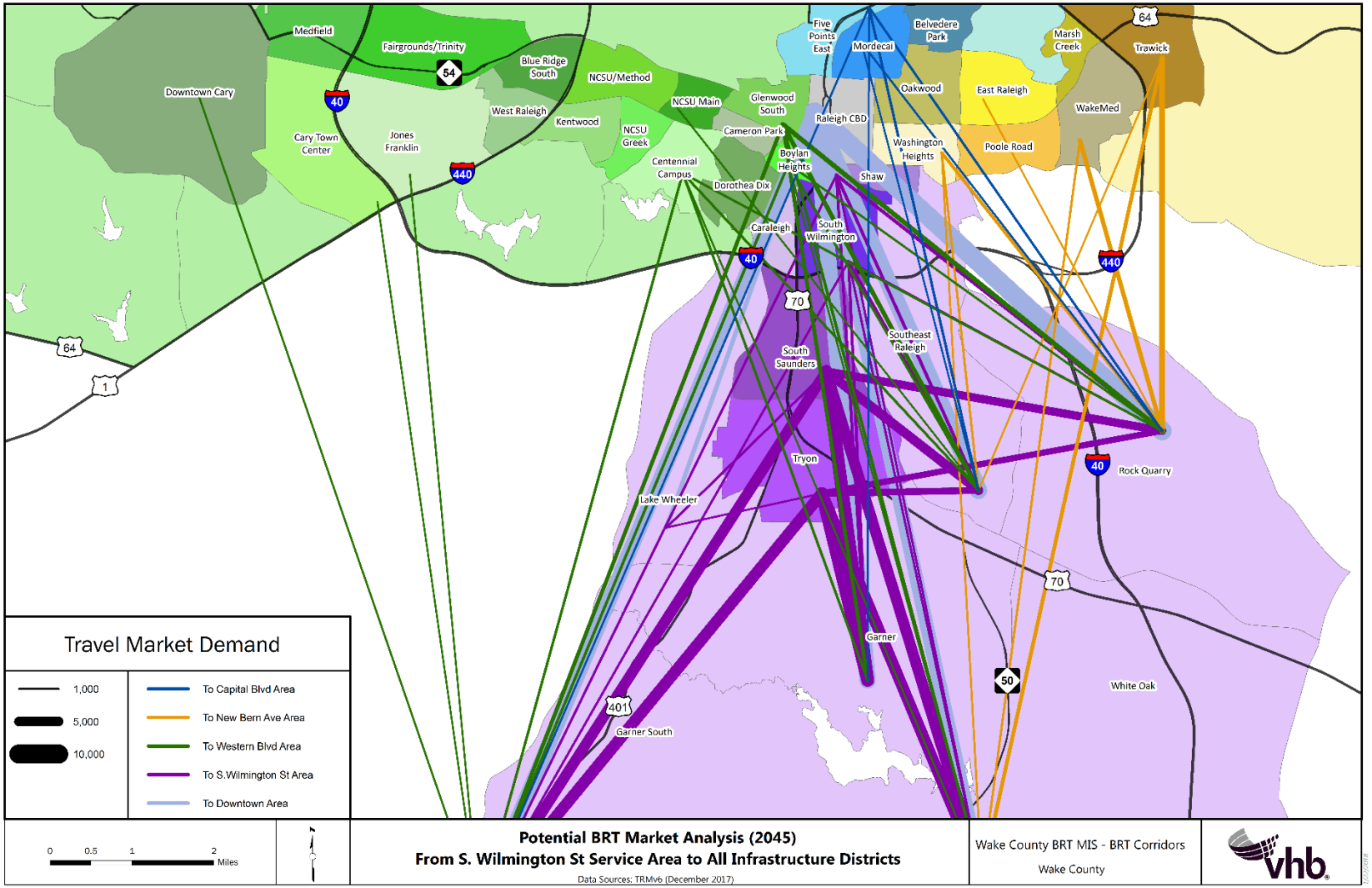
Figure 35: Population and Employment Changes in S Wilmington Street Area



Potential Travel Market

Travel patterns in the corridor infrastructure and service areas are presented as productions and attractions to demonstrate the directional characteristics of trips. As shown in Tables 1-3 above, this infrastructure area produces 71,300 trips and attracts 75,800 trips. A total of 26,000 or 24% of the trips produced in this infrastructure area stay within the area. A large proportion, 20,000 (18%), of total trips produced within this infrastructure area have destinations in the Western Boulevard infrastructure area districts. Most of these trips are attracted towards the eastern end of the Western Boulevard corridor near NCSU. A total of 13,400 (12%) of the trips produced in the S Wilmington Street infrastructure area have destinations in the Raleigh CBD. This trip pattern is expected as the Raleigh CBD and Western Boulevard area include many activity centers (i.e., huge employment demand in downtown Raleigh, NCSU Main, and Centennial Campus).

Figure 36: Potential Travel Market from S Wilmington Service Area to Other Infrastructure Areas



Of all the trips attracted to S Wilmington Street infrastructure area that are produced in any of the infrastructure area districts, the majority (26,000 or 15%) of the trips are produced in the S Wilmington Street infrastructure area districts. Most of these trips are produced towards the southern end of the corridor in Tryon and South Saunders districts. A total of 14,600 or 8% of the trips attracted to the S Wilmington Street infrastructure area are produced in the Raleigh CBD. A total of 61,200 (41%) of the trips attracted to S Wilmington infrastructure area are from all four infrastructure areas, with the highest percentage of trips (12% or 22,300) coming from the Western Boulevard infrastructure area. A total of 103,000 or 58% of the trips attracted to S Wilmington infrastructure area are produced in all four service areas. A total of 71,600 or 40% of these are produced in the S Wilmington Street service area itself. Most of these trips are attracted to the South Saunders and Tryon districts as expected due to the large employment centers. This trip pattern shows that most of the demand in this corridor is from the infrastructure and service area within the study corridors.[10].

The S Wilmington Street service area produces 422,500 trips and attracts 239,100. A total of 71,600 or 17% of these trips stay within the S Wilmington Street infrastructure area, 56,700 (13%) are attracted to the Western Boulevard infrastructure area, and 45,100 (11%) to the Raleigh CBD (see Figure 36). Approximately 152,100 (64%) of the total trips attracted to the S Wilmington Street service area are produced in this area. Appendix 3-C shows the detailed matrix of productions and attractions between each district in the infrastructure and service areas.

[10] There is a large area from the TRMv6 that is not included in this analysis, which has a potential travel market to this corridor. This area will be analyzed during ridership analysis.

Western Boulevard BRT Corridor

Population and Employment

The Western Boulevard infrastructure area consisted of 6% of the total Wake County population, and 9% of Wake County's employment in 2013. The percentage of infrastructure area population compared to Wake County in 2045 increases to 7% and employment increases to 15%. The service area population was 25% of Wake County's total population in 2013 and is projected to decrease to 21% of Wake County's total population in 2045. The employment in the service area was 31% of Wake County's employment in 2013 and is projected to increase to 41% of Wake County's total employment in 2045.

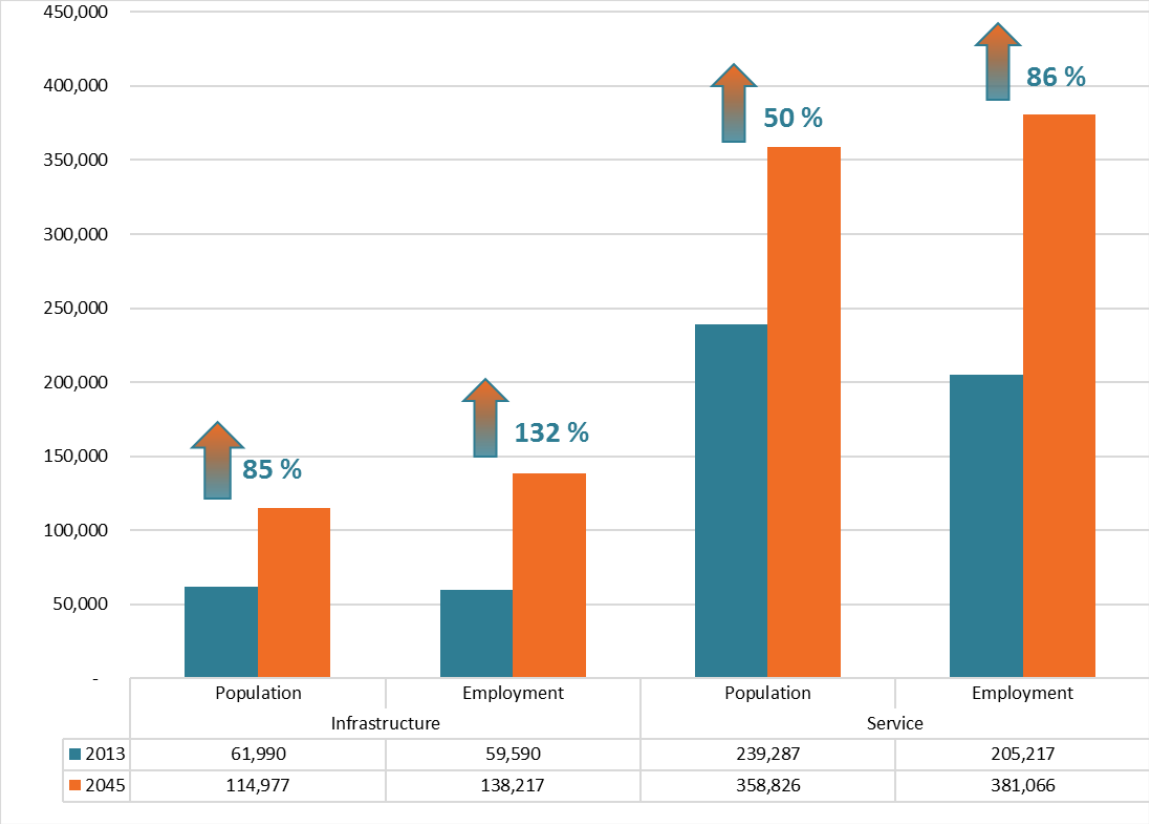
Population in the Western Boulevard infrastructure area is projected to increase 85% from 61,990 in 2013 to 114,977 in 2045. Most of this growth will be concentrated in the Dorothea Dix, Cameron Park, Centennial Campus, Blue Ridge South and Fairgrounds/Trinity districts. There is a lot of student population in the NCSU/Method, NCSU Main, Centennial Campus and NCSU Greek districts, which will grow at a steady rate in all but Centennial Campus District. Centennial is projected to grow at a much faster rate compared to other three districts. Population in the Western Boulevard service area is projected to increase at a much slower rate compared to the infrastructure area (i.e., 50% from 239,289 in 2013 to 358,826 in 2045). The percent growth is less in the service area, but it already has four times the total population compared to the Western Boulevard infrastructure area. Most of this growth will be concentrated in Centennial South, Northeast Cary, and RTP South districts.

Existing and forecasted employment growth in the infrastructure and service areas illustrates the transit ridership potential of employment centers. Employment in the infrastructure area is projected to increase 132% from 59,590 in 2013 to 138,217 in 2045. Employment growth in this corridor is concentrated in the Boylan Heights, Kentwood and West Raleigh districts. Employment in the service area is projected to increase at a slower rate compared to the infrastructure area (i.e., 86% from 205,217 in 2013 to 381,066 in 2045). Like population growth in the service area, the percent employment growth is less, but it already has four times the total employment compared to the Western Boulevard infrastructure area. Employment growth in this corridor is concentrated in the Centennial South, Morrisville and West Cary districts.

The continued growth will quickly outstrip the transportation network's ability to keep pace with transportation demand. The projected population growth will increase travel demand through the corridor and commuter trips between the residential areas in the service area and commercial and office areas within the infrastructure areas. The current transportation choices available to the public are limited. The automobile is the only available mode of travel for most trips, particularly between residential and employment centers. GoRaleigh has an existing bus service on part of Western Boulevard between downtown Raleigh and Avent Ferry Road which runs from 5:45am to 11:28pm during the weekday at a 30-minute frequency in the peak hours and at a 60-minute frequency during the off-peak hours and weekends. GoTriangle also runs a regional bus route along this corridor, which provides service to Cary. Rocky Beach Trail greenway could be used by bicycle and pedestrian commuters, but it serves limited areas within the corridor.

Refer to Figure 37 and maps in Appendix 3-B for details of land use changes in this corridor.

Figure 37: Population and Employment Changes in Western Boulevard Area



Potential Travel Market

Travel patterns in the corridor infrastructure and service areas are presented as productions and attractions to demonstrate the directional characteristics of trips. As shown in Figures 27, 28, and 29 above, this infrastructure area produces 447,900 trips and attracts 578,900 trips. A large portion (213,600 or 48%) of the trips produced in this infrastructure area stay within the area. NCSU Main, Centennial Campus, NCSU/Method and downtown Cary are the main attractors within the Western Boulevard infrastructure area (see Figure 38). Of the remaining trips, a large proportion, 26,100 (6%), of total trips produced within this infrastructure area have destinations in the Raleigh CBD. A total of 117,200 (26%) of the trips produced in the Western Boulevard infrastructure area have destinations in the Western Boulevard service area. This trip pattern is expected as the Raleigh CBD and Western Boulevard area include many activity centers (i.e., huge employment demand in downtown Raleigh, NCSU Main, Centennial Campus and downtown Cary).

Figure 38: Potential Travel Market from Western Boulevard Service Area to Other Infrastructure Areas

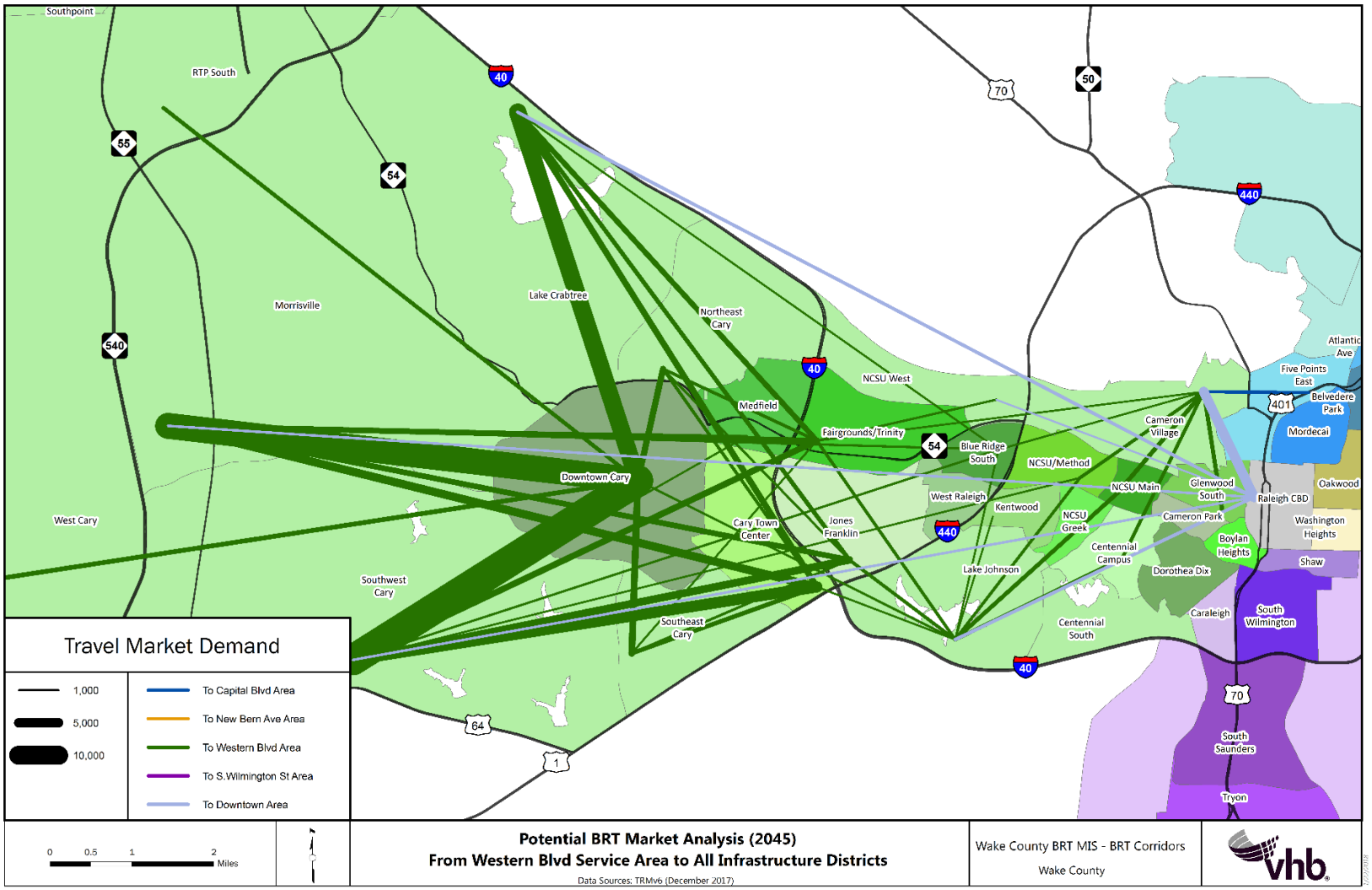


Figure 39: Potential Travel Market to NCSU Campus from Other Infrastructure Areas

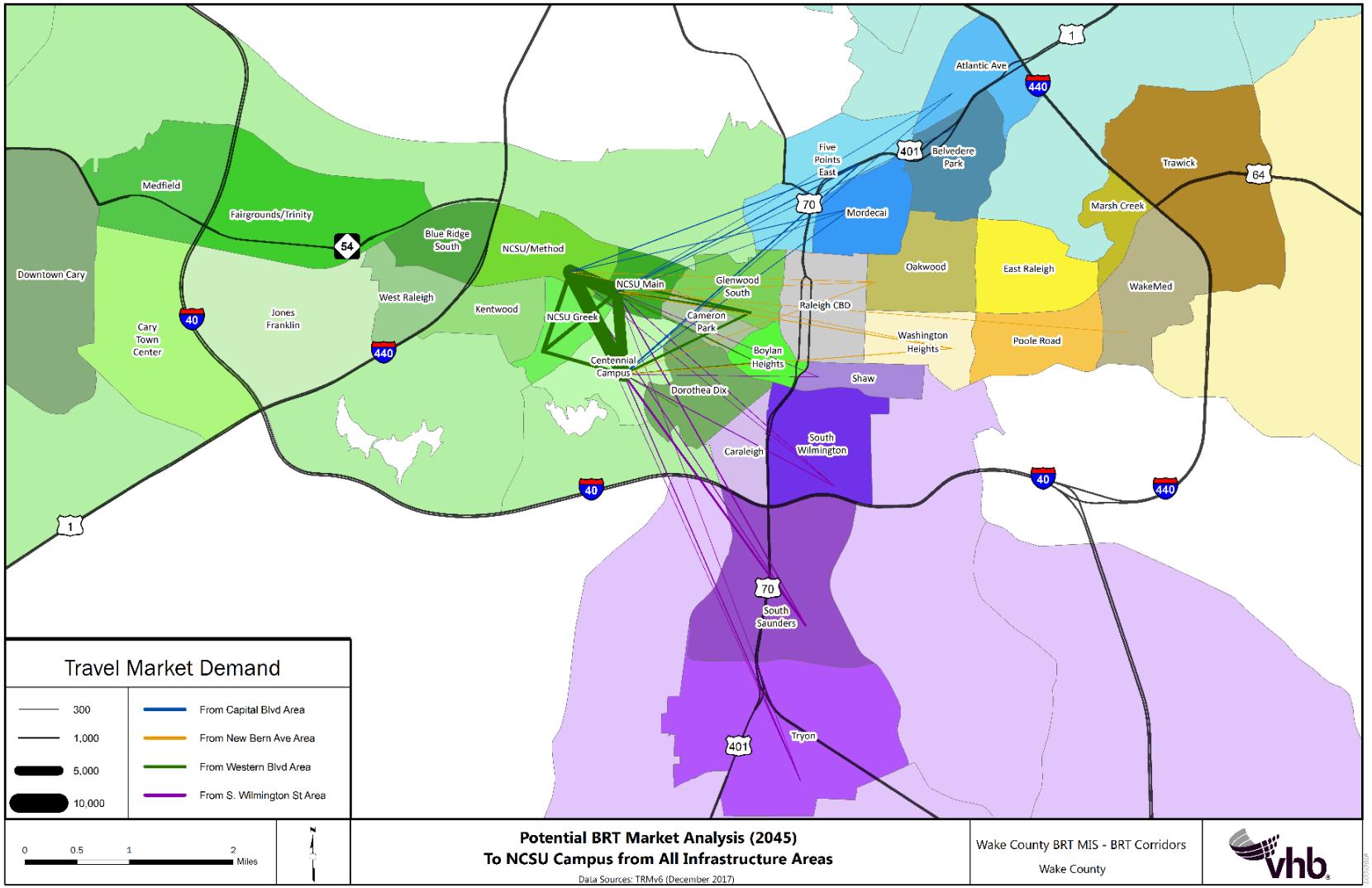


Figure 40: Potential Travel Market to NCSU Campus from Other Service Areas

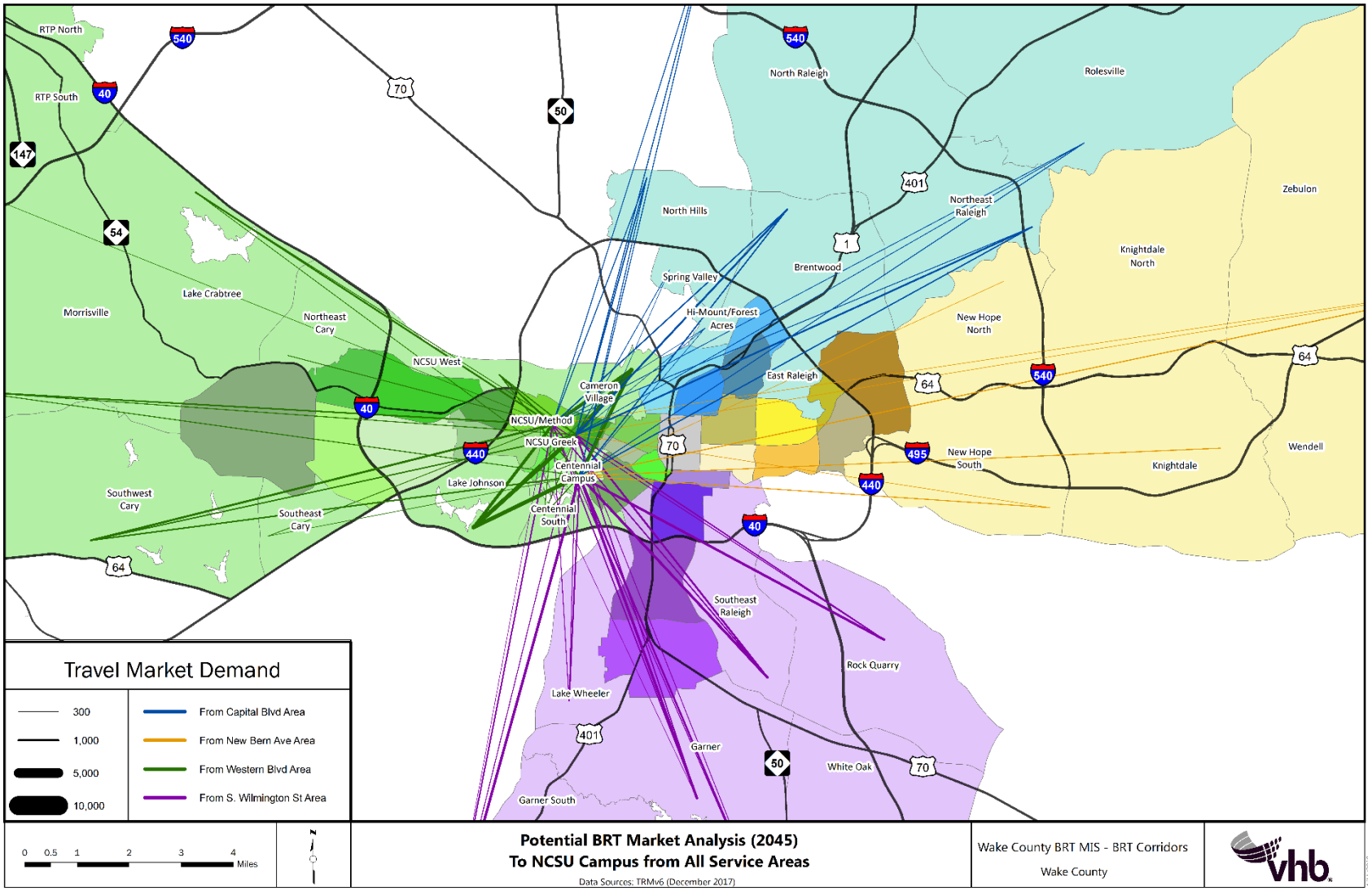


Figure 41: Potential Travel Market to Downtown Cary from Other Infrastructure Areas

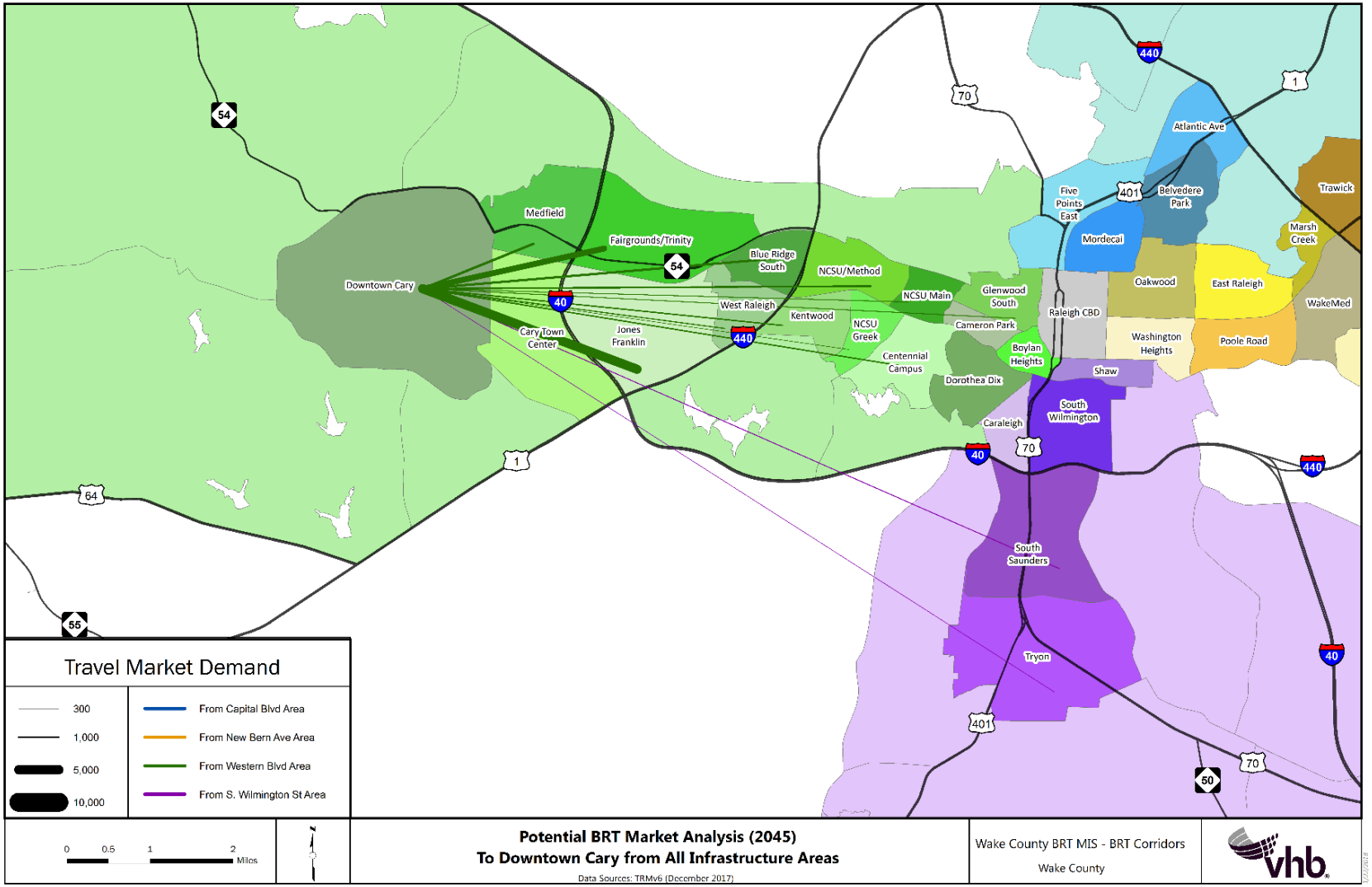
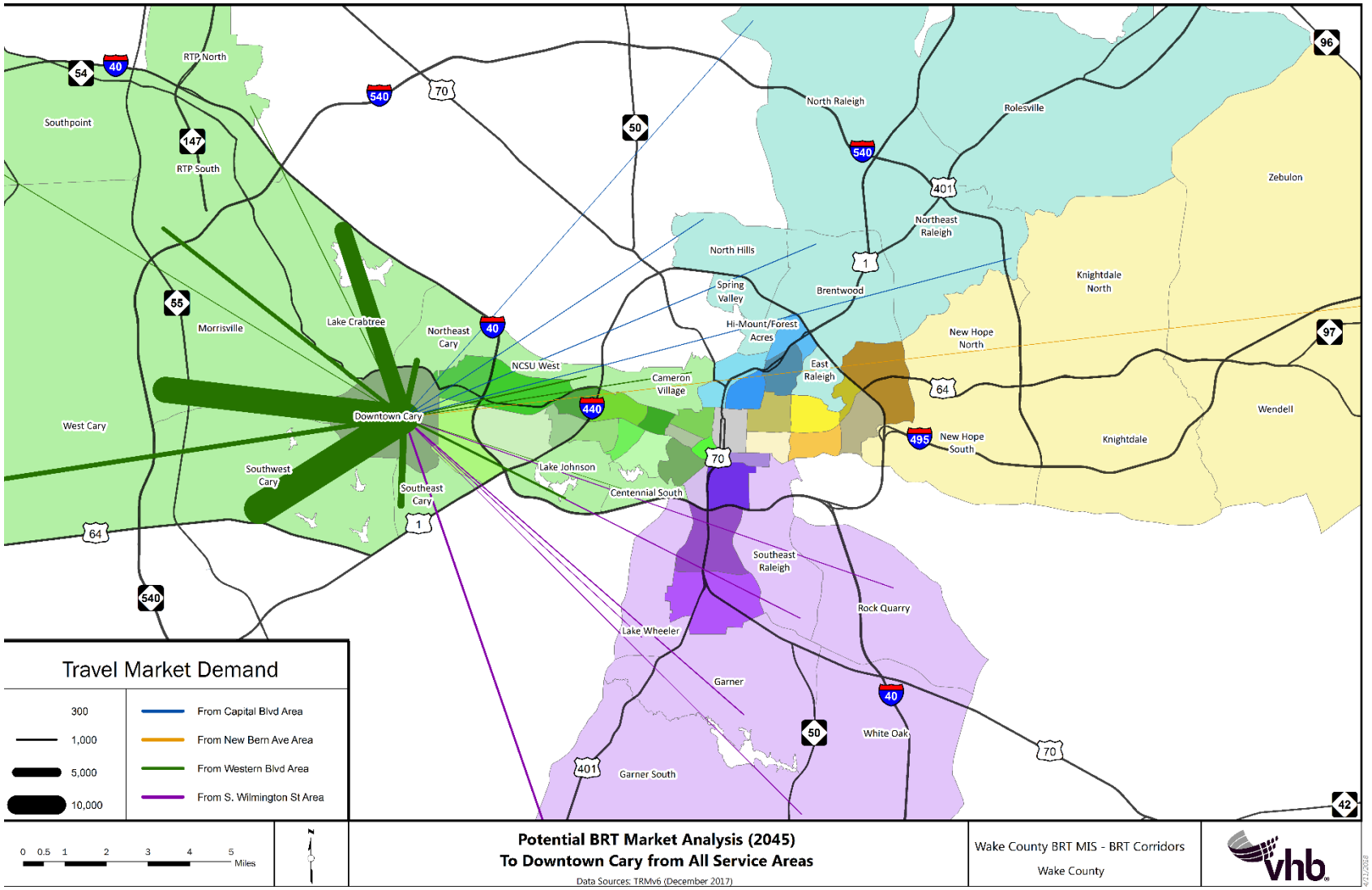


Figure 42: Potential Travel Market to Downtown Cary from Other Service Areas



The majority (213,600 or 37%) of the trips attracted to Western Boulevard infrastructure area districts are produced in the Western Boulevard infrastructure area. Most of these trips are attracted to downtown Cary or the four NCSU campus districts and the remainder of these trips are produced in the Cameron Village, Lake Johnson, or Southwest Cary Districts. Refer to Figures 39, 40, 41 and 42 for details on attracted trips to downtown Cary and NCSU campus. Only 19,500 (3%) trips attracted to the Western Boulevard infrastructure area are produced in the Raleigh CBD. A total of 126,900 (22%) of the trips attracted to Western Boulevard infrastructure area are from the other three service areas, with 48,700 (8%) trips from the Capital Boulevard service area and 56,700 (10%) from the Wilmington Street service area. Most of these trips are attracted to the NCSU Main, Centennial Campus, Downtown Cary, and Glenwood South districts, as expected due to the large employment centers. Figure 40 illustrates the attracted trips to a main employment center, NCSU Main, from all service areas. This trip pattern shows that most of the demand in this corridor is from the infrastructure and service area within the Western Boulevard study corridors.[11]

The Western Boulevard service area produces 802,500 trips and attracts 780,700. A total of 562,200 (70%) of these trips stay within the Western Boulevard service area and 170,400 (21%) within the Western Boulevard infrastructure area. A total of 16,200 (2%) trips are attracted to the Raleigh CDB and 19,900 (2%) to the Capital Boulevard service area (see Figure 38). Approximately 119,400 (69%) of the total trips stay within the Western Boulevard service area. Appendix 3-C shows the detailed matrix of productions and attractions between each district in the infrastructure and service areas.

[11] There is a large area from the TRMv6 that is not included in this analysis, which has a potential travel market to this corridor. This area will be analyzed during ridership analysis.

SUMMARY

The projected population growth will increase travel demand through the region and commuter trips between the service area residential areas and the infrastructure areas. Among the four BRT corridors studied, the Western Boulevard corridor has the highest growth and potential market, but it is also the longest corridor. This potential market could have a significant impact on the ridership of a potential fixed-guideway transit investment and may contribute to the project's ridership. The average trip demand within the CBD and all four-infrastructure areas per mile of BRT corridor is highest for trips produced in S Wilmington Street corridor (35,700 trips per mile) and then in the Western Boulevard corridor (31,900 trips per mile). The Capital Boulevard infrastructure area only produces a demand of 16,500 trips per mile and New Bern is only 10,800 trips per mile.

The Western Boulevard study corridor is also heavily populated with transit-dependent and college student populations. These two demographic populations comprise substantial portion of transit market. Providing a robust transit system will help meet their travel needs.

4 Existing Roadway Conditions

INTRODUCTION

The Wake County Transit Plan has placed a priority on transit service in major corridors throughout the County. Four corridors, and three additional corridor alternatives, have been identified for improvements defined as Bus Rapid Transit (BRT). The potential BRT improvements include having roadways dedicated to buses and giving priority to buses at intersections. It should be noted that as part of the MIS process, additional corridor alternatives may be developed. The purpose of this chapter is to provide an overview of the existing roadway conditions along each of the four main corridors.

METHODOLOGY

This section provides a summary of the existing roadway conditions for the identified BRT corridors and alternatives. The corridors were divided into sections based on variations in the roadway, and the following items were identified for each section:

- Roadway Cross Section
- Land Use
- Annual Average Daily Traffic (AADT)
- Right-of-Way Width
- Approximate Lane Width
- Approximate Median Width
- Additional Accommodations (sidewalks, on-street parking, etc.)

A current roadway design file was utilized to determine the right-of-way width and can be found in Appendix 4-A. Google Earth was used to measure approximate lane and median width. In addition, the land use, cross-section, and additional accommodations were determined using the satellite aerial imagery from Google Earth. The most recent AADT data was obtained from the North Carolina Department of Transportation (NCDOT) and the AADT was identified along each section of the corridor where data was available. The summary for each section by corridor can be found below.

FINDINGS BY BRT CORRIDOR

CAPITAL BOULEVARD BRT CORRIDOR

From Downtown to Wade Avenue

Capital Boulevard from downtown to Wade Avenue is a six-lane divided facility. The lanes are barrier separated with three lanes travelling in each direction. Sidewalks are present on both sides of the roadway. The land use in this area is a mix of primarily commercial and industrial.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Capital Boulevard	49,000 – 61,000	120 – 200	10	n/a

From Wade Avenue to Fairview Road

Capital Boulevard is a five-lane divided facility between Wade Avenue and Fairview Road. Two lanes travel southbound and three lanes travel northbound. Sidewalks remain present on both sides of the roadway. There is a mix of commercial and industrial land uses along this area of the roadway.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Capital Boulevard	n/a	125 – 150	11	16 – 40

From Fairview Road to Wake Forest Road

Capital Boulevard is a six-lane divided facility between Fairview Road and Wake Forest Road. Three lanes travel in each direction, and sidewalks are no longer present along both sides of the road. The land uses along this segment of Capital Boulevard are primarily industrial and commercial.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Capital Boulevard	54,000 – 60,000	170	11	30 – 40

From Wake Forest Road to Fenton Street

Capital Boulevard is a five-lane divided facility between Wake Forest Road and Fenton Street. Through this segment, Capital Boulevard acts as one-way pairs with commercial land uses between both roadway segments. Two lanes travel southbound and three lanes travel northbound with no sidewalks present on either side of the road. There are primarily commercial and residential land uses along this area of Capital Boulevard.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Capital Boulevard	n/a	165 – 175	11	n/a

From Fenton Street to Crabtree Boulevard

Capital Boulevard is a six-lane divided facility between Wake Forest Road and Fenton Street with three lanes travelling in each direction. Through this segment, Capital Boulevard remains acting as one-way pairs with commercial land uses between both roadway segments. An additional northbound lane is added and dropped within this segment. There are primarily commercial and industrial land uses along this area of Capital Boulevard.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Capital Boulevard	n/a	165 – 175	11	30 – 40

From Crabtree Boulevard to I-440 Interchange

Capital Boulevard is a six-lane divided facility between Crabtree Boulevard and the I-440 Interchange. The lanes are barrier separated with three travelling in each direction. No sidewalks are present along either side of the road. Land uses in the area are primarily commercial and industrial.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Capital Boulevard	n/a	160	11.5	n/a

WESTERN BOULEVARD BRT CORRIDOR

From Person Street to S Blount Street

Martin Luther King Jr. Boulevard between Person Street and S Blount Street is a five-lane undivided roadway with a two-way left-turn lane. The land use along this section is primarily residential. There are sidewalks present on both sides of the roadway and appear to be part of a continuous network around the neighborhood blocks.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Western Boulevard	21,000	80 – 90	11	n/a

From S Blount Street to Dawson Street/McDowell Street

Between S Blount Street and Dawson Street/McDowell Street, Martin Luther King Jr. Boulevard is a six-lane median divided facility that transitions to a six-lane undivided facility east of the S Wilmington Street/S Salisbury Street intersection. A sidewalk is present on the south side of this section that begins approximately 825 feet west of the S Blount Street intersection. Additionally, there is a sidewalk present on the north side of Western Boulevard between the S Blount Street and S Wilmington Street/S Salisbury Street intersection. The land use along this section is primarily institutional as this section provides access to the Shaw University Campus.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Western Boulevard	23,000	90 - 185	12	17

From Dawson Street/McDowell Street to Avent Ferry Road

Western Boulevard between Dawson Street/McDowell Street and Avent Ferry Road is a four-lane median divided roadway. There is a multi-use path on the south side of Western Boulevard that is continuous for almost the entire length of this section. There are sidewalks present along the north side of this roadway, but there is not a continuous network. The land uses along this section are primarily institutional and residential, and Western Boulevard provides access to North Carolina State University, Dorothea Dix Campus, and many downtown Raleigh neighborhoods. There are median breaks to allow access to side streets and major facilities such as the Dorothea Dix Campus and the Central Prison.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)

Western Boulevard	27,000 – 38,000	121 – 228	11	30 –124

From Avent Ferry Road to Dan Allen Drive

Western Boulevard from Pullen Road to Dan Allen Drive is a six-lane median divided facility that provides access to North Carolina State University, student residential communities, and commercial developments. One eastbound through lane drops at the intersection of Western Boulevard and Avent Ferry Road as an exclusive right-turn lane. A sidewalk is present on the south side of the roadway but is frequently interrupted due to the commercial and residential driveways. The land use along this section of Western Boulevard is institutional with this segment providing access to the campus.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Western Boulevard	36,000	160 – 165	11	30

From Dan Allen Drive to Gorman Street

Between Dan Allen Drive and Gorman Street, Western Boulevard is a four-lane median divided roadway. The land use along this section of Western Boulevard is institutional and the roadway provides access to the campus gateways. There is one median break present between Dan Allen Drive and Gorman Street, at the intersection of Varsity Drive and Western Boulevard. A multi-use path runs along the south side of this section of Western Boulevard and there are no sidewalks present on the north side.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Western Boulevard	n/a	165 – 170	11	30

From Gorman Street to Chaney Road

Western Boulevard is a six-lane median divided roadway between Gorman Street and Chaney Road. There are sidewalks present along both sides of the roadway, but the network is frequently interrupted by driveways. The land use along this section of Western Boulevard is primarily commercial, but there are some residential developments in the study area. There are median breaks present providing limited access to side streets along Western Boulevard.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Western Boulevard	39,000	100 – 125	11	8 – 20

From Chaney Road to Blue Ridge Road

Between Chaney Road and Blue Ridge Road, Western Boulevard begins as a six-lane median divided facility and transitions to a four-lane facility due to the addition and reduction of travel lanes via the ramp junctions. The land use west of the interchange is primarily commercial, while immediately east of the interchanges it is primarily residential. There is a sidewalk present on the north side of Western Boulevard, but it is not continuous and pedestrians must cross three ramps to utilize the facilities.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Western Boulevard	35,000 – 53,000	114 – 178	11	6 – 10

From Blue Ridge Road to Hillsborough Street

Western Boulevard is a four-lane median divided facility between the Blue Ridge Road and Hillsborough Street intersections. There is a multiuse path on the south side of Western Boulevard through this section. There are median openings present, providing limited access to side streets. The land use along this section of Western Boulevard is a mix of primarily residential and commercial. Parking along this section is provided via individual surface parking lots.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Western Boulevard	20,000	120 – 130	11	20

From Hillsborough Street to Jones Franklin Road

Western Boulevard begins to operate as a one-way pair with Hillsborough Street from the Hillsborough Street intersection to Jones Franklin Road. Westbound Hillsborough Street and eastbound Western Boulevard include two through lanes. The land use along this section is primarily commercial and residential. There is a continuous sidewalk network on both sides of Hillsborough Street and along the north side of Western Boulevard.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Hillsborough Street	n/a	105 – 114	12	n/a
Western Boulevard	n/a	135 – 170	12	n/a

From Jones Franklin Road to Burton Avenue

Western Boulevard continues to operate as a one-way pair with Hillsborough Street from Jones Franklin Road to Burton Avenue. Hillsborough Street, traveling westbound, begins as a three-lane section at the Jones Franklin Road intersection and decreases to a single lane before the Burton Avenue intersection. Conversely, the eastbound Western Boulevard section begins as a single lane west of the Burton Avenue intersection and immediately adds a second eastbound through lane east of Burton Avenue. Sidewalks are not present along the eastbound Western Boulevard section. There are sidewalks present on the south side of the westbound Hillsborough Street section that terminate at the European Performance Inc. driveway. The primary land uses are residential and commercial along this section, and parking is supplied via individual surface parking lots.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Hillsborough Street	n/a	60 – 80	11	n/a
Western Boulevard	n/a	95 – 100	11	n/a

From Burton Avenue to NE Maynard Road

Between Jones Franklin Road and NE Maynard Road, Hillsborough Street is a three-lane undivided facility with a two-way left-turn lane. At approximately the Bashford Road intersection, Hillsborough Street becomes E Chatham Street. The land use along this section is a mix of commercial, residential, and industrial. There is no continuous sidewalk network present along this section of Hillsborough Street/E Chatham Street.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Hillsborough Street	14,000 – 20,000	55 – 100	10	n/a

From NE Maynard Road to E Durham Road

E Chatham Street from NE Maynard Road to E Durham Road is a three-lane undivided roadway with a two-way left-turn lane. There is no on-street parking along this section of E Chatham Street. A continuous sidewalk network, only disrupted by driveways, is present on the south side of the road. The sidewalk network along the north side of the roadway terminates approximately 500 feet east of the E Durham Road intersection. There are bicycle lanes present along both sides of the road. The land use along this section of E Chatham Street is primarily commercial.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
E Chatham Street	11,000 – 12,000	55 – 90	11	n/a

From E Durham Road to Hunter Street

E Chatham Street between E Durham Road and Hunter Street is a three-lane undivided roadway with a shared two-way left-turn lane. A continuous sidewalk network, only disrupted by driveways, is present on the south side of the roadway. The sidewalk network on the north side of the road terminates at the gas station approximately 250 feet from the E Chatham Street and E Durham Road intersection. Bicycle shared lane pavement markings are present along this section of the roadway extending from and into Downtown Cary. The land use along this section of the roadway is mix of residential and commercial uses. On-street parking is located on the north side of the roadway east of the Ward Street intersection and along the south side of the roadway east of the Urban Drive intersection.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
E Chatham Street	8,300	75 – 90	12 – 14	n/a

From Hunter Street to S Harrison Avenue

Between Hunter Street and S Harrison Avenue, E Chatham Street is a two-lane undivided roadway. There is a well-established sidewalk network through the Downtown Cary area including buffer zones between the pedestrians and vehicles in some areas. On-street parking is present on either side of the street varying between downtown blocks. The land use in the area is primarily a mix of residential and commercial. There are shared lane pavement markings for bicycles along this section of E Chatham Street.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
E Chatham Street	11,000 – 12,000	40 – 70	10 – 14	n/a

WESTERN BOULEVARD BRT CORRIDOR – NC 54 ALTERNATIVE

From Hillsborough Street to Second Chance Pet Adoptions Driveway

NC 54 between Hillsborough Street to the Second Chance Pet Adoptions Driveway is a four-lane median divided facility. The land use along this section is primarily commercial. There are no sidewalks present along this section of NC 54. There are some median breaks to allow for limited access to the commercial developments in this area.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
NC 54	10,000	150	11	30 – 34

From Second Chance Pet Adoptions Driveway to Corporate Center Drive/Corporate Ridge Road

Between the Second Chance Pet Adoptions Driveway to the Corporate Center Drive/Corporate Ridge Road intersection, NC 54 is a two-lane undivided roadway. There are sidewalks present on both sides of the roadway, but there is not a continuous network along this section. The land use in this area is primarily commercial. On-street parking along this section of NC 54 is not available and parking is supplied via surface lots.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
NC 54	16,000	100 – 150	11	n/a

From Corporate Center Drive/Corporate Ridge Road to Hampton Woods Lane

NC 54 between Corporate Center Drive/Corporate Ridge Road and Hampton Woods Lane is a four-lane median divided facility including the I-40 interchange with NC 54. The land use east and west of the interchange is a mix of primarily commercial and residential. There are sidewalks along the south side of the roadway, but there is not a continuous network along this section of NC 54.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
NC 54	n/a	145 – 220	11	16

From Hampton Woods Lane to NE Maynard Road

NC 54 between Hampton Woods Lane and NE Maynard Road is a four-lane median divided roadway. There are median breaks present to provide access to the major side streets and neighborhoods along this section of NC 54. Sidewalks are present along both sides of the roadway and create a continuous network between Hampton Woods Lane and NE Maynard Road. In addition, there are bike lanes present on both sides of NC 54 west of the Trinity Road intersection to NE Maynard Road. The land use along this section is primarily residential, but there are some commercial developments located in the study area.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
NC 54	23,000 – 29,000	145 – 170	11	15 – 30

From NE Maynard Road to N Harrison Ave

Between NE Maynard Road and N Harrison Avenue, NC 54 is a two-lane undivided facility. There are sidewalks present along both sides of the roadway, but there is not a continuous network along this section of NC 54. A bike lane is present along the north side of this segment between NE Maynard Road and Reedy Creek Road. The land use is a mix of residential, commercial, and institutional uses. There is no on-street parking available along NC 54 between NE Maynard Road to N Harrison Avenue.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
NC 54	12,000 – 16,000	60 – 145	11	n/a

WESTERN BOULEVARD BRT CORRIDOR – CARY TOWNE BOULEVARD/WALNUT STREET ALTERNATIVE

Jones Franklin/Western Boulevard to End of Existing Cary Towne Boulevard

This section of possible alignment would be on new rights-of-way between the intersection of Western Boulevard at Jones Franklin Road and a section of Western Boulevard east of the I-40 interchange. This connection has been a potential extension of Western Boulevard connecting with the end of existing Western Boulevard east of the I-40 interchange.

End of Existing Cary Towne Boulevard to I-40 Interchange

Cary Towne Boulevard at the I-40 Interchange is a three-lane divided facility with two westbound lanes and one eastbound lane. There are no sidewalks present along this section of this corridor. The land use east of the interchange is primarily residential. On-street parking is not present along Cary Towne Boulevard at the I-40 interchange.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Walnut Street	n/a	280 – 310	11	10

From I-40 Interchange to SE Maynard Road

Between the I-40 Interchange and SE Maynard Road, Cary Towne Boulevard is a four-lane median divided facility. There is no on-street parking present along this section of the Cary Towne Boulevard corridor. There are sidewalks along portions of this roadway, but there is not a connected sidewalk network along this section. The land use along this section of Cary Towne Boulevard is a mix of institutional and commercial, with the Cary Towne Center Mall along the south side of the roadway and Adams Elementary School along the north side.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Walnut Street	20,000	165 – 300	11	30

From SE Maynard Road to Byrum Street

Cary Towne Boulevard, from SE Maynard Road to Byrum Street, is a five-lane undivided roadway with a two-way left-turn lane. There are sidewalks present on both sides of the street, creating a continuous network along this section of the corridor. The land use is primarily commercial east of the Ryan Road intersection and primarily residential west of the intersection. There is no on-street parking present, and parking needs are filled via surface lots along this section of the Walnut Street corridor.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Walnut Street	11,000	70 – 100	12	n/a

From Byrum Street to Kildaire Farm Road

Walnut Street between Byrum Street and Kildaire Farm Road is a three-lane undivided facility with a center two-way left-turn lane. The land use along this section of Walnut Street is a mix of primarily residential and institutional. Sidewalks are present on both sides of the roadway and create a continuous network along this section of the corridor. There are shared lane pavement markings for bicycles along this section of Walnut Street. On-street parking is not present along this section of the Walnut Street corridor.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Walnut Street	7,200	60 – 77	13	n/a

From Kildaire Farm Road to S Harrison Avenue

Between Kildaire Farm Road and S Harrison Avenue, Walnut Street becomes Dry Avenue as it enters Downtown Cary and is a two-lane undivided facility. There is a sidewalk present on the north side of the roadway. There are no bicycle lanes along this section of Dry Avenue. There is no on-street parking along this section of the corridor. The land use in this area is a mix of residential and institutional.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Dry Avenue	n/a	30 – 70	10	n/a

NEW BERN AVENUE BRT CORRIDOR

From Blount Street to Poole Road

New Bern Avenue between Blount Street and Poole Road forms a one-way pair with E Edenton Street. New Bern Avenue and E Edenton Street have a three-lane cross-section with available on-street parking located along each respective roadway. New Bern Avenue tracks eastbound out of the downtown area with E Edenton Street servicing those drivers wishing to travel westbound into downtown Raleigh. The land use in this area is primarily a mix of residential and commercial, with some institutional use near the Capitol. Sidewalks are present on both sides of each roadway.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
New Bern Avenue	8,500 – 11,000	60 – 100	11	n/a
E Edenton Street	8,200 – 11,000	65 – 90	11	n/a

From Poole Road to Raleigh Boulevard

New Bern Avenue becomes a six-lane median divided facility east of the Poole Road intersection to the Raleigh Boulevard intersection. On-street parking is not available along the New Bern Avenue east of the Poole Road intersection. Median breaks are located at Hill Street, Heath Street, and N Carver Street. A sidewalk is present along the north side of the roadway, and the land uses in this area are primarily commercial and residential.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
New Bern Avenue	18,000	125 – 150	11	16 – 40

From Raleigh Boulevard to West Campus Drive

New Bern Avenue is a four-lane median divided facility east of the Raleigh Boulevard intersection to the West Campus Drive intersection. The land uses along this segment are primarily commercial and residential. There are no sidewalks present along this segment of the roadway and on-street parking is not available.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
New Bern Avenue	19,000 – 23,000	170	11	30 – 40

From West Campus Drive to Sunnybrook Road/Shanta Drive

New Bern Avenue from West Campus Drive to Sunnybrook Road/Shanta Drive is a median divided facility, with two lanes in the westbound direction and three lanes traveling eastbound. A sidewalk is present on the south side of the roadway and is continuous along the entire length of this segment. The land use along this segment is primarily medical, with the main development in this area being the WakeMed Hospital Campus. On-street parking is not available along this segment of New Bern Avenue.

Roadway	2015 AADT	Right-of-Way Width	Lane Width	Median Width

	(vehicles per day)	(approx. feet)	(approx. feet)	(approx. feet)
New Bern Avenue	n/a	165 – 175	11	30 – 40

From Sunnybrook Road/Shanta Drive to Milburnie Road

Between Sunnybrook Road/Shanta Drive to the I-440 interchange, New Bern Avenue is a three-lane median divided facility with the third westbound through lane dropping as an exclusive right-turn at the intersection of Sunnybrook Road/Shanta Drive. There are no sidewalks nor on-street parking present along this segment of New Bern Avenue. The land use in this area is primarily residential and medical as Sunnybrook Road provides access to the WakeMed Medical Campus.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
New Bern Avenue	44,000	155 – 160	11	20 – 30

From Milburnie Road to Yonkers Road

New Bern Avenue between Milburnie Road and Yonkers Road is a median divided facility with four eastbound lanes and three westbound lanes, respectively. There are no developments along this section of New Bern Avenue, but the land use in this area is a mix of residential, industrial, and recreational uses. No on-street parking nor sidewalks are present along this section of New Bern Avenue.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
New Bern Avenue	44,000	210 – 240	11	24

From Yonkers Road to Trawick Road

This section of New Bern Avenue includes the I-440 interchange. The cross-section along this segment varies slightly with the addition and reduction of lanes based on the ramp junctions. The land use west of the interchange is a mix of residential, industrial, and recreational uses. While east of the interchange, the land use changes to primarily commercial but also includes some institutional and industrial developments. There are no sidewalks present along this section of New Bern Avenue.

Roadway	2015 AADT	Right-of-Way Width	Lane Width	Median Width

	(vehicles per day)	(approx. feet)	(approx. feet)	(approx. feet)
New Bern Avenue	49,000	140 – 240	11	20 – 40

From Trawick Road to N New Hope Road

New Bern Avenue between Trawick Road and N New Hope Road is a six-lane median divided facility. Parking along this segment of New Bern Avenue is supplied via individual surface parking lots. A sidewalk network begins approximately 500 feet west of the Trawick Road intersection on the south side of the roadway. The land use along this section of New Bern Avenue is primarily commercial, but there are some residential developments in the area.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
New Bern Avenue	33,000 – 44,000	145 – 150	11	40

WILMINGTON STREET BRT CORRIDOR

From Western Boulevard/Martin Luther King Jr. Boulevard to City Farm Road

The corridor begins as a six-lane segment at the intersection with Martin Luther King Junior Boulevard and quickly transitions to a five-lane cross section approximately 300 feet south of the intersection. The roadway has two travel lanes in each direction with a two-way left-turn lane in the median. Sidewalk facilities are present both along the northbound and southbound travel lanes of the roadway. There are both residential and industrial land uses along this segment of the roadway.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Wilmington Street	9,800 – 10,000	157 - 206	12	n/a

From City Farm Road to Ileagnes Road/Rush Street

The road continues southward from the Cargill Driveway towards I-40 and Rush Street. No access to I-40 is present along Wilmington Street. The roadway now consists of a median-divided four-lane cross section. Sidewalk facilities are present both along the northbound and southbound travel lanes of the roadway. There are residential, commercial, and institutional land uses along this segment of the roadway.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Wilmington Street	14,000	200	12	28

From Ilgeanes Road/Rush Street to US 70 (South Saunders Street)

South of Ilgeanes Road/Rush Street the roadway serves as a ramp connection for vehicles travelling from US 70 (South Saunders Street) to/from Wilmington Street. The northbound ramp consists of three travel lanes and the southbound ramp consists of two travel lanes. No sidewalks are present along the roadway and there is access to one church driveway along the northbound stretch of Wilmington Street.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Wilmington Street	15,000	200 – 544	12	n/a

From US 70 (South Saunders Street) to Chapanoke Road

After the convergence of US 70 (South Saunders Street) and Wilmington Street, the facility transitions to a median-divided nine-lane roadway with five lanes travelling southbound and four lane travelling northbound. There is limited access along this segment with access only provided to a cemetery along the northbound travel lanes and a shopping center along the southbound travel lanes. No pedestrian facilities are present along the roadway.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Wilmington Street	52,000[12]	153	12	13

From Chapanoke Road to Tryon Road

Between Chapanoke Road and Tryon Road, a fifth northbound lane opens and drops into a northbound right-turn lane at Chapanoke Road. The roadway remains median-divided and provides access to commercial and institutional land uses.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Wilmington Street	59,000	205 – 206	12	28

[12] 2015 AADT unavailable so reporting 2013 AADT

From Tryon Road to Fayetteville Road Ramps

South of Tryon Road, the roadway transitions to an eight-lane cross section with four lanes travelling northbound and four lanes travelling southbound. The roadway remains median divided and does not have any access points along this segment. At the end of this segment, the corridor begins to shift to Fayetteville Road.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Wilmington Street	n/a	Varies	12	Varies

From Wilmington Street to Garner Station Boulevard

Through this segment, the roadway acts as two ramp facilities connecting vehicles to/from Wilmington Street and Fayetteville Road. There are two travel lanes present in each direction with access to local business along the southbound lanes of Fayetteville Road. There is no uniform median or pedestrian facilities through this segment.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Fayetteville Road	38,000	Varies	12	Varies

From Garner Station Boulevard to Purser Drive/Pinewinds Drive

This segment consists of a five-lane cross section with two travel lanes in each direction. The middle lane varies from a two-way left-turn lane to dedicated exclusive left-turn lanes in either direction throughout this segment. The cross section of the roadway can vary at times with exclusive right and left-turn lanes opening for various access point throughout the segment. The roadway provides direct access to residential, commercial, and institutional land uses along the segment. There are no pedestrian facilities present along this section of the roadway.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
Fayetteville Road	42,000	149	11	Varies

WILMINGTON SOUTH SAUNDERS STREET BRT CORRIDOR

From W. South Street to Dorothea Drive

The roadway begins with an undivided three-lane cross section with one lane travelling southbound and two lanes travelling northbound. The roadway provides access to residential land uses, and sidewalks are present along the roadway for the residential units in the area.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
S. Saunders Street	10,000	85	8 – 11	n/a

From Dorothea Drive to Lake Wheeler Road

The roadway remains undivided through this segment, but the roadway transitions to a four-lane cross section with two northbound and southbound travel lanes. The roadway primarily provides access to residential land uses and sidewalks are present along the roadway servicing the residential land uses in the area.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
S. Saunders Street	10,000	60 – 80	10.5	n/a

From Lake Wheeler Road to South Saunders Street

Through this segment, the roadway keeps the same cross section; however, parallel parking is allowed on the outside travel lane in each direction. Continuous sidewalks end in this segment as a few commercial businesses sit up on the roadway and block the path of the sidewalk. The roadway primarily provides access to commercial land uses through this segment.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
S. Saunders Street	3,500	55 – 140	10.5	n/a

From South Saunders Street to South Dawson Street

This short segment consists of a median divided four-lane cross section with two travel lanes in each direction. There are no access points along this section of the roadway and no pedestrian facilities are present.

Roadway	2015 AADT	Right-of-Way Width	Lane Width	Median Width

	(vehicles per day)	(approx. feet)	(approx. feet)	(approx. feet)
S. Saunders Street	n/a	460	10.5	n/a

From South Dawson Street to Prospect Ave

This segment consists of the merger between South Saunders Street and Dawson Street/McDowell Street. The roadway consists of three southbound lanes and two northbound lanes that connect with South Saunders Street. The divided median width varies along this stretch of road and no access points or pedestrian facilities are present.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
S. Saunders Street	n/a	250 – 300	12	n/a

From Prospect Ave to I-40 Westbound Ramps

After McDowell Street/Dawson Street merge with South Saunders Street, the roadway transitions to a median-divided six-lane cross section with three lanes travelling in each direction. The road provides direct access to many residential and commercial land uses through this segment. Sidewalks are located on both sides of the road and travel along the complete length of the roadway.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
S. Saunders Street	50,000	120 – 155	12	20

From I-40 Westbound Ramps to I-40 Eastbound Ramps

The segment between the two sets of interstate ramps consist of an eight-lane cross section with three travel lanes in each direction. The other two lanes serve as northbound left-turn lanes at the westbound ramps intersection and southbound left-turn lanes at the eastbound ramps intersection. The roadway is median-divided through this segment. There is only access to I-40 along this segment and no access to any other land uses. Sidewalks are present along the northbound and southbound travel lanes of South Saunders Road.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
S. Saunders Street	n/a	n/a	11	4

From I-40 Eastbound Ramps to Pecan Road/Carolina Pines Avenue

South of the I-40 interchange, the roadway transitions to a median-divided seven-lane cross section with four southbound travel lanes and three northbound travel lanes. The additional southbound travel lanes drops as an exclusive left-turn lane at the intersection with Pecan Road. Access points along this segment provide direct access to commercial land uses, and sidewalks remain present along the road to facilitate additional access to these commercial developments.

Roadway	2015 AADT (vehicles per day)	Right-of-Way Width (approx. feet)	Lane Width (approx. feet)	Median Width (approx. feet)
S. Saunders Street	63,000	105 – 120	11	6

5 Existing Traffic Conditions

INTRODUCTION

The Wake County Transit Plan has placed a priority on transit service in major corridors throughout the County. Four corridors, and three additional corridor alternatives, have been identified for improvements defined as Bus Rapid Transit, or BRT, which includes having roadways dedicated to buses and giving priority to buses at intersections. An important step in implementing the BRT system is to evaluate the levels-of-congestion and traffic capacity of each corridor. The corridors, and specific intersections in a corridor, can then be prioritized for implementation, as a BRT system has the advantage of being incrementally developed in segments during this analysis. Appendix 5-A shows the lane geometry and traffic control of the proposed study corridors and study intersections in this existing conditions traffic analysis. The following describes the study corridors and their respective study intersections. Depending on the selected BRT alignment, not all intersections shown in the following tables are anticipated to support BRT service.

Figure 43: Capital Boulevard and Corresponding Intersection ID

ID	Intersection
1	US 401 (Capital Boulevard) at Crabtree Boulevard
2	US 401 (Capital Boulevard) Northbound at Fenton Street
3	SR 2026 (Atlantic Avenue) at US 401 (Capital Boulevard) NB Off-Ramp
4	SR 2000 (Atlantic Avenue/Wake Forest Road) at Old Louisburg Road/US 401 (Capital Boulevard) SB On-Ramp
5	Wake Forest Road at E. Whitaker Mill Road
6	Atlantic Avenue at E. Whitaker Mill Road
7	N. Dawson Street at E. Lane Street
8	N. McDowell Street at E. Lane Street
9	N West Street at W. Peace Street

Figure 44: New Bern Avenue and Corresponding Intersection ID

ID	Intersection
1	US 64 Bus. (New Bern Avenue) at SR 2517 (N. Rogers Lane)
2	US 64 Bus. (New Bern Avenue) at Freedom Drive/Hedingham Boulevard
3	US 64 Bus. (New Bern Avenue) at New Hope Road
4	US 64 Bus. (New Bern Avenue) at Corporation Parkway
5	US 64 Bus. (New Bern Avenue) at SR 2205 (Trawick Road)
6	US 64 Bus. (New Bern Avenue) at I-440 Westbound Ramps
7	US 64 Bus. (New Bern Avenue) at I-440 Eastbound Ramps
8	SR 2911 (New Bern Avenue) at SR 2277 (Yonkers Road)
9	SR 2911 (New Bern Avenue) at SR 2544 (Sunnybrook Road)
10	SR 2911 (New Bern Avenue) at Wake Medical Center Emergency Entrance
11	SR 2911 (New Bern Avenue) at Wake Medical Center Visitor Entrance
12	SR 2911 (New Bern Avenue) at SR 2921 (Raleigh Boulevard)
13	SR 2911 (New Bern Avenue) at SR 1007 (E. Edenton Street/Poole Road)
14	SR 2911 (New Bern Avenue) at N. Tarboro Street
15	SR 1007 (E. Edenton Street) at N. Tarboro Street
16	SR 2911 (New Bern Avenue) at S. Person Street
17	SR 1007 (E. Edenton Street) at N. Person Street
18	SR 2911 (New Bern Avenue/E. Morgan Street) at S. Blount Street
19	SR 1007 (E. Edenton Street) at N. Blount Street

Figure 45: S. Wilmington Street and Corresponding Intersection ID

ID	Intersection
1	SR 1565 (Salisbury Street) at E. South Street
2	SR 1564 (Wilmington Street) at E. South Street
3	SR 1564 (Wilmington Street)/Salisbury Street at Martin Luther King Jr Boulevard
4	SR 1564 (Wilmington Street) at Layden Street and Pecan Road
5	SR 1564 (Wilmington Street) at Ileagnes Street and Rush Street
6	US 70-401/NC 50 (Wilmington Street) at Chapanoke Road
7	US 70-401/NC 50 (Wilmington Street) at SR 1370-2684 (Tryon Road)
8	US 401 (Fayetteville Road) at Garner Station Boulevard/Mechanical Boulevard
9	US 401 (Fayetteville Road) at Purser Drive/Pinewinds Drive

Figure 46: Wilmington South Saunders Street Alternative and Corresponding Intersection ID

ID	Intersection
1	US 401 (S. Saunders Street) at W. South Street
2	US 401 (S. Saunders Street) at Lake Wheeler Road
3	US 401 (S. Saunders Street) at S. Dawson Street
4	US 401 (S. Saunders Street) at I-40 WB Ramps
5	US 401 (S. Saunders Street) at I-40 EB Ramps
6	US 401 (S. Saunders Street) at Carolina Pines Avenue/Pecan Road

Figure 47: Western Boulevard and Corresponding Intersection ID

ID	Intersection
0	SR 1011 (E. Chatham Street) at Harrison Avenue
1	SR 1011 (E. Chatham Street) at N. Academy Street
2	SR 1011 (E. Chatham Street) at E. Durham Road
3	SR 1011 (E. Chatham Street) at SR 1415 (Maynard Road)
4	SR 1012 (Western Boulevard) at SR 1319 (Jones Franklin Road)
5	SR 1011 (Hillsborough Street) at SR 1319 (Jones Franklin Road)
6	SR 1012 (Western Boulevard) at SR 1011 (Hillsborough Street)
7	SR 1012 (Western Boulevard) at Powell Drive
8	SR 1012 (Western Boulevard) at SR 3072 (Blue Ridge Road)
9	SR 1012 (Western Boulevard) at Method Road
10	SR 1012 (Western Boulevard) at Gorman Street
11	SR 1012 (Western Boulevard) at Varsity Drive
12	SR 1012 (Western Boulevard) at Dan Allen Drive
13	SR 1012 (Western Boulevard) at SR 1321 (Avent Ferry Road) and Morrill Drive
14	SR 1012 (Western Boulevard) at Pullen Road
15	SR 1012 (Western Boulevard) at Hunt Drive/Central Prison
16	Dawson McDowell Connector (Southbound Ramp) at Western Boulevard
17	Dawson McDowell Connector (Northbound Ramp) at SR 1564 (Martin Luther King Jr Boulevard)
18	SR 1564 (Martin Luther King Jr Boulevard) at Salisbury Street/SR 1564 (Wilmington Street)
19	SR 1564 (Martin Luther King Jr Boulevard) at S. Blount Street
20	SR 1564 (Martin Luther King Jr Boulevard) at S. Person Street

Figure 48: NC 54 (Chapel Hill Road) Alternative and Corresponding Intersection ID

ID	Intersection
1	SR 3801 (Chapel Hill Road) at N. Harrison Avenue
2	SR 3801 (Chapel Hill Road) at N. Academy Street
3	NC 54 (Chapel Hill Road) at SR 1415 (Maynard Road)
4	NC 54 (Chapel Hill Road) at SR 1655 (Trinity Road)
5	NC 54 (Chapel Hill Road) at I-40 EB Ramps
6	NC 54 (Chapel Hill Road) at I-40 WB Ramps
7	NC 54 (Chapel Hill Road) at Corporate Center Drive
8	NC 54 (Chapel Hill Road) at Edwards Mill Road
9	NC 54 (Chapel Hill Road) at SR 1011 (Hillsborough Street)

Figure 49: Walnut Street Alternative and Corresponding Intersection ID

ID	Intersection
1	S. Harrison Avenue at SR 1300 (Dry Avenue/Kildaire Farm Road)
2	SR 1300 (Dry Avenue/Kildaire Farm Road) at S. Academy Street
3	SR 1300 (Dry Avenue/Kildaire Farm Road) at Walnut Street
4	Walnut Street/Cary Towne Boulevard at Walnut Street
5	Cary Towne Boulevard at SR 1415 (Maynard Road)
6	Cary Towne Boulevard at Convention Drive/Principal Lane
7	Cary Towne Boulevard at I-40 EB Ramps
8	Cary Towne Boulevard at I-40 WB Ramps

METHODOLOGY

Data Collection

Historic AM and PM peak hour intersection turning movement counts were obtained from the City of Raleigh, Town of Cary and North Carolina Department of Transportation (NCDOT). Additionally, peak hour turning movement counts were collected in December 2017 for intersections with recently completed construction improvements. The data from the provided peak hour intersection turning movement counts were collected between 2013 and 2017. Therefore, these raw volumes were adjusted and balanced to account for the different years that the provided counts were obtained. Figure 50 summarizes the schedule used to obtain the turning movement data. The traffic counts gathered for this study can be found in Appendix 5-B. Note that as the project transitions out of this preliminary planning and feasibility screening, more detailed traffic capacity analyses will be necessary for future studies including collection of new traffic counts.

Figure 50: Weekday Peak Hour Turning Movement Count Schedule

Intersection	Time Period	Data Collection Date
Wilmington Corridor – SR 1565 (Salisbury Street) and E. South Street	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Thursday December 7, 2017
Wilmington Corridor – SR 1564 (Wilmington Street) and E. South Street)	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Thursday December 7, 2017
Western Corridor – SR 1012 (Western Boulevard) and SR 1319 (Jones Franklin Road)	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Thursday December 7, 2017

The City of Raleigh DOT, North Carolina Department of Transportation (NCDOT), and the Town of Cary provided the most recent traffic signal plans for each signalized study intersection. These signal plans were beneficial as they provided intersection geometry, base signal timings, intersection phasing, and detector settings.

Application of Methodology

To adjust the raw turning movement counts, the 2005 and 2015 AADTs along segments of each corridor were obtained to determine the respective historic growth rates. The growth rates of each corridor were then averaged to obtain an average growth rate for a study corridor. The average growth rates were applied to the raw intersection turning movement counts. Balancing adjustments were then made as needed to reduce volume discrepancies between closely spaced study intersections. Additionally, intersection peak hour turning movements for a roundabout study intersection were developed by converting AADT data using the NCDOT Intersection Analysis Utility (IAU) program. Final 2017 AM and PM peak hour turning movement volumes are illustrated in Appendix 5-C.

Existing AM and PM peak period capacity analyses were performed for each of the study corridors and surrounding transportation network. Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Professional Version 9*. Additionally, the study roundabout was analyzed using *SIDRA Intersection 7*. The recommended minimum cycle lengths by phase, per the *NCDOT Congestion Management Capacity Analysis Guidelines*, were applied to each study intersection and the signal timings were optimized. The full Synchro and SIDRA reports can be found in Appendix 5-D.

Measures of Effectiveness

Peak hour level of service (LOS) is a quantitative performance measure that represents quality of service measured on an A-F scale, with LOS A representing the best operation conditions from the driver's perspective. Intersection LOS measures the adequacy of the intersection geometrics and traffic controls of a particular intersection or approach for the given turning volumes. Levels of service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to traffic control devices (e.g., signals or stop signs). The engineering profession generally accepts LOS D as an acceptable operating condition for signalized intersections in urban areas and LOS C for rural areas.

At unsignalized intersections, LOS E is generally considered acceptable only if the side street encounters delay. Nevertheless, side streets sometimes function at LOS F during peak traffic periods; however, the traffic volumes often do not warrant a traffic signal to assist side street traffic. Figure 51 provides a general description of various levels of service categories and delay ranges as defined by the *Highway Capacity Manual*.

Figure 51: Level of Service Description for Intersections

Level of Service	Description	Signalized Intersection	Unsignalized Intersection
A	Little or no delay	<= 10 sec.	<= 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

FINDINGS BY BRT CORRIDOR

Level of Service Analysis

Existing (2017) analysis was conducted based on current roadway geometrics of each corridor. Intersection peak hour turning movements were developed by adjusting raw turning movement counts to 2017 volumes, due to the provided count data being collected in different years between 2013 and 2017. The findings for each study corridor are summarized below.

Capital Boulevard

As reported in Figure 52 and Appendix 5-E, all study intersections operate at acceptable levels of service except for US 401 (Capital Boulevard) and Crabtree Boulevard in the PM peak hour. This indicates that only one study intersection operates above capacity, while another is approaching

capacity. The remaining seven intersections within the corridor operates below capacity. See Appendix 5-F for a detailed graphic of the level of service and capacity analysis results of each study intersection.

Figure 52: Capital Boulevard Level of Service Summary

ID	Intersection Name	Existing (2017)	
		AM	PM
1	US 401 (Capital Boulevard) at Crabtree Boulevard	D (WB-F)	F (NB-F)
2	US 401 (Capital Boulevard) Northbound at Fenton Street	A (EB-E)	A (EB-E)
3	SR 2026 (Atlantic Avenue) at US 401 (Capital Boulevard) NB Off-Ramp	B (EB-E)	B (EB-E)
4	SR 2000 (Atlantic Avenue/Wake Forest Road) at Old Louisburg Road/US 401 (Capital Boulevard) SB On-Ramp	C (WB-E)	B (WB-E)
5	Wake Forest Road at E. Whitaker Mill Road	D (EB-F)	C (EB-E)
6	Atlantic Avenue at E. Whitaker Mill Road	B (EB-E)	C (WB-E)
7	N. Dawson Street at E. Lane Street	B (WB-C)	B (WB-D)
8	N. McDowell Street at E. Lane Street	A (WB-C)	C (WB-D)
9	N West Street at W. Peace Street	B (NB-D)	B (NB-D)

Legend: X - Overall Level of Service, (XX-X) - Worst Approach-Worst Approach Level of Service

New Bern Avenue

As reported in Figure 53 and Appendix 5-E, all study intersections operate at acceptable levels of service except for US 64 (New Bern Avenue) and SR 2205 (Trawick Road) in the AM peak hour. This indicates that only this study intersection operates above capacity, while the rest of the corridor operates below or near capacity. See Appendix 5-F for a detailed graphic of the level of service and capacity analysis results of each study intersection.

Figure 53: New Bern Avenue Level of Service Summary

ID	Intersection Name	Existing (2017)	
		AM	PM
1	US 64 Bus. (New Bern Avenue) at SR 2517 (N. Rogers Lane)	C (SB-E)	D (SB-E)
2	US 64 Bus. (New Bern Avenue) at Freedom Drive/Hedingham Boulevard	C (NB-E)	C (NB-E)
3	US 64 Bus. (New Bern Avenue) at New Hope Road	D (SB-E)	D (SB-E)
4	US 64 Bus. (New Bern Avenue) at Corporation Parkway	D (NB-F)	D (NB-E)
5	US 64 Bus. (New Bern Avenue) at SR 2205 (Trawick Road)	E (NB-F)	D (NB-F)
6	US 64 Bus. (New Bern Avenue) at I-440 Westbound Ramps	C (SB-C)	B (SB-B)
7	US 64 Bus. (New Bern Avenue) at I-440 Eastbound Ramps	C (EB-E)	D (NB-D)
8	SR 2911 (New Bern Avenue) at SR 2277 (Yonkers Road)	B (WB-E)	B (WB-E)
9	SR 2911 (New Bern Avenue) at SR 2544 (Sunnybrook Road)	D (EB-E)	C (EB-E)
10	SR 2911 (New Bern Avenue) at Wake Medical Center Emergency Entrance	A (EB-E)	D (NB-E)
11	SR 2911 (New Bern Avenue) at Wake Medical Center Visitor Entrance	B (WB-C)	B (WB-D)
12	SR 2911 (New Bern Avenue) at SR 2921 (Raleigh Boulevard)	D (NB-D)	D (NB-D)
13	SR 2911 (New Bern Avenue) at SR 1007 (E. Edenton Street/Poole Road)	B (NB-D)	A (NB-D)
14	SR 2911 (New Bern Avenue) at N. Tarboro Street	C (SB-D)	B (NB-D)
15	SR 1007 (E. Edenton Street) at N. Tarboro Street	B (SB-D)	C (NB-D)
16	SR 2911 (New Bern Avenue) at S. Person Street	B (EB-B)	B (NB-C)
17	SR 1007 (E. Edenton Street) at N. Person Street	D (NB-F)	C (NB-C)

ID	Intersection Name	Existing (2017)	
		AM	PM
18	SR 2911 (New Bern Avenue/E. Morgan Street) at S. Blount Street	C (EB-C)	C (SB-C)
19	SR 1007 (E. Edenton Street) at N. Blount Street	B (SB-C)	B (SB-B)

Legend: X - Overall Level of Service, (XX-X) - Worst Approach-Worst Approach Level of Service

S. Wilmington Street

As reported in Figure 54 and Appendix 5-E, four study intersections operate at acceptable levels of service during both AM and PM peak hours. The SR 1564 (Wilmington Street)/Salisbury Street and Martin Luther King Jr Boulevard intersection operates at an acceptable level of service during the PM peak hour only. The US 70-401/NC 50 (Wilmington Street) and SR 1370-2684 (Tryon Road), US 401 (Fayetteville Road) and Garner Station Boulevard/Mechanical Boulevard, and the US 401 (Fayetteville Road) and Purser Drive/Pinewinds Drive all operate at an acceptable level of service during the AM peak hour only. Lastly, the US 70-401/NC 50 (Wilmington Street) and Chapanoke Road intersection does not operate at an acceptable level of service during both peak periods. Hence, the majority of the intersections in this study corridor operate at and over capacity. See Appendix 5-F for a detailed graphic of the level of service and capacity analysis results of each study intersection.

Figure 54: Wilmington Street Level of Service Summary

ID	Intersection Name	Existing (2017)	
		AM	PM
1	SR 1565 (Salisbury Street) at E. South Street	B (SB-C)	B (EB-C)
2	SR 1564 (Wilmington Street) at E. South Street	B (NB-B)	B (NB-B)
3	SR 1564 (Wilmington Street)/Salisbury Street at Martin Luther King Jr Boulevard	E (NB-E)	D (NB-E)
4	SR 1564 (Wilmington Street) at Layden Street and Pecan Road	B (EB-D)	B (EB-D)
5	SR 1564 (Wilmington Street) at Ileagnes Street and Rush Street	B (WB-D)	B (WB-D)
6	US 70-401/NC 50 (Wilmington Street) at Chapanoke Road	F (NB-F)	F (SB-F)
7	US 70-401/NC 50 (Wilmington Street) at SR 1370-2684 (Tryon Road)	C (WB-F)	E (WB-F)

ID	Intersection Name	Existing (2017)	
		AM	PM
8	US 401 (Fayetteville Road) at Garner Station Boulevard/Mechanical Boulevard	C (WB-E)	E (SB-F)
9	US 401 (Fayetteville Road) at Purser Drive/Pinewinds Drive	D (WB-E)	E (SB-F)

Legend: X - Overall Level of Service, (XX-X) - Worst Approach-Worst Approach Level of Service

Wilmington – South Saunders

As reported in Figure 55 and Appendix 5-E, the US 401 (S. Saunders Street) and I-40 WB Ramps intersection does not operate at an acceptable level of service during the PM peak hour only. However, it should be noted that the existing roadway geometry is temporary as a divergent diamond interchange (DDI) will be constructed. The rest of the study intersections operate at acceptable levels of service and below capacity during both peak periods. See Appendix 5-F for a detailed graphic of the level of service and capacity analysis results of each study intersection.

Figure 55: Wilmington South Saunders Level of Service Summary

ID	Intersection Name	Existing (2017)	
		AM	PM
1	US 401 (S. Saunders Street) at W. South Street	B (EB-C)	C (EB-C)
2	US 401 (S. Saunders Street) at Lake Wheeler Road	C (EB-C)	B (EB-D)
3	US 401 (S. Saunders Street) at S. Dawson Street	C (WB-C)	B (SB-E)
4	US 401 (S. Saunders Street) at I-40 WB Ramps	C (WB-E)	E (SB-E)
5	US 401 (S. Saunders Street) at I-40 EB Ramps	D (EB-F)	D (EB-E)
6	US 401 (S. Saunders Street) at Carolina Pines Avenue/Pecan Road	C (EB-F)	D (EB-F)

Legend: X - Overall Level of Service, (XX-X) - Worst Approach-Worst Approach Level of Service

Western Boulevard

As reported in Figure 56 and Appendix 5-E, both the SR 1012 (Western Boulevard) and Method Road, and the SR 1012 (Western Boulevard) and Gorman Street intersections do not operate at acceptable levels of service during both AM and PM peak periods. The SR 1011 (E. Chatham Street) and SR 1415 (Maynard Road) and the SR 1012 (Western Boulevard) and SR 1321 (Avent Ferry Road)/Morrill Drive intersections only operate at an acceptable level of service during the AM peak hour only. The SR 1564 (Martin Luther King Jr. Boulevard) and Salisbury Street/SR 1564

(Wilmington Street) and the SR 1564 (Martin Luther King Jr. Boulevard) and S. Person Street intersections only operate at an acceptable level of service during the PM peak hour only. The rest of the study intersections operate at acceptable levels of service and below capacity. See Appendix 5-F for a detailed graphic of the level of service and capacity analysis results of each study intersection.

Figure 56: Western Boulevard Level of Service Summary

ID	Intersection Name	Existing (2017)	
		AM	PM
0	SR 1011 (E. Chatham Street) at Harrison Avenue	C (NB-D)	D (WB-E)
1	SR 1011 (E. Chatham Street) at N. Academy Street	B (SB-D)	C (SB-D)
2	SR 1011 (E. Chatham Street) at E. Durham Road	A (NB-A)	A (EB-B)
3	SR 1011 (E. Chatham Street) at SR 1415 (Maynard Road)	D (NB-E)	E (SB-E)
4	SR 1012 (Western Boulevard) at SR 1319 (Jones Franklin Road)	C (NB-D)	C (NB-D)
5	SR 1011 (Hillsborough Street) at SR 1319 (Jones Franklin Road)	B (NB-D)	B (NB-D)
6	SR 1012 (Western Boulevard) at SR 1011 (Hillsborough Street)	C (SB-D)	C (SB-D)
7	SR 1012 (Western Boulevard) at Powell Drive	B (NB-E)	B (SB-E)
8	SR 1012 (Western Boulevard) at SR 3072 (Blue Ridge Road)	C (EB-C)	C (SB-C)
9	SR 1012 (Western Boulevard) at Method Road	F (SB-F)	F (SB-F)
10	SR 1012 (Western Boulevard) at Gorman Street	E (NB-F)	F (WB-F)
11	SR 1012 (Western Boulevard) at Varsity Drive	C (NB-E)	D (NB-F)
12	SR 1012 (Western Boulevard) at Dan Allen Drive	C (NB-E)	C (NB-F)
13	SR 1012 (Western Boulevard) at SR 1321 (Avent Ferry Road) and Morrill Drive	D (NB-E)	E (NB-F)

ID	Intersection Name	Existing (2017)	
		AM	PM
14	SR 1012 (Western Boulevard) at Pullen Road	A (SB-D)	B (SB-D)
15	SR 1012 (Western Boulevard) at Hunt Drive/Central Prison	B (SB-F)	B (SB-E)
16	Dawson McDowell Connector (Southbound Ramp) at Western Boulevard	A (SB-D)	A (SB-D)
17	Dawson McDowell Connector (Northbound Ramp) at SR 1564 (Martin Luther King Jr Boulevard)	C (NB-D)	B (NB-D)
18	SR 1564 (Martin Luther King Jr Boulevard) at Salisbury Street/SR 1564 (Wilmington Street)	E (SB-E)	D (SB-E)
19	SR 1564 (Martin Luther King Jr Boulevard) at S. Blount Street	B (SB-C)	C (EB-C)
20	SR 1564 (Martin Luther King Jr Boulevard) at S. Person Street	F (NB-F)	B (NB-C)

Legend: X - Overall Level of Service, (XX-X) - Worst Approach-Worst Approach Level of Service

Western – NC 54

As reported in Figure 57 and Appendix 5-E, only the SR 1011 (E. Chatham Street) and SR 1415 (Maynard Road) intersection does not operate at an acceptable level of service during both AM and PM peak periods. This indicates that only this study intersection operates above capacity, while the rest of the corridor operates below or near capacity. See Appendix 5-F for a detailed graphic of the level of service and capacity analysis results of each study intersection.

Figure 57: Western NC 54 Level of Service Summary

ID	Intersection Name	Existing (2017)	
		AM	PM
1	SR 3801 (Chapel Hill Road) at N. Harrison Avenue	D (NB-E)	D (SB-E)
2	SR 3801 (Chapel Hill Road) at N. Academy Street	B (NB-E)	B (NB-E)
3	NC 54 (Chapel Hill Road) at SR 1415 (Maynard Road)	F (SB-F)	E (NB-F)
4	NC 54 (Chapel Hill Road) at SR 1655 (Trinity Road)	C (SB-D)	D (SB-E)

ID	Intersection Name	Existing (2017)	
		AM	PM
5	NC 54 (Chapel Hill Road) at I-40 EB Ramps	B (SB-D)	C (SB-E)
6	NC 54 (Chapel Hill Road) at I-40 WB Ramps	D (WB-D)	C (NB-D)
7	NC 54 (Chapel Hill Road) at Corporate Center Drive	C (NB-E)	D (NB-E)
8	NC 54 (Chapel Hill Road) at Edwards Mill Road	B (SB-C)	B (SB-D)
9	NC 54 (Chapel Hill Road) at SR 1011 (Hillsborough Street)	C (EB-C)	D (EB-D)

Legend: X - Overall Level of Service, (XX-X) - Worst Approach-Worst Approach Level of Service

Western – Walnut

As reported in Figure 58 and Appendix 5-E, all signalized intersections operate at an acceptable level of service and below capacity. However, the two unsignalized I-40 ramp intersections are over capacity as the southbound movements do not have enough gaps to make the appropriate turning movements. See Appendix 5-F for a detailed graphic of the level of service and capacity analysis results of each study intersection.

Figure 58: Western Walnut Level of Service Summary

ID	Intersection Name	Existing (2017)	
		AM	PM
1	S. Harrison Avenue at SR 1300 (Dry Avenue/Kildaire Farm Road)	C (WB-D)	C (WB-D)
2	SR 1300 (Dry Avenue/Kildaire Farm Road) at S. Academy Street	A (SB-D)	B (SB-D)
3	SR 1300 (Dry Avenue/Kildaire Farm Road) at Walnut Street	B (WB-D)	B (WB-D)
4	Walnut Street/Cary Towne Boulevard at Walnut Street	C (NB-E)	C (NB-E)
5	Cary Towne Boulevard at SR 1415 (Maynard Road)	D (WB-D)	D (WB-E)

ID	Intersection Name	Existing (2017)	
		AM	PM
6	Cary Towne Boulevard at Convention Drive/Principal Lane	B (SB-D)	C (SB-E)
7	Cary Towne Boulevard at I-40 EB Ramps	(SB-F)	(SB-F)
8	Cary Towne Boulevard at I-40 WB Ramps	(SB-F)	(SB-F)

Legend: X - Overall Level of Service, (XX-X) - Worst Approach-Worst Approach Level of Service

6 High-Level Environmental Review

INTRODUCTION

A high-level environmental review for each BRT corridor was completed to identify existing natural, human, and community resources, and potential design constraints in the study areas. Publicly available environmental databases as well as past studies were searched and analyzed to identify possible opportunities and constraints along the corridors. Geographical information systems (GIS)-based maps were produced to illustrate environmental resources to provide baseline conditions for each corridor. These maps assist in developing environmental screening criteria and in assessing alternatives for potential environmental impacts regarding the proposed BRT projects. The environmental review also includes an assessment of existing demographic data and potential environmental justice (EJ) impacts of each of the BRT corridors. The findings for each corridor are discussed in further detail below.

METHODOLOGY

For the purposes of this project, a GIS-level analysis was performed utilizing a variety of publicly available datasets from federal, state, and local resources. Every effort was made to ensure that the most appropriate and recent datasets were included.

The Environmental Screening maps for each corridor identify where EMS stations, fire stations, hospitals, libraries, parks, police departments, schools, cemeteries, places of worship, utility lines (electric transmission), waterways/floodplains, wetlands, hazardous waste sites (active and inactive), water resources, water supplies, historic properties, and public open spaces are located.

The Environmental Justice Screening maps for this project identify minority, poverty, LEP-Spanish, and zero car household percentages for the defined project region.

Data Sources for GIS mapping can be found in the References/Sources Section of the map.

FINDINGS BY BRT CORRIDORS

Capital Boulevard

The Capital Boulevard corridor is characterized primarily with commercial and industrial uses. There are pockets of residential neighborhoods within the corridor, but they typically do not front the roadway. Community resources common to residential areas such as schools, parks, and churches are located throughout the corridor (see Figure 59). Several historic districts are

located throughout the corridor—Glenwood-Brooklyn, Mordecai Place, and Roanoke Park. Fred Fletcher Park, Lions Park, and Oakwood Park are greenways found within the corridor. William Peace University is located to the southeast side of Capital near to downtown Raleigh.

There is a floodway and wetland system crossing Capital Boulevard between Crabtree Boulevard and 440 where Capital Boulevard crosses Crabtree Creek Trail, as shown in Figure 59. Other potential areas for flooding are where Capital crosses Pigeon House Branch as well as Cemetery Branch.

Neighborhoods containing 21-80% minority populations are found on the southeast side of Capital Boulevard (see Figure 60). Regions of 21-50% of populations in poverty are located on the northeast and southeast sides of Capital Boulevard, as shown in Figure 61. There is a notable EJ presence within the corridor that will require evaluation during the design phase.

Figure 59: Capital Boulevard Corridor – Environmental Screening

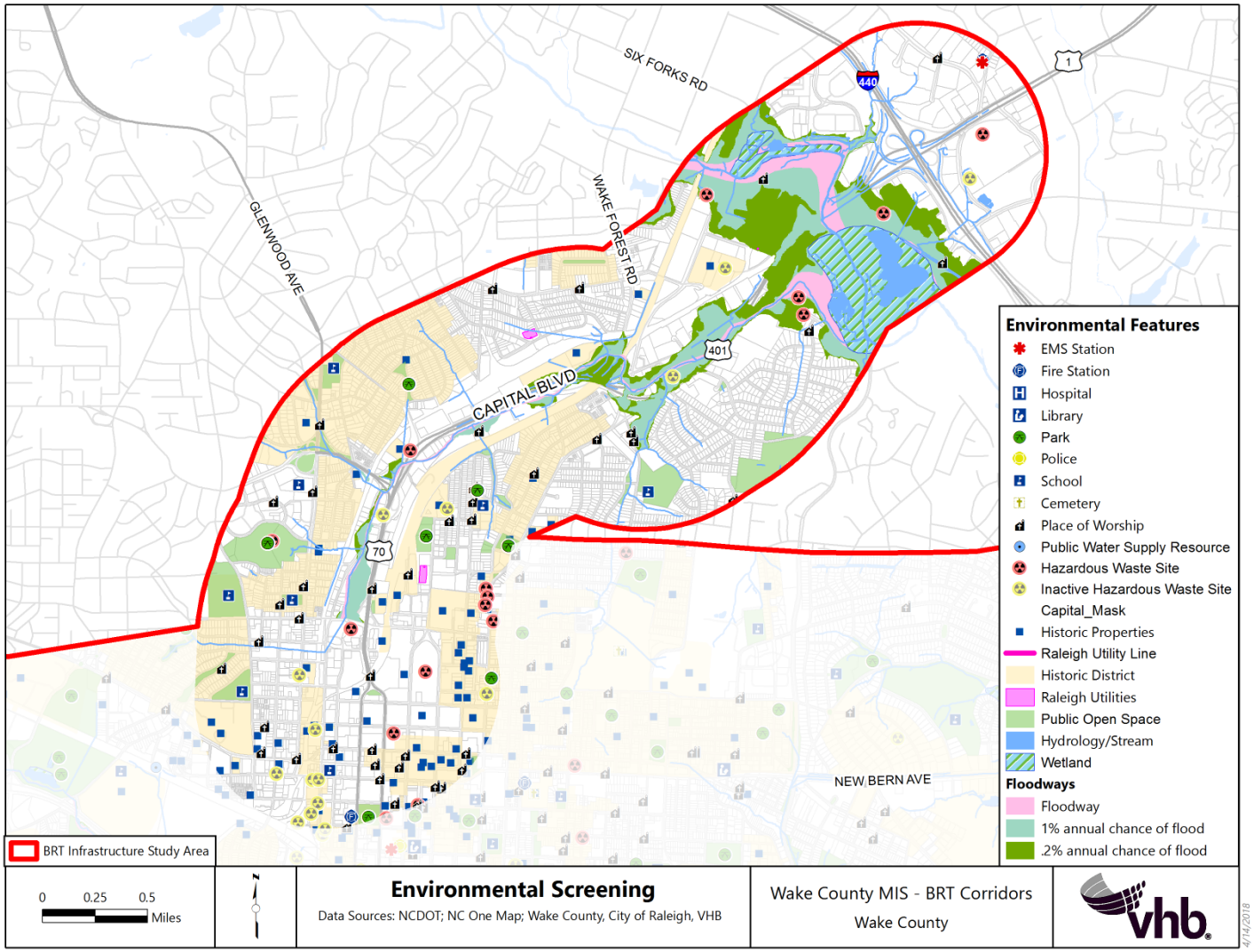


Figure 60: Minority Screening

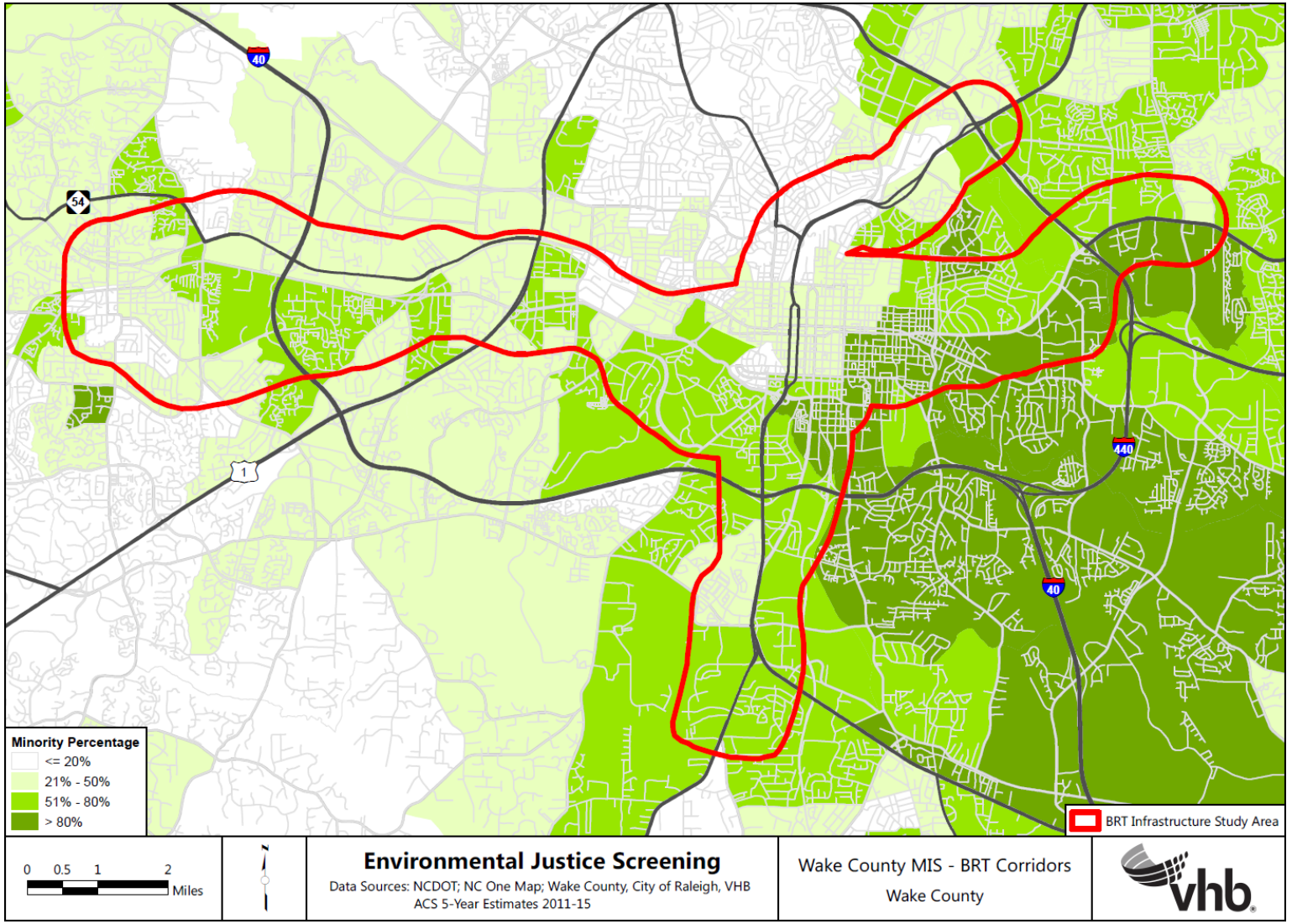


Figure 61: Poverty Screening

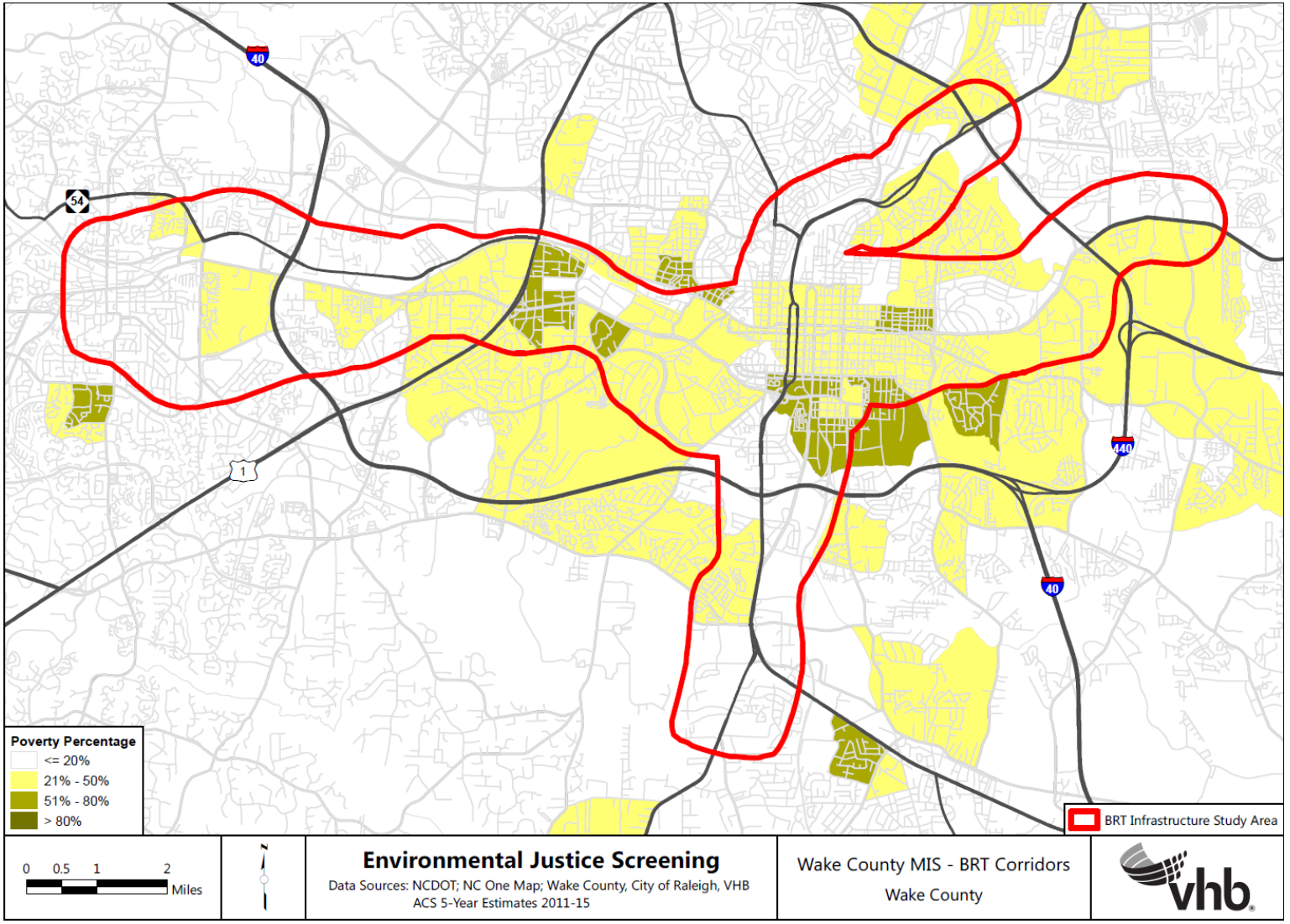
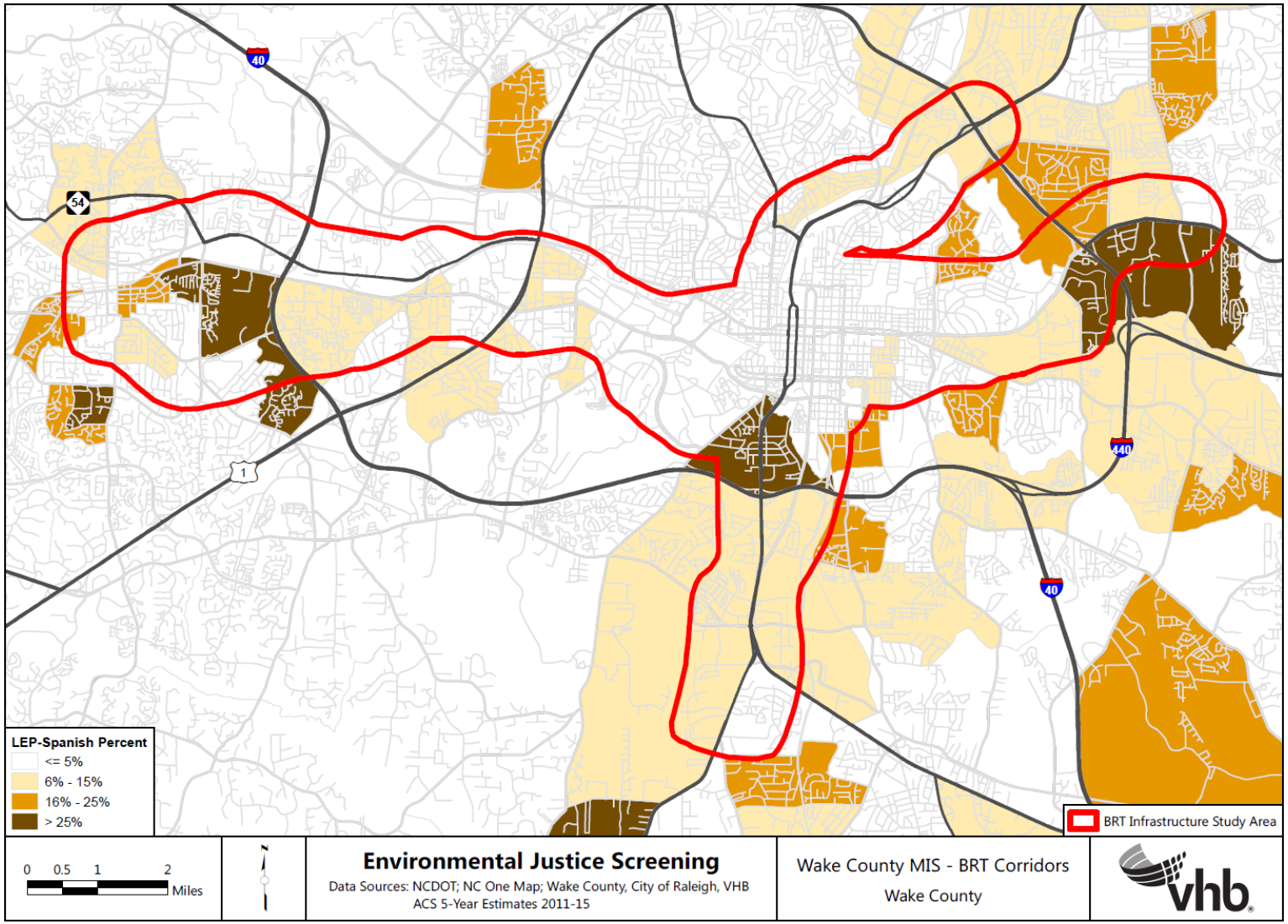


Figure 62: LEP Screening



Census data indicates a Spanish language population that meets or exceeds the US Department of Justice LEP Safe Harbor threshold is concentrated to the northwest of Capital Boulevard and near the intersection of Capital and I-440 (shown in Figure 62).

New Bern Avenue

The New Bern Avenue corridor is characterized by both residential and commercial uses. Community resources common to residential areas such as schools, parks, libraries, and churches are located throughout the corridor (see Figure 63). WakeMed Raleigh fronts New Bern Avenue and the Raleigh Country Club is located nearby. Several historic districts are found within the corridor—Oakwood, Oakwood Cemetery, Hungry Neck-Idlewild, and Longview Gardens. New Bern Avenue crosses Crabtree Creek and Trail.

There is a floodway and wetland system crossing New Bern Avenue between Sunnybrook Road and I-440 where New Bern Avenue crosses Crabtree Creek, as shown in Figure 63.

In the downtown area of Raleigh within this corridor, 21-50% of total households having zero cars are found on both sides of New Bern Avenue, as shown in Figure 64. The greatest concentration of zero car households (>21%) is found from New Bern Avenue to the intersection of Western Boulevard and Wilmington Street.

Neighborhoods with greater than 80% minority populations are found on the south side of New Bern Avenue from downtown Raleigh to New Hope Road and beyond (see Figure 60). The northern side of New Bern Avenue is abutted by 51-80% minority populated neighborhoods. There is a notable EJ presence within the corridor that will require evaluation during the design phase.

On the southern side of New Bern Avenue, from downtown to New Hope Road and beyond, the poverty percentage is 21-50% (see Figure 61). One neighborhood with a poverty percentage of 51-80% is located on the north side of New Bern Avenue near downtown Raleigh. It should be noted that the New Bern Avenue corridor has the most notable presence of EJ populations when compared to the other proposed BRT corridors.

Census data indicates a Spanish language population that meets or exceeds the US Department of Justice LEP Safe Harbor threshold is concentrated to the northeast and southeast sides of New Bern Avenue—farther from downtown (see Figure 62).

Figure 63: New Bern Corridor - Environmental Screening

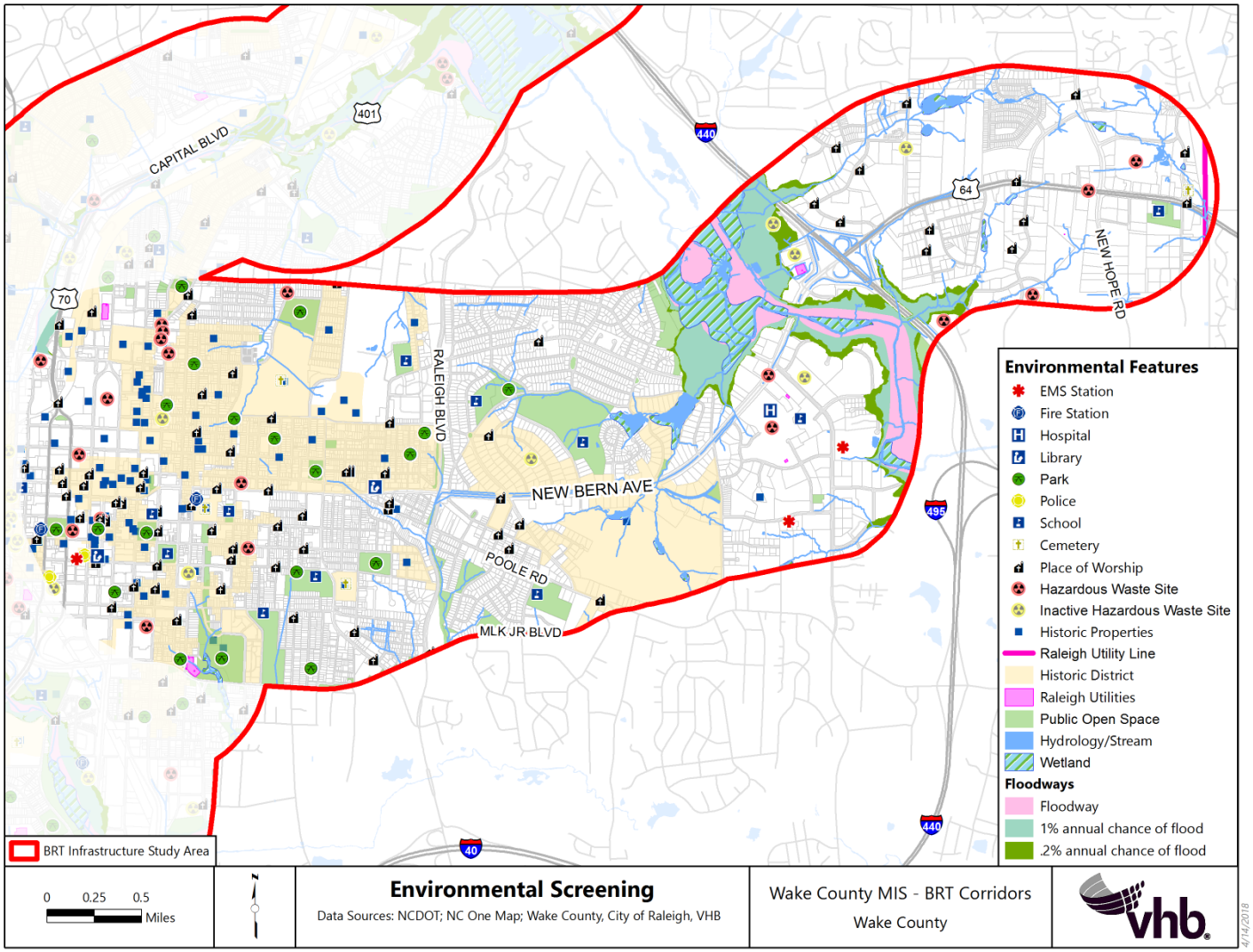
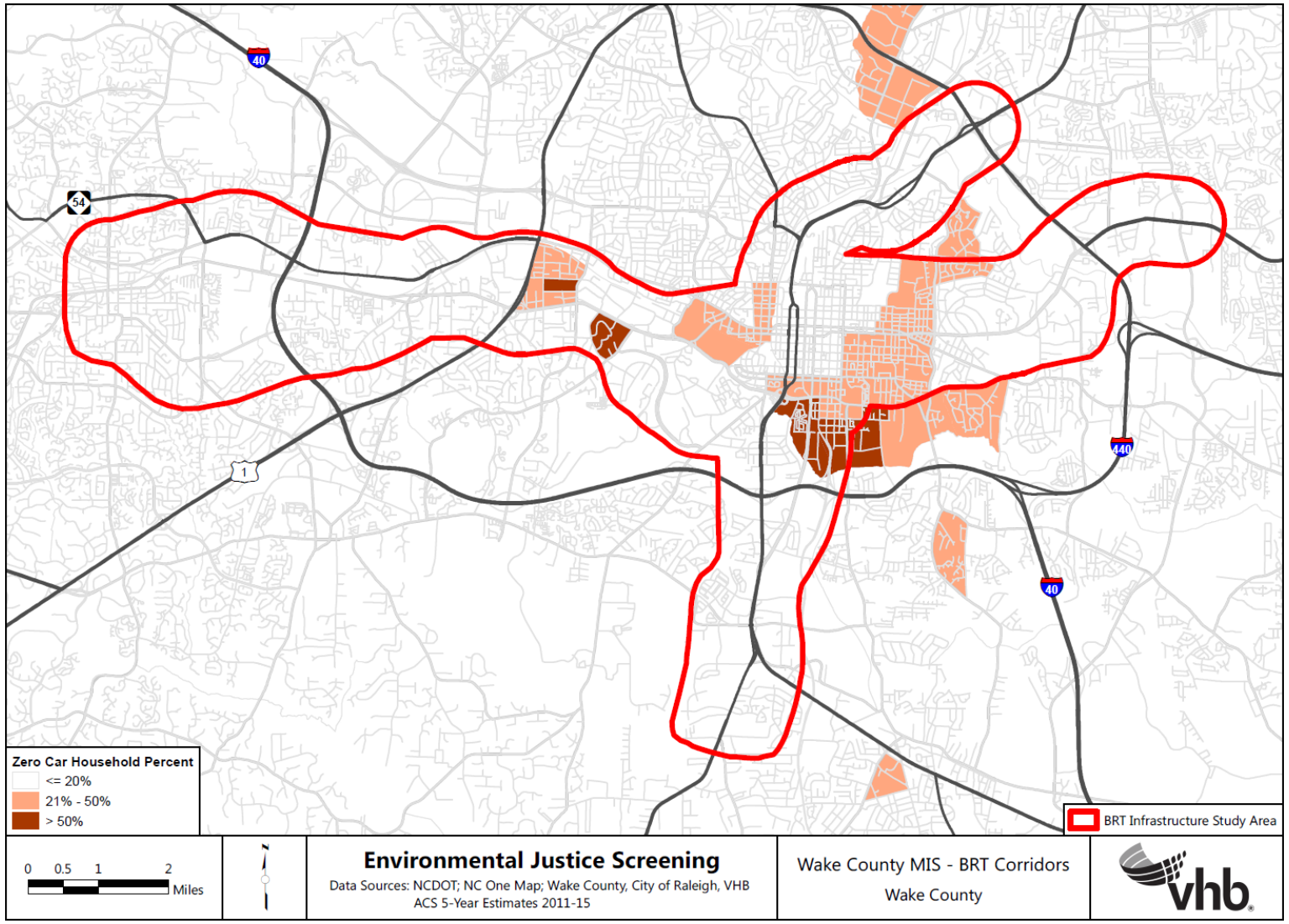


Figure 64: Zero Car Household Screening



S Wilmington Street

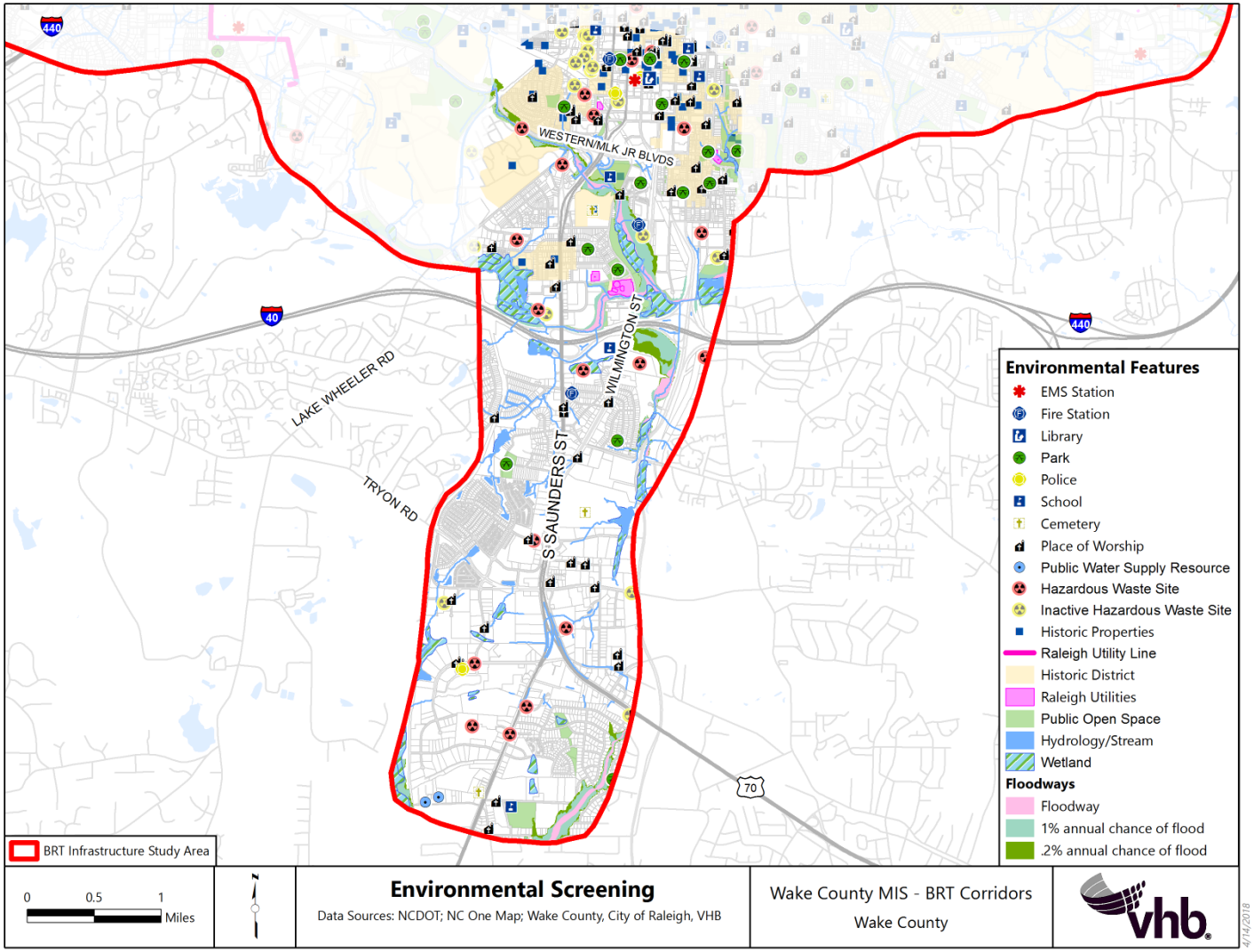
The Wilmington Street corridor is characterized by both residential and commercial uses and has substantial areas of undeveloped land. Community resources common to residential areas such as schools, parks, and churches are located throughout the corridor (see Figure 65). Montlawn Memorial Park fronts the corridor, and Mount Hope Cemetery and Eliza Park are adjacent to the corridor. Walnut Creek Wetland Center is located on the eastern side of the corridor. A few historic districts are found along the corridor—Mount Hope Cemetery and Rochester Heights. The historic Raleigh Water Works and Bain Water Treatment Plant is located on the western side of the corridor.

There is a floodway and wetland system where Wilmington Street crosses Walnut Creek (see Figure 65). Near the floodway location, Wilmington Street connects to Walnut Creek Trail and Rocky Branch Trail.

An area with greater than 50% of households having zero cars is found near the intersection of Western Boulevard and Wilmington Street (see Figure 64). The Wilmington Street corridor is comprised mainly with 51-80% minority neighborhoods (see Figure 60). At the intersection of Western Street and Wilmington Street, the poverty percentage is greater than 51% (see Figure 61). On the western side of the corridor, between I-40 and Tryon Road, there is an area of 21-50% poverty. Evaluation of potential impacts on EJ populations within the corridor will be required during the design phase.

Census data indicates a Spanish language population that meets or exceeds the US Department of Justice LEP Safe Harbor threshold has the highest concentration to the northeast of Wilmington Street —close to downtown (see Figure 62). The rest of the Wilmington corridor has 6-15% LEP-Spanish population located on either side.

Figure 65: S Wilmington Street Corridor - Environmental Screening



Western Boulevard

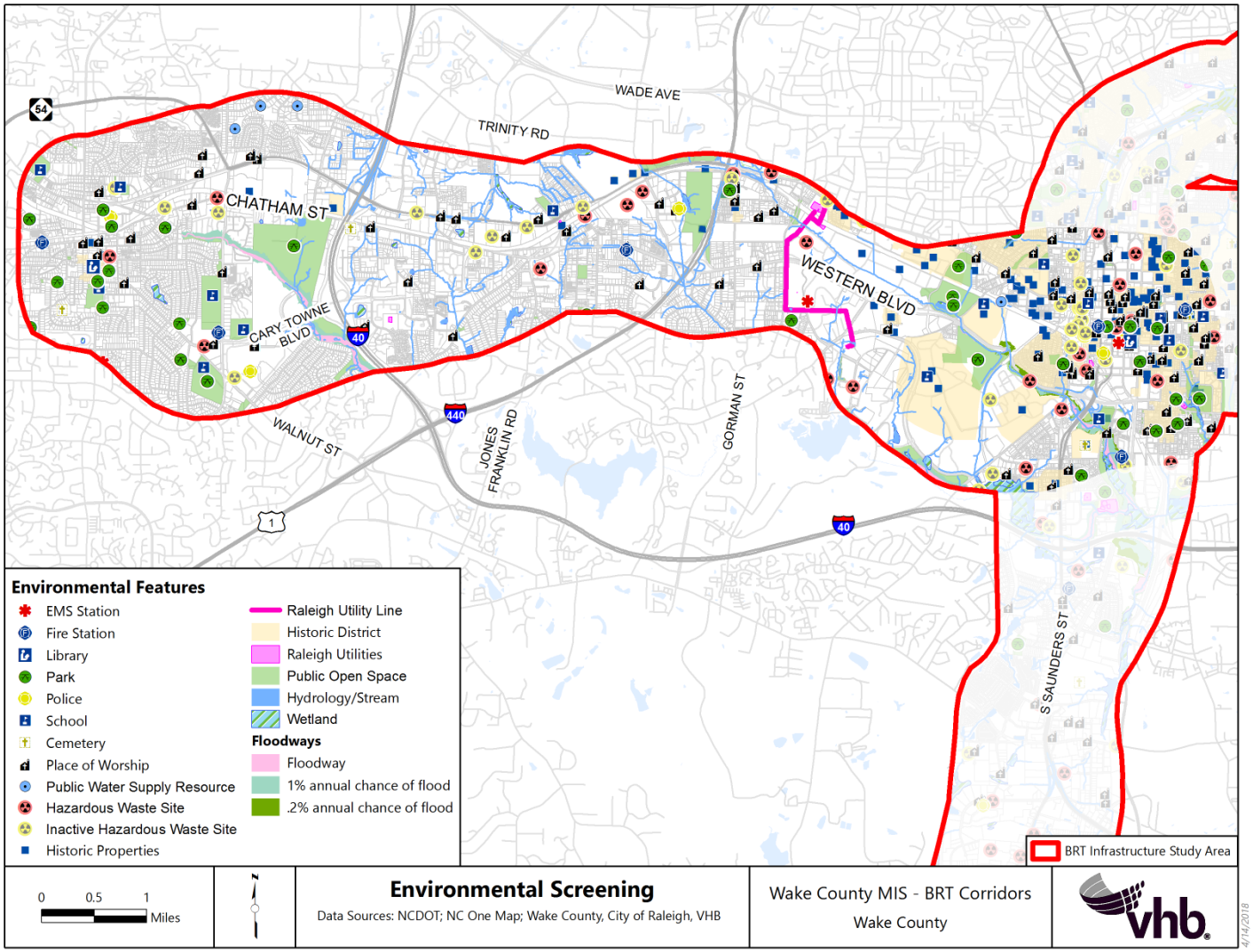
The Western Boulevard corridor is characterized primarily with residential and commercial uses. Community resources common to residential areas such as schools, parks, and churches are located throughout the corridor (see Figure 66). A few historic districts are found along the corridor—Dix Hill, Boylan Heights, and Nazareth. Parts of North Carolina State University front the corridor. Dix Soccer Park, Capital Area Greenway, Rocky Branch Trail, and Pullen Park are public spaces found within the corridor. The City of Raleigh is currently exploring options to revamp Dorothea Dix Park into Raleigh's Central Park. Western Boulevard crosses Rocky Branch near Ashe Avenue. There is a large electric transmission corridor that crosses Western Boulevard at Gorman Street, which then extends east on Marcom Street into NCSU Centennial campus. Two main rail tracks, owned by Amtrak, run parallel to the corridor. They are found between Western Boulevard and Hillsborough Street. The tracks also run through North Carolina State University.

Two, 21-50% zero car household neighborhoods are located on the northern side of Western Boulevard (see Figure 64). Another neighborhood with greater than 50% of total households having zero cars is located between Western Boulevard and Centennial Parkway. The Western Boulevard corridor has 21-80% minority population neighborhoods on both the northern and southern sides (see Figure 60).

Western is mainly comprised of 21-50% poverty populations with two regions of 51-80% poverty population (see Figure 61). The 21-80% poverty population areas are located near I-440 and I-40 on Western Boulevard. The EJ populations within the corridor will require evaluation during the design phase.

Census data indicates a Spanish language population that meets or exceeds the US Department of Justice LEP Safe Harbor threshold is concentrated to the southwest of Western corridor on the west side of I-40 (see Figure 62).

Figure 66: Western Boulevard - Environmental Screening



APPENDICES