Appendix A:
Implementation Steps

1 The Path to Capital North:
From Here to The Future

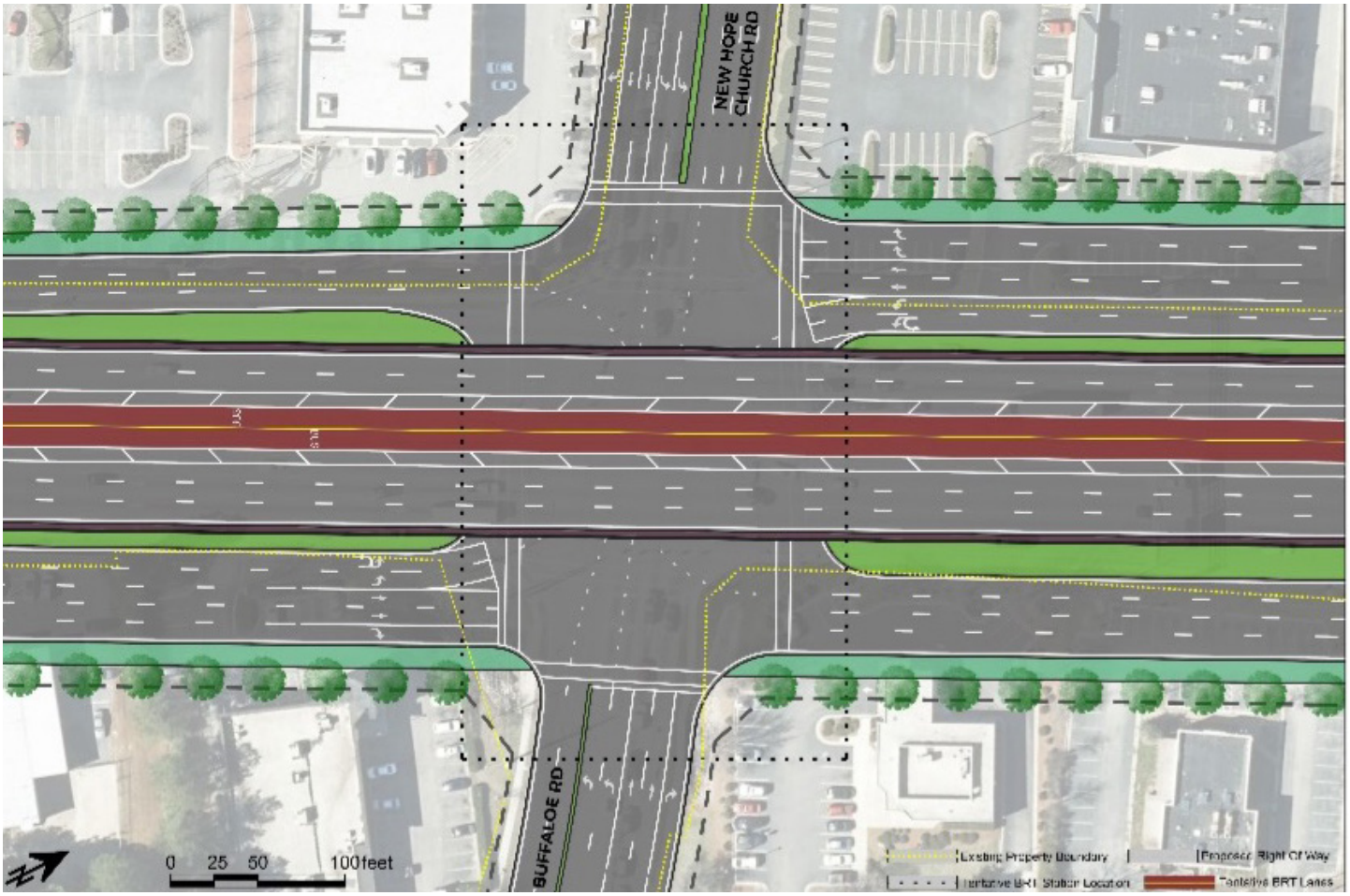
Policy Recommendations

The improvements described in the previous sections are ambitious and will take several years to come to fruition. There are many inter-related factors in the proposed changes to the corridor that require careful thought. In order to ensure that the future corridor truly reflects the ideals set forth by the participants in this study, this report provides the following written directions. These are policies and actions that fill in some of the details about how the changes to the corridor should carry out the vision of the people here.

The policies listed in this section are intended to become part of Raleigh's 2030 Comprehensive Plan. That means they will become official city policies for guiding public investments, new development, and community amenities. These actions give City departments, other agencies, and community organizations specific goals for putting these policies into effect. This list is organized according to the four Vision Themes created at the beginning of the study process. Each Vision Theme and its description is shown above the policies that reflect it.

These themes have also been incorporated into the design concepts and spatial policies that are shown in detail in the previous section. For example, Policy AP-CN 1.3 states Design new and reconstructed interchanges to accommodate future bus rapid transit stations and the map on page 64 highlights an area where a location was identified for a future incorporation of a Bus Rapid Transit (BRT) station. The previous sections also highlighted how these policies were incorporated in the land use policies for the corridor, such as incorporating Policy AP-CN 3.1: "As existing commercial areas redevelop, encourage urban form and land uses that support transit ridership and create a comfortable and accessible public realm on secondary streets near Capital Boulevard."

FIGURE 1. **MULTIWAY BOULEVARD**



Vision Theme: Flow

Capital Boulevard will be a safe, direct, reliable, and high-capacity connection for travel by all modes of transportation to centers of employment and economic activity in Raleigh and the surrounding region.

Policy AP-CN 1.1 Traffic Management: Accommodate the traffic volume projected in 2045 by the Triangle Regional Model while also maintaining access to land uses along the corridor.

Policy AP-CN 1.2 Low-Impact Interchange Design: Interchange design should minimize and mitigate impacts on nearby development. Impacts to be considered should include access, visibility, and future development potential.

Policy AP-CN 1.3 BRT Preparedness: Design new and reconstructed interchanges to accommodate future bus rapid transit stations.

Policy AP-CN 1.4 Bicycle Concurrency: Prioritize implementation of bicycle facilities on adjacent and/or parallel streets to be constructed in a similar time frame as interchange and street projects for Capital Boulevard, as called for in the Bike Raleigh plan.

Policy AP-CN 1.5 Mature Tree Preservation: To the maximum extent possible, preserve existing mature trees along Capital Boulevard during road construction, particularly in the area between Spring Forest Road and Oak Forest Drive.

Action AP-CN 1.1 Bicycle Transitions to Interchanges: Bicycle facilities approaching and within interchanges should be constructed as shown in the Bicycle Design figures in Appendix F of the plan report.

Action AP-CN 1.2 Quick-Build Bicycle Projects: Pursue quick-build bicycle projects for some locations near the corridor. Consider temporary, low cost, and low maintenance options that can be constructed quickly and serve as interim facilities until more permanent facilities are constructed.

Action AP-CN 1.3 Pedestrian Circulation in the I-440 Interchange: Ensure that the I-440/ Capital Boulevard interchange improvement project provides a safe, direct, and convenient pedestrian connection through the interchange.

Vision Theme: Go

Capital Boulevard will provide for safe and accessible local travel for all modes of transportation. Pedestrian and bicycle facilities will connect transit, parks, neighborhoods, shopping, and employment while reducing conflicts with vehicle traffic. Local streets should be designed with all users in mind and help to activate nearby land uses.

Policy AP-CN 2.1 Pedestrian Safety: Increase pedestrian/overall safety through grade separation, parallel street network development, or other capital projects as described in this plan.

Policy AP-CN 2.2 Pedestrian Bridge at Triangle Town Center: Encourage reservation of land on both sides of Capital Boulevard between Sumner Boulevard and Old Wake Forest Road for the construction of a pedestrian bridge in this location.

Policy AP-CN 2.3 Retaining Pedestrian Access: Where an existing through street is converted to right-in/right-out or grade separation without access to Capital Boulevard, identify appropriate locations for facilities to ensure a high level of pedestrian access across Capital Boulevard, including pedestrian bridges. Any reduction in pedestrian level of service for crossing Capital Boulevard should be minimized in magnitude and duration.

Policy AP-CN 2.4 Accommodating New Streets: Consider allowing greater height and density than what is recommended by Table LU-2 for sites that contain streets on the Street Plan Map. Carefully balance additional density with appropriate neighborhood transitions.

Policy AP-CN 2.5 Innovative Bike/Ped Facilities: Evaluate the operational feasibility and potential benefits of creating new types of bicycle and pedestrian facilities that fill small gaps in the existing network, can be constructed quickly, or have been difficult to implement in the past due to divergence from adopted facility types. Consider incorporating this work into the Greenway Master Plan update process.

Policy AP-CN 2.6 Interchange Corners at Grade: New interchanges should be designed such that local vehicle lanes are constructed as close as possible to the existing grade of adjacent developments where they meet the street. Where this policy conflicts with the desire for site access as described in Policy 1.1 "Traffic Management", this policy should be given

FIGURE 2. **EXAMPLE OF PEDESTRIAN BRIDGE (IEW CONSTRUCTION GROUP)**

priority.

Policy AP-CN 2.7 Neighborhood Edges: Improve the safety, appearance, and connectivity of transition areas between commercial and residential uses.

Action AP-CN 2.1 Streetscape Plan: Create a streetscape design to be applied on cross streets where new interchanges are proposed. Allow for design of some elements, particularly vertical items such as light poles and benches, to be customized according to the character of the nearby area. Include residents, businesses, and civic organizations from the adjacent neighborhoods in the design and/or selection of these items.

Action AP-CN 2.2 Pedestrian Crossings: Construct improved pedestrian crossings as shown in the Priority Bicycle and Pedestrian Recommendations maps in this report. Explore the possibility of a pedestrian crossing at Baugh Street and Buffaloe Road to connect with the Raleigh Housing Authority (RHA) development on the north

side. If a crossing is installed, improve the sidewalk through the RHA development to a multi-use path.

Action AP-CN 2.3 Marsh Creek Greenway Land Acquisition: Identify and pursue opportunities to acquire land, including as part of capital projects, for the implementation of the Marsh Creek Greenway between Brentwood Park and N. Raleigh Boulevard. Identify and seek to implement connections between the Marsh Creek greenway and Hill Street Park as well as with civic spaces in the Highwoods/ Westinghouse Multi-modal District.

Action AP-CN 2.4 New Civic Life in Existing Spaces: Seek novel ways to utilize underused spaces, such as vacant retail outlets and existing public right-of-way, in the corridor for public benefit. Consider the installation of small-scale park facilities and amenities that attract positive, healthy activity and raise visibility of out-of-the-way areas. Explore this concept in a future Parks, Recreation and Cultural Resources System Plan Update.

Action AP-CN 2.5 Safety by Design: Explore the feasibility of installing lighting, "blue light" emergency phones, cameras, and public Wi-Fi networks along the proposed bicycle and pedestrian network, including in the form of "safety refuges" that combine all four elements listed. If pursued, integrate these items with the "loops" described in Action 4.9 "Neighborhood Loops".

Vision Theme: Grow

A mixed-use corridor that provides residential choices, economic opportunity, and a variety of goods and services for Raleigh's residents and workers.

Policy AP-CN 3.1 Transit-Supportive Urban Design: As existing commercial areas redevelop, encourage urban form and land uses that support transit ridership and create a comfortable and accessible public realm on secondary streets near Capital Boulevard. The recommended land uses and building heights from this plan should be used for the review of rezoning cases. Zoning heights greater than 7 stories should be discouraged until bus rapid transit is planned for the corridor and economic assistance resources are available for small businesses

Policy AP-CN 3.2 Promoting Vertical Mixed-Use Development: When large commercial sites are rezoned, encourage zoning conditions that promote office and employment uses, such as limiting the square footage of single-story retail.

Policy AP-CN 3.3 Large Site Design Quality: Facilitate a high level of design quality for large commercial sites such as Triangle Town Center through staff assistance in planning of infrastructure, building orientation, landscaping, and open space.

Policy AP-CN 3.4 Affordable Units in Dense Development: Through the rezoning process, encourage all new development 7-stories or greater and containing a residential component to reserve as affordable units (as defined by Raleigh Housing & Neighborhoods or adopted City policy) EITHER 5% of the total number of residential units OR one-half of the number of units lost through demolition of existing housing, whichever is greater.

Policy AP-CN 3.5 Equitable Investment and Redevelopment: Alleviate the detrimental or inequitable impacts to residents, businesses, and non-profit organizations related to new infrastructure and redevelopment using existing and expanded tools and programs. If BRT is implemented, apply the tools identified in the Equitable Transit Oriented Development guidebook.

Action AP-CN 3.1 Applying TOD Urban Form: If BRT stations are planned for Capital Boulevard North, initiate zoning map amendments to apply the TOD Urban Form designation to Capital Boulevard and the TOD overlay zoning to areas surrounding stations. Where the TOD Urban Form designation would overlap with a City Growth Center or Mixed Use Center, retain the existing designation.

Action AP-CN 3.2 De-Emphasizing Capital Boulevard Frontage: Consider adding provisions to the UDO to prevent Capital Boulevard from being designated as a primary street within the TOD overlay district.

Action AP-CN 3.3 Retrofitting Shopping Centers: Investigate the potential for modifying zoning requirements or awarding grants to encourage existing commercial buildings to be retrofit or internally subdivided to allow for low cost residential units or small-scale retail spaces.

Action AP-CN 3.4 Homeowner Education: Organize a workshop, led by City staff, to educate existing residents of Brentwood, Starmount, and other neighborhoods with high rates of home ownership about homeowner repair programs, down payment assistance programs, the Accessory Dwelling Unit development option, National Historic Register listing, and other resources that can help homeowners maintain their homes.

Action AP-CN 3.5 Funding Healthy Lifestyles: Evaluate the feasibility of using tax increments as funding to pay for bicycle and pedestrian improvements, safety stations, and micro-parks in the corridor area with any surplus proceeds dedicated to increasing the supply of affordable housing. Use the Equity Fund from the Equitable Transit Oriented Development guidebook as a model where suitable.

Action AP-CN 3.6 Business Alliance Startup Grant and Support: Offer organizational support and resources with potential for additional funding based on attainment of pre-determined outcomes. Provide initial staff support for organizing and administrative tasks. Allow for funding of two alliances as indicated by business needs and relationships.

Action AP-CN 3.7 Small Business Grant Program: Develop a small business assistance program to respond to specific needs related to construction, new street configuration, and redevelopment. Consider making permanent to respond to other transportation projects. Explore various forms of assistance such as in-kind technical support and loans.

Action AP-CN 3.8 Small Business Incubator: Seek an existing commercial space for conversion to a small business incubator. Use flexible and shared spaces as well as training and coaching to foster emerging small businesses. Coordinate with employment matching and small business loan program to assist growing businesses enter permanent locations.

Action AP-CN 3.9 Northwest Technology Corridor: Conduct an economic development study of the area on the west side of Capital Boulevard between Oak Forest Drive and Durant Road and east of the railroad corridor. The study should investigate the potential for this area to be marketed as an industrial technology corridor, including identification of sites where there are constraints on development or redevelopment for industrial, manufacturing, or research users.

Action AP-CN 3.10 First Source Agreements: Seek to establish a standard agreement for inclusion in city-funded construction projects for this corridor that give preference to local companies and companies that primarily employ local workers.

Action AP-CN 3.11 Job Skills Training: Partner with Capital Area Workforce Development to develop a construction training course or support expansion of existing similar programming to help local residents build skills and receive certifications, particularly for construction jobs. Seek collaboration with small business incubator for training space and job placement assistance.

Action AP-CN 3.12 Density Bonus for Retail Space: Investigate a text change to allow a height bonus for projects that include a minimum percentage of retail space in new development. If BRT is implemented, consider making this a part of the TOD overlay that is specific to Capital Boulevard.

Action AP-CN 3.13 Public Improvement Reimbursement Schedule: Explore the creation of a rate schedule of reimbursement for public street improvements for subdivisions and site plans in the corridor. Limit eligibility for reimbursement to those developments that provide a minimum percentage of affordable housing units in new development.

Action AP-CN 3.14 Monitor Success: Gather current economic and demographic data prior to implementation of community development action items. Monitor these indicators as programs are implemented and transportation projects are constructed. Proactively respond to community needs as indicated by data through modifications to community development programs.

Vision Theme: Show

Capital Boulevard North will be an inviting gateway, corridor, and destination that expresses Raleigh's best qualities as well as the local character of the people and geography in the corridor.

Policy AP-CN 4.1 Community-Led Investments: Invest in community facilities, infrastructure, and amenities that improve the appearance and quality of life of the Capital North area. Seek partnerships with property owners, businesses, and non-profit organizations to identify solutions that leverage existing community assets.

Policy AP-CN 4.2 Public Art: Identify appropriate sites for murals or other public art to be incorporated into new transportation facilities including bridges,

retaining walls, medians, and bus stops. Work with businesses, neighborhoods, and civic groups to identify artists who can be contracted to produce artworks.

Policy AP-CN 4.3 Incentives for Civic Amenities: Seek opportunities for improving outdoor amenity areas, opening public streets, or adding multi-modal facilities in return for exemptions or reductions to site review requirements. Consider the use of an overlay zoning district for this purpose.

Action AP-CN 4.1 Community Leadership Workshops: Organize as many as two special Community Leadership Academy cohorts of stakeholders from the corridor over a period of two years. Tailor programming to the challenges and opportunities in the corridor. Consider contracting a speaker/consultant to help with focused content. Explore using the academy or a subsequent event with the participants as a workshop for a specific community project.

Action AP-CN 4.2 Creating a Gateway to Raleigh: Place public art and/or signage on new interchanges in the corridor so that it is visible to vehicles travelling south on Capital Boulevard to create an attractive and welcoming gateway into Raleigh.

Action AP-CN 4.3 CPTED in New Projects: Support the inclusion of Crime Prevention Through Environmental Design (CPTED) elements in capital projects where possible.

Action AP-CN 4.4 Grants for Visible Beautification: Explore modifications to the neighborhood grant program to allow registered neighborhoods to sponsor public art in commercial areas.

Action AP-CN 4.5 Capital North Custom Streetscapes: Create a streetscape design to be applied on cross streets where new interchanges are proposed. A preliminary approach to this streetscape plan is shown in Appendices F and G of the report. Allow for design of some elements, particularly vertical items such as light poles and benches, to be customized according to the character of the nearby area. Include residents, businesses, and civic organizations from the adjacent neighborhoods in the design and/or selection of these items.

Action AP-CN 4.6 Activating Existing Spaces: Encourage activation of under-utilized surface parking lots through events such as cultural festivals, food truck rodeos, or temporary markets. Identify regulatory barriers to such activities and investigate revisions that would allow them while avoiding or minimizing impacts to other properties.

Action AP-CN 4.7 Run/Bike to Celebrate Success: When construction of the Capital Boulevard Multi-way is complete, organize a run or bike ride within the corridor area that crosses at least two interchanges. Use this event to promote the use of bicycle and pedestrian facilities.

Action AP-CN 4.8 Neighborhood Loops: Support the development of neighborhood- or district-branded "loops" within the proposed bicycle and pedestrian network. Loops should use wayfinding markers and maps to encourage the use of these dedicated facilities for walking and cycling between neighborhoods, commercial areas, and transit stops.

FIGURE 3. **EXAMPLE OF NEIGHBORHOOD LOOP (CITY OF CUYAHOGA FALLS)**

Bringing the Recommendations to Life

Drivers and Transit Riders

The implementation of the recommended multiway boulevard alternative along the Capital Boulevard North Corridor was divided into three time periods, along with corresponding timeframes:

- Near Term – within 10 years
- Mid-Term – between 10 and 20 years
- Long Term – beyond 20 years

An implementation table was developed for the recommend multiway boulevard alternative, describing the timeframe for implementation, the agency likely responsible for implementation, and a preliminary cost estimate. The cost estimate is shown at the segment level, but the proposed intersection/interchange configurations within that segment are described in the table below. It is important to note that the various projects below will likely not be constructed all at once and the order in which they are built will likely be based on how they score in the NCDOT Strategic Transportation Prioritization (SPOT) process, which is used to determine project funding. Five projects were submitted in the most recent round of SPOT (SPOT 6) and include:

- I-440 to US 401 – Full corridor project (multiway boulevard with interchanges)
- US 401 to I-540 – Full corridor project (multiway boulevard with interchanges)
- New Hope Church Road (Buffaloe Road)/US 401 – interchange
- Millbrook Road/Spring Forest Road – interchange
- Old Wake Forest Road/Sumner Blvd. – interchange

Projects that score well in SPOT 6 could then be included in the Draft 2023-2032 State Transportation Improvement Program (STIP) scheduled to be released in May 2022. The STIP identifies the construction funding and schedule for projects over a 10-year period and is updated approximately every two years.

TABLE 1. **IMPLEMENTATION OF ROADWAY PROJECTS**

Segment	Description	Location	Phase	Agencies	Cost
1	**Multiway Boulevard**	**North of Brentwood Road to South of Starmount Drive**	**Long/Mid Term***	**NCDOT**	**$50,025,000**
	Tight Diamond Interchange	Trawick Road	Long/Mid Term*	NCDOT	
2	**Multiway Boulevard**	**South of Starmount Drive to South of Calvary Drive**	**Long/Mid Term***	**NCDOT**	**$192,395,000**
	Grade Separated Pedestrian Crossing and Right In/Right Out	Starmount Drive	Long/Mid Term*	NCDOT	
	Grade Separation	Old Buffaloe Road	Long/Mid Term*	NCDOT	
	Single Point Urban Interchange (SPUI)	New Hope Church Road/ Buffaloe Road	Long/Mid Term*	NCDOT	
3	**Multiway Boulevard**	**South of Calvary Drive to North of Spring Forest Road**	**Long/Mid Term***	**NCDOT**	**$133,170,000**
	Tight Diamond Interchange	Calvary Drive	Long/Mid Term*	NCDOT	
	Tight Diamond Interchange	Millbrook Road/New Hope Road	Long/Mid Term*	NCDOT	
	Tight Diamond Interchange	Spring Forest Road	Long/Mid Term*	NCDOT	
4	**Multiway Boulevard**	**North of Spring Forest Road to I-540**	**Long/Mid Term***	**NCDOT**	**$135,240,000**
	Grade Separated Pedestrian Crossing and Right In/Right Out	Oak Forest Drive	Long/Mid Term*	NCDOT	
	Tight Diamond Interchange	Sumner Boulevard	Long/Mid Term*	NCDOT	
	Tight Diamond Interchange	Old Wake Forest Road	Long/Mid Term*	NCDOT	

*Potentially Mid Term if funded within SPOT 6.0. SPOT.

Grade Separated Pedestrian Crossings

While grade separated pedestrian bridges are included as a part of the NCDOT roadway projects, the City of Raleigh could explore the possibility of funding and building the pedestrian bridges as standalone pedestrian projects. In order to further explore this option, it is recommended that the City of Raleigh perform a feasibility analysis in to determine the funding and design requirements for one or both of the pedestrian bridges.

Street Plan Amendments

There are several recommended changes to the City of Raleigh Street Plan, including adding new streets, modifying designations of streets, and removing streets. Amendments to the street plan were recommended based on the ability to:

- Provide a parallel facility (both vehicular and bicycle and pedestrian) to Capital Boulevard,
- Provide a connection (or fill in a gap) to bicycle and pedestrian infrastructure,
- Provide additional and potential major access to businesses that currently front Capital Boulevard, or in order to limit potential interruption of a proposed facility.

The table below describes the location and change recommended:

TABLE 2. **IMPLEMENTATION OF ROADWAY PROJECTS, PART 1**

Street	Location	Recommended Street Plan Change	Proposed Street Type
Capital Boulevard	Modify Capital Boulevard between I-440 and I-540 to multiway boulevard.	Modify	Multiway Boulevard, Parallel Parking
Poplarwood Court extension	Highwoods Blvd to New Roadway.	New	Main Street, Parallel Parking
Glenridge Drive	Highwoods Blvd to 2900 Highwoods Blvd entrance.	Remove	
New Roadway	Between Brentwood Road and Poplarwood Court, south of Bardwell Road and Glenridge Drive.	New	Main Street, Parallel Parking
New Roadway	New roadway over Capital Boulevard between Westinghouse Boulevard and Brentwood Drive; connecting to new roadways to the north and south.	New	Main Street, Parallel Parking
Appliance Court	Appliance Court between Operations Way and Westinghouse Boulevard.	Remove	
New Roadway	New roadway parallel to Capital Boulevard, between Capital Boulevard and Stony Brook Drive, from Appliance Court to just north of Brentwood Road.	New	Main Street, Parallel Parking
New Roadway	New roadway just south of Westinghouse Boulevard that connects Capital Boulevard to new roadway east of Capital Boulevard.	New	Main Street, Parallel Parking

TABLE 3. **IMPLEMENTATION OF ROADWAY PROJECTS, PART 1**

Stony Brook Drive	Stony Brook Drive between Brentwood Road and Starmount Drive will be reclassified from Neighborhood Street to Main Street, Parallel Parking.	Modify	Main Street, Parallel Parking
Stony Brook Drive extension	Extend Stony Brook Drive from Starmount Drive to Old Buffaloe Road.	New	Main Street, Parallel Parking
New Roadway	New roadway between Huntleigh Drive and Mayflower Drive just west of Capital Boulevard	New	Main Street, Parallel Parking
Hobby Court extension	Extend Hobby Court to connect with new Stony Brook extension.	New	Main Street, Parallel Parking
Scott Drive extension	Extend Scott Drive to connect with new Stony Brook extension.	New	Neighborhood Street
Pine Knoll Drive extension	Extend Pine Knoll Drive to connect with Pine Knoll Drive, just north of Mayflower Drive	New	Main Street, Parallel Parking
Pine Knoll Drive extension	Extend Pine Knoll Drive to connect to Lake Ridge Drive	New	Main Street, Parallel Parking
Lake Ridge Drive	Modify Lake Ridge Drive	Modify	Main Street, Parallel Parking
Calvary Drive	Remove curve on Calvary Drive between Louisburg Road and Capital Boulevard; realign Calvary drive to create a four-way intersection with Rolling Green Court	Remove; New	Avenue 2-Lane, Divided
Rolling Green Court	Realign Rolling Green Court to create an intersection with Dansey Drive	New	Avenue 2-Lane, Undivided
Dansey Drive	Add Dansey Drive to Street Plan as Avenue 2-Lane, Undivided	New	Avenue 2-Lane, Undivided
Green Acres Lane Extension	Extend Green Acres Lane to Spring Forest Road	New	Avenue 2-Lane, Undivided
Hollenden Drive	Modify Hollenden Drive	Modify	Avenue 2-Lane, Undivided
Greens Dairy Road Extension	Extend Greens Dairy Road to Oak Forest Drive	New	Avenue 2-Lane, Undivided
Trust Drive	Add Trust Drive to Street Plan as Avenue 2-Lane, Undivided	New	Avenue 2-Lane, Undivided
Signett Drive extension	Extend Signett Road between Millbrook Road and Calvary Drive; add Signett Drive to Street Plan	New	Avenue 2-Lane, Undivided
New Roadway	New roadway connecting Signett Drive extension and Rolling Green Court, crossing over Capital Boulevard	New	Avenue 2-Lane, Undivided
New Roadway	New roadway connecting Green Acres Lane extension to Leigh Drive, crossing over Capital Boulevard	New	Avenue 2-Lane, Undivided
Leigh Drive extension	Add Leigh Drive to Street Plan as Avenue 2-Lane, Undivided; extend Leigh Drive from Spring Forest Road to Capital Boulevard	New	Avenue 2-Lane, Undivided

Transit Recommendations

A key component for the proposed roadway projects along the corridor is the incorporation of dedicated transit lanes within the design to allow for enhanced transit, possibly BRT, in the future along Capital Boulevard. The current Wake Transit Plan, which has a horizon year of 2027, calls for BRT service along Capital Boulevard from Downtown Raleigh to Crabtree Boulevard. This planned route ends to the south of the Capital Boulevard North study area. The Capital Area Metropolitan Planning Organization (CAMPO)'s 2045 Metropolitan Transportation Plan (MTP) includes BRT service along the corridor to Triangle Town Center. In addition to providing space for transit within the design of the of the multiway boulevard, there are other short-term recommendations that could improve and expand transit service along the corridor and are described in the table below. The timeframe for implementation is the same as the bicycle and pedestrian recommendations:

- Near Term: 1-5 years
- Mid Term: 6-10 years

The Metropolitan Transportation Plan (MTP) is the long-range plan for transportation improvements across the region. It includes roadway, transit, rail, bicycle, pedestrian and other transportation projects to be implemented through the year 2045.

TABLE 4. **IMPLEMENTATION OF ROADWAY PROJECTS, PART 1**

Description	Phase	Agencies
Coordinate with Wake Transit Plan to fund increase frequency of local transit routes along Capital Boulevard.	Near	GoRaleigh
Coordinate with the CAMPO to identify Wake Transit Plan BRT funding and implementation timeline for the Capital Boulevard North Corridor to extend the currently planned Capital Boulevard BRT from Crabtree Boulevard to Triangle Town Center.	Near	GoRaleigh, CAMPO
Consider implementing a Transit Signal Priority (TSP) pilot project along Capital Boulevard for existing local transit service.	Near	City of Raleigh (COR) Engineering Services, GoRaleigh
Continue to support land use policies that are transit supportive.	Near/Mid	COR Planning
Consider providing more city and social services along the corridor.	Near/Mid	Various COR Departments
Consider expanding the Citrix bikeshare and scooter programs along Capital Boulevard to increase first/last mile connectivity to existing transit services.	Near/Mid	COR Transportation Planning
Ensure all stops have shelters.	Near	GoRaleigh
Provide enhanced NextBus service information at stops to provide real time arrival information for waiting customers.	Near	GoRaleigh
Increase wayfinding at bus stops. This could include wayfinding that describes where the nearest crosswalk is located to promote safe pedestrian crossings.	Near	GoRaleigh, COR Transportation Planning
Consider installing a physical barrier in median (vegetation, etc.) to discourage pedestrians from crossing Capital Boulevard mid-block. This application could be applied only along certain blocks and/or in front of high trafficked bus stops.	Near/Mid	COR Engineering Services
Promote the free rides offered by GoRaleigh. This includes free rides for seniors age 65 and older, teenagers and children.	Near	GoRaleigh, Various COR Departments
Provide pedestrian safety education at schools and community facilities along the corridor.	Near	Various COR Departments
Conduct an additional study to consider limited stop service along Capital Boulevard. This study should include the origin and destination data that will be collected during GoRaleigh's onboard surveys during Fall 2020.	Near	GoRaleigh
Conduct an additional study to investigate different signal coordination schemes.	Near	COR Transportation/Engineering Services

Implementation of Enhanced Transit Service

When enhanced transit services, such as BRT, are funded for the Capital Boulevard North Corridor, it is important to consider how the implementation of those projects interact with the implementation of the roadway projects. CAMPO's 2045 MTP states that "An extension of dedicated fixed guideway for the initial BRT corridors in Wake County as well as the addition of BRT service to Midtown in Raleigh is scheduled for the latter part of the 2026-2035 time period of this plan." Depending on the outcome of SPOT 6.0, there will likely be recommended roadway projects along Capital Boulevard with schedules overlapping with the implementation schedule of BRT. It will be critical for GoRaleigh and NCDOT to coordinate early in the planning process for all projects. Due to the estimated costs, it is unlikely that the two full corridor projects (one from I-440 to US 401 and the other from US 401 to I-540) would both be funded at the same time. Because of this is, it can be assumed that BRT would potentially be implemented before some or all of the proposed projects along the corridor. It will be critical to BRT operations, that as roadway construction along Capital Boulevard occurs, the maintenance of traffic should prioritize BRT service during construction.

Homes and Workplaces

The land use recommendations along the corridor will come from a series of FLUM and Urban Form amendments, that will help shape future development as the corridor continues to grow and redevelop.

In the land use Vision Areas, many of the amendments were made to incorporate the whole vision area and create a more grid-like street network within the Vision Areas. The highest intensity development tends to be oriented toward Capital Boulevard and nearby interchanges, where a BRT transit stop could be located in the future. The proposed changes outside of the Vision Areas were to have the FLUM better align with the current development and ideas for future development.

TABLE 5. **PROPOSED FLUM AND URBAN FORM AMENDMENTS**

Amendment Type	Proposed Amendment/Proposed Designation	Location
Urban Form	Expand City Growth Center	Highwoods/Westinghouse Vision Area
Urban Form	Add Mixed Use Center	Mini City Vision Area
Urban Form	Add Urban Thoroughfares	Highwoods/Westinghouse Vision Area; Mini City Vision Area; Triangle Town Center Vision Area
FLUM	Office and Residential Mixed Use, Neighborhood Mixed Use, Moderate Density Residential	Highwoods/Westinghouse Vision Area
FLUM	Moderate Density Residential, Office and Residential Mixed Use	Lake Ridge Drive
FLUM	Office and Residential Mixed Use	Lee Road
FLUM	Community Mixed Use, Office and Residential Mixed Use	Mini City Vision Area
FLUM	Community Mixed Use, Office and Residential Mixed Use	Triangle Town Center Vision Area

Walking and Cycling

Bicycle and Pedestrian Recommendations

Unlike the roadway projects described above which will mostly be implemented by NCDOT, many of the bicycle and pedestrian recommendations are likely to be implemented at the local level by the City of Raleigh. Because of this, along with varying project scale and complexity, the timeframe for implementation is different for bicycle and pedestrian projects and includes three phases:

- Near Term: 1-5 years
- Mid Term: 6-10 years
- Long Term: 10 years or more

While these projects are listed under the City of Raleigh for implementation, bicycle and pedestrian improvement are also a part of NCDOT projects. There is a possibility that some of these improvements closer to Capital Boulevard could be included in a potential NCDOT project, but those details would be worked out during further design phases of the roadway projects.

Table 10 highlights the projects in each of the three phase and Figure 2 shows the location of these projects.

TABLE 6. **IMPLEMENTATION OF BICYCLE AND PEDESTRIAN RECOMMENDATIONS, PART 1**

Description/ Street Name(s)	Location		Cost				Agencies
	From	To	Segment Cost (Low)	Segment Cost (High)	Corridor Cost (Low)	Corridor Cost (High)	
Near Term							
Stony Brook Drive	Brentwood Road	Trawick Road	$144,142	$170,835	$144,142	$170,835	City of Raleigh
Huntleigh Drive	Capital Boulevard	Ingram Drive	$522,536	$849,991	$653,018	$1,062,242	City of Raleigh
	Ingram Drive	New Hope Church Road	$130,482	$212,251			
Ingram Drive	Huntleigh Drive	Brinkley Drive	$54,352	$88,412	$54,352	$88,412	City of Raleigh
Medium Term							
Wedgewood Drive/ Charleston Park Drive/ Stillmeadow Road	Hinton Grove Place	North New Hope Road	$103,369	$122,511	$255,377	$340,502	City of Raleigh
	Charleston Park Drive	Hinton Grove Place	$74,936	$121,896			
	Stillmeadow Road	Wedgewood Drive	$10,760	$17,502			
	Southall Road	Charleston Park Drive	$66,313	$78,593			

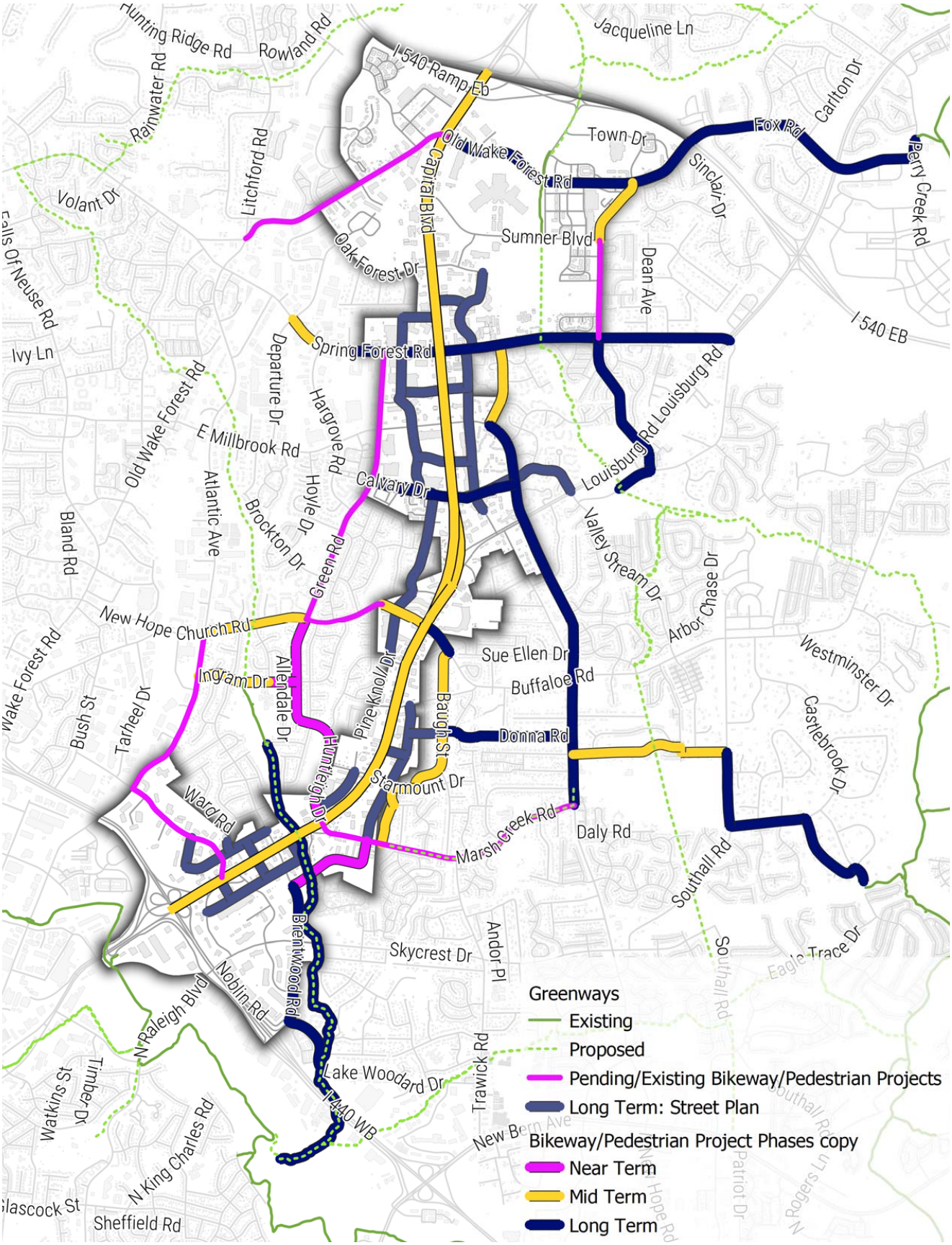
TABLE 7. **IMPLEMENTATION OF BICYCLE AND PEDESTRIAN RECOMMENDATIONS, PART 2**

Description/ Street Name(s)	Location		Cost				Agencies
	From	To	Segment Cost (Low)	Segment Cost (High)	Corridor Cost (Low)	Corridor Cost (High)	
Medium Term							
Edgetone Drive/ Monterey Street/ Starmount Drive/Baugh Road	Monterey Road	Trawick Road	$82,741	$134,592	$469,262	$763,332	City of Raleigh
	Starmount Drive	Edgetone Drive	$37,535	$61,057			
	Baugh Street	Monterey Street	$42,478	$69,097			
	Buffaloe Road	Starmount Drive	$306,508	$498,586			
Ingram Drive	Brinkley Drive	Atlantic Avenue	$145,784	$237,142	$145,784	$237,142	City of Raleigh
New Hope Church Road	Green Road	Atlantic Avenue	$928,226	$3,253,479	$1,349,873	$4,731,373	City of Raleigh
	Capital Boulevard	Deana Lane	$421,647	$1,477,894			
Spring Forest Road	Primavera Court	Departure Drive	$150,219	$526,527	$150,219	$526,527	City of Raleigh
Hollenden Drive	Spring Forest Road	North New Hope Road	$120,269	$142,541	$120,269	$142,541	City of Raleigh
Fox Road	Old Wake Forest Road	Sumner Blvd	$368,036	$1,289,986	$368,036	$1,289,986	City of Raleigh
Long Term							
Marsh Creek Greenway	Glenraven Drive	Crabtree Creek Greenway	$3,014,867	$3,859,030	$3,014,867	$3,859,030	City of Raleigh
Southhall Road/ Castlebrook Drive/ Allenby Drive/ Abington Lane	Castlebrook Drive	Stillmeadow Road	$761,033	$2,667,458	$1,306,106	$4,242,110	City of Raleigh
	Allenby Drive	Southhall Road	$400,299	$1,403,067			
	Abington Lane	Castlebrook Drive	$119,572	$141,715			
	Neuse River Trail	Allenby Drive	$25,203	$29,870			
Lake Woodard Drive/ Brentwood Road	Brentwood Road	Marsh Creek Greenway (future)	$287,585	$467,805	$484,618	$701,326	City of Raleigh
	Stony Brook Drive	Lake Woodard Drive	$197,033	$233,521			

TABLE 8. **IMPLEMENTATION OF BICYCLE AND PEDESTRIAN RECOMMENDATIONS, PART 3**

Description/ Street Name(s)	Location		Cost				Agencies
	From	To	Segment Cost (Low)	Segment Cost (High)	Corridor Cost (Low)	Corridor Cost (High)	
Long Term							
North New Hope Road	Hollenden Drive	Marsh Creek Road	$2,839,676	$9,953,209	$2,839,676	$9,953,209	City of Raleigh
Calvary Drive	North New Hope Road	Capital Boulevard	$126,063	$205,062	$247,820	$349,367	City of Raleigh
	Capital Boulevard	Green Road	$121,757	$144,305			
Buffaloe Road	Baugh Street	Capital Boulevard	$52,125	$61,778	$52,125	$61,778	City of Raleigh
Scott Drive/ Donna Road	North New Hope Road	Baugh Street	$263,155	$428,065	$263,155	$428,065	City of Raleigh
Spring Forest Road	Louisburg Road	Spring Court	$2,014,492	$7,060,895	$2,014,492	$7,060,895	City of Raleigh
Kyle Drive/Fox Road	Beaverdam Creek Greenway	Fox Road	$195,794	$686,269	$411,740	$942,205	City of Raleigh
	Kyle Drive	Spring Forest Road	$215,946	$255,936			
Old Wake Forest Road/ Fox Road/ Perry Creek Road	Segal Drive	Capital Boulevard	$1,055,130	$3,698,284	$2,459,670	$8,293,365	City of Raleigh
	Louisburg Road	Segal Drive	$1,263,194	$4,427,560			
	Perry Creek Road	Louisburg Road	$113,643	$134,688			
	Neuse River Trail	Fox Road	$27,702	$32,832			

FIGURE 4. **COMPREHENSIVE PEDESTRIAN AND BIKEWAY RECOMMENDATIONS**



Policy Related to Greenway Trail Recommendations

The City of Raleigh is in the process of developing a Capital Area Greenway System Master Plan Update, also called the Greenway Master Plan. This plan is in the early stages of the planning process and will most likely not be completed until after the Capital Boulevard North Corridor Study is approved by City Council. However, the recommendations of the Greenway Master Plan may provide strategies and/or design guidance that could benefit the Capital Boulevard North study area as well as neighborhoods and areas of the City that have limited connectivity or gaps in the bikeway network. If guidance for urban trails or a trail classification that is focused on linking people along or parallel to the existing street network is developed in the final Greenway Master Plan, it is recommended that the Capital Boulevard North Corridor Study and similar plans revisit recommendations to determine if such guidance can be applied to increase connectivity and mobility for people of all ages and abilities. Although guidance may be developed through the Greenway Master Plan, implementation may be carried out by a variety of City departments or even private development.

A key consideration during this study for greenways was the idea that they should connect to parks throughout the corridor and create a network of greenways linking parks and green spaces. An example of this is the current and future Marsh Creek Greenway and its ability to connect Hill Street Park and Brentwood Park, along with future greenspace within the Highwoods/Westinghouse Vision Area.

Quick-Build Policy Recommendation

Addressing gaps in a mobility network is critical to ensure that people have safe and connected access to destinations within a community. Often, funding is not available to complete a variety of capital projects with competing interests. Bicyclists and pedestrians may experience gaps in the network in a more substantial manner due to increased time for detouring or the lack of safe alternatives. Quick-build street projects can provide connectivity or safety benefits that are experienced in the short-term and offer an interim solution until a larger capital project can be planned and designed through the appropriate public process.

Quick-build street projects are characterized by:

- Leadership from city government or other public agencies.
- Shortened timeline from planning to installation (within one year).
- Flexibility in design to change/adjust after installation occurs.
- Installed with materials that allow changes and adjustments as necessary.
- Potentially lower cost to implement

Policy Recommendation

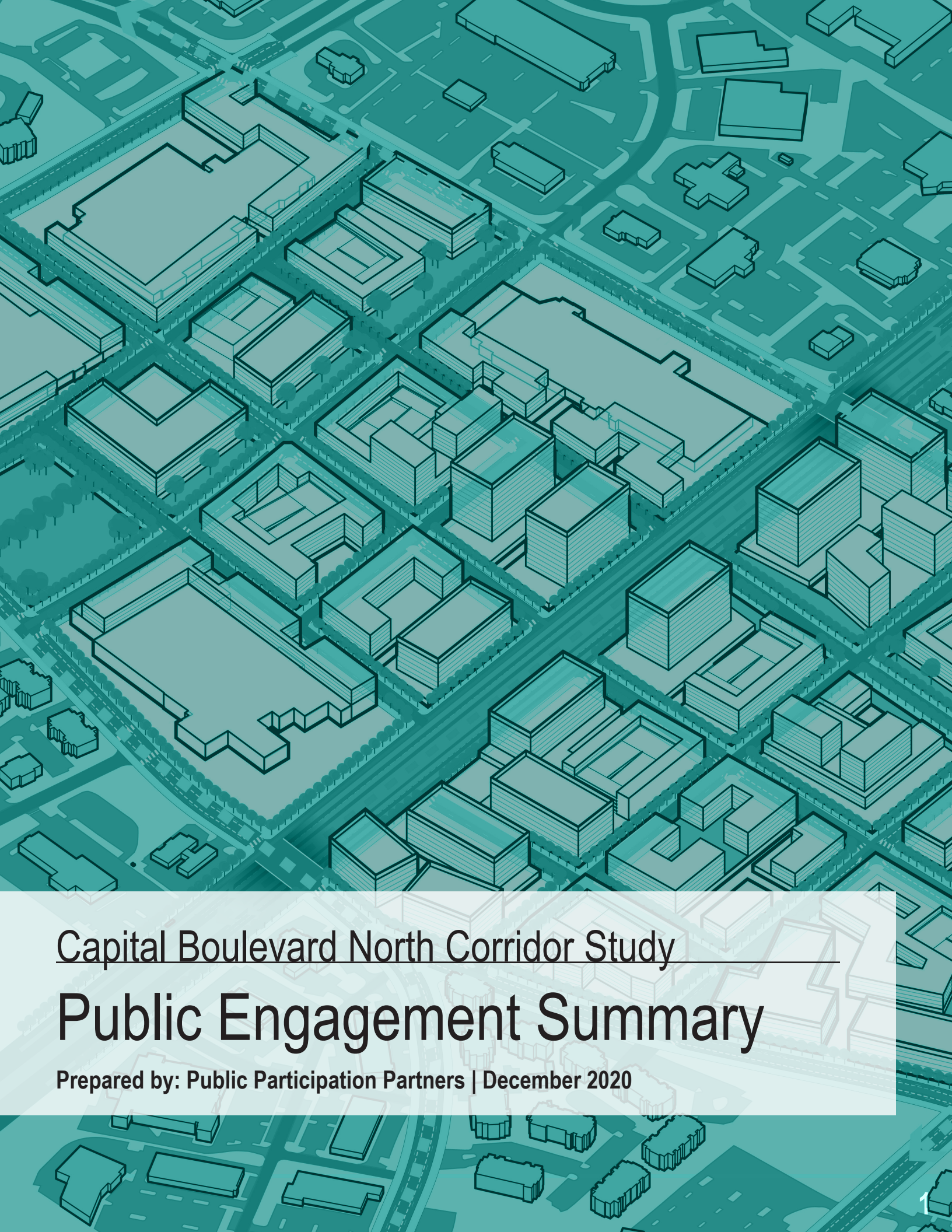
The Capital Boulevard North Corridor Study is an example of a planning project that will shape the future of the corridor and the surrounding community. While changes to Capital Boulevard and the surrounding land uses may take time, there are and will be a variety of opportunities to connect people to places along to corridor incrementally.

The City of Raleigh should consider establishing a policy for quick-build projects to be used along Capital Boulevard and throughout the City of Raleigh to increase connectivity and safety for all users, with specific attention to bicycle and pedestrian facilities. The policy should establish:

- Purpose of quick-build projects. Purpose may include:
- Increasing safety for users immediately;
- Filling micro-gaps in the bicycle and/or pedestrian network;
- Collecting additional data on a location or facility treatment; and/or,
- Providing short term connectivity prior to permanent infrastructure that would be created with new development.
- A budgetary threshold for quick-build projects to qualify.
- A funding mechanism for quick-build planning, design, and installation.
- A recommendation for the City of Raleigh to develop quick-build design guidance that addresses both design for a variety of potential projects and materials to be used during installation.
- Methodology for collecting data before and during quick-build project installation.
- Procedures for changing and adjusting design after installation.
- Communication strategies to inform the public of the project and receive feedback after installation.

A quick-build streets project policy should be comprehensive in nature to address a variety of scenarios. However, much like quick-build projects, the policy should note the need for updates and changes as new opportunities are identified.

Appendix B:
Public Engagement



Capital Boulevard North Corridor Study

Public Engagement Summary

Prepared by: Public Participation Partners | December 2020

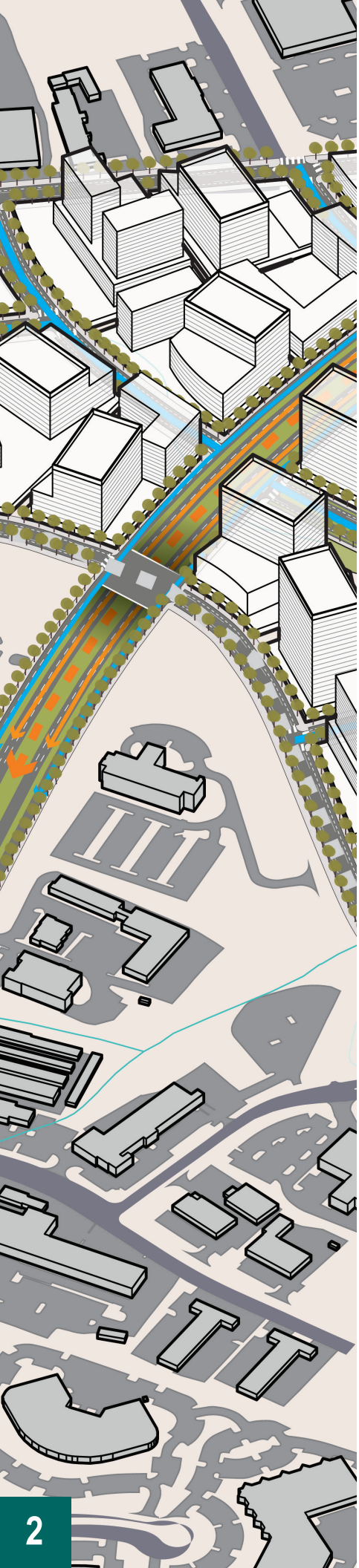


Table of Contents

Introduction

Project Overview

The Capital Boulevard North Corridor study focused on creating a vision and policies to guide future development and investments within the corridor. This study served to develop a long-range plan for Capital Boulevard North that incorporated visions for multi-modal transportation, mixed-use development, urban design, and community development.

The Capital Boulevard North project includes an area of about five miles between the I-440/Capital Boulevard intersection and the I-540/Capital Boulevard intersection. Capital Boulevard is home to a lot of movement as people travel to shopping centers, restaurants, personal services, and places of work along the boulevard. This corridor is also serviced by public transit, specifically Route 1 of GoRaleigh, which has the highest overall ridership of any bus routes in the Raleigh transit system.

This goal of this study was to draft policy recommendations for transportation, development, and design improvements in the corridor. These recommendations were created through feedback received from residents and travelers within the study area.

The project and consulting teams were established in March of 2018, with the first round of public engagement kicking off in June of the same year. The final phase of the project concluded in October 2020.

Project Notifications

Throughout the project, the City of Raleigh used a variety of methods to effectively reach and communicate with the public, including:

- Street signs along the corridor
- Presentations and flyer distribution at CAC meetings
- Meetings and canvassing with local businesses
- Internal meetings with various departments, including GoRaleigh, NCDOT, RDOT, and more
- Flyers distributed at local businesses and organizations
- Postcards sent to residential addresses in the study area
- Pop-ups at central locations throughout the corridor
- A mobile tour of the study area with key organization representatives
- Press releases sent to Raleigh media outlets, including minority media outlets, such as El Pueblo and Que Pasa, to reach Spanish-speaking populations
- Social media posts on Instagram, Facebook, and Twitter from the Raleigh Planning account
  - Facebook Live was also used to promote meetings as they were happening.
- GovDelivery email blasts to those that subscribed for project updates
- Information and updates posted on the City of Raleigh project webpage

Round 1: Visioning

In the initial phase of the Capital Boulevard North project, staff worked to identify the community's vision, goals, needs, and concerns for the area. The City conducted various outreach activities to gather community feedback and understand the overall vision of those that live, work, and travel in the study area.

Visioning Workshop Summary

Overview

The visioning process for the Capital Boulevard North project included two major engagement efforts: a Visioning Workshop and an online survey. The Visioning Workshop took place on June 23rd, 2018 at New Hope Baptist Church. This is a central and accessible location in the study area. 60 people attended the meeting. The workshop included a voting exercise, an open-ended exercise, and a mapping exercise. These meetings helped staff understand community members' thoughts on issues, opportunities, and overall visions for the area.

When asked what they like about the area, participants mentioned the connectivity, availability of shopping destinations, community resources, diversity, and housing affordability in the area.

When discussing areas that need improvements, participants largely focused on traffic, pedestrian safety, and other infrastructure concerns, such as transit and bicycle facilities. Participants discussed public transit and the need for improved transportation infrastructure in the area.

Others mentioned the appearance of the corridor as an area for improvement, including landscape and streetscape improvements to make the area more appealing. Several participants also noted the need for more trees in the area.

Multiple participants also noted the need for mixed-use development in the area. Others mentioned the need to support existing businesses over new development.

When discussing visions of the future, participants hoped the area would be more free-flowing, attractive, affordable, and diverse.

In the mapping exercise, participants generally shared positive comments around shopping centers, parks, schools, and churches. They shared more negative feedback around infrastructure, private developments, or areas with higher rates of crime.

Survey Summary

An online visioning survey was available from June 2nd to July 15th on Public Input. This survey asked participants about issues and opportunities for improvement in the study area. It also asked about priorities for the study. 321 people participated in the online survey, submitting over 4,000 responses and 543 comments.

The survey also collected demographics on age and where the participant lived in the study area. Not all participants answered these voluntary demographic questions. Of those who participated, 46% were between the ages of 25-44.

Outreach Activities

The City notified residents about the Visioning Workshops and survey through the following communication methods:

- Pop-up events (with flyer distribution) hosted in the study area:
  - Green Road Public Library Summer Reading Program Kickoff on Saturday, June 2nd from 2:00 PM – 4:00 PM
  - Dia de Guatemala, Food Bank of Eastern and Central NC on Saturday, June 9th from 3:00 PM – 6:00 PM
  - United Skates of America on Saturday, June 16th from 10:00 AM – 12:00 PM
- Presentations and flyer distribution at Citizen Advisory Council (CAC) meetings:
  - Forestville CAC on 2/13/2018 and 6/12/2018
  - Northeast CAC on 3/8/2018 and 6/14/2018
  - Atlantic CAC on 3/15/2018 and 6/21/2018
  - East CAC on 3/19/2018 and 9/17/2018, flyers were sent on 5/16/2018
  - North CAC on 4/17/2018, 5/16/2018, and 6/19/2018
- Postcards sent to property owners and residents within the study area
- GovDelivery email blasts sent to project subscribers
- Social media posts on the Raleigh Planning Instagram, Facebook, and Twitter
- Information and event details posted on City of Raleigh project webpage
- Street signs posted along the corridor

Round 2: Kickoff

In this round of engagement, project staff shared findings from the visioning round with community members and worked with them to define goals and success measures for the project.

Kickoff Open House Summary

Overview

The project team hosted the Kickoff Open House on Saturday, October 27th, 2018 from 10:00 AM to 12:00 PM at Brentwood Elementary School. In the open house, staff presented findings from previous engagement and discussed the future of the project with attendees. Approximately 50 residents attended the Kickoff Open House.

This meeting included a presentation of visioning results by project staff, a polling exercise, and a group question and answer session. Attendees then visited display boards that detailed the Capital Boulevard North study and information on zoning, housing, development, and other analyses of the study area. Attendees were also provided a handout with an information summary. These handouts were available in both English and Spanish.

An online survey supplemented the open house. Those that attended the open house were able to participate in a paper version of the survey, and thirteen participants submitted paper surveys.

350 Survey Participants

Presentation to local middle school PTSA

Survey translated into Vietnamese

Kickoff Survey Summary

The City hosted an online Kickoff survey on Public Input from October 27th and it remained open through December 2nd, 2018. 350 people participated in the online survey. An additional 19 people completed a paper survey.

The survey asked participants to identify success measures for each of the six topics prioritized during the visioning process: traffic, land uses, appearance, pedestrians, bicycles, and transit. The top two goals under traffic were increasing safety by separating cars from people and bicycles and reducing congestion by separating local and regional traffic. The top two goals under land use were discouraging or limiting high-impact uses (like pawn shops, car dealerships, hotels, etc.) and encouraging mixed-use development.

The top two goals under appearance were making the street more uniform and attractive and encouraging more uniform urban design. The top two goals for were making the sidewalk network more complete and making it easier to cross Capital Boulevard. The top two goals for bicycles were making the bicycle network more complete and improving connections between greenways and on-road bicycle facilities. The top two goals for transit were focusing on regional or rapid transit service and making transit stops easier to get to or better connected to destinations.

When asked for comments on specific improvements, many commented on the need for rejuvenation of the area. Other commonly mentioned improvements focused on connectivity and mobility through the corridor. Traffic and safety were also frequently mentioned as necessary improvements.

Demographics were not collected in this survey, although respondents were asked to share if they lived within the area of study.

Outreach Activities

The City notified residents about the Kickoff Open House through these communication methods:

- A presentation was given and flyers were distributed at these local organizations:
  - Forestville CAC on 10/9/2018 (with flyers)
  - North CAC on 10/16/2018 (with flyers)
  - East Millbrook Middle School PTSA on 10/16/2018
  - Northeast CAC on 10/18/2018
- Pop-up events at the following locations:
  - Green Road Library: Bilingual Story Time on 10/10/2018
  - Raleigh Rescue Mission Thrift Store on 10/13/2018
  - New Hope Baptist Vietnamese Worship on 10/20/2018
    - The survey was translated into Vietnamese for this event.
- Notifications sent to the following organizations:
  - Catholic Charities of the Diocese of Raleigh
  - Millbrook Human Services Center Community Action Committee
  - Crossroads Fellowship Church
- Press releases sent to media organizations, including minority media outlets like Que Pasa and El Pueblo
- Postcards sent to residential addresses in the study area.
- Social media posts were shared on the Raleigh Planning Instagram, Facebook, and Twitter. A Facebook Live was also shared the morning of the open house.
- GovDelivery email blasts to previous project subscribers
- Information and event details posted on City of Raleigh project webpage
- Yard signs posted around study area

City of Raleigh CACs also assisted with notification about the Kickoff meeting through these methods:

- Atlantic CAC posted on their Facebook page and put meeting information in their newsletter.
- The East CAC conducted a presentation on the study and the upcoming open house in their September meeting.
- The Forestville, North, and Northeast CACs placed a flyer in their newsletter and conducted a presentation during their October meetings.

Businesses Kickoff Meeting Summary

Overview

In addition to the public open house and survey, the City conducted a separate Kickoff Meeting and Survey for local businesses. The meeting was held at the Northeast Outreach Center on Capital Boulevard on Wednesday, November 14th, 2018. This was a drop-in format where business owners could stay as long as they wanted. The purpose of this meeting was to have conversations with business owners and understand their needs for the area.

Businesses Kickoff Survey Summary

Business owners were also invited to participate in an online survey on Public Input. 30 business owners responded to this survey. The survey gathered information from business owners in the area such as:

- How long they have been in the area
- The size of their business
- Why they chose Capital Boulevard for their business
- What they like/dislike about the area
- Potential improvements for the area
- How they and their employees travel in the area
- And more.

Many of the business owners that responded noted they had been in the corridor for over 10 years. When asked why they chose the area, respondents commonly answered that the available space, volume of traffic, affordability of space, and access to transit were some of the motivations for choosing the area. Most respondents noted that they and their employees drive alone to get to work. When asked for potential improvements for the area, some responded that improving traffic lights and traffic flow would be beneficial, as well as improvements to public transit, accessibility, appearance, and crime prevention in the area.

The mention of traffic and appearance were similar concerns brought forth by the general public in the public Kickoff survey.

Outreach Activities

The City notified business owners about the meeting and survey through these communication methods:

- A letter sent to business owners in the study area
- Business canvassing in the area

Round 3: Big Ideas

Following the visioning and kickoff rounds of engagement, the City conducted this round to share strategies to address previously identified community goals. During the Big Ideas round of engagement, the City asked for public feedback on preferences for area improvements for transportation and land use.

Big Ideas Workshops Summary

Overview

Project staff hosted three Big Ideas public workshops:

- Monday, April 1st, 2019at 6:00 PM at the Green Road Community Center
- Saturday, April 6th, 2019 at 10:00 AM at the Marsh Creek Community Center
- Tuesday, April 16th, 2019 at 6:00 PM at the Body of Christ Church – Dream Center

In these workshops, project staff worked with the public to determine options for improvements that could affect traffic, safety, transit, and access in the Capital Boulevard North corridor. In this meeting, they discussed preferences for interchanges, cross-sections, and land use in the area. __ people attended the workshops.

An online survey was also available to gather additional input from those that attended the meetings and those that were unable to attend.

462 Survey Participants

Bus riding in the corridor to reach transit riders for feedback

Pop-up meeting at the Hispanic Family Center

Big Ideas Survey Summary

The City hosted an online survey on Public Input to gather additional feedback on preferences for interchanges, cross-sections, and land use in the study area. This survey remained open until May 18th, 2019. The survey was available in both English and Spanish. 462 people participated in the English survey and 1 person participated in the Spanish survey.

When asked about preference for the three cross-section concepts, a majority of participants indicated that they liked Concept 3 the most. This concept included a dedicated bus lane, widened sidewalks, a median separating inner and outer lane of traffic, and more. This was the widest roadway design of the three concepts. Participants were also asked if they would give up business and parking entrances in exchange for increased ease of movement through seven different intersections in the corridor. Participants answered that they would prefer to move through the intersections more easily for each of the seven intersections.

Many comments on these questions brought forth concerns about pedestrian and cyclist safety and traffic. Participants called for options that would increase pedestrian and cyclist safety in these intersections, as well as improve traffic congestion and deter cars from cutting through neighborhoods.

The data collected from participants in this survey assisted the project team with drafting improvement concepts for the corridor.

Demographic information of participants was not collected in this survey.

Outreach Activities

The City notified residents about the Big Ideas Meetings and Survey through these communication methods:

- Presentations at the following CACs:
  - Forestville CAC on 3/12/2019
  - Northeast CAC on 3/14/2019
  - East CAC on 3/18/2019
  - North CAC on 3/19/2019
  - Atlantic CAC on 3/21/2019
  - Millbrook CAC on 4/12/2019
- A pop-up event at Millbrook on 4/19/2019
- Business canvassing in the area
- A meeting with the Hispanic Family Center on 5/6/2019
- Bus riding in the corridor to answer questions and have conversations with transit riders
- Postcards sent to residential addresses in the study area
- Social media posts were shared on the Raleigh Planning Instagram, Facebook, and Twitter
- GovDelivery email blasts to previous project subscribers
- Information and event details posted on City of Raleigh project webpage

Round 4: Design Directions

Following the Big Ideas round of engagement, the project team conducted the Design Directions round to discuss proposed concept ideas for the area and to gather public feedback. Project staff wanted to ensure these concepts would work for the area and hear any lingering concerns from the community.

Design Directions Workshops Summary

Overview

The City of Raleigh hosted two Design Directions Workshops. The first took place on Thursday, November 9th, 2019 from 6:00 PM to 8:00 PM at the Central Operations Building in Raleigh. The second workshop took place on Saturday, November 16th, 2019 from 10:00 AM to 12:00 PM at the Crossroads Fellowship Church. 65 people attended the Design Directions workshops.

Both of these workshops featured a formal presentation and five stations with display boards. These boards had information on interchange types, cross-sections, land use, and multi-modal transportation. These boards also showed street design concepts and transportation directions for four different areas of Capital Boulevard. Participants were given the opportunity to provide feedback on and ask questions about the concepts.

The City also received public feedback from an online survey.

Design Directions Survey Summary

An online survey was hosted on Public Input to give more people the chance to participate and provide feedback on proposed concepts. This survey remained open through December 31st, 2019. 375 people participated in the survey, leaving 2,743 response and 294 comments. 40 people subscribed to project updates.

This survey showed images of specific proposals and asked participants how well it met the goals of the project. When asked about 12-foot sidewalks with an area for trees to be planted, 70% of participants noted that this met the goal of improving pedestrian safety “much or very much.” When asked about pedestrian islands, 71% of participants said that this met the goal of improving pedestrian safety “much or very much.” When presented with the idea of a landscaped median in the corridor, 80% of participants said this met the goal of improving appearance “much or very much.” When asked about changing street view and including parking behind storefronts, 76% of participants said this met the goal of improving appearance “much or very much.”

Participants largely agreed that the outlined suggestions and strategies would meet the goals of the project that were identified in earlier engagement.

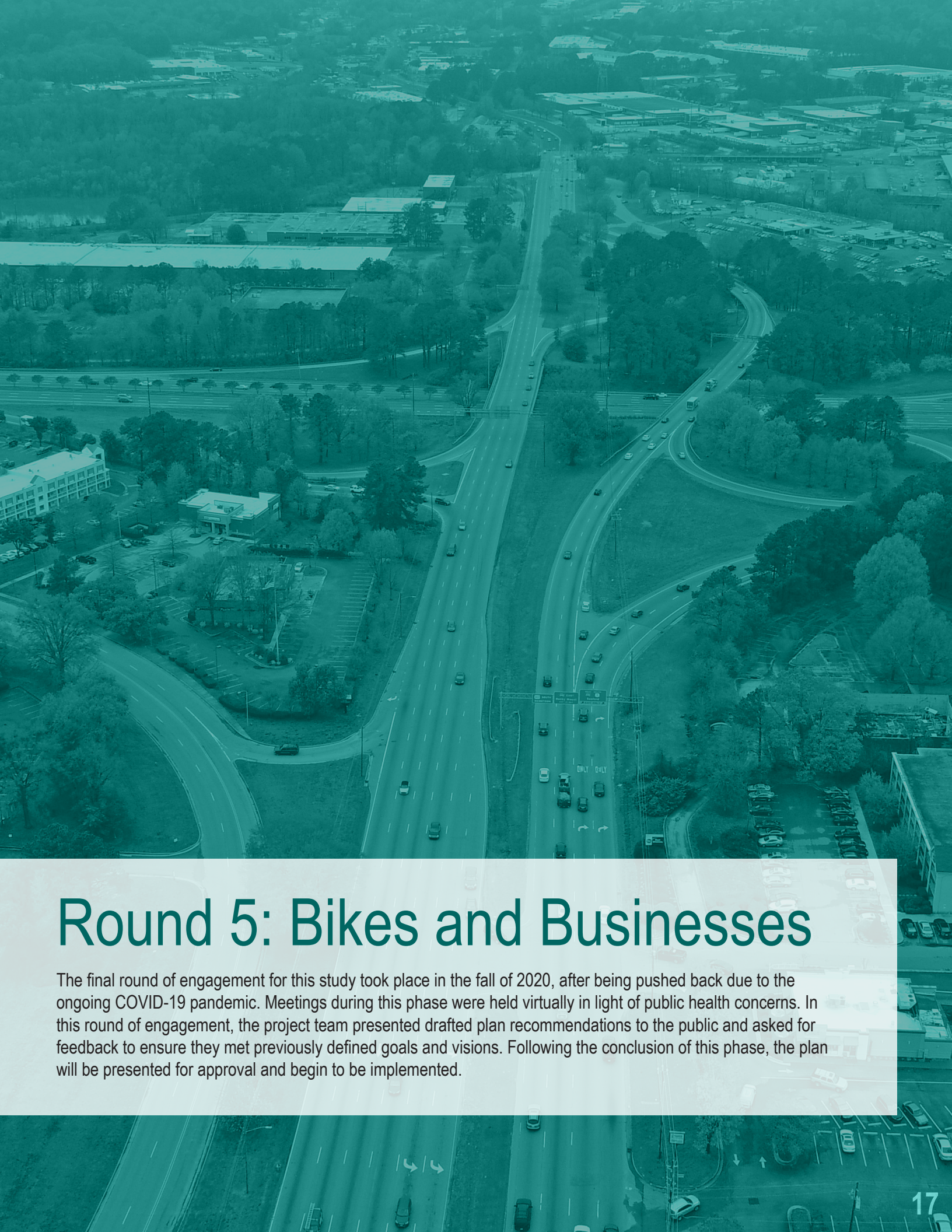
Participants were also asked voluntary demographic questions after the survey to gauge how representative the data is of the study area. Here are key takeaways from the demographics data of this survey:

- 61% of respondents identify as male.
- 43% of respondents are between the ages of 30-44.
- 41% of respondents have a household income of $118,000 or more.
- 86% of respondents are White.

Outreach Activities

The City notified residents about the Design Directions Workshops and Survey through these communication methods:

- Meetings with CACs, in which the project team presented information and informed members about upcoming events:
  - East CAC on 9/16/2019
  - Atlantic CAC on 9/19/2019
  - Forestville CAC on 10/8/2019
  - Northeast CAC on 10/10/2019
  - Millbrook CAC on 10/11/2019
  - North CAC on 10/15/2019
- Community property drop-ins on 10/7/2019 and 10/16/2019
- Business canvassing in the corridor
- Pop-ups at the following organizations:
  - Raleigh Rescue Mission Thrift Store on 10/26/2019
  - Green Road Community Center Halloween on 10/30/2019
  - Green Road Library: Bilingual Storytime on 11/13/2019
  - Regional Transportation Alliance on 11/14/2019
  - Hispanic Family Center on 12/4/2019
  - Raleigh Transit Authority on 12/12/2019
  - Millbrook Human Services on 12/17/2019
  - Triangle Town Center on 12/20/2019
- A postcard sent to residential addresses in the study area
- Social media posts were shared on the Raleigh Planning Instagram, Facebook, and Twitter
- GovDelivery email blasts to previous project subscribers
- Information and event details posted on City of Raleigh project webpage



Round 5: Bikes and Businesses

The final round of engagement for this study took place in the fall of 2020, after being pushed back due to the ongoing COVID-19 pandemic. Meetings during this phase were held virtually in light of public health concerns. In this round of engagement, the project team presented drafted plan recommendations to the public and asked for feedback to ensure they met previously defined goals and visions. Following the conclusion of this phase, the plan will be presented for approval and begin to be implemented.

Bikes and Businesses Meetings Summary

Overview

The City conducted three virtual meetings over Zoom, the last of which was conducted in Spanish. These meetings were held on:

- October 8th, 2020 from 6:00 PM – 8:00 PM
- October 10th, 2020 from 10:00 AM – 12:00 PM
- October 12th, 2020 from 6:00 PM – 8:00 PM (in Spanish)

60 participants attended these meetings. These meetings were also recorded and posted on the project Public Input page to allow those that could not attend the live session to still view it. The meetings included a formal presentation, which discussed the project background and timeline, results from the bicycle and pedestrian analysis, proposed facilities and priorities, and efforts to assist small businesses in the area.

After the presentation, participants had the opportunity to ask questions about the improvements, recommendations, and the project as a whole. This could be done verbally or through comments in the chat box on Zoom.

A survey was also available for community members to provide feedback on bike lanes, pedestrian crossings, and drafted recommendations.

108 Survey Participants

Three virtual meetings over Zoom

Meeting with the Bicycle and Pedestrian Advisory Committee

Bikes and Businesses Survey Summary

The online meetings were accompanied by an online survey hosted on Public Input. This survey asked participants to share feedback on bike and pedestrian facility improvements and drafted plan recommendations. 108 people participated in the online survey, which was open from October 6th, 2020 through November 1st, 2020.

Participants were asked about locations for bike lanes and pedestrian crossings in the study area. Common street names mentioned for bicycle lanes were Atlantic Avenue, Brentwood Road, Highwoods Boulevard, Wake Forest Road, Durant Road, Brooks Avenue, New Bern Avenue, New Hope Road, Capital Boulevard and more.

On the discussion of pedestrian crossing locations, several respondents mentioned the intersection of Capital Boulevard and Brentwood Road as an intersection they would like to see dedicated pedestrian crossing. Other intersections mentioned for pedestrian crossings included Capital Boulevard and Highwoods Boulevard, Capital Boulevard and Durant Road, Capital Boulevard and Trawick Road, Atlantic Avenue and Highwoods Boulevard, and more.

Participants were also asked to share feedback on the drafted recommendations strategies. Largely, comments focused on the need for improved bicyclist/pedestrian facilities in the corridor and quicker policies to address traffic concerns, especially those regarding safety of those traveling in the area.

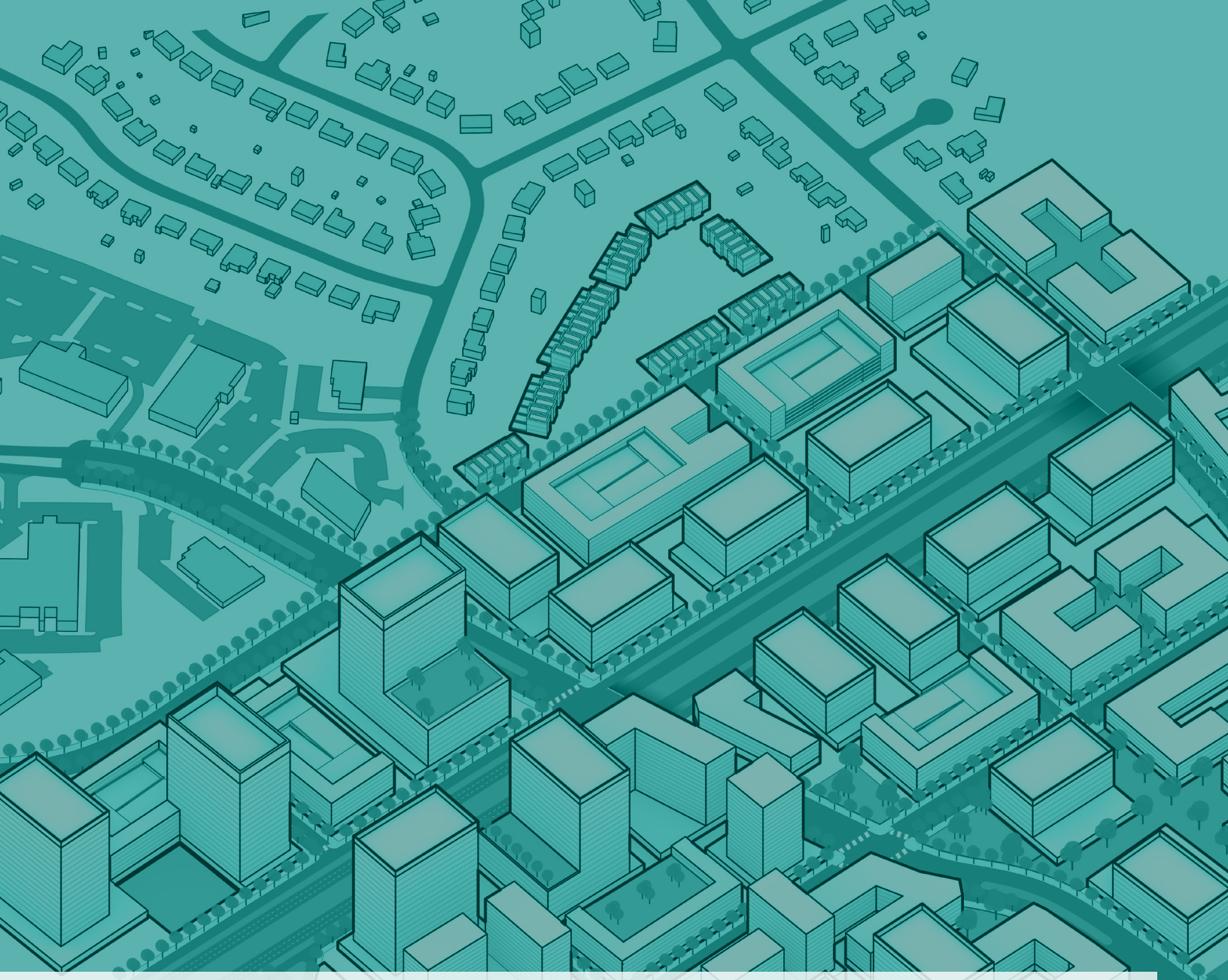
Participants were asked voluntary demographic questions after the survey to gauge how representative the data is of the study area. Here are key takeaways from the demographics data of this survey:

- 55% of respondents identify as male.
- 43% of respondents are between the ages of 30-44.
- 44% of respondents have an annual household income of $118,000 or greater.
- 77% of respondents are White.

Outreach Activities

Community members were notified of the Bikes and Businesses meetings and survey through these communication methods:

- A presentation at the Millbrook CAC on 9/11/2020
- A meeting with the Bicycle and Pedestrian Advisory Committee on 6/22/2020
- Community property drop ins in the corridor
- A press release sent to media outlets, including minority media outlets, in Raleigh
- A postcard sent to residential addresses in the study area
- Social media posts were shared on the Raleigh Planning Instagram, Facebook, and Twitter
- GovDelivery email blasts to previous project subscribers
- Information and event details posted on City of Raleigh project webpage



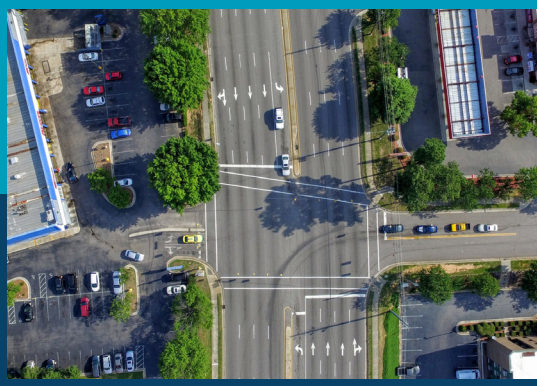
Engagement Summary

The City of Raleigh conducted a multitude of outreach efforts and events throughout the course of this project. In each phase, staff worked to gather public feedback and incorporate that into decision-making in future phases of the project. Through various communication methods, outreach efforts, public meetings, and surveys, community members had numerous opportunities to participate during the project. Even so, many of those that were reached throughout the project were White, male, and had a relatively high annual household income. Age representation was also largely in the middle ranges, with the most participants ranging from 25-44 years old. This is not entirely representative of the study area, which has a higher poverty rate (3.7%), higher rates of Limited English Proficiency, and more racial and ethnic diversity than the City of Raleigh as a whole.

Appendix C:
Travel Profile

Capital Blvd North

Corridor Study



Travel Profile Report

June 2019

Raleigh

raleighnc.gov


MILLER-MOTTE COLLEGE
Cabinets
Surplus Warel

Contents

Introduction

The focal point of the Travel Profile report is understanding the existing and future transportation conditions of the Capital Boulevard North corridor. This understanding will assist in evaluating viable solutions for achieving the corridor's vision. The core of the analysis presented here is the travel patterns of private vehicles. Next, demographic information has been compiled to illuminate existing equity disparities and equity impacts of proposed transportation changes. Finally, transit, bicycle, and pedestrian facilities are inventoried to ensure that future improvements have multi-modal benefits.

The analysis of demographics and existing travel conditions is provided to understand the contexts of the study corridor within the Triangle region. This context-setting discussion illuminates the following items:

- who is likely to be traveling the corridor and for what purposes;
- who is most likely to be affected by potential transportation, land use, and technology changes within the corridor;
- and how local and regional development patterns interact with the highway network to influence the travel demand for the study corridor.

It raises key issues to consider when developing and evaluating alternative visions and strategies for improving the corridor.

Traffic

The traffic analysis was undertaken using a three-tiered approach where the context of the corridor is first explored at a regional level, then at a focused corridor level, and finally at the site and segment level. This report summarizes the findings of that analysis.

Regional Analysis

The Triangle Regional Model (TRM) is the official travel demand modeling and analysis tool for the Triangle region of North Carolina. TRM is used to predict existing and future travel behavior based on factors that include population and employment density, socioeconomic data, and roadway and transit facilities. Expected future changes to these factors are built into the model when developing forecasts of travel demand.

Streetlight is a web-based tool used to analyze existing travel patterns based on cellphone locations. Streetlight data is more detailed than the TRM in terms of time and geography, but its

Location	Traffic Forecast	Daily Through trips	Through Trips %	Peak Hour Through Trips	Peak hour %
Capital Blvd at I-440	78,000	24,527	31.4%	2,207	9%
Capital Blvd at I-540	70,000	14,059	20.1%	1,406	10%
Louisburg Rd at I-540	42,000	11,677	27.8%	1,284	11%

Traffic Forecast and Peak hour percentage based on Traffic Forecast Report
Through trips percentage calculated from StreetLight Index TM

use is limited to existing and past travel patterns of passenger cars and commercial vehicles.

When conducting the regional analysis, both Triangle Regional Model and Streetlight data were used. The Triangle Regional Model is the primarily-used transportation model for the Triangle region of North Carolina. Streetlight data was also used to confirm the data from the Triangle Regional Model. The two data sets were very similar in their outputs, which allowed the Triangle Regional Model to be confirmed for use in the Capital Boulevard North study. Because the two models matched closely, the Streetlight data could also be used where any information was lacking in the Triangle Regional Model.

Capital Boulevard is a major north-south corridor in Raleigh. While there are many local destinations along the corridor, a large portion of the drivers on Capital Boulevard are passing through. These "through" trips are external to external, meaning both their origin and destination are outside of the corridor study area, but travel through the corridor at some point during their trip.

Through trips can be contrasted with "to" trips. "To" trips may be external to internal, internal to external, or internal to internal trips. These are trips with either an origin or destination, or both origin and destination, within the study area. The table above highlights the number of north-south through trips along the corridor.

The "Capital Boulevard at I-440" row represents trips that either start at I-440 and go to either of the two other external locations listed (Capital Boulevard at I-540 or Louisburg Road at I-540) or vice versa with trips starting at one of the two other locations and ending at I-440. For the other two rows, "Capital Boulevard at I-540" and "Louisburg Road at I-540" are the starting locations and they on go to I-440 or vice versa with trips starting from I-440 and ending at either of the two locations.

The regional analysis is also important for understanding the types of vehicle trips that are made within the corridor. The regional analysis identifies trips in the corridor as:

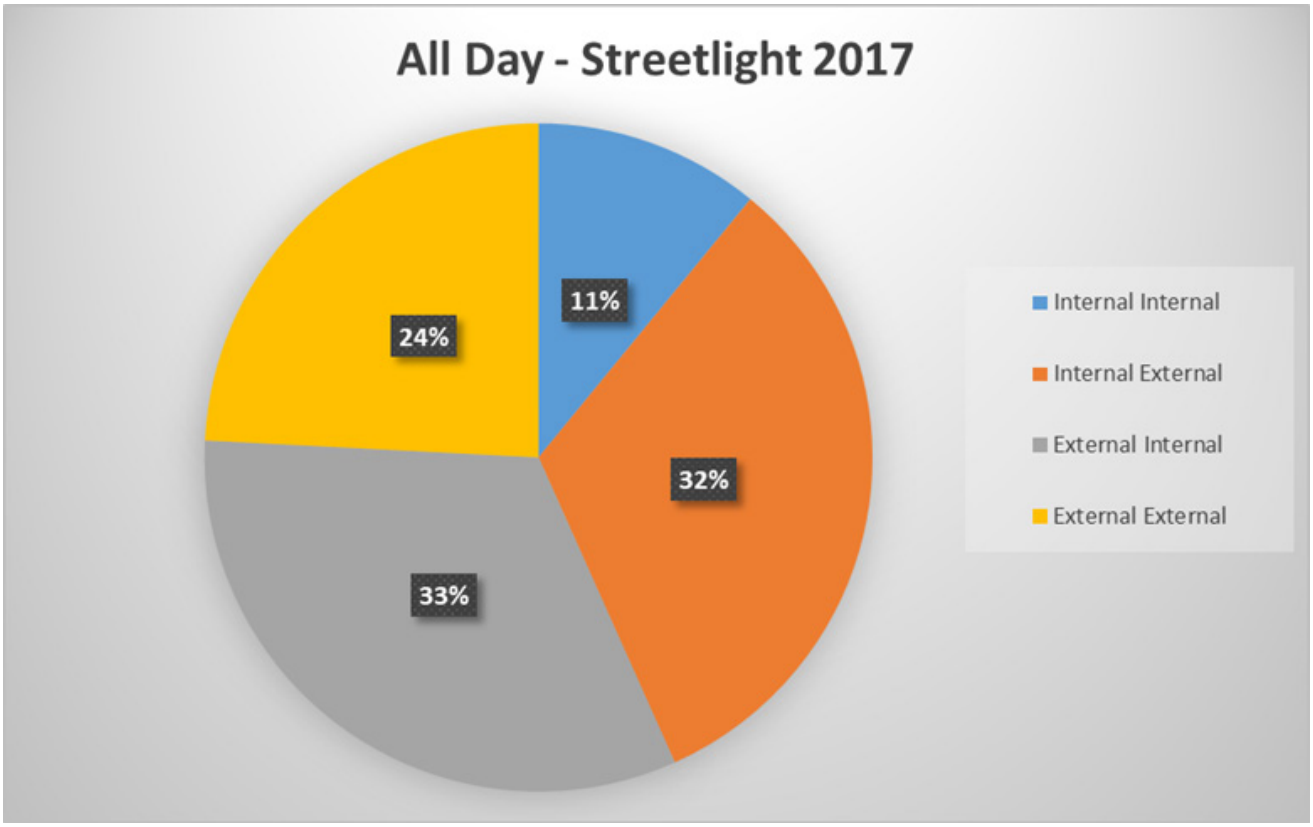
- completely internal to the corridor study area (Internal to Internal);
- trips that begin within the corridor study area, but have destinations outside of the study area (Internal to External);
- trips that begin outside of the corridor study area, but have destinations inside the study area (External to Internal);
- and finally, trips that both begin and end outside of the corridor study area, using the corridor as a part of their travel path (External to External).

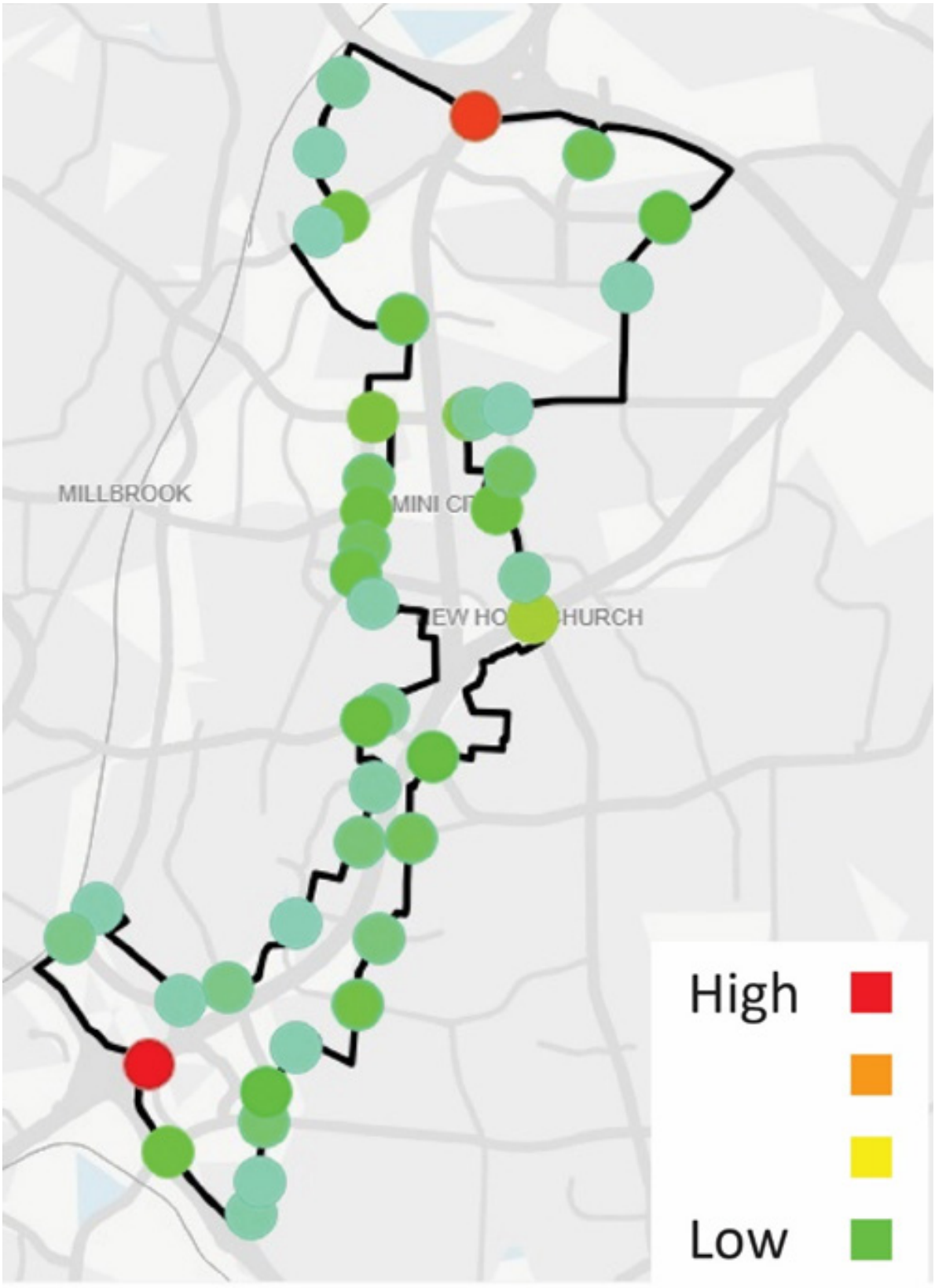
This analysis is useful for understanding the importance of the corridor within the region and identifying geographic subareas that depend most heavily on Capital Boulevard to serve local travel needs. This section describes the corridor within the context of this analysis.

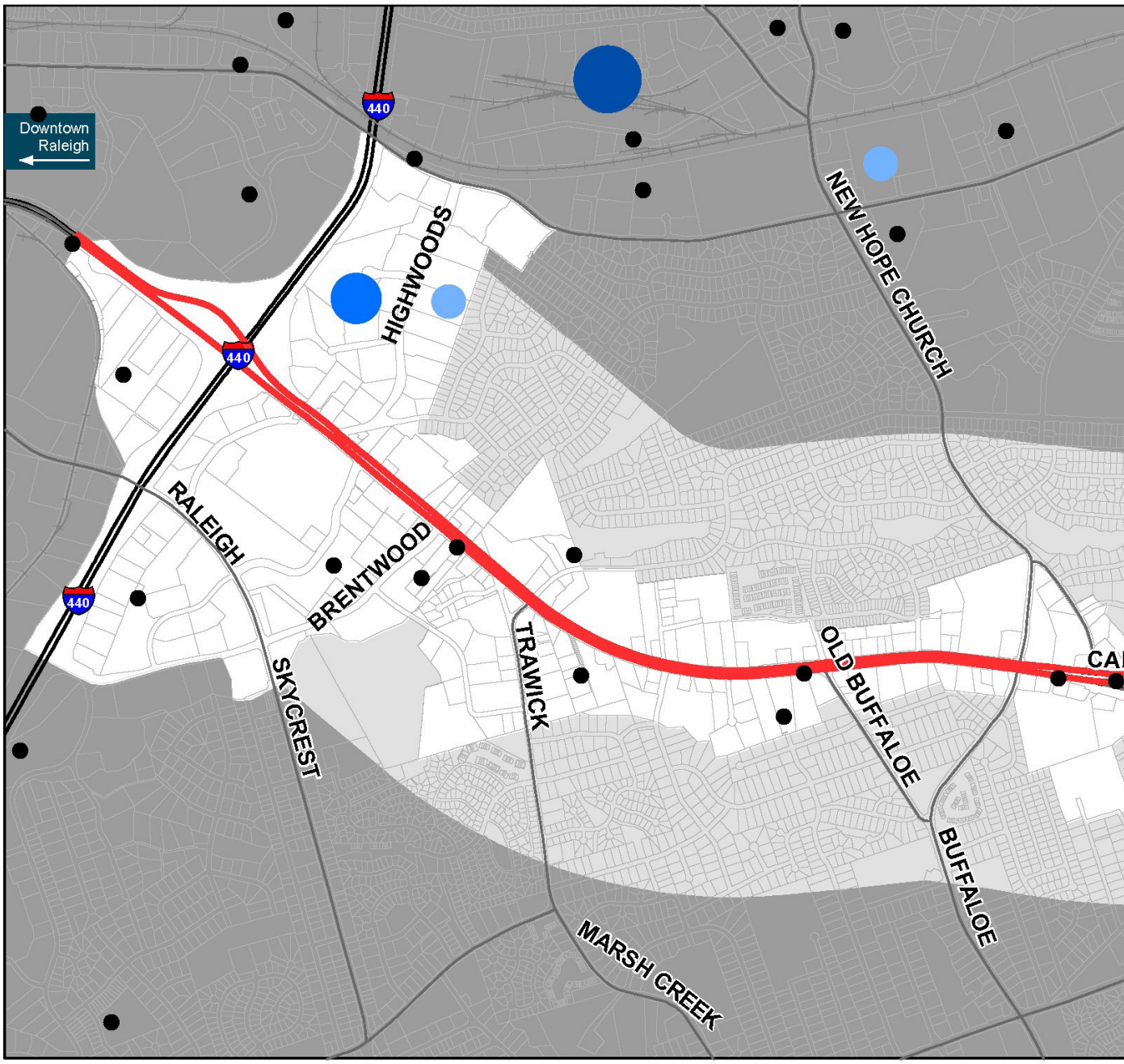
The pie chart on page 6 highlights the trip patterns on Capital Boulevard. As indicated in the chart, 24 percent of the trips on Capital Bouelvard are external to external and 11 percent of trips were internal to internal. The largest percentage of trips were external to internal and internal to external. These two categories together account for 75

percent of all trips on the corridor. This means that three of every four trips either start or end in the study area but also involves travel outside the study area. Pairing this with the "gate" map on page 7, highlights the importance of cross street connections in the study area.

Using Streetlight, "Gates" were established at all the streets leading into the study area. These "gates" indicate the volume of trips that enter the corridor from that specific location. The map below shows that the highest volume of trips entering the




MILLBROOK
High
Low



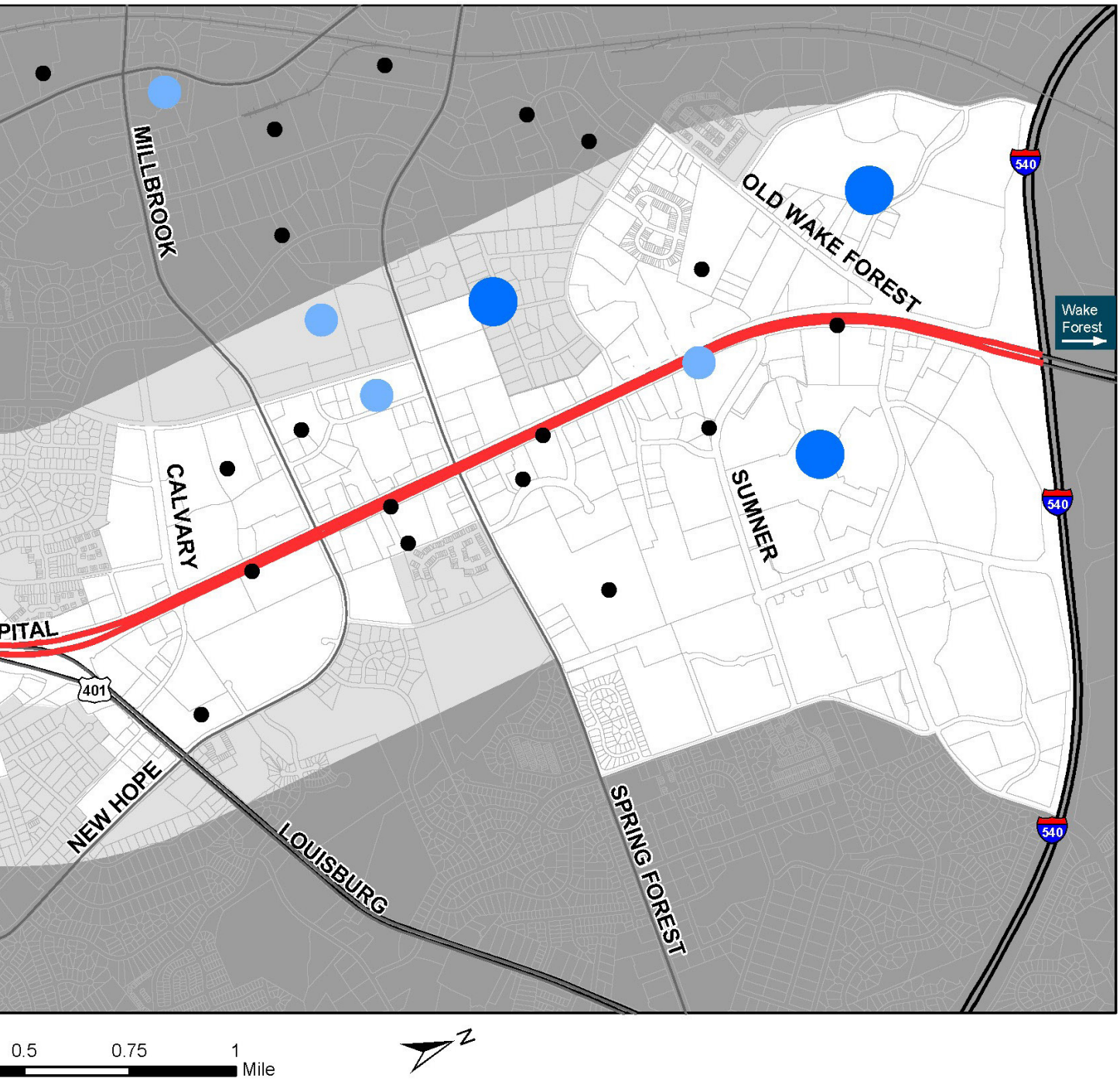
Workplace Locations for Wake Forest Residents (Number of Employees)
Source: 2015 OnTheMap LEHD Census Data

Railroads
Study Area
Area of Influence

0 0.25

Capital Boulevard North Corridor

10 - 50 Employees
51 - 100 Employees
101 - 300 Employees
> 300 Employees


MILLBROOK
OLD WAKE FOREST
Wake Forest
CALVARY
SUMNER
PITAL
401
NEW HOPE
LOUISBURG
SPRING FOREST
540
540
540
0.5
0.75
1
Mile
N

corridor pass through the interchanges of I-440 and I-540.

There is a significantly lower number of trips entering the corridor from other locations, and the trip volumes at these locations are similar in magnitude. This indicates that, aside from the I-540 and I-440 interchanges, trips are somewhat evenly dispersed throughout the network of streets that surround Capital Boulevard. The data indicate that it will be important to consider the entire network when developing transportation alternatives rather than focusing on a few intersections.

Using The Town of Wake Forest as an example of where through trips may have originated, the map on pages 8 and 9 highlights where the citizens of Wake Forest work. As indicated in the map, many citizens of Wake Forest work along the Capital Boulevard Corridor. One of the large clusters is in Midtown, near the Duke Raleigh Hospital. Another cluster is near North Hills. As with the "gate" map on page 7, this map shows that that an individual travelling from Wake Forest has a number of ways to reach the Midtown and North Hills area by using Capital Boulevard because there are many cross streets that allow for east-west connections.

Location	ROUTE	AADT_2003*	AADT_2007*	AADT_2009*	AADT_2017*
Capital Blvd North of I-440 Interchange	US 1-401	72,000	68,000	75,000	76,000
Capital Blvd South of Brentwood Road	US 1-401	65,000	63,000	71,000	72,000
Capital Blvd South of Trawick Road	US 1-401	58,000	66,000	70,000	83,000
Capital Blvd North of Trawick Road	US 1-401	66,000	62,000	66,000	69,000
Capital Blvd South of Old Buffalo Road	US 1-401	62,000	61,000	67,000	72,000
Capital Blvd North of Buffalo Road	US 1-401	70,000	60,000		65,000
Capital Blvd North of Louisburg Road	US 1				44,000
Capital Blvd South of Millbrook Road	US 1	46,000	41,000	43,000	40,000
Capital Blvd South of Spring Forest Road	US 1	51,000	48,000	49,000	48,000
Capital Blvd North of Spring Forest Road	US 1	52,000	50,000	50,000	53,000
Capital Blvd South of Old Wake Forest Road	US 1	44,000	45,000	45,000	51,000
Capital Blvd South of I-540 Interchange	US 1				60,000
I-540 West of Capital Blvd	I-540	20,000	72,000	72,000	85,000
I-540 East of Capital Blvd	I-540	7,900	55,000	58,000	76,000
I-440 West of Capital Blvd	I-440	113,000	113,000	108,000	132,000
I-440 East of Capital Blvd	I-440	96,000	97,000	92,000	114,000

**Vehicles per day*

Corridor Analysis

Past Traffic Counts

The corridor analysis adds more detail about the local street network that connects to Capital Boulevard. The chart below shows the average annual daily traffic (AADT) on the corridor at major cross streets. This information is also shown in chart form on pages 12 and 13. The AADT data show recorded volumes along the road for four historical years. For the years shown, traffic tends to be heaviest towards I-440 and decreases along the corridor towards I-540, but then increases slightly as Capital Boulevard approaches I-540.

Traffic Forecast

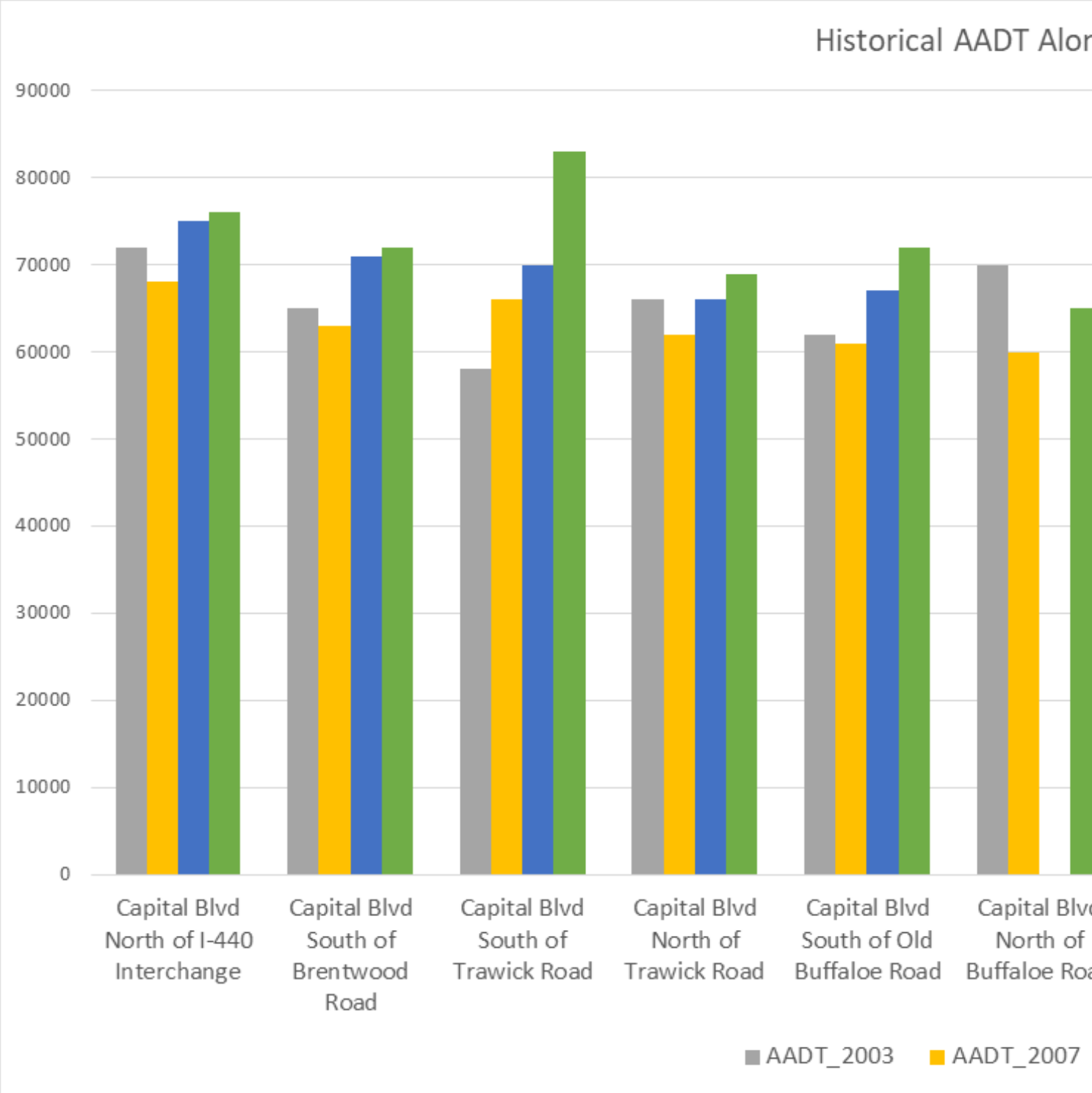
A traffic forecast was prepared by WSP in January 2019 (See Appendix A) for the Capital Boulevard corridor from I-440 to I-540 using the existing, approved NDCOT Transportation Planning Division forecasts: FS-1805A (May 2018), I-5970 (November 2018) and U-5307 (June 2017).

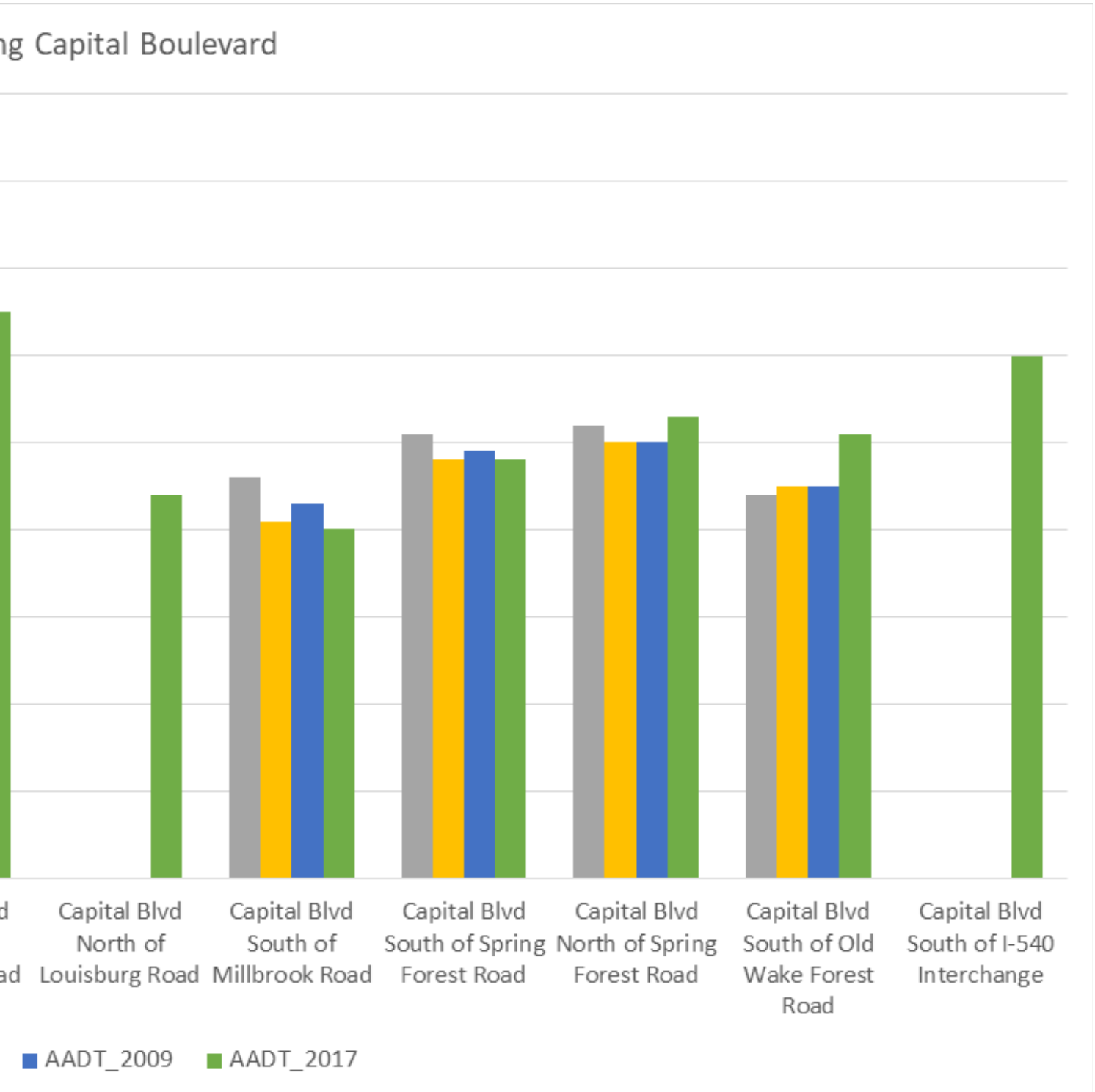
In addition, new count data was collected at the intersections of Capital Boulevard at Oak Forest Road and Greywood Road in September 2018. The 2018 volumes at these two intersections were developed based on turning movement counts that were collected for this forecast.

The tables on pages 14 and 15 show the forecasted traffic volumes along Capital Boulevard and major cross streets for both the year 2018 and 2045. This information is presented in diagram form in the Appendix. Traffic volume at each of the locations listed in the table is forecast to increase between 2018 and 2045, with the volume growth in many locations expected to be substantial.

The 2045 volumes were developed by assuming a growth rate for the 2018 volumes that is consistent with the growth rates used in the previously approved forecasts. The traffic forecast provides Average Annual Daily Traffic (AADT) volumes, design hourly factors, peak hour directional split percentages, PM peak direction of flow, and heavy vehicle percentages.

Using the projected 2045 future year peak hour volumes, a capacity analysis was completed for major cross streets using the Federal Highway Administration's (FHWA) Capacity Analysis for Planning of Junctions (Cap-X) software tool. Cap-X was developed by FHWA to identify the types of intersections and interchanges that are likely to be able to accomodate predicted traffic volumes and eliminate infeasible alternatives at an early stage of the planning process. Cap-X evaluates the feasibility of an intersection or interchange based on two metrics, called Volume to Capacity (V/C) Ratio and Critical Lane Volume.


Historical AADT Alor
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
Capital Blvd North of I-440 Interchange
Capital Blvd South of Brentwood Road
Capital Blvd South of Trawick Road
Capital Blvd North of Trawick Road
Capital Blvd South of Old Buffaloe Road
Capital Blvd North of Buffaloe Roa
AADT_2003
AADT_2007


ng Capital Boulevard
Capital Blvd North of Louisburg Road
Capital Blvd South of Millbrook Road
Capital Blvd South of Spring Forest Road
Capital Blvd North of Spring Forest Road
Capital Blvd South of Old Wake Forest Road
Capital Blvd South of I-540 Interchange
AADT_2009
AADT_2017

High volume intersections were analyzed for the Cap-X analysis. Using the 2045 traffic forecast, AM and PM peak hour turning movement volumes were developed using NCDOT Congestion Management Section's Intersection Analysis Utility (IAU) tool for the following locations:

- US 1 (Capital Boulevard) at Old Wake Forest Road
- US 1 (Capital Boulevard) at Johnson Lexus Driveway/Sumner Boulevard
- US 1 (Capital Boulevard) at Oak Forest Road
- US 1 (Capital Boulevard) at Spring Forest Road
- US 1 (Capital Boulevard) at Millbrook Road
- US 1 (Capital Boulevard) at Calvary Road
- US 1 (Capital Boulevard) at New Hope Church Road/Buffaloe Rd
- US 1 (Capital Boulevard) at Huntleigh Drive/ Trawick Road
- US 1 (Capital Boulevard) at Brentwood Road
- US 1 (Capital Boulevard) at Highwoods Boulevard1

ROUTE	LOCATION	2018 AADT	2045 AADT
Capital Blvd			
Capital Blvd	NORTH of I-540	74,000	109,600
Capital Blvd	NORTH of Old Wake Forest Rd	70,000	92,800
Capital Blvd	NORTH of Sumner Blvd	56,800	63,600
Capital Blvd	NORTH of Oak Forest Rd	61,200	75,200
Capital Blvd	NORTH of Spring Forest Rd	62,800	77,200
Capital Blvd	NORTH of Millbrook Rd	57,200	78,800
Capital Blvd	NORTH of Calvary Dr	49,200	73,600
Capital Blvd	NORTH of US 401	47,600	72,800
Capital Blvd	NORTH of Buffalo Rd	77,600	115,200
Capital Blvd	NORTH of Greywood Rd	74,000	113,600
Capital Blvd	NORTH of Old Buffalo Rd	73,600	113,200
Capital Blvd	NORTH of Starmount Dr	78,400	113,200
Capital Blvd	NORTH of Trawick Rd	76,000	118,000
Capital Blvd	NORTH of Brentwood Rd	80,400	124,400
Capital Blvd	NORTH of I-40	78,000	119,600
Capital Blvd	SOUTH of I-40	42,000	71,600

Notes:

AADT - Annual Average Daily Traffic

Volumes are in vehicles per day (vpd)

ROUTE	LOCATION	2018 AADT	2045 AADT
Cross Streets (North to South)			
I-540	WEST of Capital Blvd	86,400	157,600
I-540	EAST of Capital Blvd	78,000	156,800
Old Wake Forest Rd	WEST of Capital Blvd	26,800	43,200
Old Wake Forest Rd	EAST of Capital Blvd	20,000	39,600
Johnson Lexus Dwy	WEST of Capital Blvd	2,400	12,000
Sumner Blvd	EAST of Capital Blvd	10,800	15,200
Oak Forest Rd	WEST of Capital Blvd	5,200	6,800
Oak Forest Rd	EAST of Capital Blvd	2,800	3,600
Spring Forest Rd	WEST of Capital Blvd	25,600	32,400
Spring Forest Rd	EAST of Capital Blvd	18,800	35,600
E Millbrook Rd	WEST of Capital Blvd	25,200	45,600
E New Hope Rd	EAST of Capital Blvd	23,200	39,600
US 401	NORTH of E New Hope Rd	42,000	59,200
E New Hope Rd	EAST of US 401	26,000	43,600
Calvary Dr	WEST of Capital Blvd	8,800	16,400
Calvary Dr	EAST of Capital Blvd	7,200	13,600
US 401	SOUTH of E New Hope Rd	35,600	48,000
Credit Union	EAST of US 401	1,600	2,000
US 401	EAST of Capital Blvd	30,000	42,400
New Hope Church Rd	WEST of Capital Blvd	16,800	33,600
Buffalo Rd	EAST of Capital Blvd	10,800	22,400
Greywood Rd	WEST of Capital Blvd	1,200	1,600
Greywood Rd	EAST of Capital Blvd	800	1,200
Old Buffalo Rd	WEST of Capital Blvd	2,400	2,800
Old Buffalo Rd	EAST of Capital Blvd	6,800	7,600
Mayflower Dr	WEST of Capital Blvd	1,600	2,000
Starmount Dr	EAST of Capital Blvd	4,000	4,400
Huntleigh Dr	WEST of Capital Blvd	6,400	13,200
Trawick Rd	EAST of Capital Blvd	8,800	13,200
Brentwood Rd	WEST of Capital Blvd	8,400	11,200
Brentwood Rd	EAST of Capital Blvd	14,800	19,200
I-440	WEST of Capital Blvd	132,400	204,800
I-440	EAST of Capital Blvd	114,000	194,400

Notes:

AADT - Annual Average Daily Traffic

Volumes are in vehicles per day (vpd)

Location	Type	Alternative Concepts
Capital Boulevard at Old Wake Forest Road	Grade Separation	1. Double Crossover Diamond Interchange 2. Diamond Interchange 3. Partial Cloverleaf Interchange
Capital Boulevard at Sumner Boulevard/Johnson Lexus Driveway	At Grade	1. Median U-turn Intersection 2. Restricted Crossing U-turn 3. Displaced Left-turn Intersection
	Grade Separation	1. Partial Cloverleaf Interchange 2. Double Crossover Diamond Interchange 3. Displaced Left-turn Interchange
Capital Boulevard at Oak Forest Road	At Grade	1. Displaced Left-turn Intersection 2. Median U-turn Intersection 3. Quadrant Roadway NW
Capital Boulevard at Spring Forest Road	Grade Separation	4. Diamond Interchange 5. Double Crossover Diamond Interchange 6. Partial Cloverleaf Interchange
Capital Boulevard at E Millbrook Road/N New Hope Road	Grade Separation	1. Double Crossover Diamond Interchange 2. Diamond Interchange 3. Partial Cloverleaf Interchange
Capital Boulevard at Calvary Road	Grade Separation	1. Partial Cloverleaf Interchange 2. Double Crossover Diamond Interchange 3. Diamond Interchange
Capital Boulevard at Buffalo Road/New Hope Church Road	Grade Separation	1. Double Crossover Diamond Interchange 2. Diamond Interchange 3. Displaced Left-turn Interchange
Capital Boulevard at Trawick Road/Huntleigh Drive	Grade Separation	1. Diamond Interchange 2. Double Crossover Diamond Interchange 3. Partial Cloverleaf Interchange
Capital Boulevard at Brentwood Road	Grade Separation	1. Partial Cloverleaf Interchange 2. Diamond Interchange 3. Double Crossover Diamond Interchange
Capital Boulevard at Westinghouse Road	Grade Separation	1. Partial Cloverleaf Interchange 2. Double Crossover Diamond Interchange 3. Diamond Interchange
Capital Boulevard at Highwoods Boulevard		

Crash Analysis

This Travel Profile includes a summary of crash data along the corridor. The data summary will inform a more in-depth analysis during the alternatives analysis phase of the study. The crash data illustrate the safety performance along the corridor and describe the severity of collisions that occurred at different locations in the study area. NCDOT provided crash data for the intersections along the corridor for a five-year period, from December 1, 2013 to November 30, 2018.

Crashes at several locations along the corridor were evaluated as shown in the table on pages 18 and 19. A total of 3,670 crashes were reported at these locations with 2,851 classified as property damage only (PDO) crashes and 795 classified as injury crashes. Of the 795 injury crashes, 19 were severe injury (Class A) crashes and five (5) were fatal crashes.

The I-440 Westbound Off-Ramp intersection entering Capital Boulevard was the site of the greatest number of crashes, with 345 PDO crashes and 60 non-fatal injury crashes (Class B and C). There was one severe injury (Class A) crash and no fatal crashes reported at this location during the study period. The intersections of Capital Boulevard with Trawick Road/Huntleigh Drive, Calvary Drive, and Old Buffaloe Road had the highest percentage of severe/fatal within the corridor.

The severity index of the reported crashes is shown for each of the locations listed in the table. The statewide average of severity indices for roadways like Capital Boulevard is 3.87, as reported in the NCDOT Traffic Safety Unit 2015-2017 Three Year Crash Rate table. Locations where the reported crash severity exceeds the statewide average are marked in red.

Bicycle and pedestrian crashes are often the result of multiple factors related to street design, environmental conditions, or human error. Crash characteristics were reviewed to identify common themes for crashes throughout the Capital Boulevard North Corridor Study Area. The summary crash table below, previously shown in the Community Profile, compares bicycle and pedestrian crashes across the project segments, which are:

- Segment 1: I-440 to Huntleigh Dr/Trawick Rd
- Segment 2: Huntleigh Dr/Trawick Rd to New Hope Church Rd/Buffaloe Rd
- Segment 3: New Hope Church Rd/Buffaloe Rd to Millbrook Rd/New Hope Rd
- Segment 4: Millbrook Rd/New Hope Rd to I-540

	Segment 1		Segment 2		Segment 3		Segment 4		Total Crashes
Bicycle Crashes	4	10%	6	15%	24	60%	6	15%	40
Pedestrian Crashes	30	19%	26	17%	67	43%	32	21%	155
Total Crashes by Segment	**34**		**32**		**101**		**38**		**195**
Pedestrian Fatalities	2		3		4		0		9
Disabling Injuries	1 – bicycle 1 – pedestrian		2 – bicycle 2 – pedestrian		1 – bicycle 2 – pedestrian		0 – bicycle 1 – pedestrian		10

Location along Capital Boulevard		Total Crashes	Fatal Crashes	
ID	Cross Street			
1	I-540 Eastbound Off-Ramp	226	0	
2	I-540 Eastbound On-Ramp	78	1	
3	Old Wake Forest Road	201	0	
4	Sumner Boulevard/Johnson Lexus Driveway	66	0	
5	Oak Forest Road	84	0	
6	Trust Drive	24	0	
7	Spring Forest Road	216	0	
8	E Millbrook Road/N New Hope Road	261	0	
9	Capital Crossing Driveway	7	0	
10	Calvary Road	177	1	
11	US 401 (Louisburg Road)	23	0	
12	Deana Lane	100	0	
13	Buffalo Road/New Hope Church Road	283	0	
14	Greywood Drive	59	0	
15	Old Buffalo Road	141	1	
16	Hobby Court	19	0	
17	Mayflower Drive/Starmount Drive	146	0	
18	Capital Square Crossover	4	0	
19	Trawick Road/Huntleigh Drive	236	1	
20	Brewton Place/Old Trawick Lane	20	0	
21	Brentwood Road	259	1	
22	Westinghouse Road	173	0	
23	Highwoods Boulevard	236	0	
24	Baskin-Robins Crossover	37	0	
25	I-440 Westbound On-Ramp	35	0	
26	Appliance Court	15	0	
27	I-440 Westbound Off-Ramp	406	0	
28	I-440 Westbound Off-Ramp (US 1 South)	29	0	
29	I-440 Westbound On-Ramp	1	0	
30	I-440 Eastbound Off-Ramp	14	0	
31	I-440 Eastbound Off-Ramp	6	0	
32	Yonkers Road/Ratchford Road	88	0	
Total		**3,670**	**5**	

Class A Injury	Class B/C Injury	PDO Crashes	Severity Index (SI)	Statewide* Severity Index (SI) Average	Difference between SI and Statewide SI
1	45	180	2.81	3.87	-1.06
0	25	52	4.34	3.87	0.47
0	32	169	2.18	3.87	-1.69
0	12	54	2.35	3.87	-1.52
1	16	67	3.31	3.87	-0.56
0	10	14	4.08	3.87	0.21
0	52	164	2.78	3.87	-1.09
2	48	211	2.94	3.87	-0.93
0	1	6	2.06	3.87	-1.81
2	46	128	4.21	3.87	0.34
0	8	15	3.57	3.87	-0.3
0	20	80	2.48	3.87	-1.39
1	60	222	2.84	3.87	-1.03
1	17	41	4.42	3.87	0.55
2	24	114	3.87	3.87	0
1	2	16	5.77	3.87	1.9
0	33	113	2.67	3.87	-1.2
0	1	3	2.85	3.87	-1.02
2	60	173	3.84	3.87	-0.03
0	3	17	2.11	3.87	-1.76
0	66	192	3.18	3.87	-0.69
2	36	135	3.42	3.87	-0.45
2	56	178	3.40	3.87	-0.47
0	15	22	4.00	3.87	0.13
0	6	29	2.27	3.87	-1.6
0	2	13	1.99	3.87	-1.88
1	60	345	2.28	3.87	-1.59
0	10	19	3.55	3.87	-0.32
0	0	1	1.00	3.87	-2.87
0	2	12	2.06	3.87	-1.81
1	1	4	14.87	3.87	11
0	26	62	3.19	3.87	-0.68
19	**795**	**2,851**	**-**	**-**	**-**

- Spring Forest Connector Trail: off-road paved path to connect Beaverdam Creek Greenway to the Spring Forest Trail near Sumner Boulevard.
- Greenway near Triangle Town Center: proposed off-road multi-use path from Triangle Town Boulevard near Town Drive to Perry Creek to Spring Forest Trail.

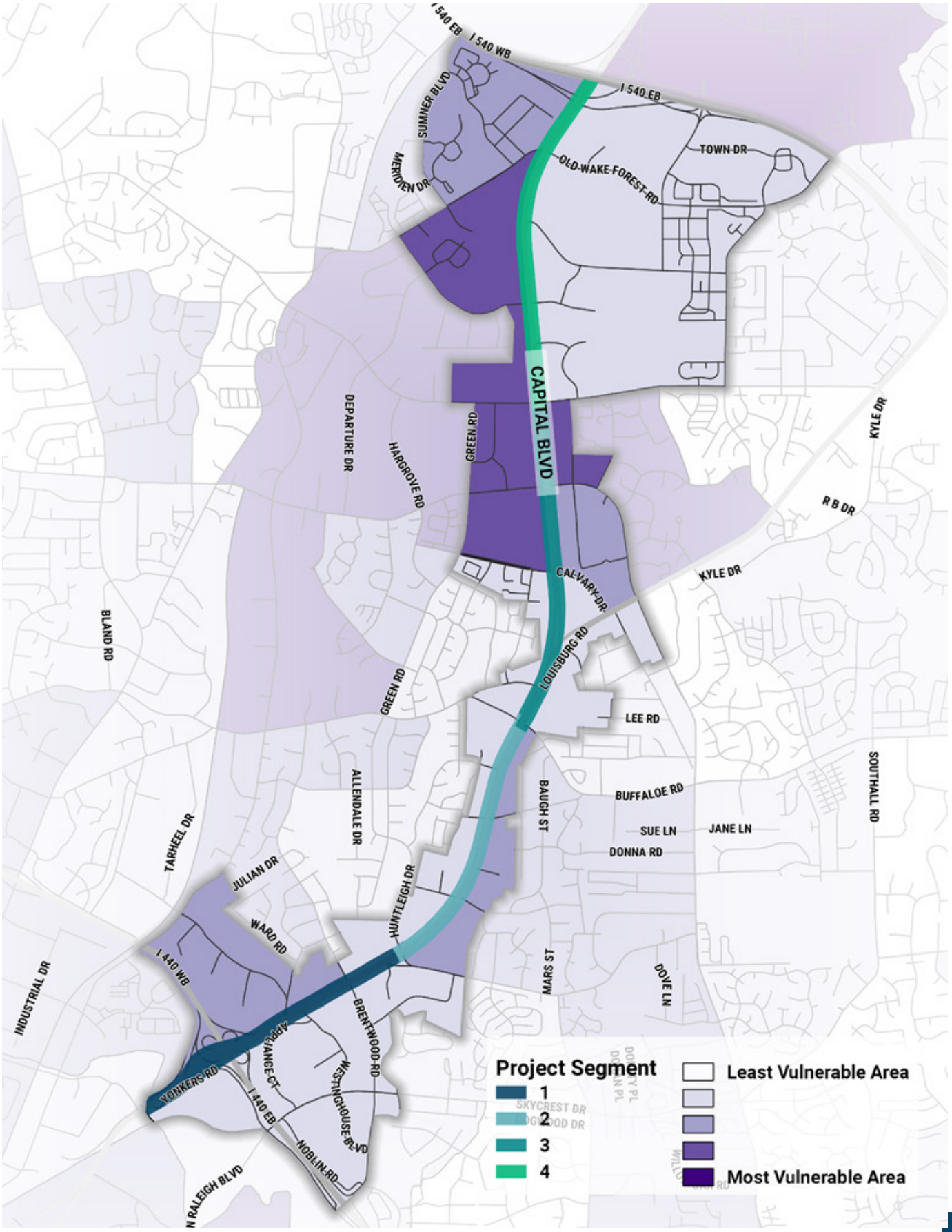
The Travel Profile evaluates existing conditions and the impact on multimodal travel and connectivity within the Capital Boulevard Study Area. The analyses conducted may be used to better understand where bicycle and pedestrian facilities should be prioritized and the type of infrastructure that may be most appropriate for attracting users of all ages and abilities.

Equity Analysis

Although the Capital Boulevard corridor is more notably home to a mixture of commercial uses, there are several neighboring residential communities that shop, commute, or work along this thoroughfare on a daily basis. An equity analysis was used to understand where vulnerable households are most common along the corridor. The results of this analysis are illustrated on the map on page 21, which shows the concentration of vulnerable households.

The term "vulnerable" in this analysis signifies that a

Zero Car Households	Percentage of households within each Census Block Group without access to a vehicle. Households that do not own or have access to a vehicle may have trouble accessing community facilities and other resources; they may benefit more by having access to safe, connected routes for bicycling and walking.
Vulnerable Populations	Percentages of people within each Census Block Group over 65, under 18 and below the poverty line. Underserved or vulnerable communities often bear a disproportionate burden of transportation externalities (traffic, lack of choice, etc.). These groups can often benefit significantly by having non-motorized or public transportation options.

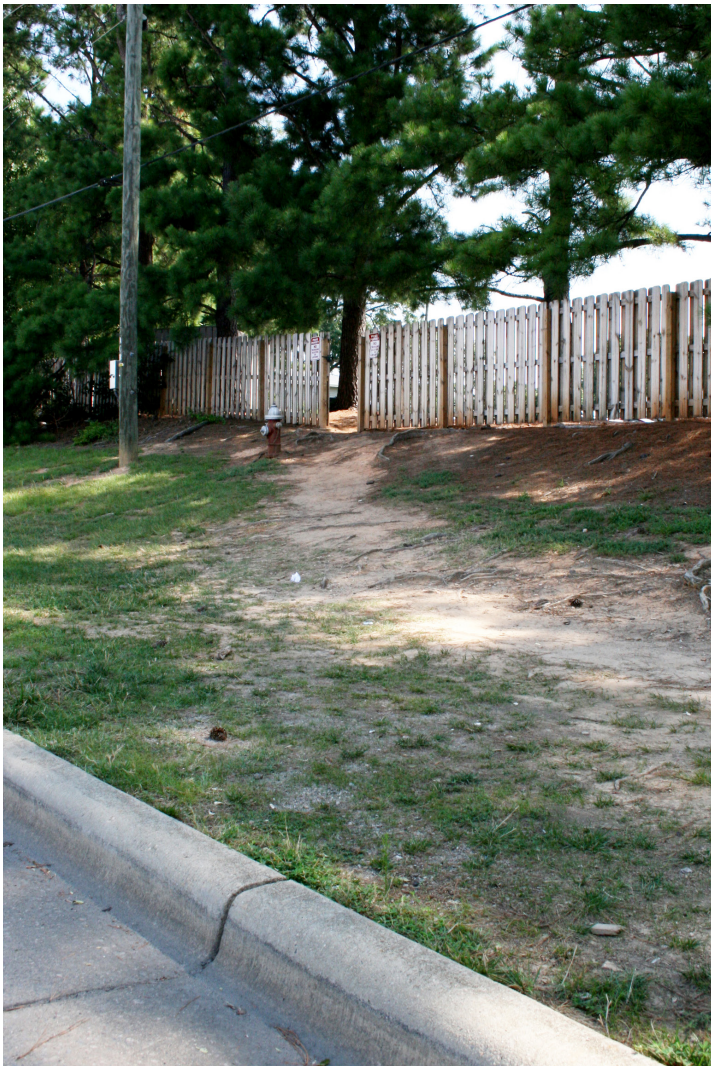

I 540 EB
I 540 WB
SUMNER BLVD
MERIDEN DR
I 540 EB
TOWN DR
OLD WAKE FOREST RD
CAPITAL BLVD
DEPARTURE DR
HARGROVE RD
GREEN RD
KYLE DR
R B DR
KYLE DR
CALVARY DR
LOUISBURG RD
BLAND RD
GREEN RD
LEE RD
SOUTHALL RD
BUFFALOE RD
SUE LN
JANE LN
DONNA RD
BAUGH ST
ALLENDALE DR
TARHEEL DR
JULIAN DR
WARD RD
HUNTLEIGH DR
I 440 WB
INDUSTRIAL DR
MARS ST
DOVE LN
APPLIANCE CT
BRENTWOOD RD
YONKERS RD
I 440 EB
WESTINGHOUSE BLVD
NOBLIN RD
N RALEIGH BLVD
Project Segment
1
2
3
4
Least Vulnerable Area
Most Vulnerable Area

Bicycles and Pedestrians

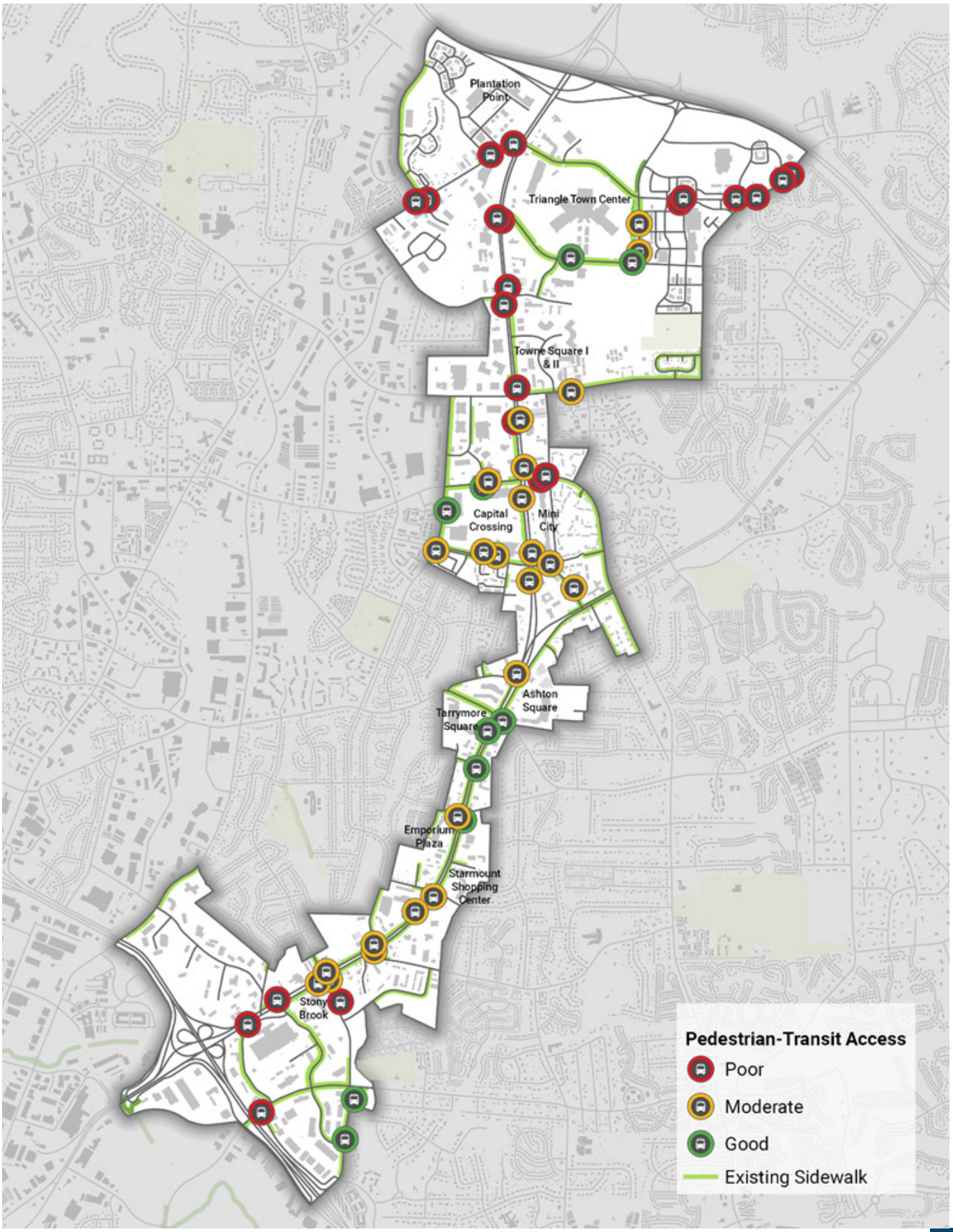
Pedestrian Access

A specific analysis was completed to assess the level of pedestrian access to transit stops, ranking the access as poor, moderate or good and also highlighting sidewalk connectivity to key destinations along the corridor. This analysis used the existing transit stops and sidewalk data to calculate a ratio of sidewalk completeness surrounding each stop. An eighth of a mile was used as a buffer for each stop to provide a more detailed sidewalk access score for individual bus stops.

While there are over 80 transit stops across Capital Boulevard and the surrounding study area, not all stops are equally accessible to pedestrians. "First-and-last mile" connections are used to describe the beginnings and endings of trips where pedestrians are walking to/from a transit stop to their end destination. For a study area this size, the travel profile analyzed the pedestrian connectivity within a 1/8th mile radius around each stop.



Well Connected Stops	Sidewalks exist on both sides of many or all the streets within 1/8th of a mile of the stop
Moderately Connected Stops	Sidewalks exists on both sides of some of the streets or only on one side of the street within 1/8th of a mile of the stop
Poorly Connected Stops	Sidewalks are intermittent or do not exist on either side of the streets within 1/8th of mile of the stop


Plantation Point
Triangle Town Center
Towne Square I & II
Capital Crossing
Mini City
Ashton Square
Tarrymore Square
Emporium Plaza
Starmount Shopping Center
Stony Brook
Pedestrian-Transit Access
Poor
Moderate
Good
Existing Sidewalk

Bicycle Level of Stress Analysis

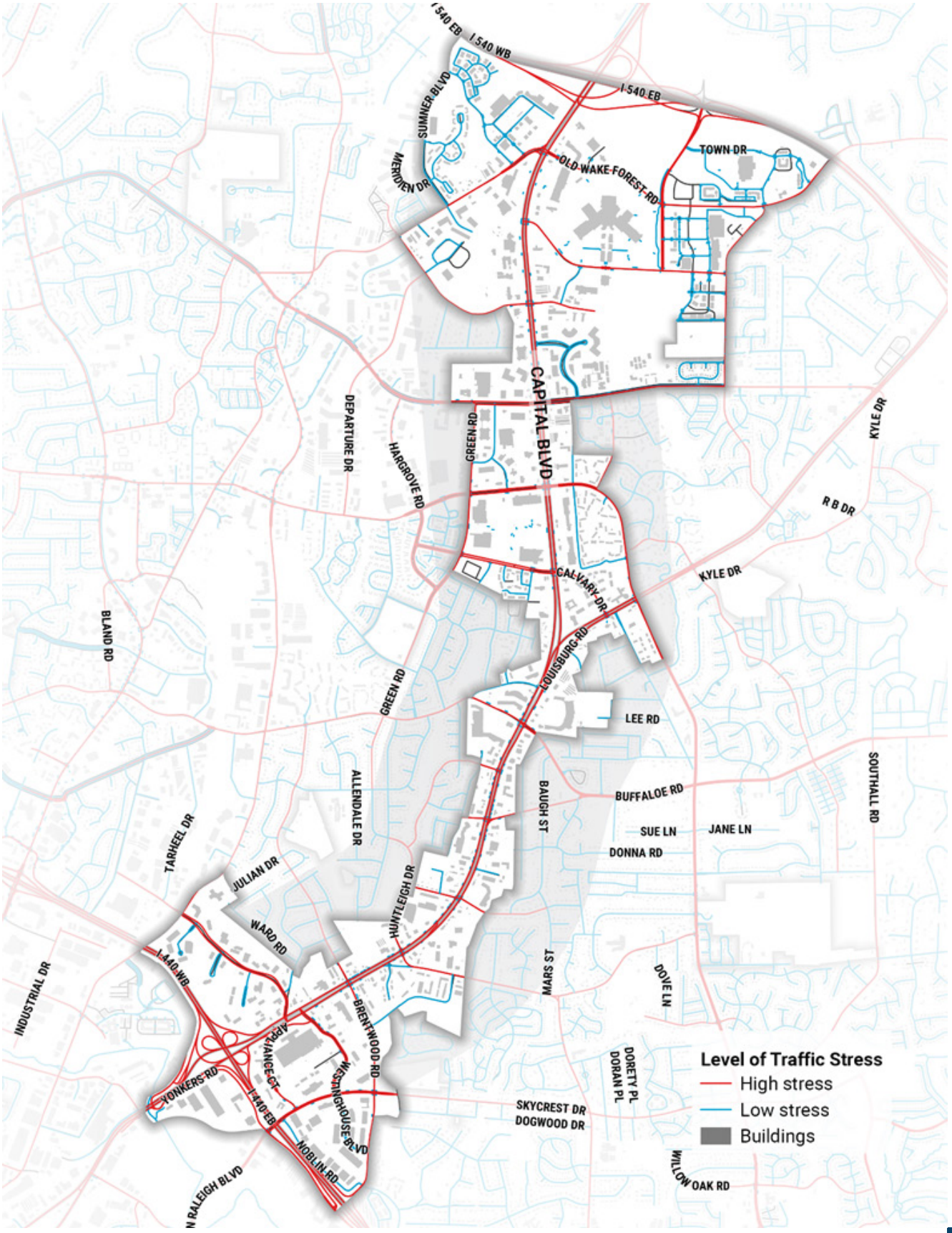
Level of Traffic Stress (LTS) is a qualitative indicator of the stress felt by a bicyclist based on the characteristics of the bicycle facility and adjoining street. This analysis includes a variety of factors including the speed limit, the type of street, the existing bicycle and pedestrian infrastructure (i.e., shared use paths, bike lanes, etc.), and the number of travel lanes.

Two classifications were used to describe the area's level of stress. "Low Stress" indicates a more comfortable riding environment that is appropriate for most ages and abilities. These streets are characterized by lower traffic speeds (30 mph or less) and two or three travel lanes.

"High Stress" indicates riding environments that are less comfortable and potentially unsafe for bicycle traffic. Streets that are only fitting for the most advanced levels of bicyclists—those who identify as "highly confident" riders—are considered "High Stress". Speeds on these streets exceed 30 mph, and there are multiple travel lanes in each direction.

Some high stress streets are not suitable for bicycle traffic at all due to a lack of dedicated bicycle facilities, dangerous intersections, and high traffic volumes. Capital Boulevard and Louisburg Road are generally not suitable for cycling within the study area.

While LTS is not necessarily reflective of all cyclists' experience on each segment, it serves as a basic measure of how the street network supports mobility for people on bicycles. The map on page 27 illustrates the stress scores for streets within the study area.

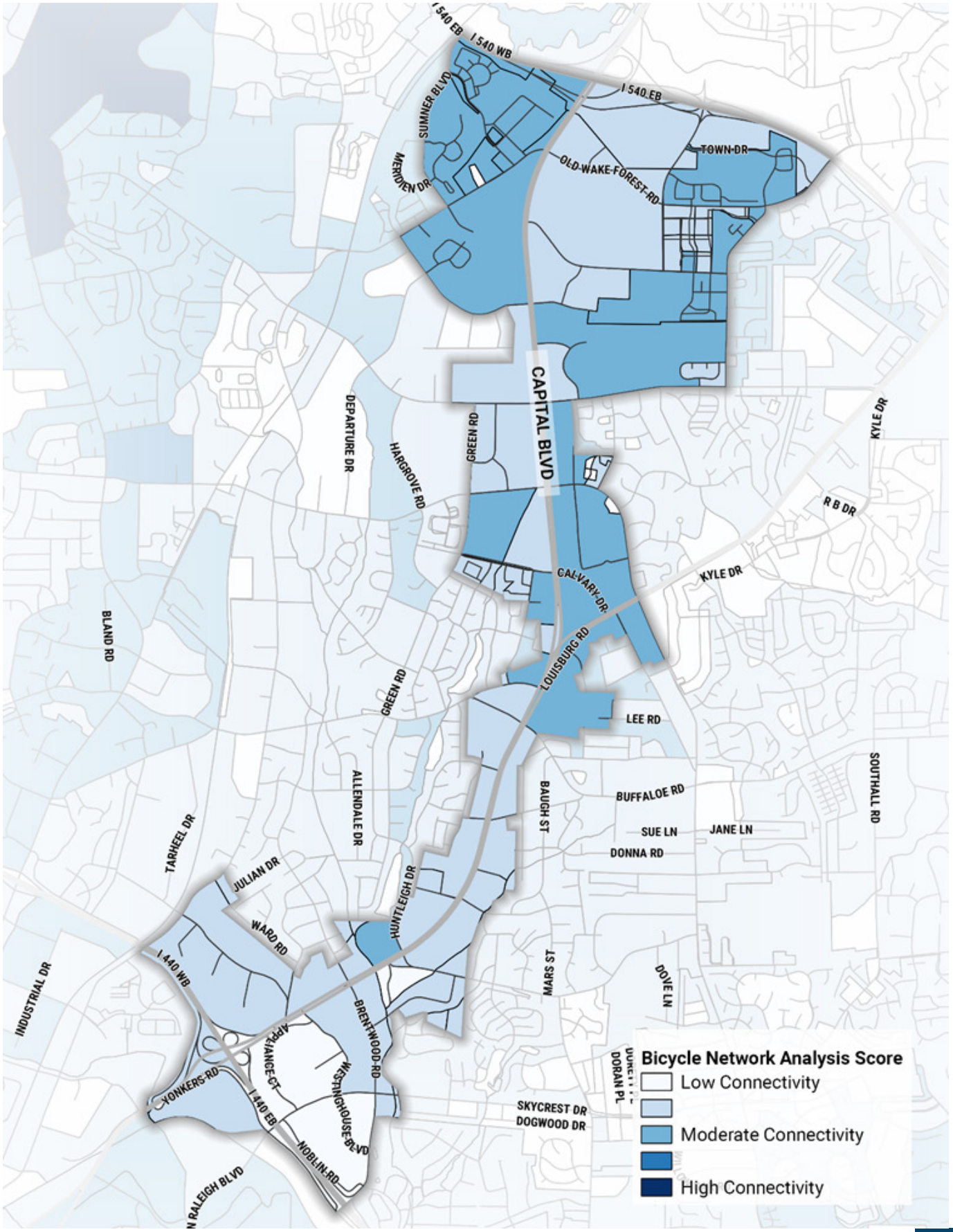

I-540 EB
I-540 WB
I-540 EB
SUMNER BLVD
MERIDIEN DR
OLD WAKE FOREST RD
TOWN DR
CAPITAL BLVD
DEPARTURE DR
HARGROVE RD
GREEN RD
KYLE DR
R B DR
KYLE DR
CALVARY DR
LOUISBURG RD
BLAND RD
GREEN RD
LEE RD
SOUTHALL RD
BUFFALOE RD
BAUGH ST
SUE LN
JANE LN
DONNA RD
ALLENDALE DR
TARHEEL DR
JULIAN DR
WARD RD
HUNTLEIGH DR
I-440 WB
MARS ST
DOVE LN
INDUSTRIAL DR
BRENTWOOD RD
APPLIANCE CT
YONKERS RD
I-440 EB
WESTINGHOUSE BLVD
NOBLIN RD
SKYCREST DR
DOGWOOD DR
DORETY PL
DORAN PL
WILLOW OAK RD
N RALEIGH BLVD
Level of Traffic Stress
High stress
Low stress
Buildings

Bicycle Connectivity

A bicycle connectivity analysis was conducted within the study area along the Capital Boulevard corridor. This analysis—Bicycle Network Analysis (BNA)— measures connectivity of a community's existing transportation network to key destinations within a study boundary from the bicyclists' perspective.

The BNA summarizes the number and types of destinations available in each census block, including population, opportunities (jobs and education), core services, recreation, retail, and transit. Pairing this information with the knowledge of which census blocks are connected by streets identified as low-stress, the BNA tool calculates a score for each census block by comparing the number and type of reachable destinations on the low-stress bicycle network to the destinations accessible by car within the same distance.

The BNA tool was used to illustrate connectivity along the corridor and can be used to compare how recommended bikeway changes could increase overall bicycle network connectivity and access. This information provides valuable guidance for strategic implementation and facility selection. The following map provides the results of the BNA connectivity scores for the census blocks along the corridor.


I 540 EB
I 540 WB
I 540 EB
SUMNER BLVD
MERIDIEN DR
TOWN DR
OLD WAKE FOREST RD
CAPITAL BLVD
DEPARTURE DR
HARGROVE RD
GREEN RD
KYLE DR
R B DR
KYLE DR
CALVARY DR
LOUISBURG RD
BLAND RD
GREEN RD
LEE RD
SOUTHALL RD
BUFFALOE RD
BAUGH ST
SUE LN
JANE LN
DONNA RD
ALLENDALE DR
TARHEEL DR
JULIAN DR
WARD RD
HUNTLEIGH DR
I 440 WB
INDUSTRIAL DR
MARS ST
DOVE LN
BRENTWOOD RD
APPLE CHANGE CT
YONKERS RD
I 440 EB
WESTINGHOUSE BLVD
NOBLIN RD
SKYCREST DR
DOGWOOD DR
DORAN PL
N RALEIGH BLVD
Bicycle Network Analysis Score
Low Connectivity
Moderate Connectivity
High Connectivity

Transit

Capital Boulevard is served by a number of transit routes in the study area, including both GoRaleigh and GoTriangle service. The northern portion of the study area is crossed by multiple routes connecting to destinations east and west of the corridor. In addition, north-south mobility is available parallel to the corridor on the east and west sides.

Numerous transit stops exist along Capital Boulevard, with varying degrees of amenities including covered shelters and benches. The concentration of commercial uses on Capital Boulevard makes it a draw for workers and shoppers travelling by transit, including individuals in households without access to a personal vehicle. Transit on the corridor also provides a connection between Downtown Raleigh and points north of I-540, such as the Town of Wake Forest.

GoRaleigh routes that serve the corridor include:

- 1 - Capital
- 23L - Millbrook Connector
- 24L - North Crosstown Connector
- 15L - Trawick Connector
- 25L - Triangle Town Center Connector

GoTriangle routes that serve the corridor include:

- 201 - North Raleigh-RTC
- WRX - Wake Forest-Raleigh Express

GoRaleigh provides paratransit service along the corridor and within the study area.

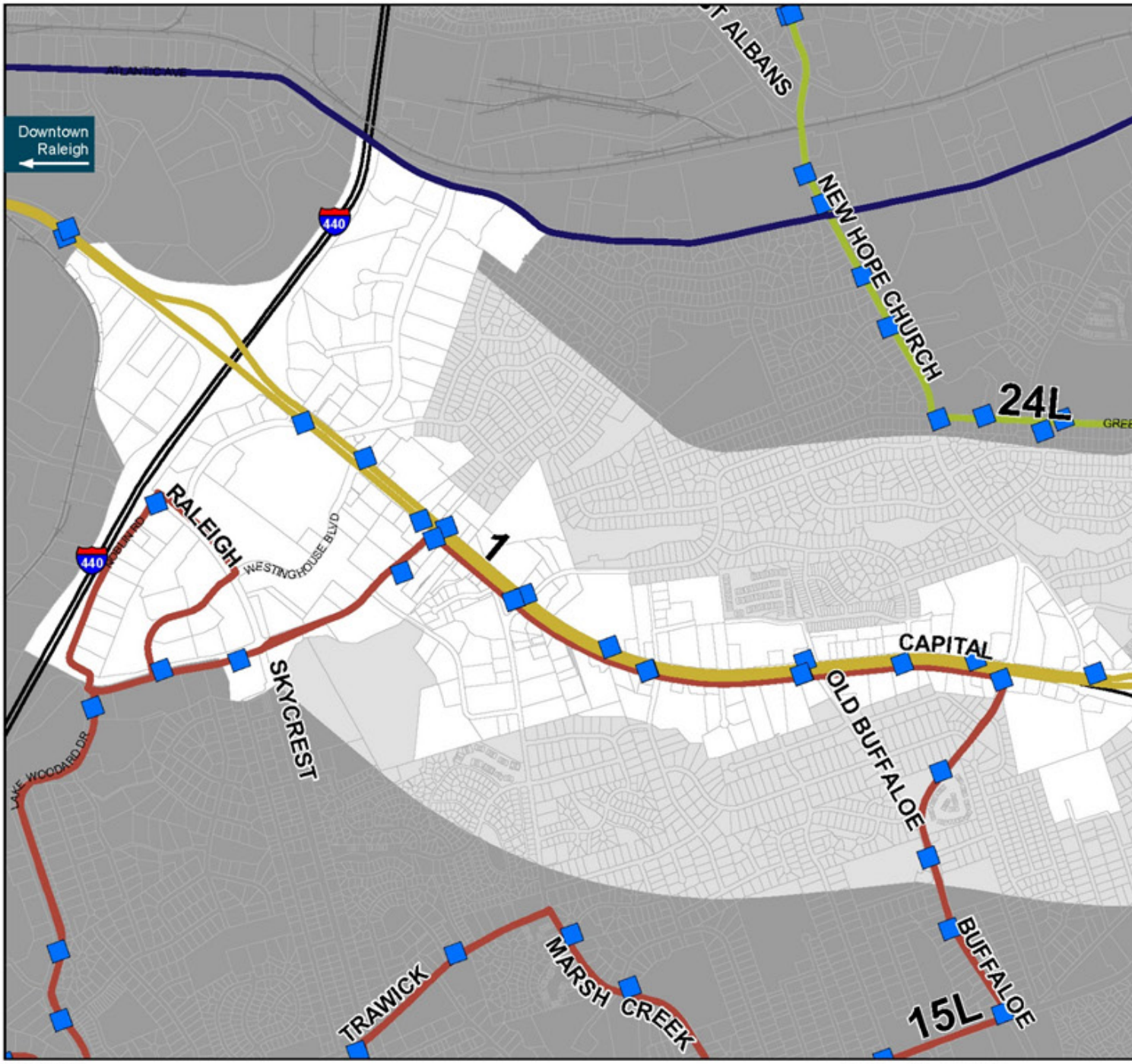
Potential BRT Stop Locations	Boardings by Location*	Percent of Boardings
Triangle Town Center	424	28%
Sumner Boulevard	36	2%
Old Forest Drive	20	1%
Spring Forest Road	177	12%
E Millbrook Road / N New Hope Road	146	10%
Calvary Drive	247	17%
New Hope Church Road / Buffaloe Road	74	5%
Old Buffaloe Road	72	5%
Starmount Drive	74	5%
Old Trawick Lane	168	11%
Highwoods Boulevard	56	4%

Future Transit

The Wake County Transit Plan envisions four "big moves" to connect the region, connect all Wake County communities, and enhance urban mobility. The four big moves include:

- Connect Regionally
- Connect All Wake County Communities
- Frequent, Reliable Urban Mobility
- Enhanced Access to Transit

The plan includes BRT service and infrastructure improvements along Capital Boulevard between downtown Raleigh and I-440. All-day frequent local bus service along the Capital Boulevard North Corridor between I-440 and Triangle Town Center is another component of the plan. Future planning efforts may identify adding enhanced transit service to the Capital Boulevard North Corridor, which could include infrastructure changes, improved bus stations, and other service changes.



Transit

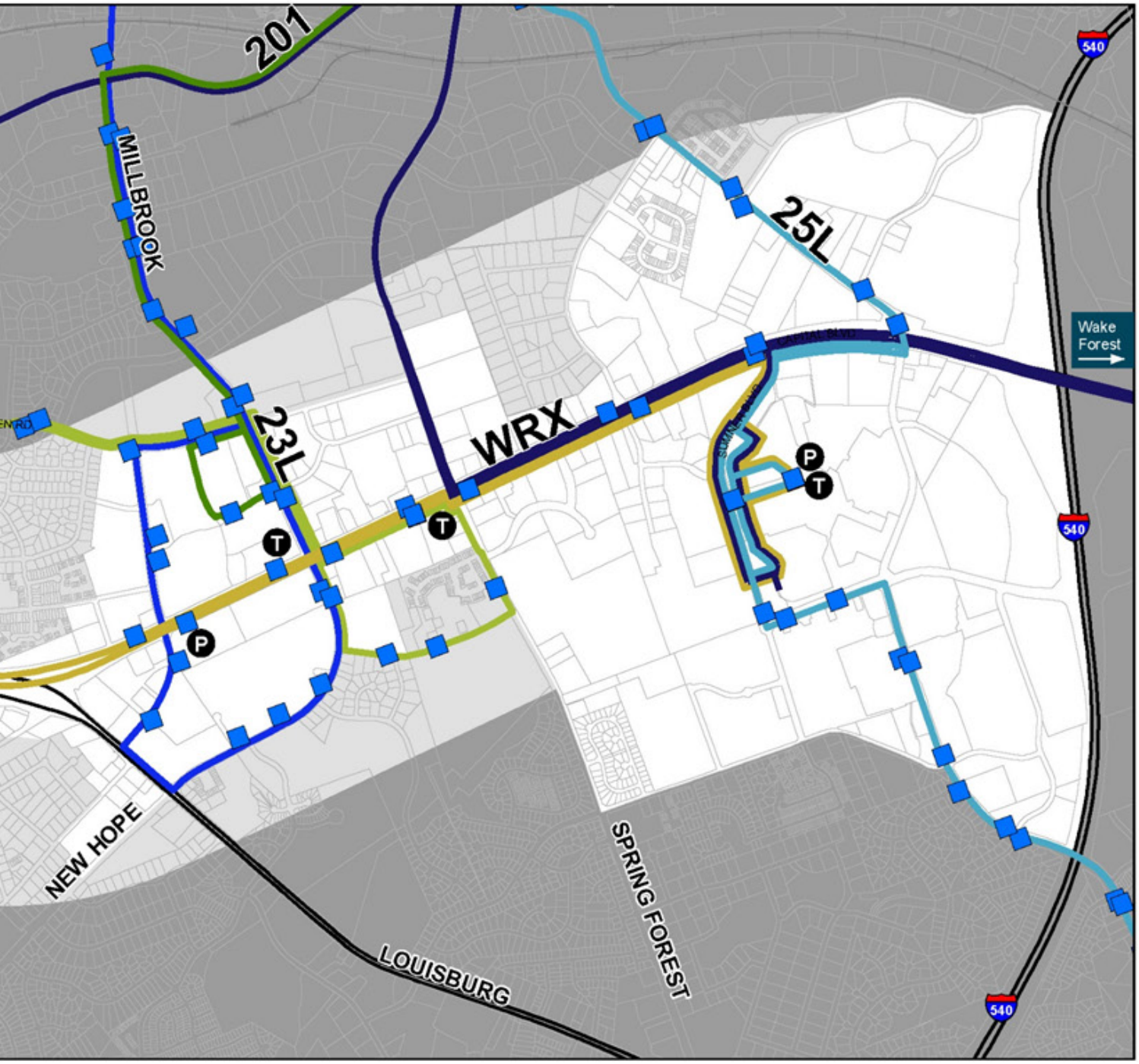
GoRaleigh Routes

- 1 - Capital
- 23L - Millbrook Connector
- 24L - North Crosstown Connector
- 15L - Trawick Connector
- 25L - Triangle Town Center Connector

GoTriangle Routes

- 201 - North Raleigh-RTC
- WRX - Wake Forest-Raleigh Express

- Transfer Point
- Park and Ride
- Transit Stops
- Railroads
- Study Area
- Area of Influence


201
MILLBROOK
23L
WRX
25L
Wake Forest
540
NEW HOPE
LOUISBURG
SPRING FOREST
N
0.25
0.5
0.75
1
Mile

Existing Plans

The Summary of Existing Plans report looked at all existing plans and their recommendations for the Capital Boulevard North area. One major existing planis the 2045 Metropolitan Transportation Plan (MTP). This comprehensive regional transportation plan is coordinated by two organizations charged with transportation decision-making in the Research Triangle Region: the Capital Area Metropolitan Planning Organization (CAMPO) and the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO). The most recent publication date for this plan is February 19, 2018.

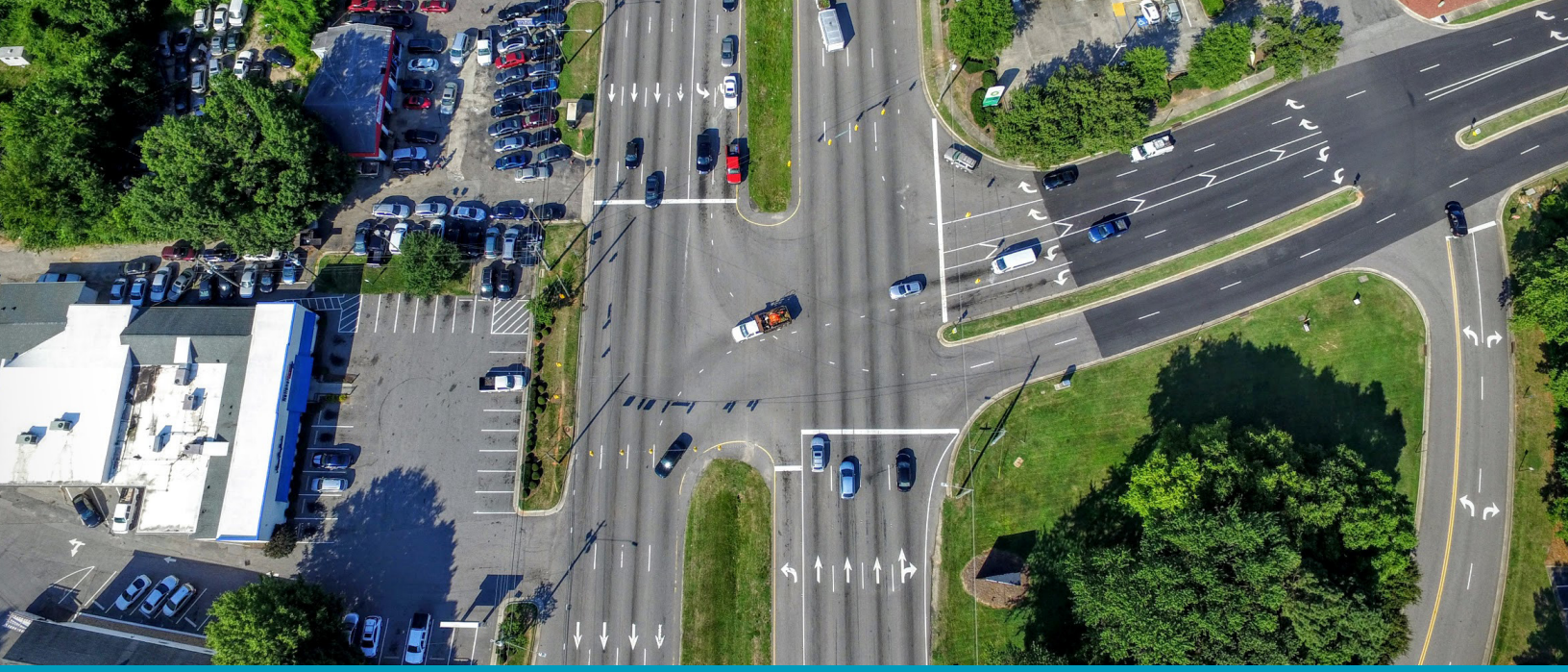
The MTP catalogs highway, public transportation, bicycle, pedestrian, and other transportation projects to be implemented over the next 25 years to address future travel demand and economic development. The multi-year process to arrive at an adopted MTP involves developing goals and objectives, alternatives, and a preferred set of options, all with numerous public involvement efforts.

Any project that is to be submitted for potential state or federal funding is expected to be in the MTP. The Capital Boulevard North Corridor study will use the MTP to guide and inform the study process. The study will assume that MTP projects will be implemented, but projects within the study area may be modified based on the more detailed analysis informing this corridor study, and to better meet the vision and goals for this study.

Projects from the MTP are used in the Triangle Regional Model (TRM) for forecasting future travel demand. Not all projects with the MTP are included in the TRM. Specific MTP 2045 projects that are within or surround the project study area are listed below:

- US 1 North from I-540 to Thornton Road (2025): proposed eight-lanes, widening, part of Comprehensive Transportation Project (CTP).
- New Hope Church Road from Green Road to Deana Lane (2025): proposed three-lanes, widening, part of Comprehensive Transportation Project (CTP).
- Old Wake Forest Road from Litchford Road/ Atlantic Boulevard to Capital Boulevard (2025): proposed four-lanes, widening, part of Comprehensive Transportation Project (CTP).
- Six Forks Extension from Atlantic Avenue to Capital Boulevard (2035): proposed four-lanes extending Six Forks Road to connect with Capital Boulevard- new roadway, part of Comprehensive Transportation Project (CTP).
- Capital Bus Rapid Transit (BRT): from Moore Square to Triangle Town Center.
- Commuter Transit Rail: from Apex to Youngsville running parallel to Atlantic Avenue.
- Sumner Boulevard extension from Old Wake Forest Road to Capital Boulevard (2035): proposed four-lanes at a new location.
- Marsh Creek/Trawick Median from Capital Boulevard to New Hope Road (2025): proposed three-lanes, turn lane.
- Atlantic Avenue Widening from Highwoods Boulevard to New Hope Church Road (2025): proposed to continue as four-lanes, transportation system management (TSM).
- Dixie Forest Road from Spring Forest Road to Atlantic Avenue (2025): proposed three-lanes, widening.
- Six Forks Road from Ramblewood Road to Lynn Road (2025): proposed six-lanes, widening.
- Skycrest Drive from Brentwood Road to New Hope Road (2035): proposed four-lanes, widening.
- Litchford Road from Old Wake Forest Road to Falls of Neuse Road (2035): proposed four-lanes, widening.
- N.W. Regional Center from Ruritania to Gresham Lake Road to I-540 (2035): proposed four-lanes, no existing lanes, widening.

- Spring Forest Road from Fox Road to US 401 (2035): proposed four-lanes, widening.
- Fox Road from Old Wake Forest Road to US 401 (2035): proposed four-lanes, widening.
- Fox Road from Spring Forest Road to Old Wake Forest Road (2045): proposed three-lanes, turn lane.
- East Coast Greenway: proposed off-road paved trail from Rocky Branch Trail near South Saunders and Jamaica Drive to near Windsor Drive and Forestville Road (Wake Forest).
- Brentwood Drive: recommends a bicycle only lane from New Hope Church Road to Raleigh Boulevard/Skycrest Drive.
- New Hope Church Road: recommended bicycle only lane from Brentwood Road to Capital Boulevard.
- Green Road: proposes a bicycle only lane from New Hope Church Road to Spring Forest Road.
- Buffaloe Road: proposed bicycle only lane from Buffaloe Road near Capital Boulevard to Horton Road.
- Beaverdam Creek Greenway: proposed off-road multi-use greenway trail from near Spring Forest Road to Neuse River.
- Spring Forest Road: recommended bicycle only lane from Sandy Forks Road to Green Road.



Capital Blvd North

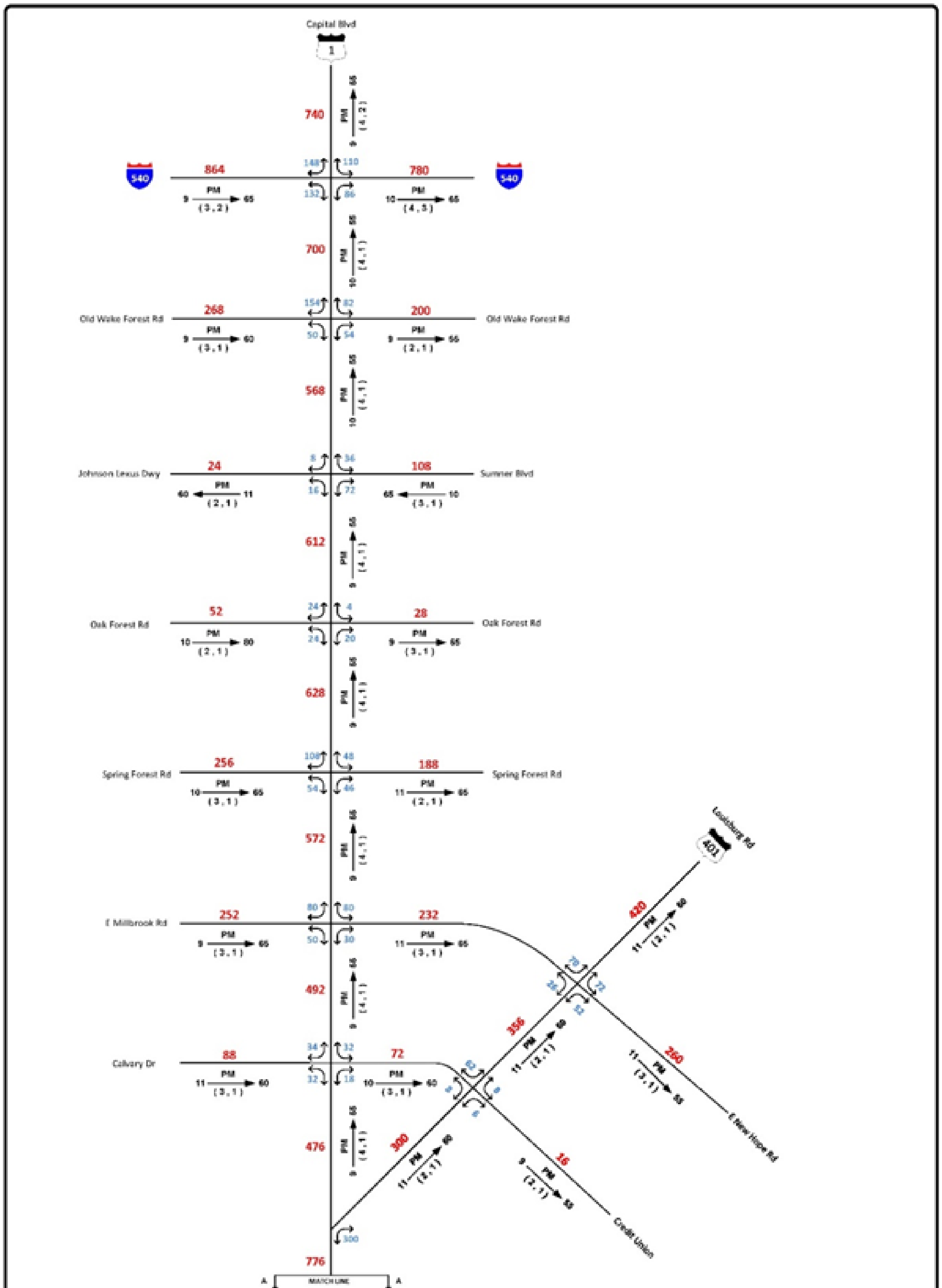
Corridor Study

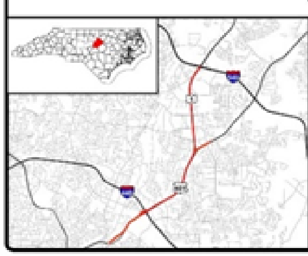
CITY PLANNING

Raleigh

Appendix A

Traffic Forecast





2018 Average Annual Daily Traffic

Sheet 1 of 2

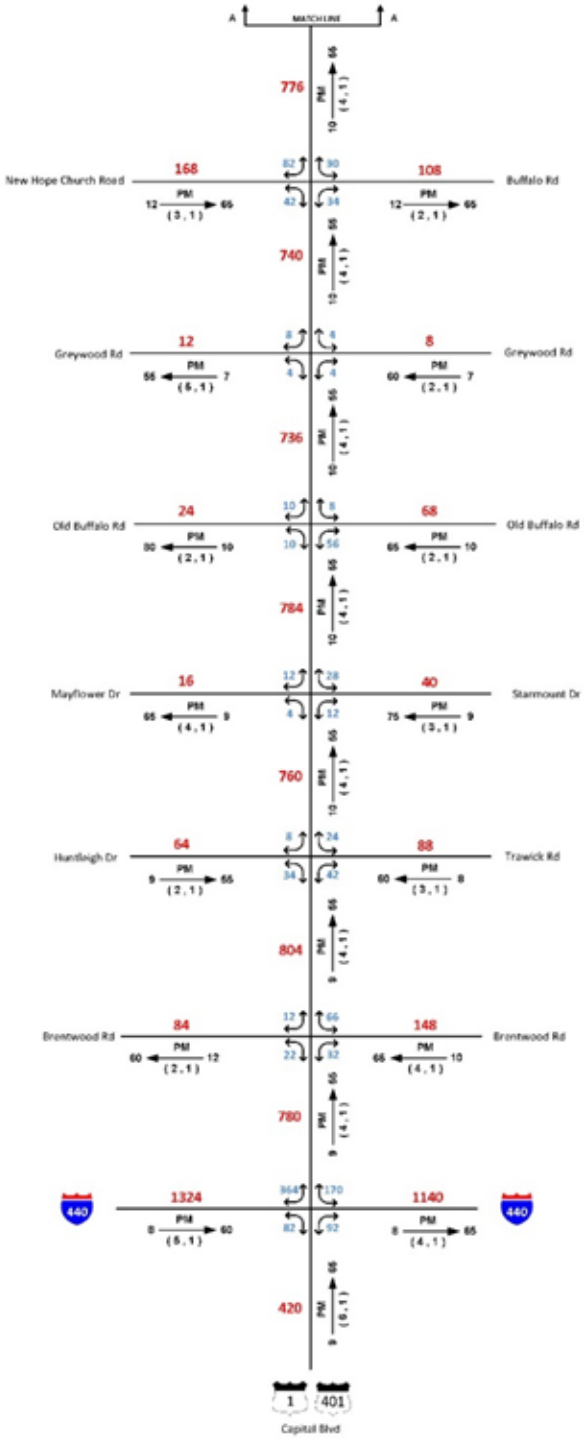
NO BUILD ALTERNATIVE

LEGEND

K —PM→ D (d,t)

###	Vehicles Per Day (VPD) in 100s	K	Design Hour Factor
###	Bidirectional VPD	PM	PM Peak Hour
1-	Less than 50 VPD	D	Peak Hour Directional Split
X	Movement Prohibited	→	Indicates Direction of D
—	Roadway	(d,t)	Duals, TT-STs (%)

TIP: N/A	**WBS:** N/A
COUNTY: Wake	**DIVISION:** 5
DATE: January 16, 2019	
PREPARED BY: WSP, USA	
LOCATION: US 401 / US 1 (Capital Blvd) between I-440 and I-540	
PROJECT: Corridor Study	



2018 Average Annual Daily Traffic

Sheet 2 of 2

NO BUILD ALTERNATIVE

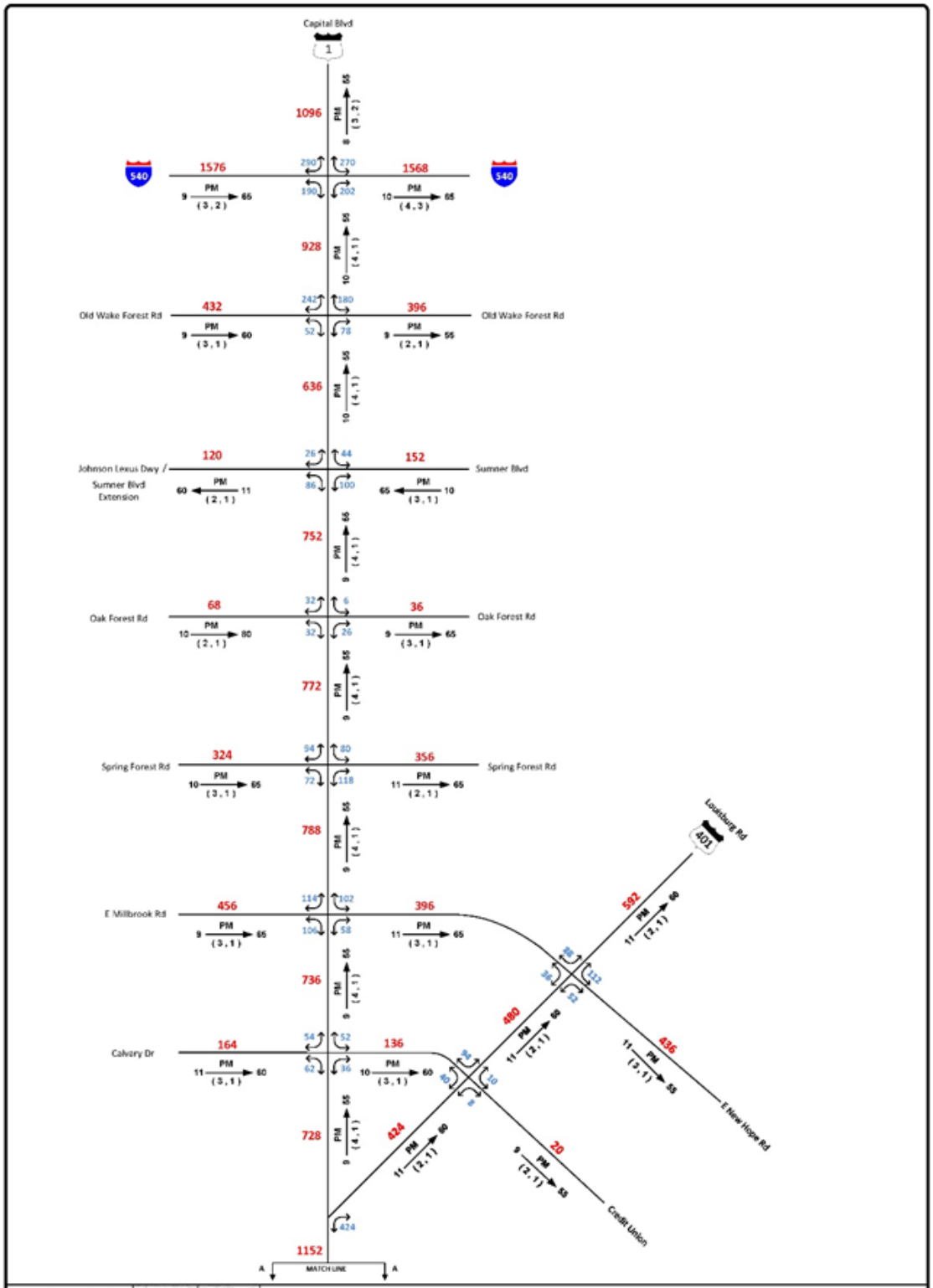
LEGEND

###	Vehicles Per Day (VPD) in 100s
###	Bidirectional VPD
1-	Less than 50 VPD
X	Movement Prohibited
——	Roadway

K PM (d,t) D

K	Design Hour Factor
PM	PM Peak Hour
D	Peak Hour Directional Split
→	Indicates Direction of D
(d,t)	Duals, TT-STs (%)

TIP: N/A	**WBS:** N/A
COUNTY: Wake	**DIVISION:** 5
DATE: January 16, 2019	
PREPARED BY: WSP, USA	
LOCATION: US 401 / US 1 (Capital Blvd) between I-440 and I-540	
PROJECT: Corridor Study	



2045 Average Annual Daily Traffic

Sheet 1 of 2

NO BUILD ALTERNATIVE

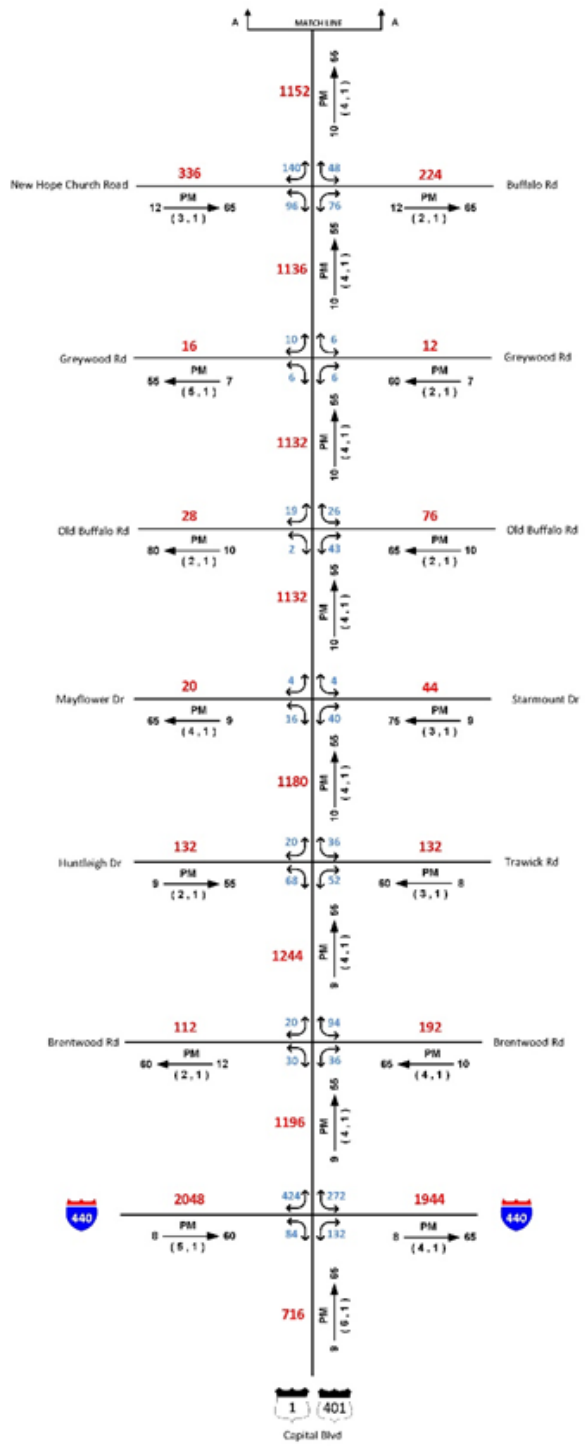
LEGEND

###	Vehicles Per Day (VPD) in 100s
###	Bidirectional VPD
1-	Less than 50 VPD
X	Movement Prohibited
——	Roadway

K PM (d,t) D

K	Design Hour Factor
PM	PM Peak Hour
D	Peak Hour Directional Split
→	Indicates Direction of D
(d,t)	Duals, TT-STs (%)

TIP: N/A	**WBS:** N/A
COUNTY: Wake	**DIVISION:** 5
DATE: January 16, 2019	
PREPARED BY: WSP, USA	
LOCATION: US 401 / US 1 (Capital Blvd) between I-440 and I-540	
PROJECT: Corridor Study	



2045 Average Annual Daily Traffic

Sheet 2 of 2 **NO BUILD ALTERNATIVE**

LEGEND

###	Vehicles Per Day (VPD) in 100s
###	Bidirectional VPD
1-	Less than 50 VPD
X	Movement Prohibited
	Roadway

K PM (d,t) D

K	Design Hour Factor
PM	PM Peak Hour
D	Peak Hour Directional Split
→	Indicates Direction of D
(d,t)	Duals, TT-STs (%)

TIP: N/A	**WBS:** N/A
COUNTY: Wake	**DIVISION:** 5
DATE: January 16, 2019	
PREPARED BY: WSP, USA	
LOCATION: US 401 / US 1 (Capital Blvd) between I-440 and I-540	
PROJECT: Corridor Study	

Appendix D:
Traffic Model Results

Capital Boulevard North Traffic Operations

Microsimulation Analysis (VISSIM) of the Preferred Alternative (Build Alternative 2)

Introduction

A traffic analysis for the Capital Boulevard North corridor was prepared to summarize the traffic operations for the future year (2045) no-build and three build alternatives. The three build alternatives analyzed were:

- Alternative 1: Urban Freeway (Boulevard)
- Alternative 2: Multiway Boulevard
- Alternative 3: Hybrid (Multiway Boulevard in the South and Urban Freeway to the North)

Based on the analysis, City of Raleigh selected Build Alternative 2 (Multiway Boulevard) as the preferred alternative. The purpose of this memorandum is to summarize the microsimulation analysis methodology, assumptions, and results for the Preferred Alternative for the Capital Boulevard North Corridor Study. The analysis was performed using VISSIM software.

Study Area

Both the local lanes and express lanes were included in the analysis. Similar to the previous analysis, the following intersections along the local lanes were analyzed in the AM and PM peak hours under 2045 future year conditions in both northbound and southbound directions:

- Capital Boulevard & Trawick Road/Huntleigh Drive
- Capital Boulevard & Starmount Drive/Mayflower Drive
- Capital Boulevard & Old Buffaloe Road
- Capital Boulevard & Greywood Drive
- Capital Boulevard & New Hope Church Road/Buffaloe Road
- Capital Boulevard & Calvary Drive
- Capital Boulevard & E Millbrook Road/New Hope Road
- Capital Boulevard & Spring Forest Road
- Capital Boulevard & Oak Forest Drive
- Capital Boulevard & Sumner Boulevard/Johnson Lexus Driveway
- Capital Boulevard & Old Wake Forest Road
- US 401/Louisburg Road & Calvary Drive
- US 401/Louisburg Road & New Hope Road

The express lanes along with the ramps connecting to local lanes were included in the analysis as well.

Roadway Configuration

Under the "multiway-boulevard" configuration for Capital Boulevard, the express lanes would include a three-lane expressway (two general purpose lanes, one exclusive bus lanes) and shoulders in each direction with a Jersey barrier in the center. The local lanes (non-expressway lanes) would include two 10-foot lanes in each direction with turn lanes as necessary for operations at the grade-separated intersections along the corridor. To provide access between the local lanes and express lanes of Capital Boulevard, slip ramps are provided along the corridor. For this analysis, slip ramp access points from the local lanes to the express lanes are provided at the following locations:

<u>Northbound Express Lane Access</u>

- North of Trawick Road
- North of Buffaloe Road

- North of Calvary Drive
- North of New Hope Road
- North of Spring Forest Road
- North of Sumner Boulevard

Southbound Express Lane Access

- South of Huntleigh Drive
- South of Mayflower Drive
- South of New Hope Church Road
- South of E Millbrook Road
- South of Spring Forest Road
- South of Oak Forest Drive
- South of Old Wake Forest Road

To provide access between the express lanes and local lanes of Capital Boulevard, slip ramps are provided along the corridor. For this analysis, slip ramp access points from the express lanes to the local lanes are provided at the following locations:

Northbound Local Lane Access

- South of Trawick Road
- South of Buffaloe Road
- South of New Hope Road
- South of Spring Forest Road
- South of Oak Forest Drive
- South of Old Wake Forest Road

Southbound Local Lane Access

- North of Huntleigh Drive
- North of New Hope Church Road
- North of Calvary Drive
- North of Millbrook Road
- North of Spring Forest Road

Note that the local lanes are proposed to be merged into express lanes near US 401 between New Hope Church Road/Buffaloe Road and Calvary Road to avoid weaving issues between the slip ramps and the ramps to US 401.

Access Management

Access to major east-west roadways along the corridor is provided using grade separated intersections along the local lanes. Due to the low volumes in the future year analysis, the following existing signalized intersections are assumed to be restricted to right-in/right-out (RIRO) only movements along the local lanes:

- Capital Boulevard & Starmount Drive/Mayflower Drive
- Capital Boulevard & Greywood Drive
- Capital Boulevard & Oak Forest Drive

For the purposes of the analysis, no U-turns were assumed along the northbound and southbound local lanes corridor. However, U-turns can be accommodated in Alternative 2 and evaluated further along in the project development.

Methodology

Volumes

The traffic volumes for the analysis were developed as described in the memorandum for the previous Synchro Build Alternative 2 analysis and were imported from Synchro model into the VISSIM model.

Analysis

All intersections and access ramp along express lanes, such as ramp merges and diverges, were analyzed using VISSIM microsimulation software. Exclusive bus lanes were not included in the analysis given they will operate largely independent of express and local lanes. The analysis was completed in accordance with the NCDOT Congestion Management Simulation Guidelines, dated October 1, 2016.

The following are the inputs given in VISSIM for the basic freeway and intersections.

For freeway segments, these inputs and typical values were used in the analysis:

- Peak hour traffic volumes for the basic segment and On-Ramp/Off-Ramp were directly imported from Synchro which were derived from the NCDOT IAU results. Additionally, some ramp volumes were manually adjusted in VISSIM to account for relocation of select ramps.
- Number of lanes are based on proposed future geometry.
- Terrain type is assumed to be "Rolling" for this area per the design criteria
- Lane width set to 10 feet on local lanes, and 11 feet on express lanes and side streets
- The truck percentages along future freeway segments were assumed to be 5%, based on the forecast
- Free Flow Speeds for the express lanes were set to 50 mph (45 mph speed limit) and 40 mph (35 mph speed limit) for the local lanes.

For intersections, these inputs and typical values were used in the analysis:

Optimized signal timings were imported into VISSIM from the previous Synchro Build Alternative 2. Additionally, timings at some intersections were manually adjusted in VISSIM as needed based on simulation.

Capacity Analysis Results

The section below discusses the analysis for express lanes as well as the study area intersections for the Preferred Alternative.

Express Lanes Analysis

The travel time for the northbound and southbound express lanes along Capital Boulevard were determined from the VISSIM analysis. Table 1 summarizes the VISSIM results for the Capital Boulevard express lanes in the northbound direction under the configurations and conditions associated with Build Alternative 2.

Table 1 2045 Build Alternative 2 Travel Time Results for Northbound Express Lanes

Segment #	From	To	Distance (miles)	Travel Time (seconds)	
				AM	PM
1	Trawick Road	Starmount Drive	0.344	30	38
2	Starmount Drive	Old Buffaloe Road	0.366	32	32
3	Old Buffaloe Road	Greywood Drive	0.215	18	18
4	Greywood Drive	Buffaloe Road	0.225	19	19
5	Buffaloe Road	Calvary Road	0.689	57	58

6	Calvary Road	New Hope Road	0.368	31	31
7	New Hope Road	Spring Forest Road	0.364	31	31
8	Spring Forest Road	Oak Forest Drive	0.429	35	36
9	Oak Forest Drive	Sumner Boulevard	0.356	29	30
10	Sumner Boulevard	Old Wake Forest Road	0.316	26	27

Table 2 displays the VISSIM results for the freeway analysis of the southbound Capital Boulevard freeway segments under the configurations and conditions associated with Alternative 2.

Table 2 2045 Build Alternative 2 Travel Time Results for Southbound Express Lanes

Segment #	From	To	Distance (miles)	Travel Time (seconds)	
				AM	PM
1	Old Wake Forest Road	Sumner Boulevard	0.322	80	27
2	Sumner Boulevard	Oak Forest Drive	0.358	30	30
3	Oak Forest Drive	Spring Forest Road	0.426	36	35
4	Spring Forest Road	E Millbrook Road	0.365	31	31
5	E Millbrook Road	Calvary Road	0.368	31	31
6	Calvary Road	New Hope Church Road	0.674	159	55
7	New Hope Church Road	Greywood Drive	0.233	41	18
8	Greywood Drive	Old Buffaloe Road	0.216	18	17
9	Old Buffaloe Road	Mayflower Drive	0.365	30	28
10	Mayflower Drive	Huntleigh Drive	0.333	28	26

Intersection Analysis

Table 3 summarizes the VISSIM intersection analysis results for all the study area intersections. Based on the analysis, with the proposed configuration, all the intersections along the Capital Boulevard local lanes are projected to operate at LOS E or better during the AM and PM peak hours in both the northbound and southbound directions.

Table 3 2045 Future Year Alternative 2 VISSIM Intersection Analysis Results Summary

Intersection	Northbound							Southbound						
	LOS		Delay		Approach	LOS		LOS		Delay		Approach	LOS	
	AM	PM	AM	PM		AM	PM	AM	PM	AM	PM		AM	PM
Capital Boulevard & Trawick Road/Huntleigh Drive	B	C	18.0	26.8	Eastbound	B	C	D	C	41.6	31.2	Eastbound	C	C
					Westbound	C	C					Westbound	B	C
					Northbound	C	C					Northbound	-	-
					Southbound	-	-					Southbound	F	D
Capital Boulevard & Starmount Drive/Mayflower Drive	A	B	8.0	15.6	Eastbound	-	-	B	A	14.5	7.5	Eastbound	D	E
					Westbound	D	D					Westbound	-	-
					Northbound	A	A					Northbound	-	-
					Southbound	-	-					Southbound	A	A
Capital Boulevard & Old Buffaloe Road	C	B	22.5	20.0	Eastbound	-	-	C	B	22.5	20.0	Eastbound	D	E
					Westbound	E	D					Westbound	-	-
					Northbound	B	B					Northbound	-	-
					Southbound	-	-					Southbound	B	A
Capital Boulevard & Greywood Drive/Driveway	-	-	-	-	Eastbound	-	-	A	B	9.9	10.0	Eastbound	D	C
					Westbound	-	-					Westbound	-	-
					Northbound	-	-					Northbound	-	-
					Southbound	-	-					Southbound	A	A
Capital Boulevard & New Hope Church Road/Buffaloe Road	C	C	21.5	33.8	Eastbound	C	E	C	C	21.5	33.8	Eastbound	C	E
					Westbound	D	D					Westbound	D	D
					Northbound	C	D					Northbound	-	-
					Southbound	-	-					Southbound	C	C
Capital Boulevard & Calvary Drive	B	B	17.2	14.6	Eastbound	A	A	E	D	64.0	41.2	Eastbound	C	C
					Westbound	A	A					Westbound	B	B
					Northbound	D	D					Northbound	-	-
					Southbound	-	-					Southbound	F	B
Capital Boulevard & Millbrook Road/New Hope Road	C	C	33.2	21.1	Eastbound	C	C	C	D	23.9	40.9	Eastbound	C	E
					Westbound	D	C					Westbound	B	D
					Northbound	E	D					Northbound	-	-
					Southbound	-	-					Southbound	D	D
Capital Boulevard & Spring Forest Road	C	C	30.5	23.6	Eastbound	D	B	C	C	26.2	28.8	Eastbound	C	D
					Westbound	D	D					Westbound	C	D
					Northbound	C	C					Northbound	-	-
					Southbound	-	-					Southbound	E	D
Capital Boulevard & Oak Forest Drive	B	A	13.2	7.1	Eastbound			B	B	12.9	18.3	Eastbound	C	D
					Westbound	F	E					Westbound	-	-
					Northbound	A	A					Northbound	-	-
					Southbound	-	-					Southbound	B	A
Capital Boulevard & Sumner Road/Johnson Lexus Driveway	D	D	40.3	54.4	Eastbound	D	E	E	D	55.8	36.5	Eastbound	D	C
					Westbound	D	E					Westbound	E	E
					Northbound	D	E					Northbound	-	-
					Southbound	-	-					Southbound	F	E
Capital Boulevard & Old Wake Forest Road	C	E	24.6	61.8	Eastbound	B	A	C	D	30.0	49.8	Eastbound	D	D
					Westbound	D	F					Westbound	D	D
					Northbound	D	E					Northbound	-	-
					Southbound	-	-					Southbound	E	F

Observations and Conclusions

The microsimulation analysis for the preferred alternative (Multiway Boulevard) for Capital Boulevard North Corridor was performed using VISSIM software under the future year conditions.

Based on the analysis, the northbound and southbound AM and PM peak hour travel times along Capital Boulevard local lanes and express lanes are projected to reduce by at least 69% and 86%, respectively, between the future year no-build and the preferred alternative. Table 4 summarizes the travel time comparison between the 2045 no-build and build operations.

Table 4 2045 Future Year Travel Time Comparison

Summary of MOEs for the Corridor	Existing Configuration				Local Lanes				Express Lanes			
	2045 No-Build (Synchro)				2045 Build Alternative 2 (VISSIM)				2045 Build Alternative 2 (VISSIM)			
	Northbound		Southbound		Northbound		Southbound		Northbound		Southbound	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Total Delay (seconds/vehicle)	1846.1	2987.4	3541.1	1963.8	228.9	278.8	322.7	318.1	142.8	154.7	318.4	130.5
Travel Time (seconds)*	2140.1	3281.4	3835.1	2257.8	606.9	656.9	700.7	696.2	308.1	320.0	483.6	295.8
Travel Time (minutes)*	35.7	54.7	63.9	37.6	10.1	10.9	11.7	11.6	5.1	5.3	8.1	4.9
Travel Time Difference (minutes)#	-	-	-	-	25.6	43.7	52.2	26.0	30.5	49.4	55.9	32.7
Travel Time Difference (%)#	-	-	-	-	72%	80%	82%	69%	86%	90%	87%	87%

* Corridor Travel Time is the sum of total delay and travel time along the entire corridor
# Corridor Saved Travel Time is the time saved between 2045 No-Build and 2045 Build conditions

Although the analysis results show travel time benefits, the corridor is projected experience heavy congestion south of US 401 and north of Old Wake Forest Road. This is due to the heavy demand of traffic to/from US 401 which is expected to cause significant weaving along the section between New Hope Church Road/Buffaloe Road intersection and US 401. It is likely that braided ramps will be required at this location to reduce the congestion; however, further investigation into the weaving volumes is required to determine the appropriate mitigations.

Additionally, significant weaving is anticipated between I-540 and Old Wake Forest Road in the southbound direction which could be mitigated by providing additional capacity at the grade separated intersection and appropriate turn lane capacity on the southbound ramps.

The traffic demand in the northbound direction south of Trawick Road is projected to be too high for the proposed express lane concept. Additional analysis is recommended to investigate the traffic operations at this location and the connectivity to the STIP I-5970 project that includes the I-440 interchange as well as the Highwood Boulevard, Westinghouse Boulevard and Brentwood Road intersections.

Based on the intersection capacity analysis, the study area intersections are projected to operate at an overall LOS E or better in both the AM and PM peak hour conditions. Table 4 summarizes the intersection analysis results for 2045 no-build Synchro analysis and Build Alternative 2 (VISSIM) analysis.

Table 5 2045 Future Year Traffic Analysis Results Summary

Intersection	2045 No-Build (Synchro)									2045 Build Alternative 2 Northbound (VISSIM)										2045 Build Alternative 2 Southbound (VISSIM)									
	LOS		Delay		Approach	LOS		Delay		LOS		Delay		Approach	LOS		Delay			LOS		Delay		Approach	LOS		Delay		
	AM	PM	AM	PM		AM	PM	AM	PM	AM	PM	AM	PM		AM	PM	AM	PM		AM	PM	AM	PM		AM	PM	AM	PM	
Capital Boulevard & Trawick Road/Huntleigh Drive	F	F	378.4	405.7	Eastbound	F	F	288.0	341.3	B	C	18.0	26.8	Eastbound	B	C	18.76	26.62		D	C	41.6	31.2	Eastbound	C	C	22.82	27.48	
					Westbound	F	F	364.5	442.5					Westbound	C	C	20.26	27.31						Westbound	B	C	14.02	31.24	
					Northbound	F	F	346.5	489.3					Northbound	C	C	25.93	30.96						Northbound	-	-	-	-	
					Southbound	F	F	411.5	311.9					Southbound	-	-	-	-						Southbound	F	D	184.05	54.55	
Capital Boulevard & Starmount Drive/Mayflower Drive	F	F	144.8	202.0	Eastbound	F	F	189.6	118.9	A	B	8.0	15.6	Eastbound				-		B	A	14.5	7.5	Eastbound	D	E	50.04	55.59	
					Westbound	F	F	301.5	281.9					Westbound	D	D	53.11	52.4						Westbound	-	-	-	-	
					Northbound	F	F	103.6	253.7					Northbound	A	A	2.73	6.66						Northbound	-	-			
					Southbound	F	F	176.5	132.7					Southbound	-	-	-	-						Southbound	A	A	7.08	5.09	
Capital Boulevard & Old Buffaloe Road	F	F	171.8	183.2	Eastbound	F	F	232.2	162.5	C	B	22.5	20.0	Eastbound	-	-	40.42	55.4		C	B	22.5	20.0	Eastbound	D	E	40.42	55.4	
					Westbound	F	F	226.6	262.1					Westbound	E	D	62.22	38.74						Westbound	-	-	62.22	38.74	
					Northbound	F	F	153.2	242.8					Northbound	B	B	16.13	16.14						Northbound	-	-	16.13	16.14	
					Southbound	F	F	182.4	101.2					Southbound	-	-	13.48	8.36						Southbound	B	A	13.48	8.36	
Capital Boulevard & Greywood Drive/Driveway	F	F	114.8	107.0	Eastbound	F	F	207.1	211.4	-	-	-	-	Eastbound	-	-	-	-		A	B	9.9	10.0	Eastbound	D	C	37.46	34.78	
					Westbound	F	F	146.8	158.6					Westbound	-	-	-	-						Westbound	-	-	-	-	
					Northbound	E	F	69.7	125.5					Northbound	-	-	-	-						Northbound	-	-	-	-	
					Southbound	F	F	150.4	82.7					Southbound	-	-	-	-						Southbound	A	A	5.99	9.84	
Capital Boulevard & New Hope Church Road/Buffaloe Road	F	F	339.8	367.0	Eastbound	F	F	264.8	454.7	C	C	21.5	33.8	Eastbound	C	E	33.26	61.36		C	C	21.5	33.8	Eastbound	C	E	33.26	61.36	
					Westbound	F	F	391.8	240.7					Westbound	D	D	38.2	50.67						Westbound	D	D	38.2	50.67	
					Northbound	F	F	294.5	467.8					Northbound	C	D	27.44	38.82						Northbound	-	-	27.44	38.82	
					Southbound	F	F	378.7	224.2					Southbound	-	-	23.29	23.29						Southbound	C	C	23.29	23.29	
Capital Boulevard & Calvary Drive	F	F	380.0	243.7	Eastbound	F	F	553.0	154.7	B	B	17.2	14.6	Eastbound	A	A	6.44	4.59		E	D	64.0	41.2	Eastbound	C	C	20.42	20.39	
					Westbound	F	F	92.5	91.9					Westbound	A	A	6.65	6.16						Westbound	B	B	15.71	13.38	
					Northbound	F	F	222.9	276.6					Northbound	D	D	47.66	42.59						Northbound	-	-	-	-	
					Southbound	F	F	559.3	259.3					Southbound	-	-	-	-						Southbound	F	B	107.51	11.56	
Capital Boulevard & Millbrook Road/New Hope Road	F	F	384.1	310.6	Eastbound	F	F	163.6	342.4	C	C	33.2	21.1	Eastbound	C	C	31.49	30.71		C	D	23.9	40.9	Eastbound	C	E	26.06	60.39	
					Westbound	F	F	589.5	261.3					Westbound	D	C	50.52	27.97						Westbound	B	D	16.02	50.88	
					Northbound	F	F	136.5	274.1					Northbound	E	D	62.12	39.28						Northbound	-	-	-	-	
					Southbound	F	F	505.5	349.2					Southbound	-	-	-	-						Southbound	D	D	52.55	50.44	
Capital Boulevard & Spring Forest Road	F	F	223.6	226.3	Eastbound	F	F	177.2	341.7	C	C	30.5	23.6	Eastbound	D	B	39.56	18.29		C	C	26.2	28.8	Eastbound	C	D	32.09	41.19	
					Westbound	F	F	311.3	173.1					Westbound	D	D	38.23	43.07						Westbound	C	D	24.11	41.19	
					Northbound	F	F	143.7	246.3					Northbound	C	C	31.38	21.58						Northbound	-	-	-	-	
					Southbound	F	F	245.7	147.1					Southbound	-	-								Southbound	E	D	72.27	51.42	
Capital Boulevard & Oak Forest Drive	E	E	64.1	65.4	Eastbound	F	F	107.4	128.3	B	A	13.2	7.1	Eastbound			-	-		B	B	12.9	18.3	Eastbound	C	D	34.07	41.52	
					Westbound	F	F	180.7	186.7					Westbound	F	E	83.36	61.75						Westbound	-	-	-	-	
					Northbound	C	F	32.2	81.9					Northbound	A	A	3.94	4.59						Northbound	-	-	-	-	
					Southbound	F	C	82.8	29.0					Southbound	-	-	-	-						Southbound	B	A	11.26	8.64	
Capital Boulevard & Sumner Road/Johnson Lexus Driveway	F	F	153.9	130.2	Eastbound	F	F	219.1	213.2	D	D	40.3	54.4	Eastbound	D	E	45.39	55.18		E	D	55.8	36.5	Eastbound	D	C	36.33	21.66	
					Westbound	F	F	160.7	146.0					Westbound	D	E	53.34	79.09						Westbound	E	E	72.15	55.91	
					Northbound	F	F	105.9	94.8					Northbound	D	E	52.44	55.7						Northbound	-	-			
					Southbound	F	F	180.0	155.5					Southbound	-	-	-	-						Southbound	F	E	80.27	66.59	
Capital Boulevard & Old Wake Forest Road	F	F	286.9	205.3	Eastbound	F	F	117.4	217.8	C	E	24.6	61.8	Eastbound	B	A	17.52	4.09		C	D	30.0	49.8	Eastbound	D	D	35.33	40.2	
					Westbound	F	F	293.0	199.9					Westbound	D	F	35.36	369.02						Westbound	D	D	37.35	51.07	
					Northbound	F	F	272.8	274.6					Northbound	D	E	48.28	76.37						Northbound	-	-	-	-	
					Southbound	F	F	343.8	142.0					Southbound	-	-	-	-						Southbound	E	F	75.24	91.62	

Appendix E:
Market Analysis

CAPITAL BOULEVARD NORTH

MARKET ANALYSIS
NOVEMBER 2018

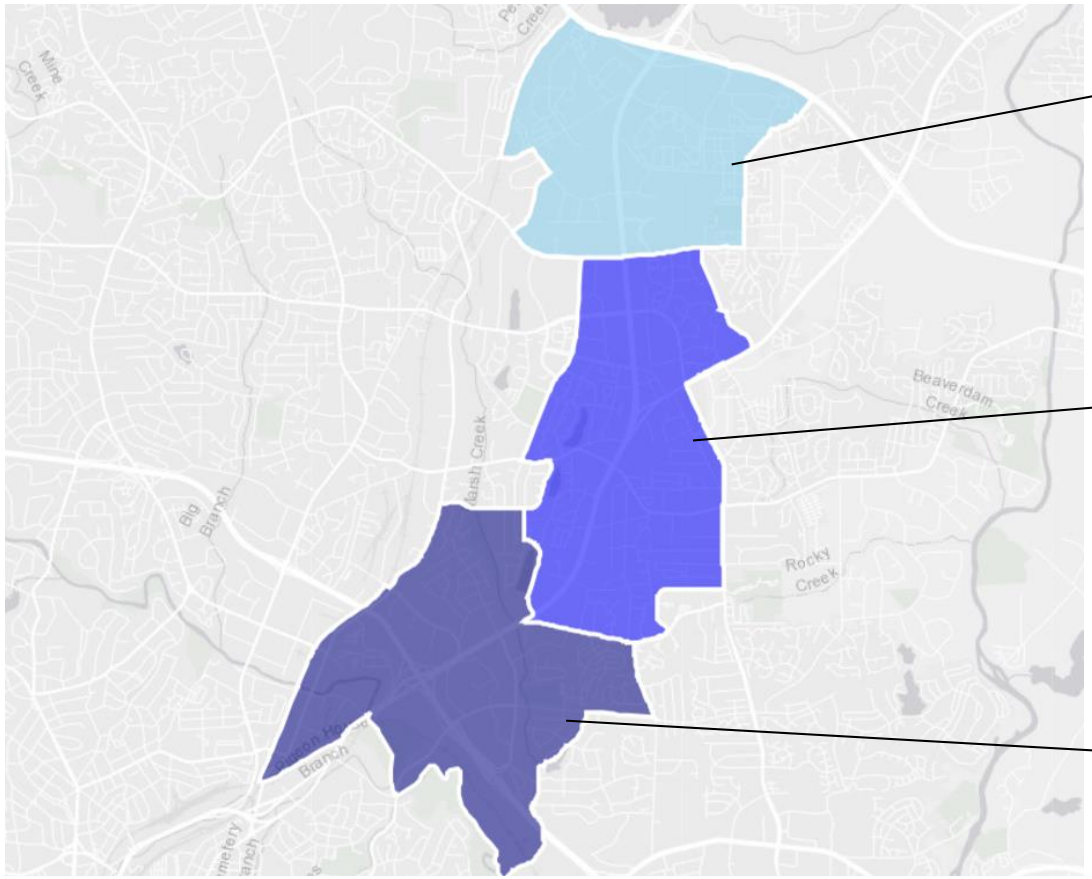
HR&A Analyze. Advise. Act.

HR&A Advisors, Inc.

Table of Contents

Socioeconomic Conditions

HR&A assessed market potential along Capital Boulevard in each of three districts that have unique demand drivers and development outlooks.



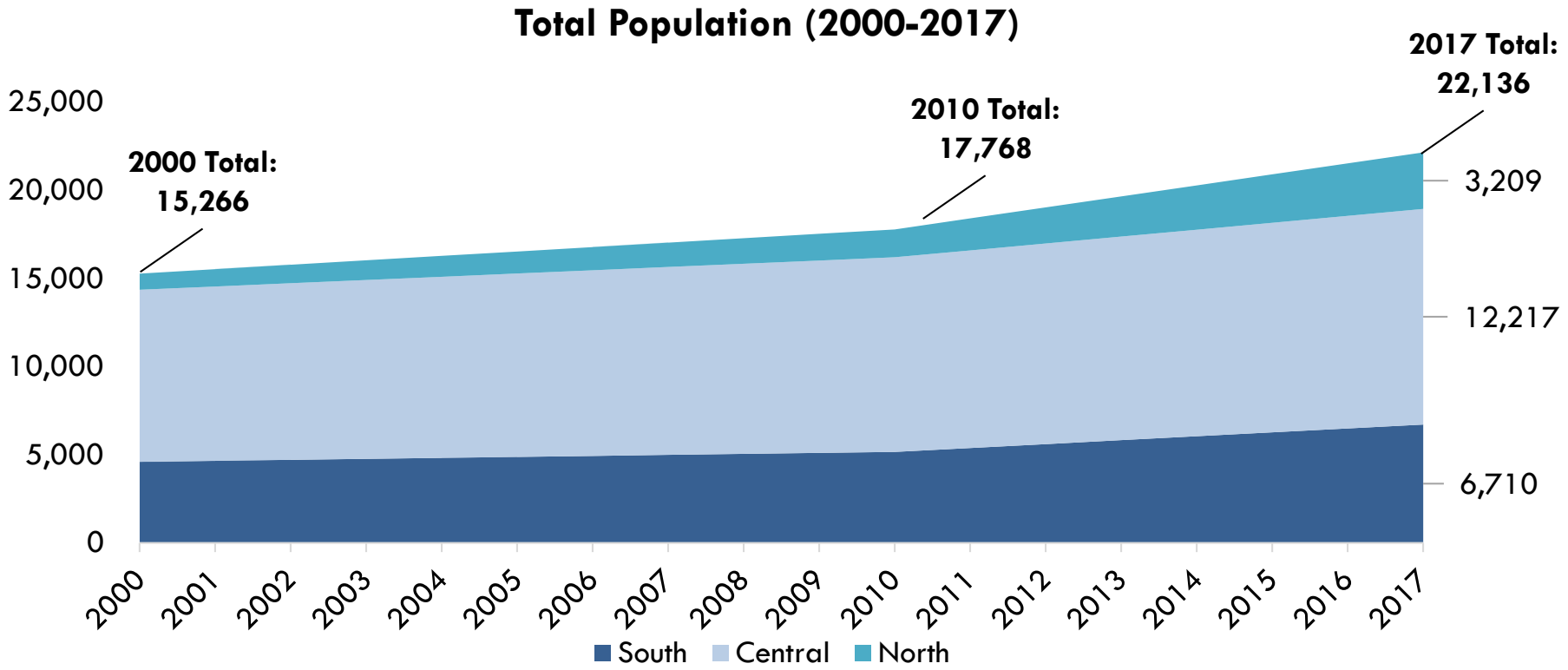
NORTH DISTRICT
Spring Forest Road to 540

CENTRAL DISTRICT
Tarwick Road to Spring Forest Road

SOUTH DISTRICT
Crabtree Creek to Tarwick Road

For the purposes of analysis, WSP and HR&A divided the Capital Boulevard North area of influence into three distinct subdistricts. The **South District**, closest to Downtown, is the most commercial and industrial, with a growing presence of high-density residential south of I-440. The **Central District** largely consists of auto-oriented retail along Capital Blvd and surrounding low-density residential development. The **North District** is primarily commercial, with residential and mixed-use growth emerging around Triangle Town Center.

The Corridor has experienced a significant uptick in population since 2010 in comparison to the decade prior due to increased multifamily development.

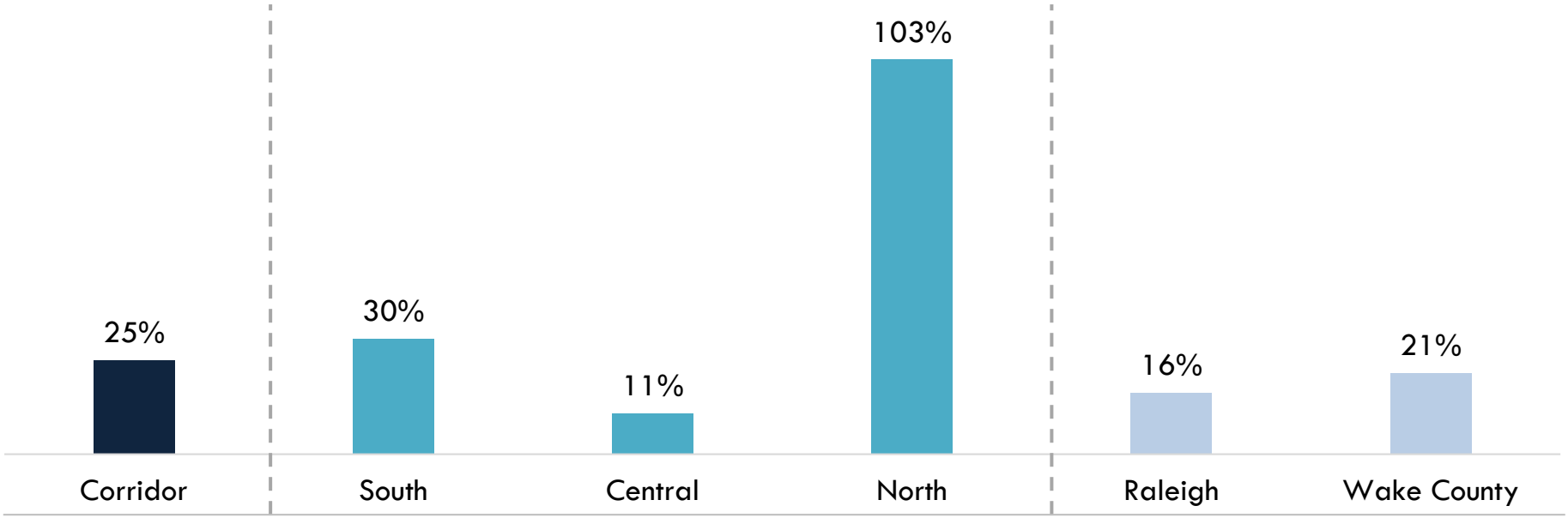


The Corridor experienced steady population growth between 2000 and 2010, increasing by 16%. Growth began to accelerate in 2010, with the Corridor's population increasing by 25% in only seven years. This owes primarily to the increasing prevalence of multifamily housing development in the study area. Multifamily unit growth of over 1,300 units in the seven years since 2010 has already exceeded the number of units delivered from 2000 to 2010 (1,240 units). This growth was concentrated in the South and North Districts, which accounted for just 36% of the Corridor's population in 2000, but totaled 45% of the Corridor's population in 2017.

Source: ESRI Business Analyst

Since 2010, the Corridor's population has grown by 25%—faster than both Raleigh and Wake County—with the fastest rate of growth in the North.

Annual Population Growth, Total and Percentage (2010 - 2017)

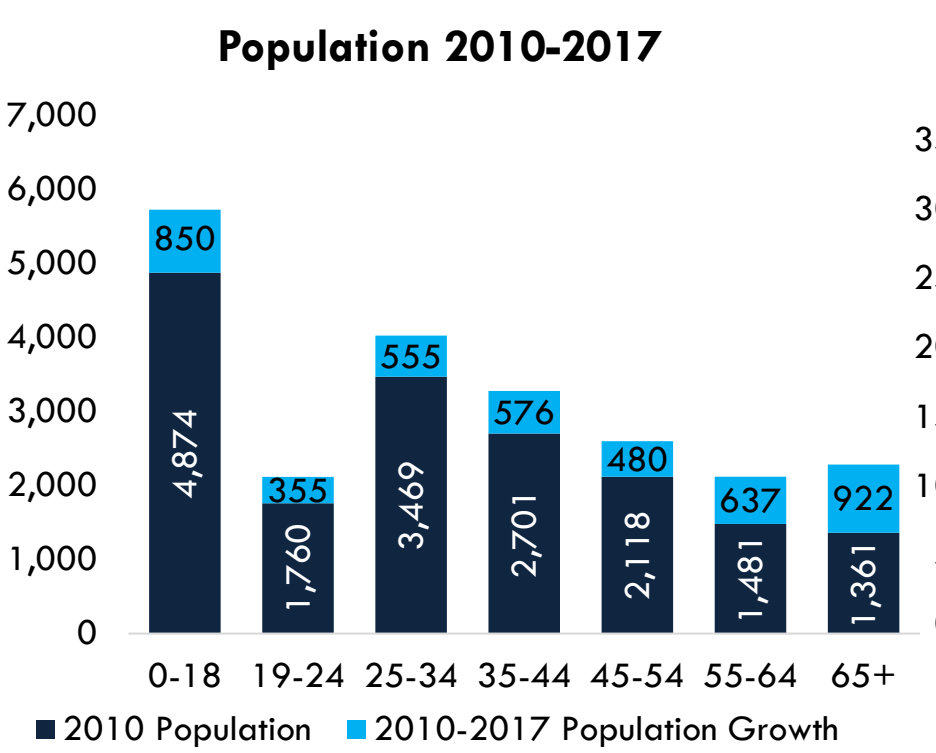


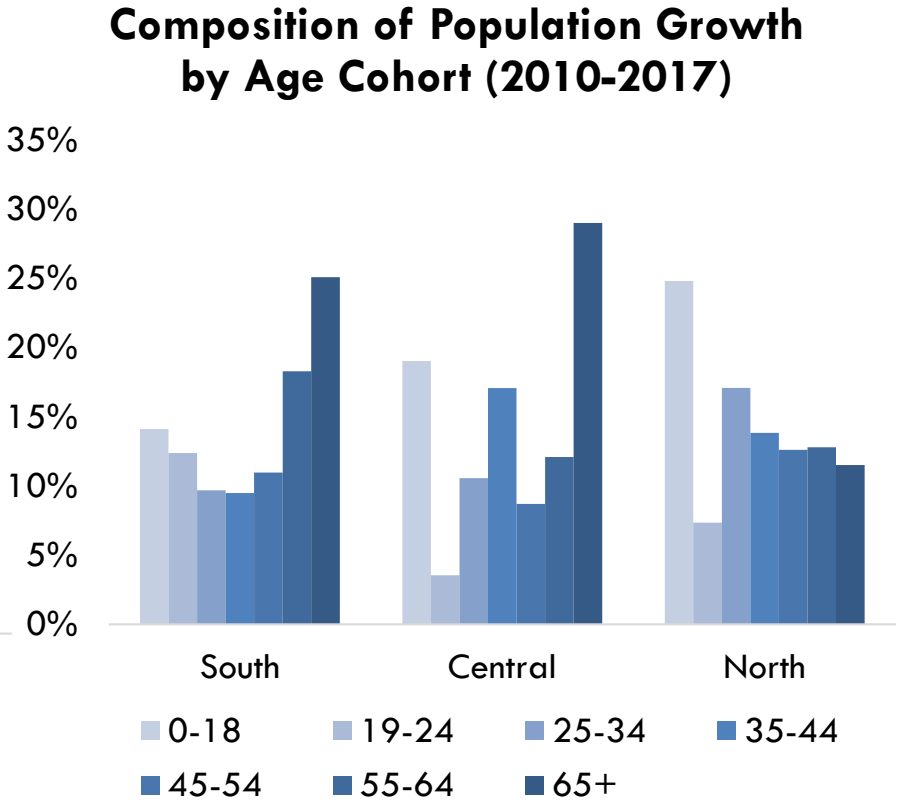
	Corridor	South	Central	North	Raleigh	Wake County
2010-17 Change	4,368	1,555	1,184	1,629	65,196	191,643

The faster growth of the Corridor is due in part to a post-recession regional shift that saw increased interest in locating closer to urban centers to access more urban amenities. This shift led to amplified development activity that both accommodated and further attracted new residents. The North District grew the most, and doubled its population from between 2010 and 2017. Of the 1,555 units added in the South District, 81% of the growth is accounted for in the southwest quadrant of the I-440/Capital Boulevard interchange where new multifamily development occurred. Each district along the Corridor added over 1,000 new residents since 2010.

Source: ESRI Business Analyst

Consistent with other outer-ring urban communities, the Corridor's population growth has been driven by families and empty nesters.

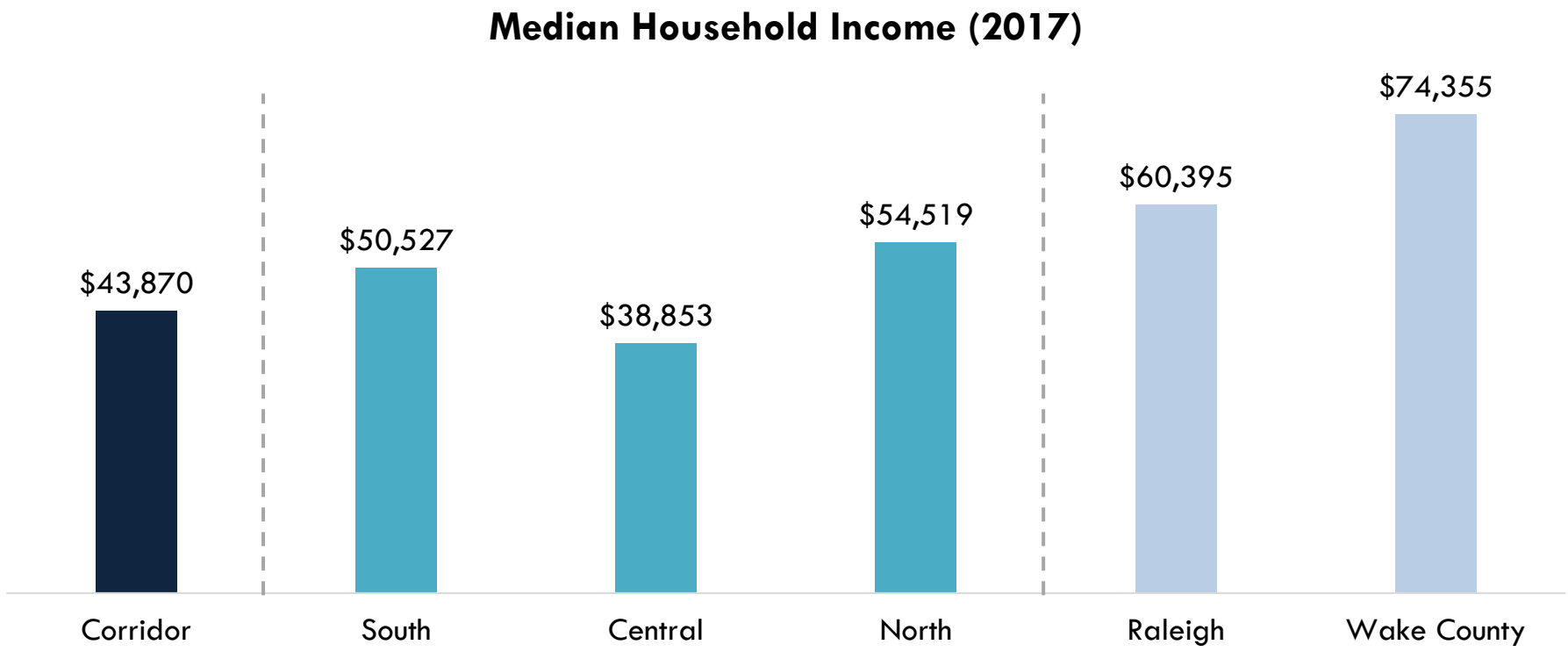




While the Corridor's population is largely comprised of households with school-aged children, empty nesters have driven a significant share of recent population growth. Older populations gravitated towards the South and Central Districts, while households with schooled-aged children accounted for the majority of growth in the North District. As transit-connected development continues along the Corridor it will attract both young worker and empty nester populations that seek decreased dependence on cars and greater access to convenient urban amenities.

Source: ESRI Business Analyst

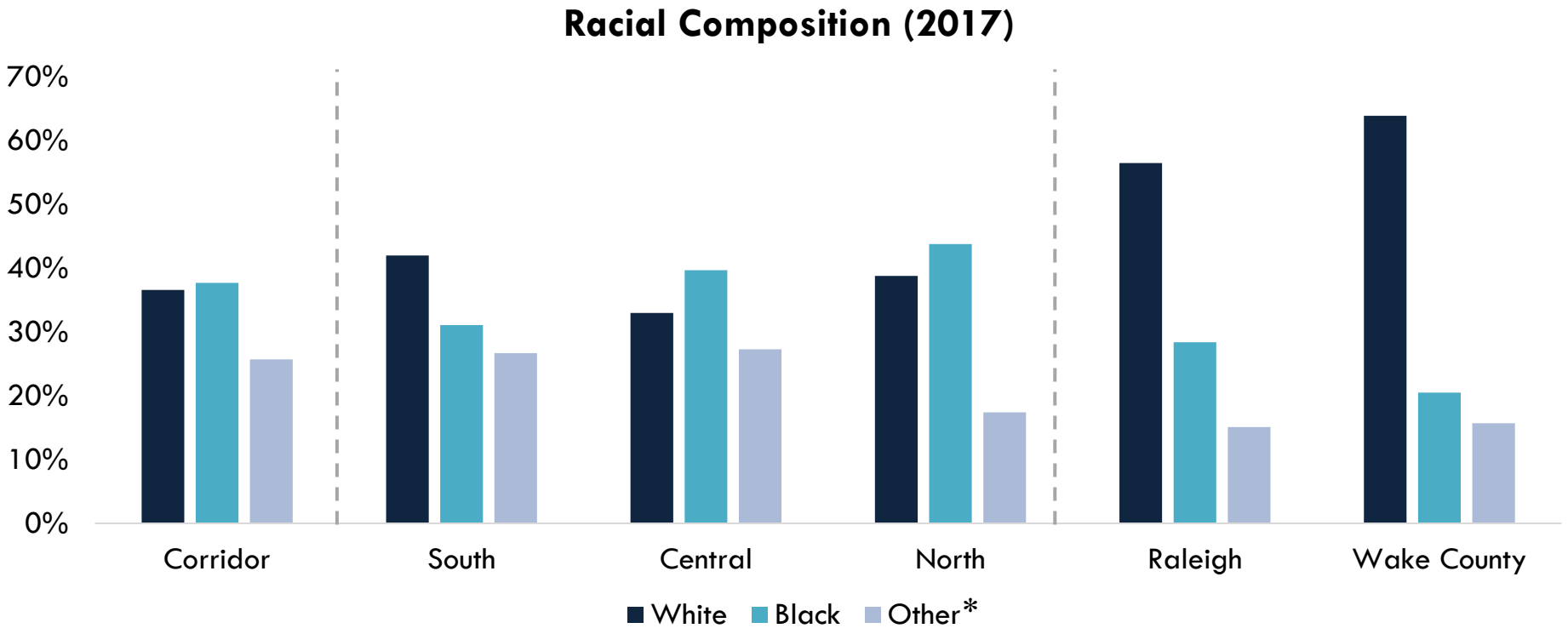
Median household incomes in the Corridor are below the city's, with the difference from Wake County even more pronounced.



The median household income of the Corridor is below both the City of Raleigh and Wake County. In a regional context, the Corridor's housing stock, access to major highways, and proximity to Downtown Raleigh make it an appealing option for new residents with a range of incomes. There is risk that current residents with moderate incomes will be susceptible to displacement. As the area develops, ensuring Capital Boulevard remains home to a mixed-income community will not only benefit the region, but will also support the diversity of local business that thrive along the Corridor today.

Source: ESRI Business Analyst

With a 65% non-white population, the Corridor is a more diverse area within the majority white region.



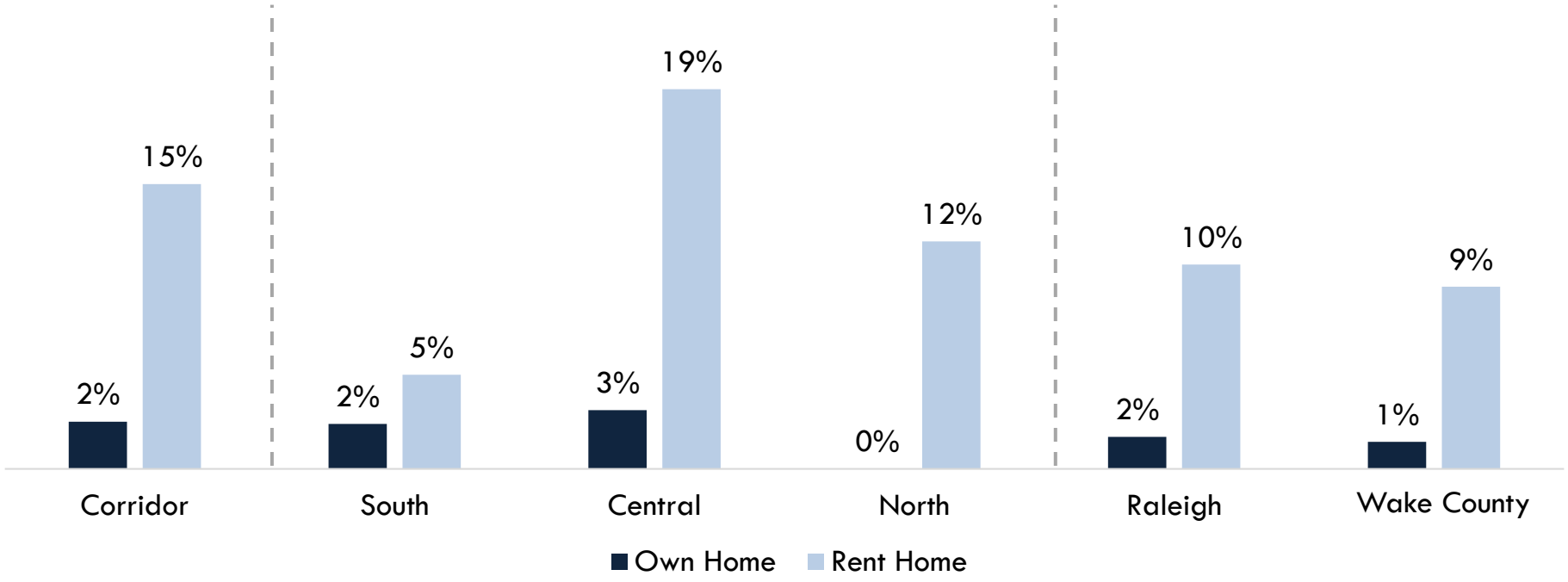
Unlike the City of Raleigh and Wake County, the Corridor is a majority minority area. Throughout the Corridor the plurality share of the population identifies as Black or African American and over 25% of the population identifies as belonging to the Hispanic or Latino ethnic group. With almost 2/3rd of the population being non-white, the Corridor represents a rich mixture of cultures and backgrounds in a growing region.

*Includes American Indian, Alaska Native, Asian, Native Hawaiian, Other Pacific Islander Alone, and Two or more races.

Source: ESRI Business Analyst

As a historically mixed-income community, many people who rent don't have access to a vehicle, highlighting the importance of public transit investments.

Households Without Vehicle Access by Tenure (2017)



Corridor-wide, homeowners are generally as secure in their ability to access a private vehicle as those living in Raleigh and in the rest of Wake County. However, a higher share of people who rent their homes do not have regular access to a vehicle. Capital Boulevard is well-served by public transit that grants accessibility to destinations such as Downtown Raleigh. Still, regional growth trends have led to more dispersed destinations, furthering dependence on cars to reach work and other destinations. This speaks to the continued need for robust transit investment along the Corridor.

Source: ESRI Business Analyst

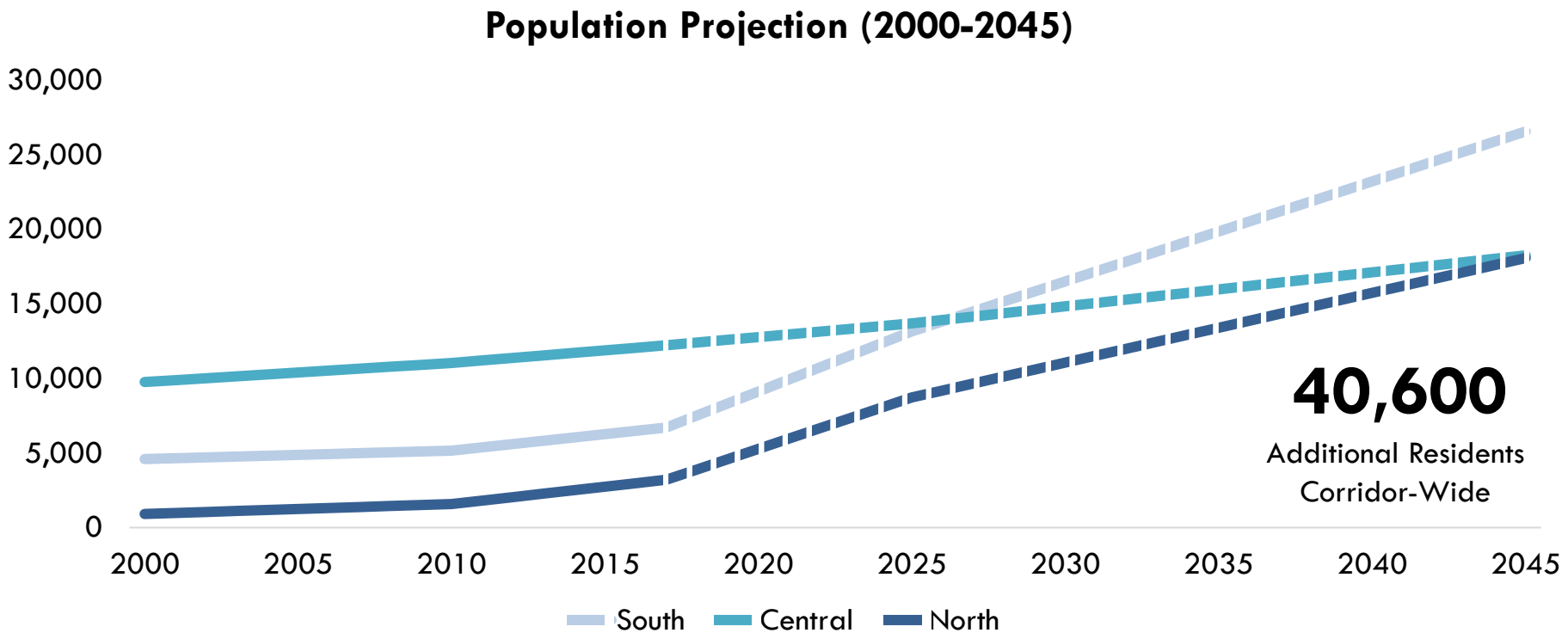
To anticipate future population and workforce growth, HR&A relied on publicly available projections made by the local Metropolitan Planning Agency.

This analysis utilizes population and workforce projects development by the North Carolina Capital Area Metropolitan Planning Organization (CAMPO). CAMPO is a federally-funded and federally-regulated policy organization comprised of representatives from local government and local transportation authorities including Wake County and parts of Franklin Granville, Harnett, and Johnston Counties.

As part of its 2045 Metropolitan Transportation Plan, CAMPO convened planners and real estate development experts from throughout the Triangle to help produce robust development estimates for each of the 1,550 Traffic Analysis Zones (TAZs) that comprise the region. Within these areas, planners determined the remaining development potential of individual parcels based on the level of current buildings, zoning, and other constraints ("supply side"). The region's total anticipated population and employment growth was then allocated across TAZs by applying development suitability factors intended to measure which areas with available supply would be most attractive to future development ("demand side"). These projections provide a baseline for HR&A's future demand analysis.

Source: CAMPO, City of Raleigh

The Corridor's population is projected to increase significantly through 2045, a result of Raleigh becoming more attractive for new residents and companies.

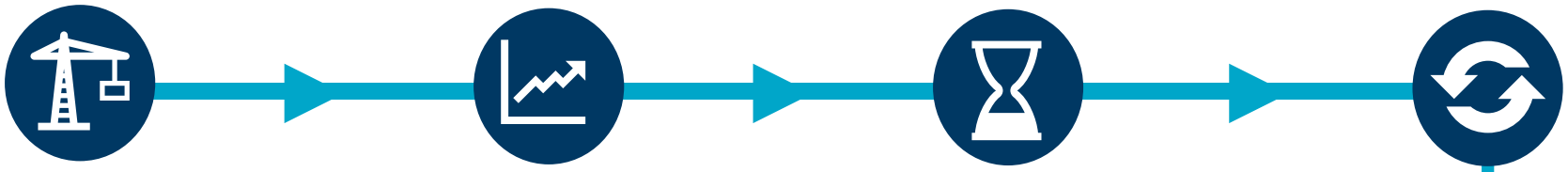


CAMPO projects that Raleigh and the region will continue to attract new residents and businesses. The Corridor will capture some of that growth, with its population expected to increase by more than 40,000 residents by 2045, a 184% increase from 2017. The South District (including those areas just South of I-440) is anticipated to be a large driver of that growth, possibly becoming the most-populous District in 2026 and holding 42% of the Corridor's population by 2045. The South's growth may be catalyzed by efforts to promote mixed-used, higher density residential development and its proximity to Downtown Raleigh.

Source: ESRI Business Analyst, CAMPO

Capital Boulevard's future real estate conditions will be shaped by reinvestment and redevelopment catalyzed by the market cycle and public investment.

DEVELOPMENT CYCLE AND MARKET DYNAMICS



New Development

New development or renovation creates space for highly-demanded uses (e.g. residential, office, or retail). This demand must be strong enough to justify the cost of construction/renovation.

Stabilization

Development fulfils demand in the market and provides value to users, including new and existing residents, workers, or visitors while generating revenue for developers.

Depreciation

Development ages over time and no longer meets the most pressing demands of the market; revenues fall. Depreciation may happen quickly or slowly, depending on how well a project continues to align with market needs.

Under-Utilization

With higher sustained costs and low revenues, development will eventually become under-utilized or blighted. At this point, redevelopment can become more valuable than continued under-utilization if demand is sufficiently strong.

Investments in infrastructure, placemaking, and transportation catalyze this cycle by enhancing market demand and making the area more attractive for private development. These investments often result in development that happens sooner, creates more value, and is of a higher quality.

Infrastructure and transportation improvements for Capital Boulevard can raise land values and improve redevelopment potential.

The City of Raleigh is considering improvements along Capital Boulevard North as part of the Corridor planning process, including facilitating transportation improvements to expand bus service on a corridor that already captures 30% of GoRaleigh ridership. As direct investments in infrastructure, these improvements can be a powerful tool in guiding the local market to meet community needs now and in the future. While the end result of these improvements is dependent on a host of factors within and outside of City control, research suggests that significant investments in infrastructure and attendant placemaking and mobility improvements have several benefits to development, including:

Support for Business and Job Growth

Placemaking and transportation improvements can enhance the health of the local business community and support the creation of office and retail jobs by making it easier to access businesses and by delivering amenities that make an area more attractive for day-time workers.

Reduced Development Cost

Investments in infrastructure to improve the safety and security of pedestrians, automobiles, and bicyclists send powerful signals to the marketplace that an area is prime for redevelopment. Investments in enhanced sidewalks, placemaking, and lighting that a developer may be less willing to take on alone due to cost or market uncertainty will improve the marketability of sites for redevelopment and bring confidence to developers looking for new opportunities.

Increased Property Values

Research from Eugene, Cleveland, Boston, Pittsburgh, and Quebec shows that BRT investments typically generate a 5-10% value premium for office properties, condos, and single family homes. Higher land values help facilitate redevelopment by promoting sales to active developers. Higher tax burdens from property appreciation can put a burden on residents close to transit, however, and displacement concerns should be carefully considered as part of a holistic planning approach.

Sources: GoRaleigh, American Public Transportation Association, Project for Public Spaces, HR&A

Socioeconomic Findings

HIGH GROWTH AREA
Capital Boulevard's population is growing at a rate that exceeds the city and county. This growth is more pronounced in the North and South Districts where proximity to transportation connections is leading to development and strong population growth.

The North and South Districts are projected to grow even more substantially in the coming years. The Central District's currently stable supply of naturally occurring affordable housing is a valuable asset for the City that may require active preservation as development results in higher prices.

A UNIQUELY DIVERSE PART OF RALEIGH
Whereas Raleigh and Wake County are majority white at 57% and 64% respectively, the majority of residents along the Corridor are non-white.

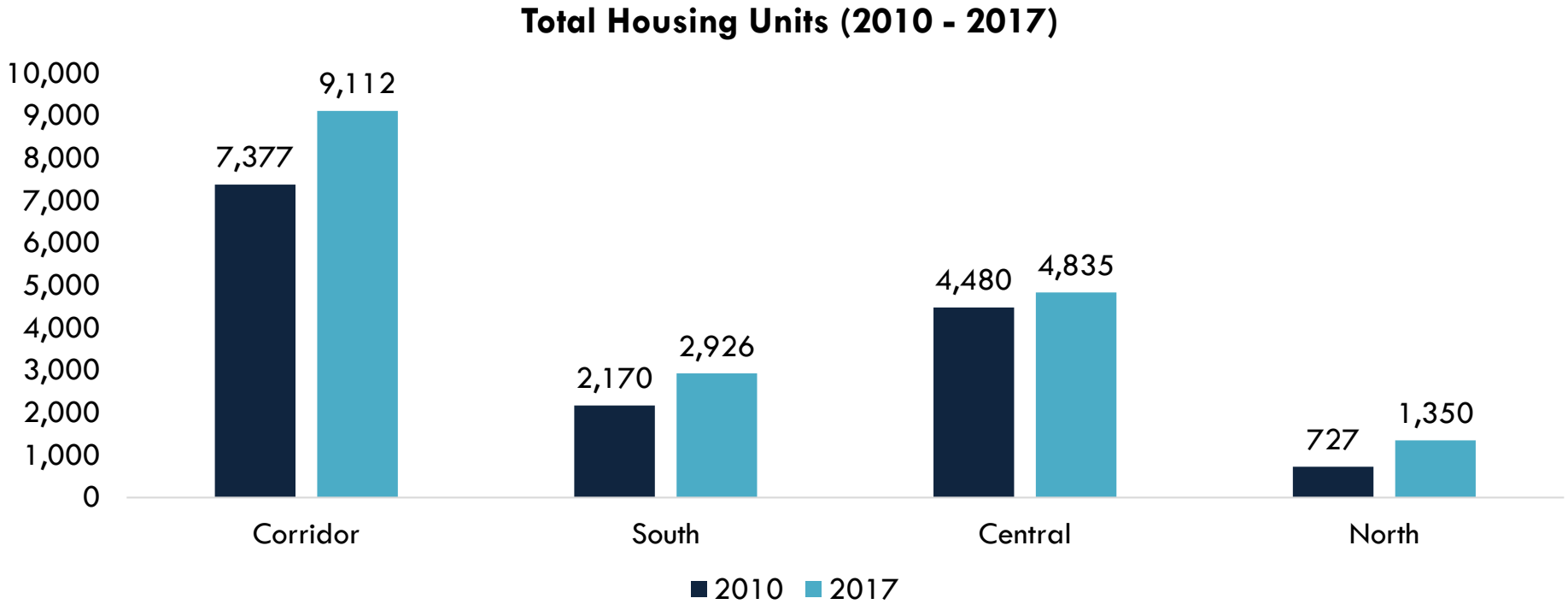
As the area continues to grow there should be concerted efforts to maintain affordability and accessibility of housing, and strengthen and preserve the cultural resources of this highly diverse community.

ACCESS TO OPPORTUNITY
Despite lower household incomes and rates of access to personal vehicles, low and middle income residents have access to transit, amenities, and opportunities that may not exist in areas farther from the center of Raleigh.

Capital Boulevard can benefit from investment to improve accessibility for current and future residents. These investments should focus not only on improving accessibility to the rest of the city and county, but also placing those opportunities near the neighborhoods.

Residential Market Analysis

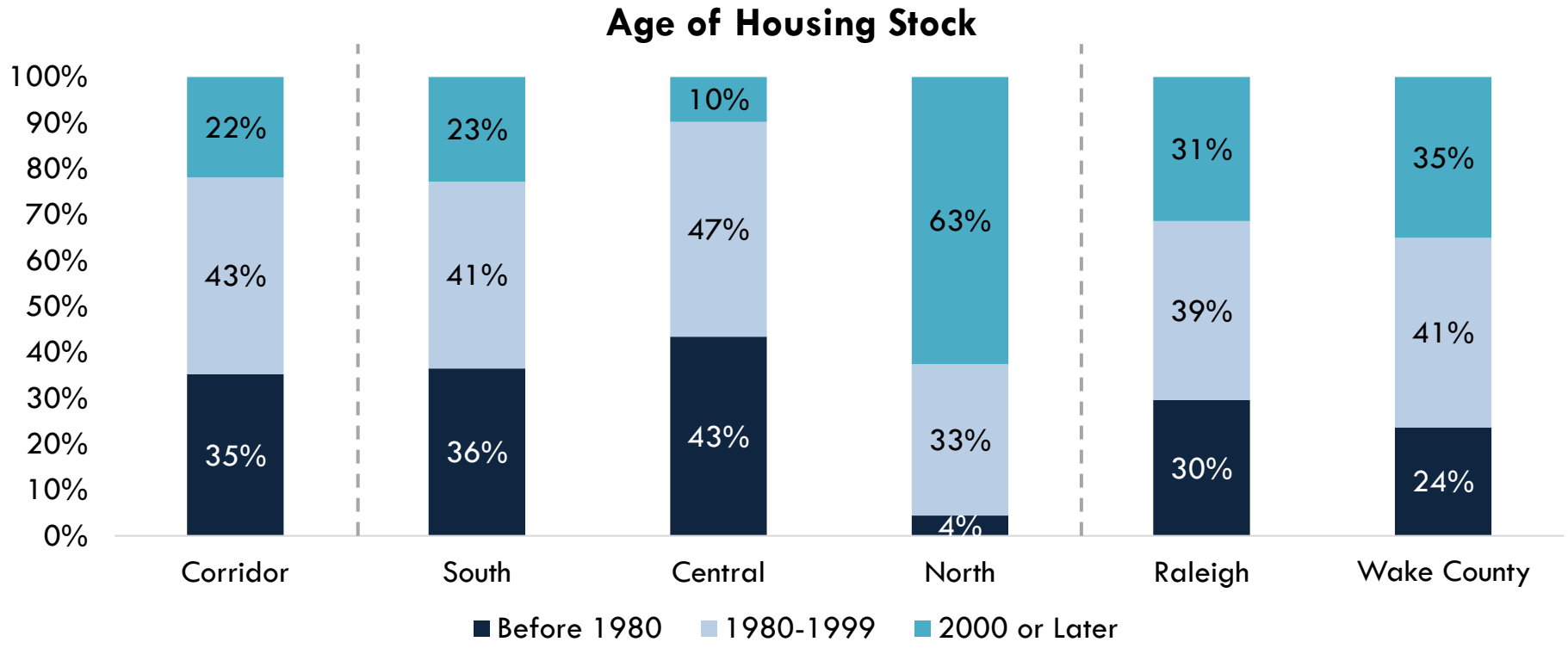
The Corridor's residential inventory grew by 1,700 units from 2010 to 2017, with 80% of this growth stemming from the North and South Districts.



The Corridor's stock of housing units—including both multifamily dwelling units and single-family homes—grew by 24% from 2010 to 2017 to reach more than 9,110 units in 2017. While the North District almost doubled in population and accounted for 36% of overall Corridor growth, 44% of the Corridor's growth was accounted for in the South District. Housing unit growth in the South District was facilitated by new construction of multifamily units southwest of the I-440/Capital Boulevard interchange. This indicates that recent residential development has been concentrated on the northern and southern ends of the study area where convenient transportation access drives demand and where land has been most readily available for significant multifamily development.

Source: ESRI Business Analyst

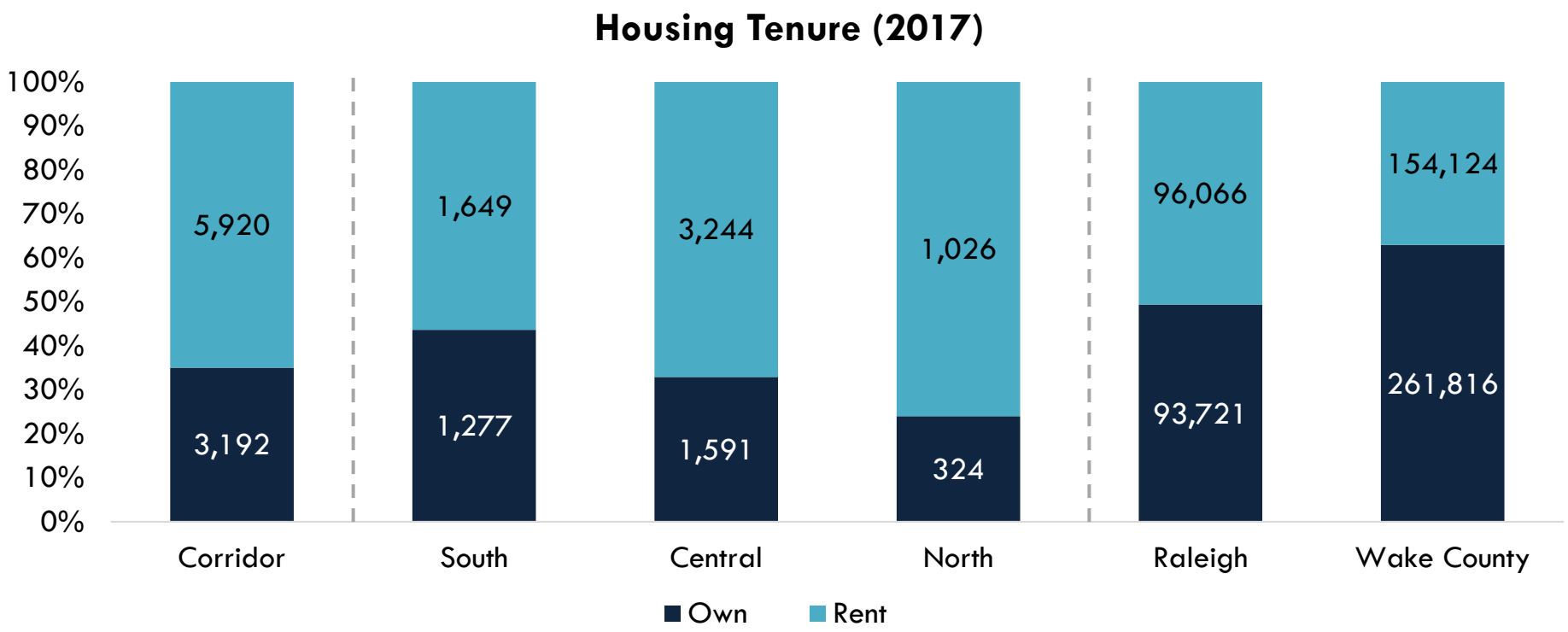
Housing stock in the South and Central Districts is older than in Raleigh, whereas the North's newer stock is indicative of the fast growth in that District.



Almost 80% of the Corridor's housing stock was constructed before 2000, owing primarily to the Central District's older housing product. However, the majority of the North District's housing was delivered after 2000, a higher share than what is seen in either the city or county. While this is a factor of there being few residential units in the North historically, it indicates strong development interest in the North that can be expected to spread to other parts of the Corridor as population increases and pressure to redevelop existing commercial areas intensifies.

Source: ESRI Business Analyst

Capital Boulevard has many residents who rent their homes. These residents may be more at risk of short-term market changes than home owners.

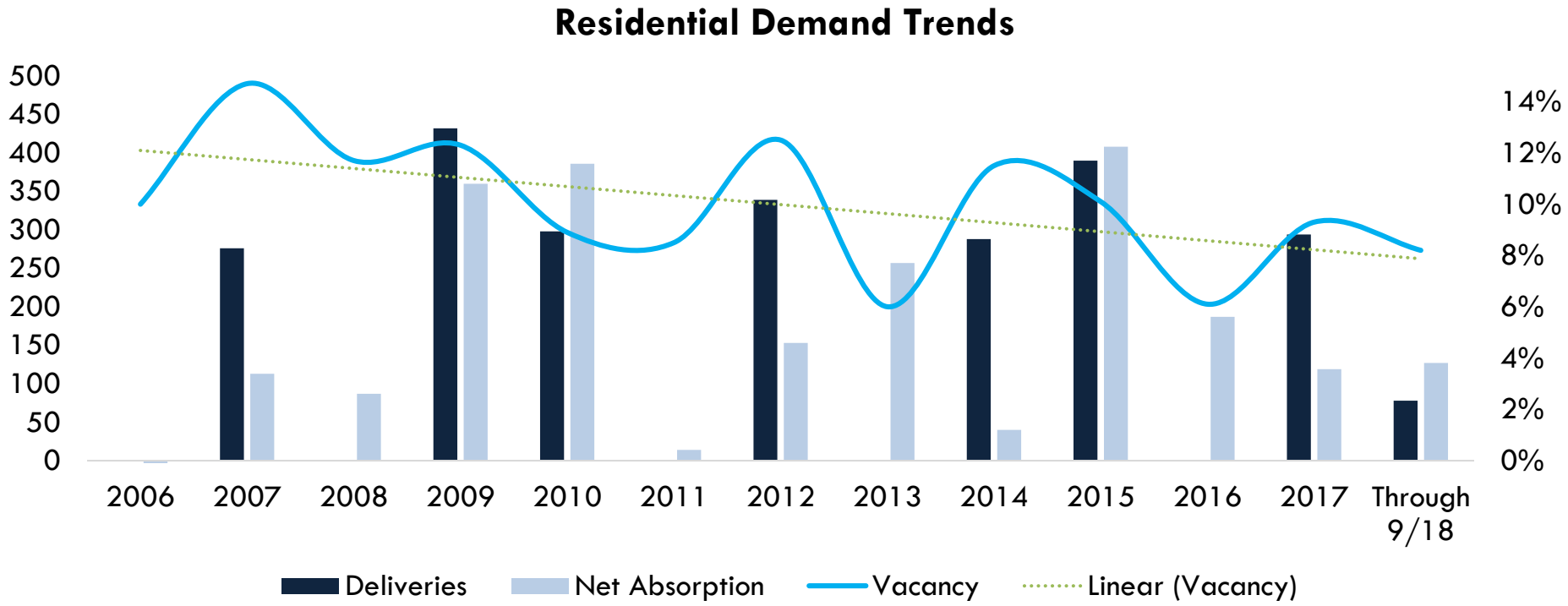


65% of Corridor residents rent their homes, as opposed to the 51% and 37% of residents renting in the City of Raleigh and Wake County, respectively. Households that rent are particularly susceptible to displacement due to market changes that increase housing prices. Therefore, the dangers of displacement in a rapidly redeveloping Corridor would be most heavily felt by residents who rent their homes rather than those who own their homes.

**People who rent their homes include those living in both multifamily housing and single-family housing*

Source: ESRI Business Analyst

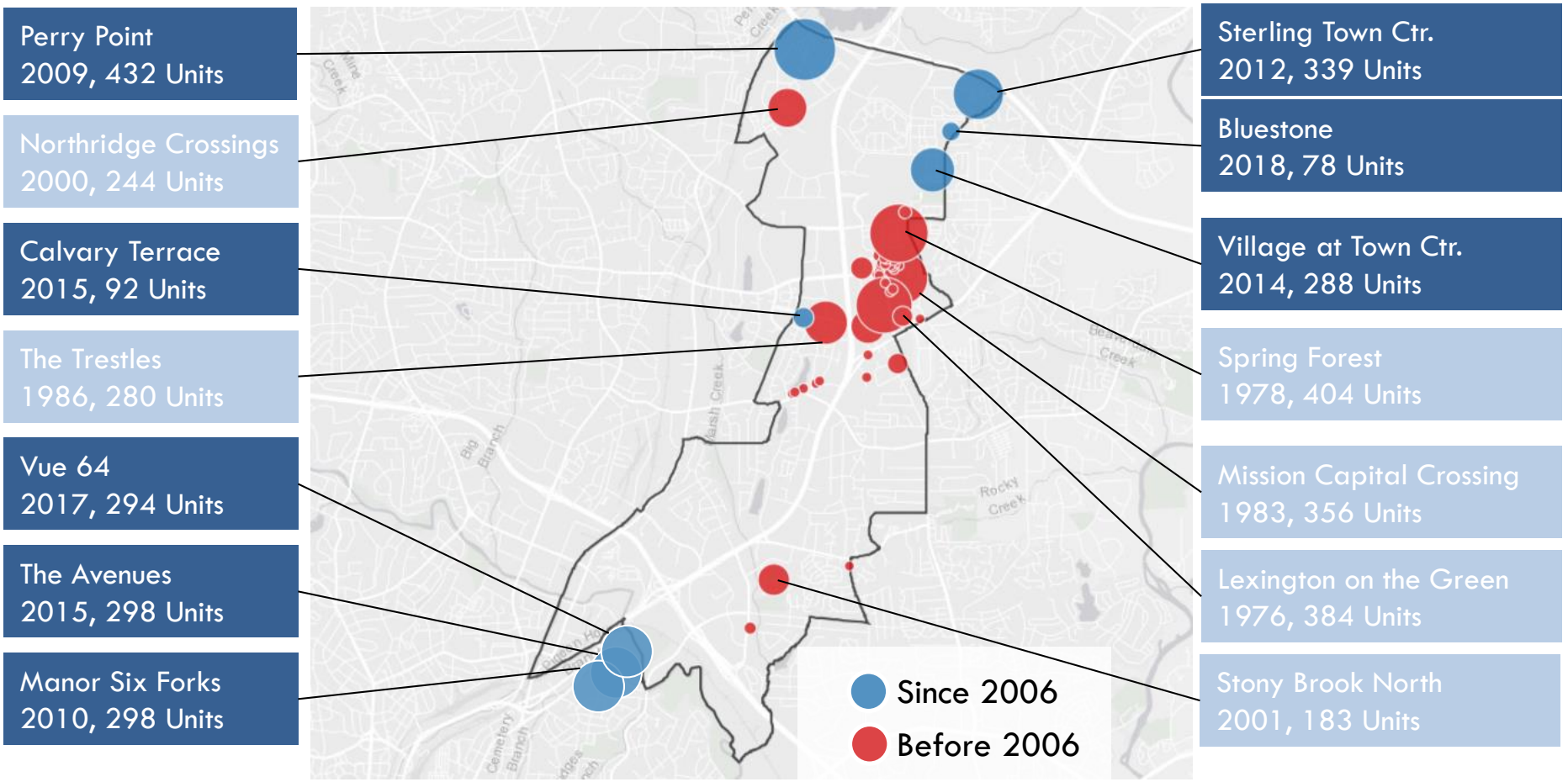
Multifamily deliveries since 2006 have been largely quickly absorbed and have lead to falling vacancy, indicating a strengthening multifamily market.



As recent multifamily developments have entered the market along the Corridor they have been well received by the market. When these developments are delivered there are a correspondingly high numbers of units being leased, indicating that those new units are being absorbed. Vacancy fluctuates as new deliveries are added but has decreased to 8.2%. The decreasing vacancy and the strong leasing activity indicate that the multifamily residential market along the Corridor is healthy.

Source: CoStar

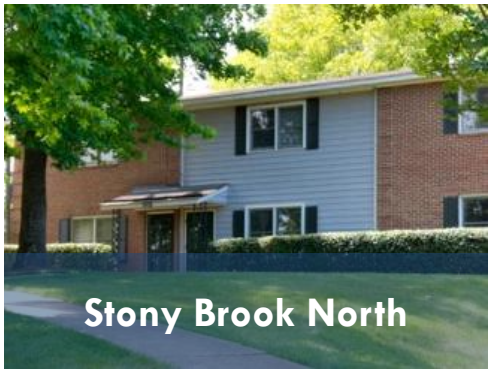
Older multifamily development is concentrated in the Central District while new development gravitates towards vacant land and transportation connections.



Recent multifamily development has moved away from the Central District and gravitated towards interstate-accessible areas adjacent to commercial development. While development pressures in the North and South have not inspired true redevelopment activity yet, interest exists to build at prominent interchanges.

Source: CoStar, ESRI Business Analyst

The South and Central Districts are dominated by older product, while the quickly growing North is home to the majority of new multifamily product.

	 Stony Brook North	 Lexington on the Green	 Bluestone
District	South	Central	North
Year Built	2001	1976	2018
Avg. Rents/Unit	$734	$843	$1,144
Vacancy	5.5%	0%	25.6% (lease-up*)
Unit Count	183	384	78
Amenities	Wheelchair accessible, pool, clubhouse	A/C, Balcony, Patio, Pet Area, Fitness Center	A/C, Balcony, Patio, Open Floorplans, Pool, Play Area, Pet Area, Fitness Center

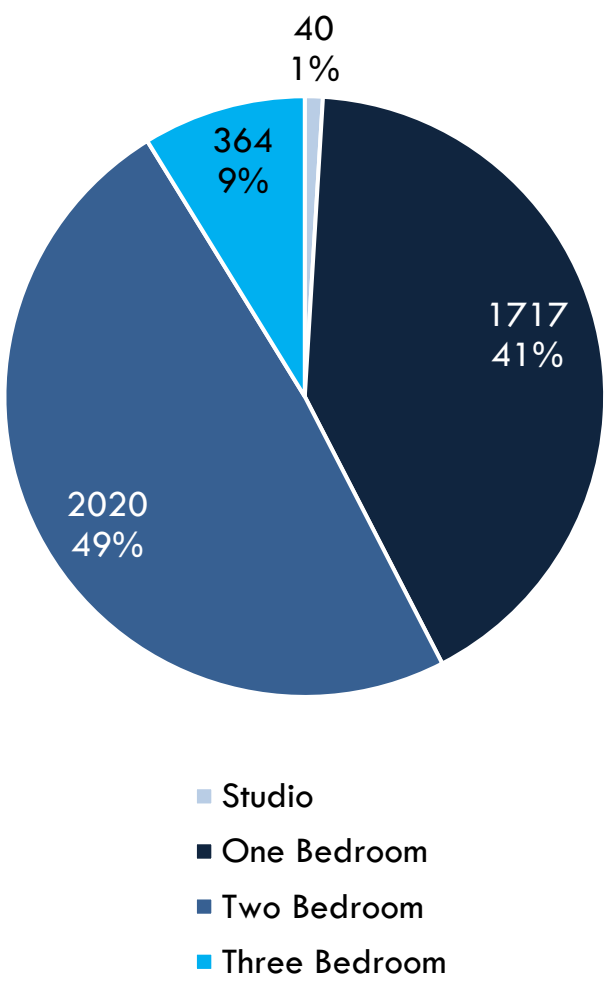
The housing developments above are representative of existing multifamily developments in their respective Districts. Newer product is concentrated in the North District where developments like the Bluestone offer modern design, upscale finish materials and appliances, and communal space amenities. As development continues throughout the Corridor, particularly, in the North and South Districts, construction will more closely resemble the Bluestone than older product.

Source: CoStar

** Recently opened, this project is still filling vacant units before reaching expected stable vacancy*

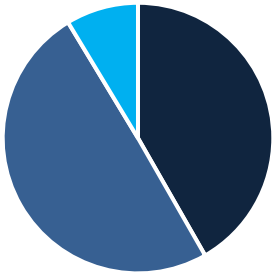
The Corridor's rental unit composition heavily favors one and two bedroom units, and holds only a small share of three bedrooms more suitable for families.

Corridor-wide Unit Mix



North District Unit Mix

Central District Unit Mix

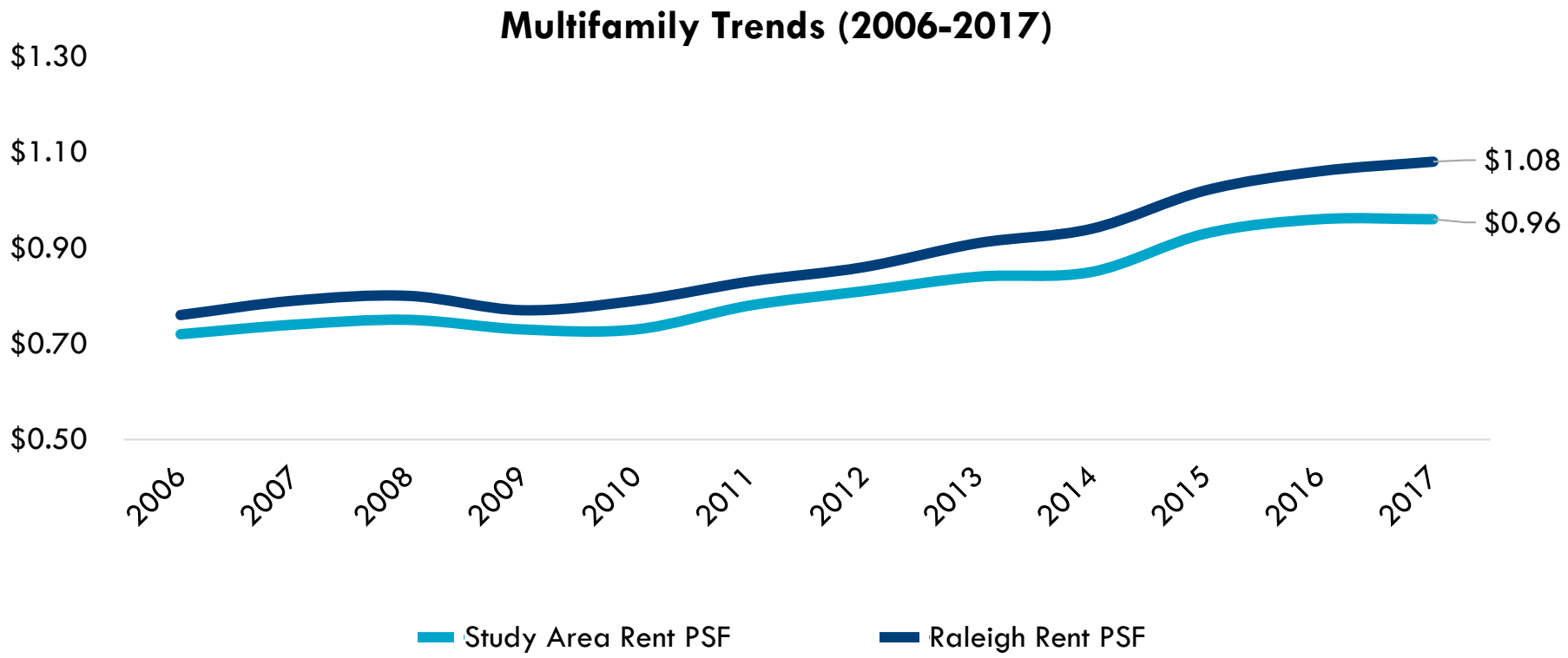


South District Unit Mix

90%, of rental units along the Corridor are one to two bedrooms, which can be attractive to individuals and small families. However, in contrast to the City as a whole, there is a lack of Studio apartments that cater to the needs of younger professionals. Additionally, only 9% of the units have three bedrooms that are able to house families with multiple children. The fact that the North District unit mix follows this trend, and that recent deliveries within the District have been identified as a potential model for future multifamily development along the Corridor, indicates that future development along Capital Blvd. will continue to prioritize one to two bedroom deliveries.

Source: CoStar

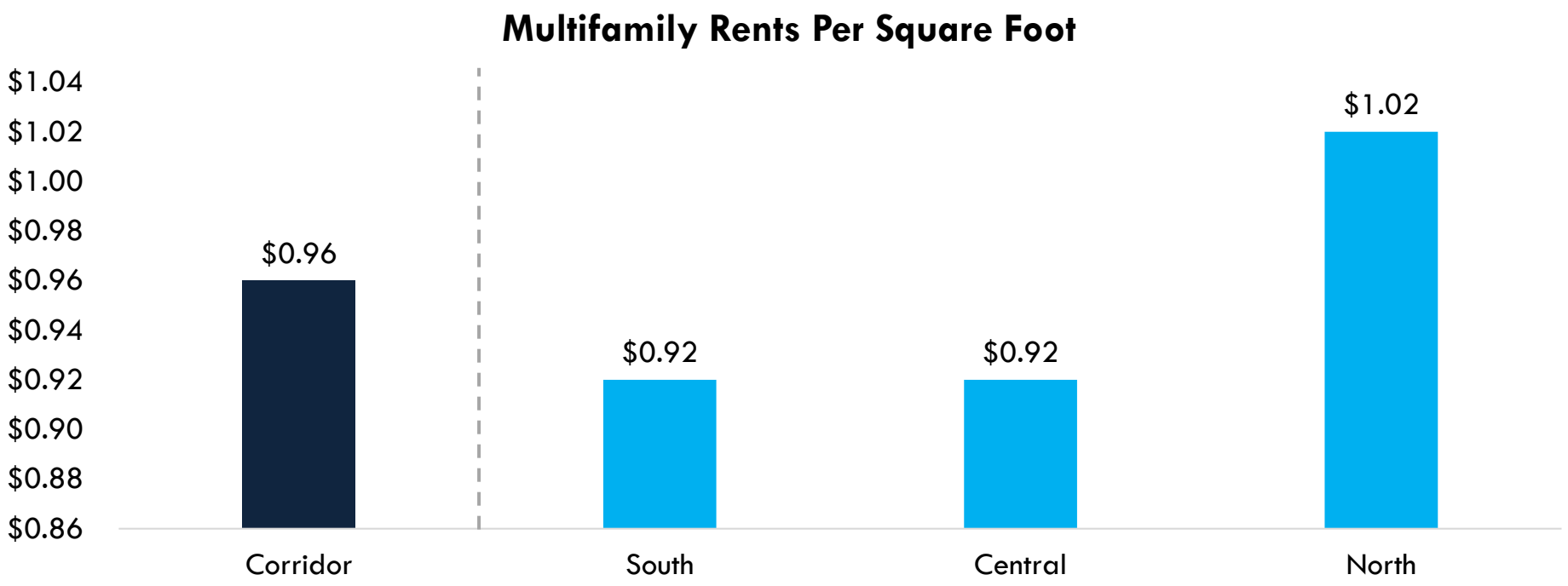
Delayed recovery post-Recession led to a widening rent gap between the Corridor and the city.



The gap in rental rates between the City of Raleigh and Capital Blvd North grew from $0.05 per square foot in 2011 to $0.12 per square foot in 2017. Higher rental rates can be a product of a place being desirable based on location, amenities, quality of the surrounding environment, and how new the development is. Given that new developments are able to command higher rents, the difference in rents is due to Raleigh seeing new development citywide that is still nascent along Capital Boulevard. Currently, renting along the Corridor is more affordable than in Raleigh as a whole.

Source: CoStar

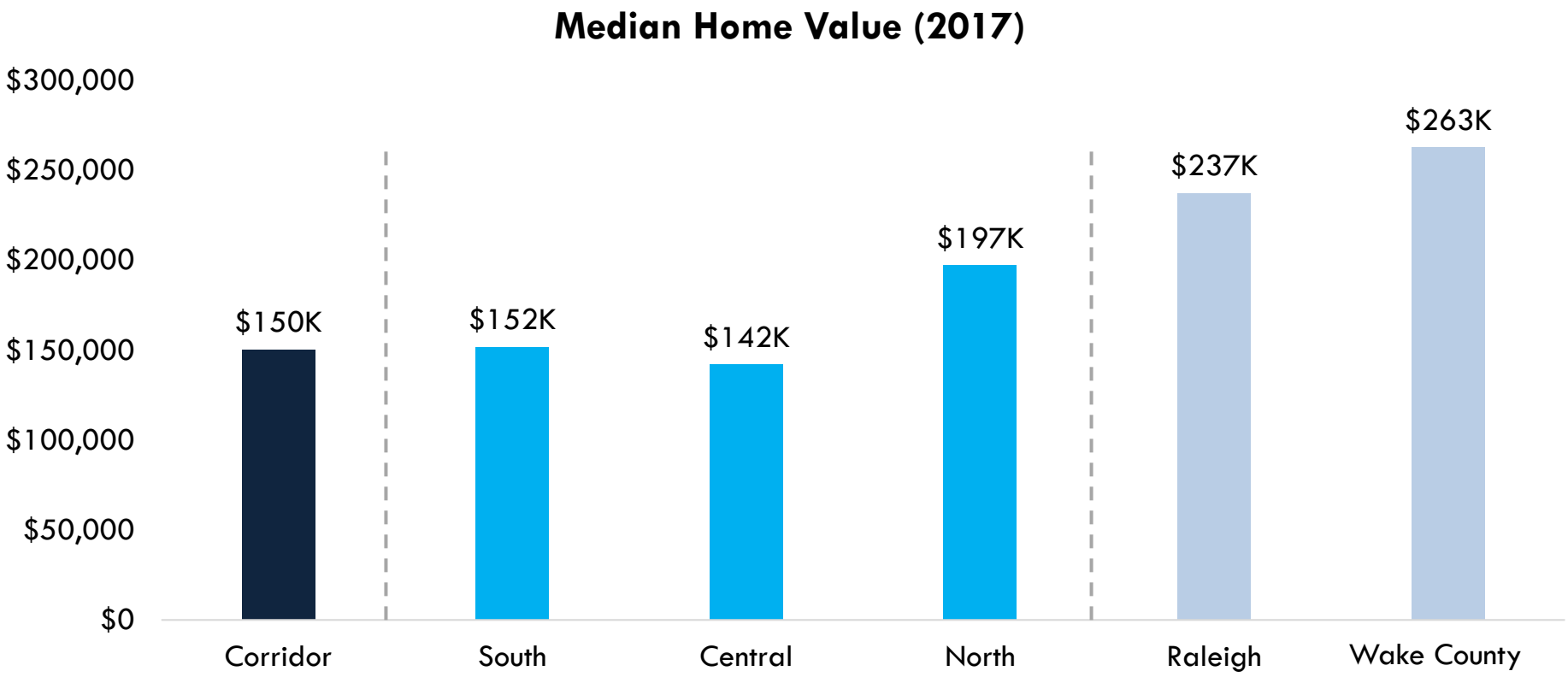
Residential product in the South and Central Districts has relatively low average rents, while newer product results in higher average rents in the North District.



The North District's rents per square foot exceed the rents in the other two Districts by $0.10. This is due to the concentration of new multifamily projects with attractive amenities concentrating in the North, as well as its proximity to a lifestyle center and interstate. As development pressures lead to new deliveries in the South District that take advantage of its location near Downtown and I-440, it is highly likely there will be a subsequent rise in average rental rates. With few additional developable plots in the Central District, rents may have to rise significantly to trigger the high costs of redevelopment in its existing aging commercial centers.

Source: CoStar

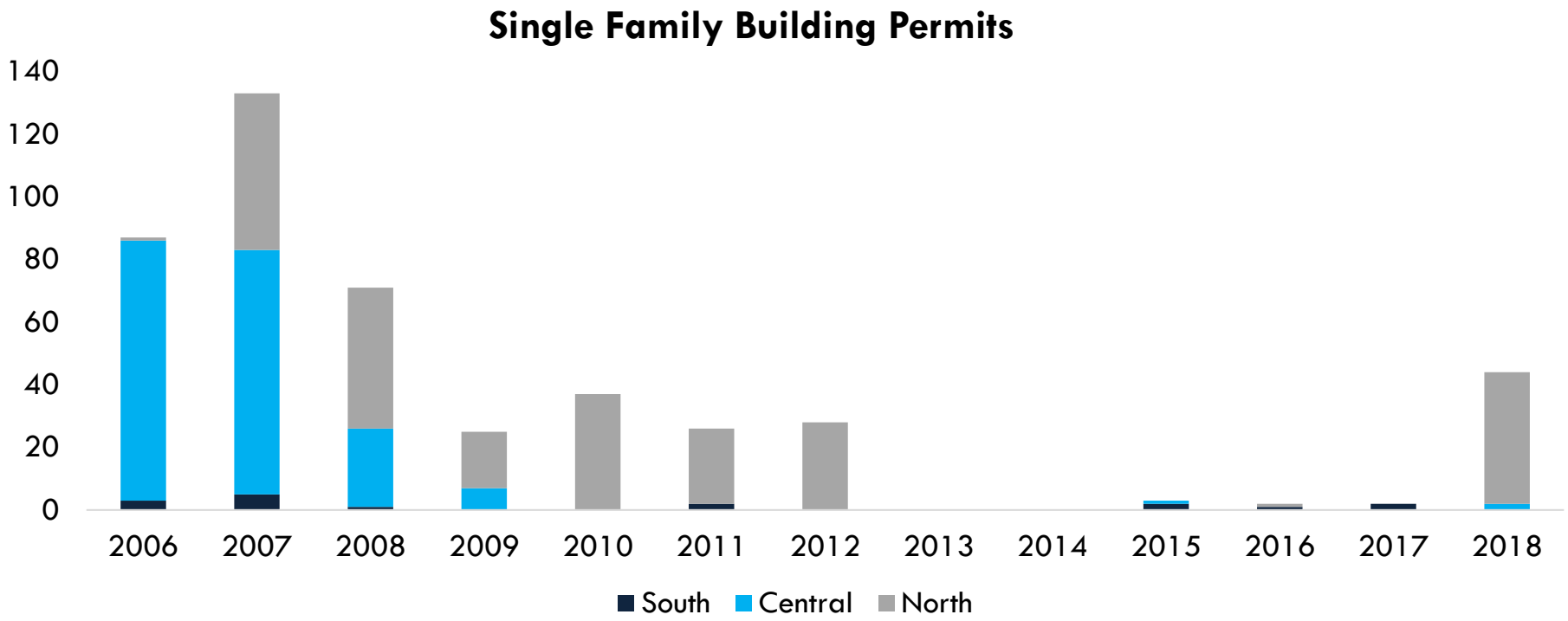
Median home values of homes in the South and Central Districts fall well below the city and county, whereas homes in the North approach those prices.



The newer residential developments in the North District correlate to higher median home values. These values approach those seen throughout Raleigh and Wake County, where new product is being delivered in other thriving housing markets. As increasing development pressures and public investments lead to new construction—particularly in the South District—existing home values will also see growth due to Corridor-wide appreciation.

Source: ESRI Business Analyst

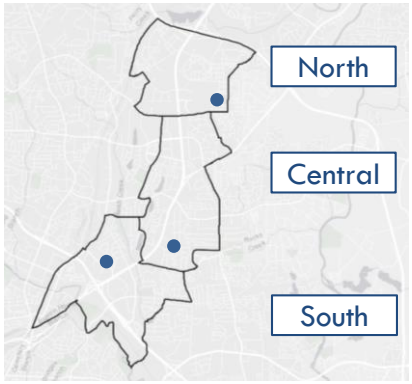
The recession impeded single family residential development in the Corridor, with new home starts only recently beginning again in the North.

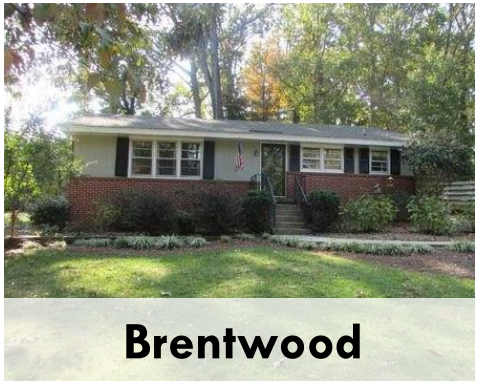


Between 2013 and 2017 virtually no new single family homes were built along the Corridor. Over that same time period, almost 1,000 new multifamily units were delivered to the market. While there has been renewed demand for single family homes in the North, the recent character of residential growth trends towards higher-density multifamily development being a more value-added opportunity along this urbanizing corridor.

Source: City of Raleigh

Single family homes range from older, smaller ranch and split level homes to newer, larger product with amenities like enclosed garages.





Brentwood

Broadlands

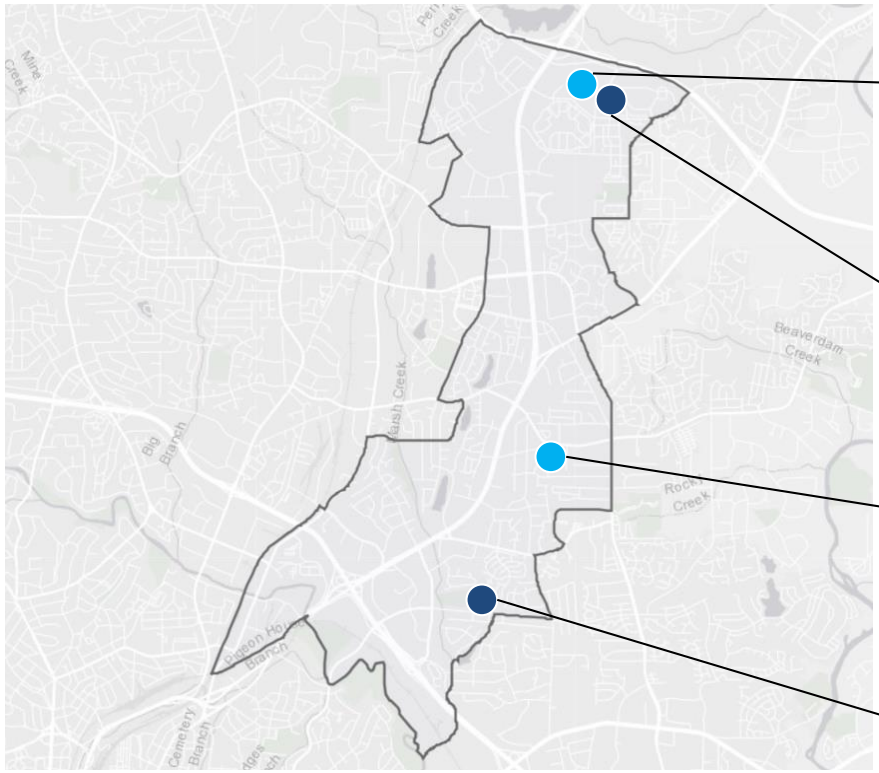
Somerset Spring

	Brentwood	Broadlands	Somerset Spring
District	South	Central	North
Years Built	1960's-1970's	1980's-1990's	2000's
Approximate Home Value	$120K – $220K	$120K – $190K	$160K – $210K
Size	1,200 SF – 2,000 SF	1,300 SF – 2,800 SF	1,500 SF – 3,300 SF
Bed/Bath	3Bed/2Bath	3Bed/2Bath	3Bed/3Bath

The Corridor currently consists of single family home typologies that represent a variety of architectural and development types. The Brentwood neighborhood is defined by older ranch homes, medium to large yards, and is distributed along a collector road. Somerset Spring, a newer development, is defined by multi-level American style homes with attached garages, small yards, and a low-density residential streets.

Source: Zillow

Pipeline projects continue to be mostly clustered in the North, with scattered smaller projects along the Corridor as development interest returns.



Cadence at Town Center
27.5-acre townhome development

The Piedmont Apartments
382 Multifamily Units, 12 Acres

Waterview Townhomes
55 Townhomes

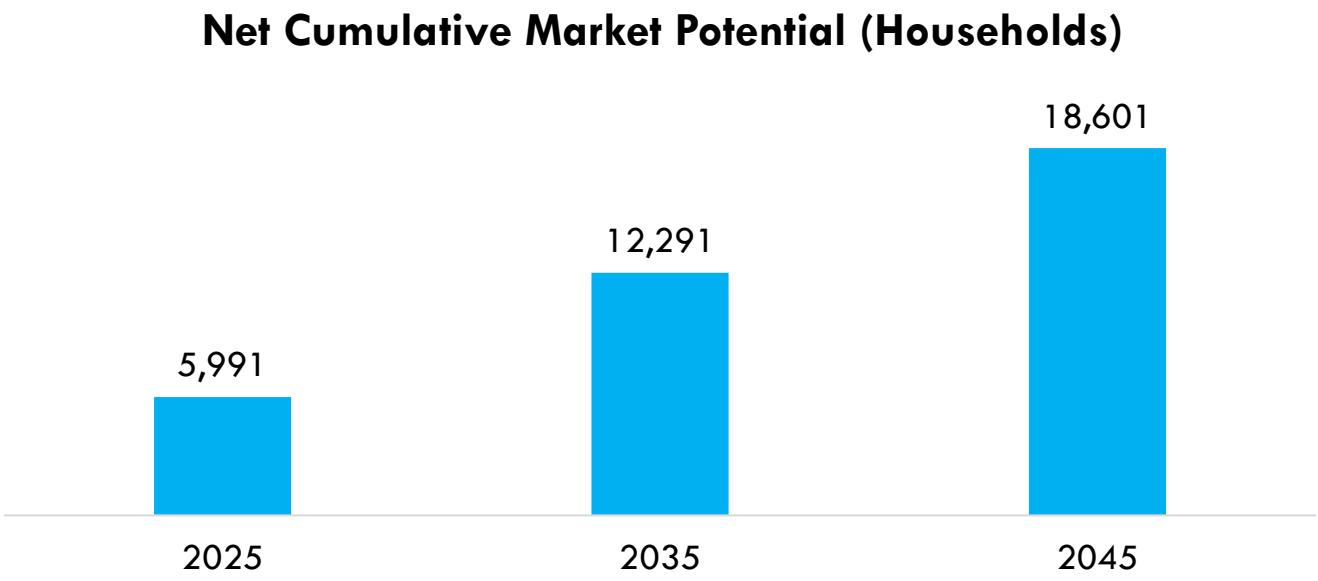
Hill Street Apartments
14 Multifamily units

Multifamily **Single Family/Attached**

A mixture of both rental and for-sale units will continue to be delivered in the Corridor. Pipeline development follows recent trends and is concentrated in the North District. Nearly 400 units of multifamily development and 27.5 acres of townhomes will be developed adjacent to the Triangle Town Center. That there are smaller residential pipelines developments in the Central and South Districts is indicative of development interest in the Corridor strengthening. Additional infill multifamily and single family projects will likely continue, as well as larger projects when land becomes available or the dynamics of the development cycle allow for redevelopment of the commercial centers that currently dot the Corridor.

Source: Triangle Business Journal

With over 40,000 additional residents anticipated by 2045, Capital Boulevard is projected to accommodate18,600 additional residential units.



Using projected TAZ data from CAMPO, HR&A estimated the net cumulative market demand for housing out to 2045. These figures demonstrate how many new households may be added above current pipeline figures. Based on the end of each time frame, HR&A calculates the amount of demand that has accumulated by that point. In order to meet the 2045 population projection, 18,600 additional housing units beyond the 530 housing units currently planned will need to be delivered. Accommodating this level of demand will require that the City undertake concerted efforts to ensure that the area can adequately support this level of development. Robust infrastructure and transportation investments can channel growth to the Corridor in a way that encourages transit-oriented development and ensures minimal disruption to surrounding neighborhoods.

Source: ESRI Business Analyst, CAMPO

Residential Findings and Implications

RENTAL MARKET DOMINANCE

The study area's residential character is largely defined by single family homes. There is a high share of people who rent as opposed to owners, particularly in relation to the city and the county.

Recent multifamily deliveries are targeted to the young professional and empty nester demographics. If this trend continues there will be a lack of housing that provides a greater variety of units and caters to households of different sizes.

NEW DEVELOPMENT

Newer development has concentrated in the North and South Districts, gravitating towards transportation networks and employment centers. Primary demand drivers in the North are Triangle Town Center and access to I-540, and in the South are access to the North Hills and Six Forks areas.

Easy access to amenities and job opportunities on and off the Corridor will continue to drive new residential development as the region grows and expands. While the North and South Districts both have their respective draws for future development, the Central District has few developable sites, limiting development opportunities for future residential product.

LIMITED PIPELINE, STRONG DEMAND

Only one major new development, the Piedmont in the North District, is slated to be delivered in the pipeline. Deliveries will likely continue to respond to strong demand as sites are available, with more than 18,000 additional residential units projected for the Corridor by 2045.

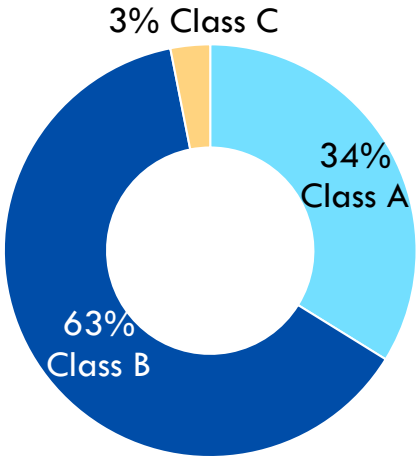
New product will continue to be delivered on highly developable sites in the South, west of the I-440 junction and around Triangle Town Center. Additional market pressures are required for redevelopment of commercials sites into residential in the Central District, but future investments in the Corridor may accelerate the redevelopment process and help accommodate projected demand.

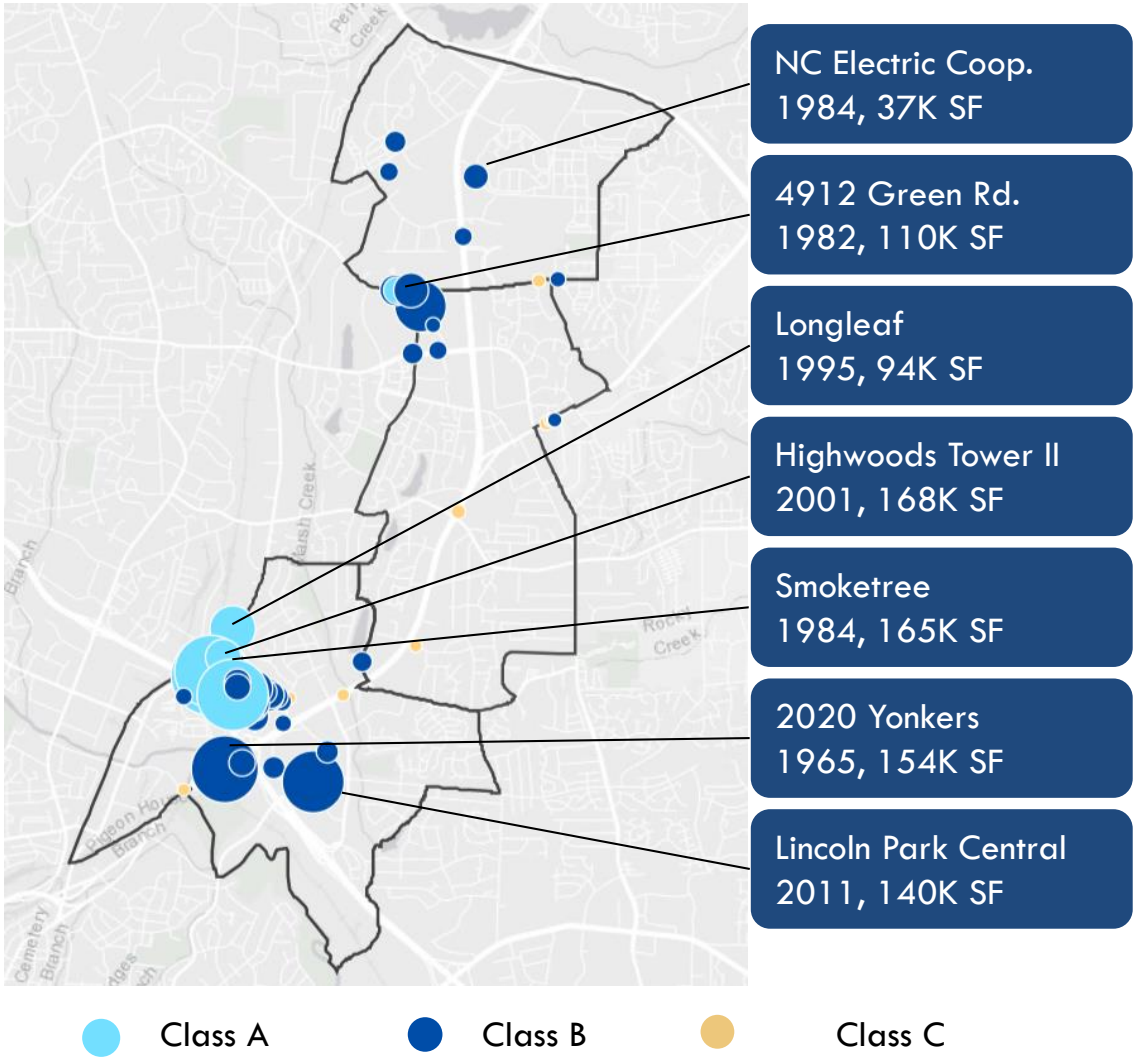
Office Market Analysis

Most of the corridor is mid-sized class B office product, with the notable exception of the Highwoods Office Park in the South.

Capital Boulevard North's office market is limited in size, with just 2.2 million square feet, or just 5.8% of the city's total office supply. For a smaller submarket in the Raleigh region, however, Capital Boulevard has a unique mix of Class A (entirely consisting of properties off of Highwoods Boulevard) and Class B, with very few Class C properties. This healthy mix of middle and top-tier spaces is indicative of the Corridor's prime location near higher-priced areas closer to Raleigh central core.

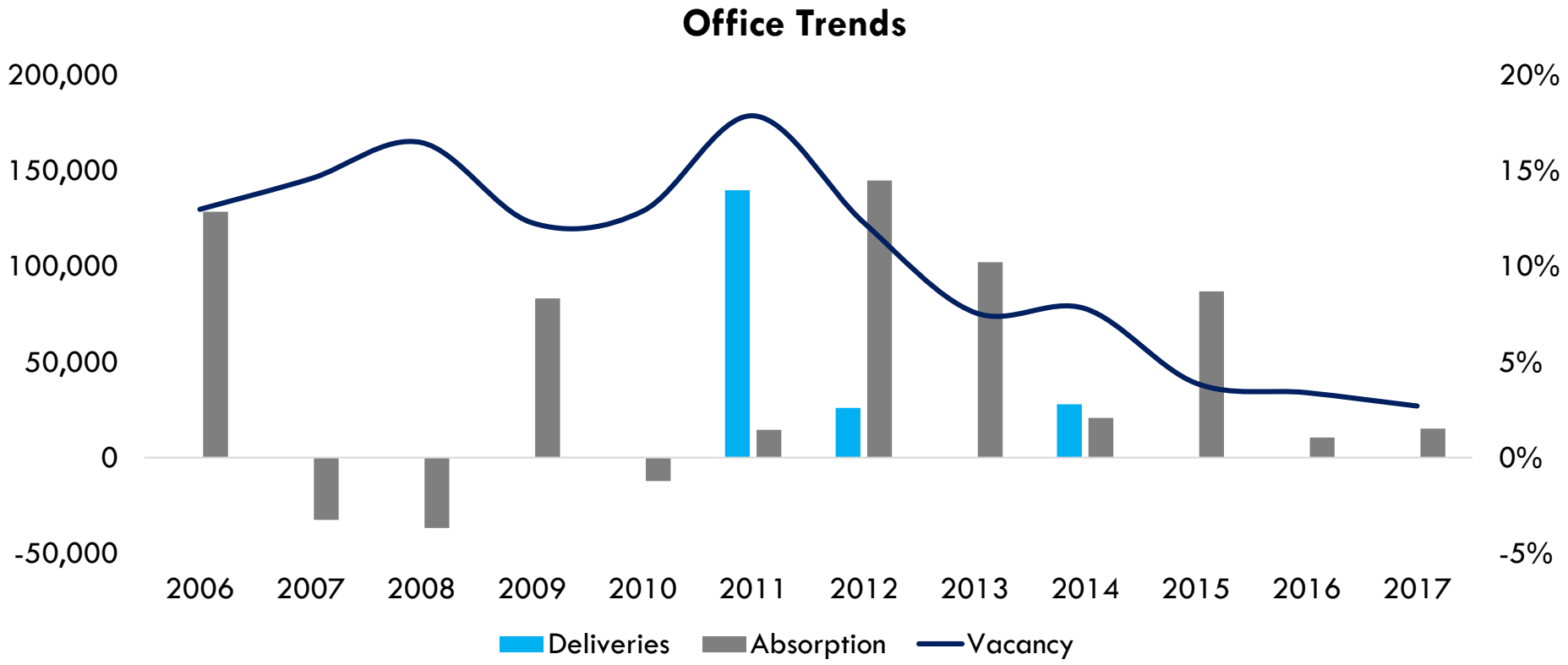
Office SF by Class





Source: CoStar

Since 2012 a series of major leases has reduced vacancy to its lowest point since 2000, reflecting strong demand for space and few new deliveries.

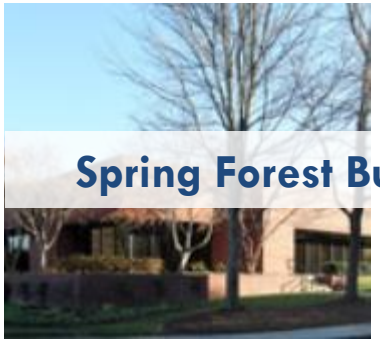


Since 2006 there have only been three new office buildings on the market, totaling 194,000 square feet. Absorption—the net change in occupied space over the last year—along the Corridor has outpaced these new deliveries. The Corridor experienced only a moderate rise in vacancy during the start of the Recession in 2008, and since then, continued strong leasing has resulted in vacancies as low as 2.7% in 2017. This leasing is reflective of general trends in office leasing spreading out from Downtown Raleigh. Recent projects just south of the Corridor show how this area could be a new office node. However, without new office construction there is little vacant space for new jobs to locate along the Corridor.

Source: CoStar

Office product around the corridor remains largely suburban, with high-rise development at the Highwoods Center supported by surface parking.

Highwoods Office Park



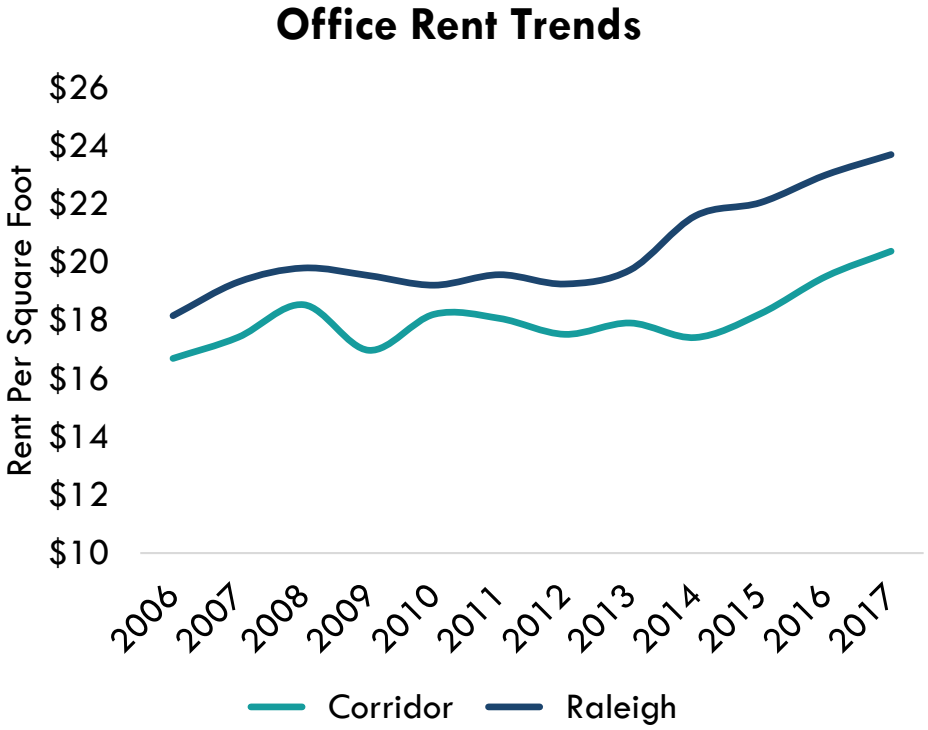
Spring Forest Business Center

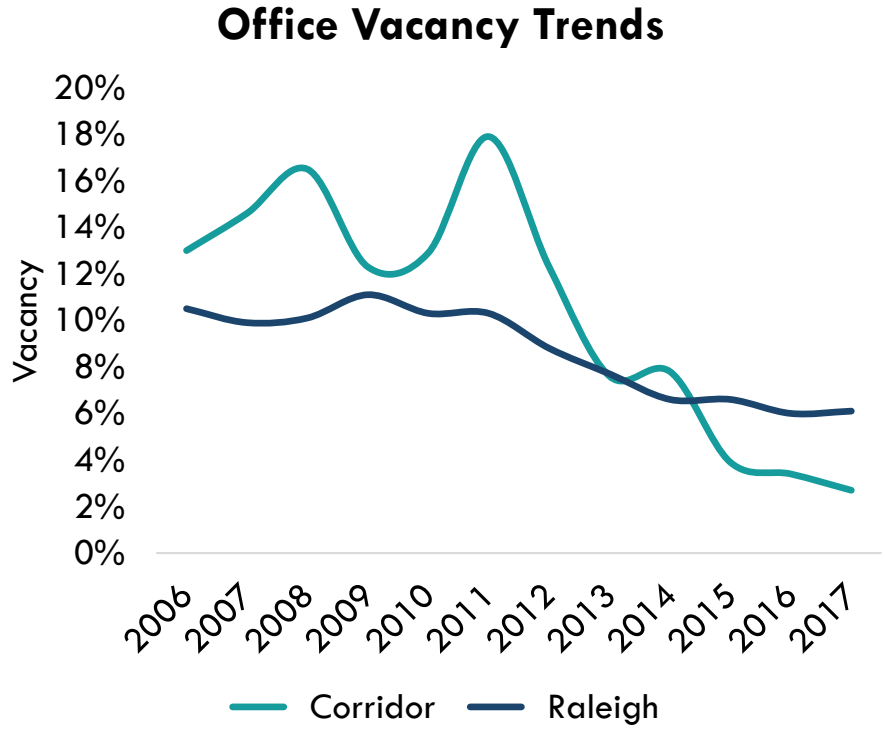
District	South	Central
Class	A	B
Year Built	1977–2001	1977–2002
Rent PSF	$22.30	$15.70
Parking	Surface	Surface
Vacancy	4%	5%
Major Tenants	Banking, Telecoms, Healthcare, Federal & State Government	Insurance, Payment Systems, & Human Resources

Despite a mix of Class A and Class B product along the corridor, all of the office space along the Corridor is of a suburban typology. These include surface parking and large setbacks from both the Corridor or feeder roads. Tenants consist primarily of telecoms, insurance, human resources, and government. To support more dense urban office product with structured parking, significantly higher rents are required.

Source: CoStar, Triangle Business Journal

Office rents along Capital Boulevard average 16% lower than the city, but bottoming vacancy may point to potential for higher rents for the right product.

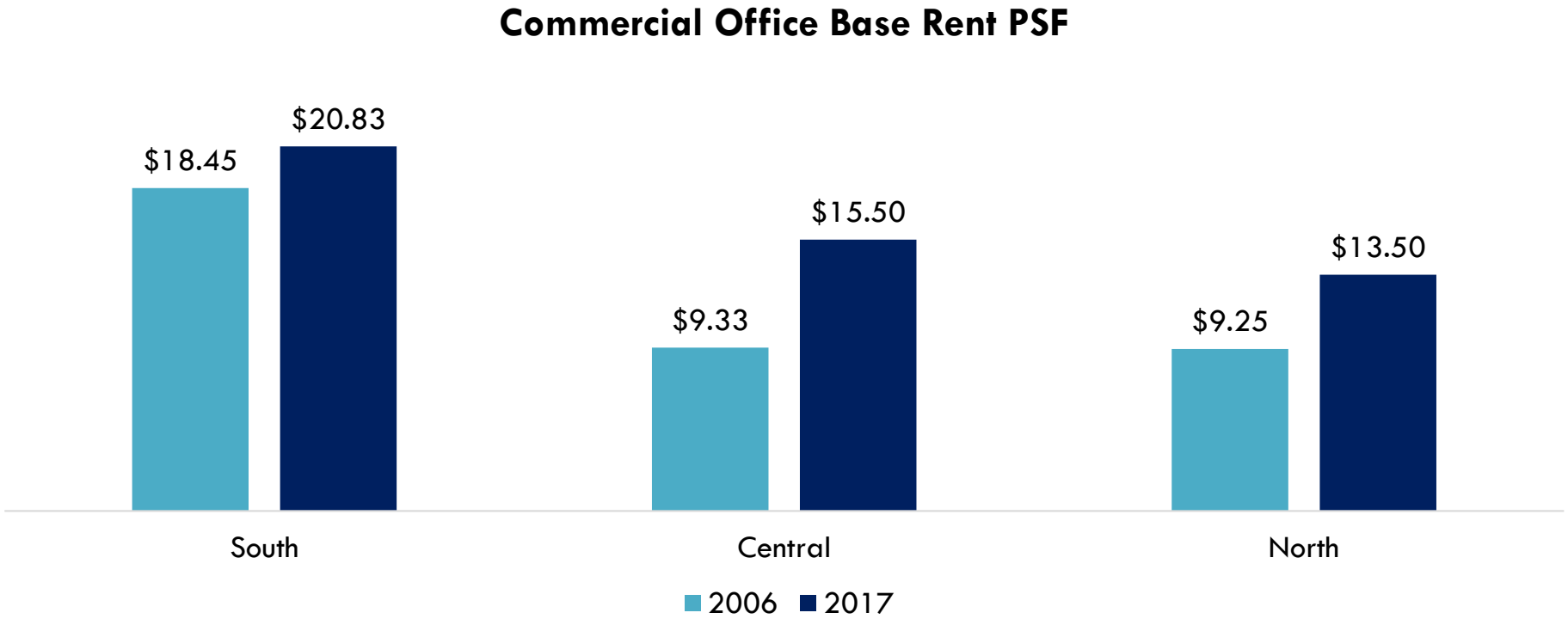




Office rents—now averaging above $20 per square foot on a weighted basis— have recently risen at a faster rate than the city as a whole. Rent increases are likely in response to growing demand and falling vacancies, leading to additional pressures on existing office stock. Also contributing to the rise in rents are larger market forces encouraging the expansion of new office product outside of Raleigh's central business district.

Source: CoStar

Rents are highest in the Class A South, but the Central District saw the most rent growth since 2006, showing the strength of older Class B product in this area.

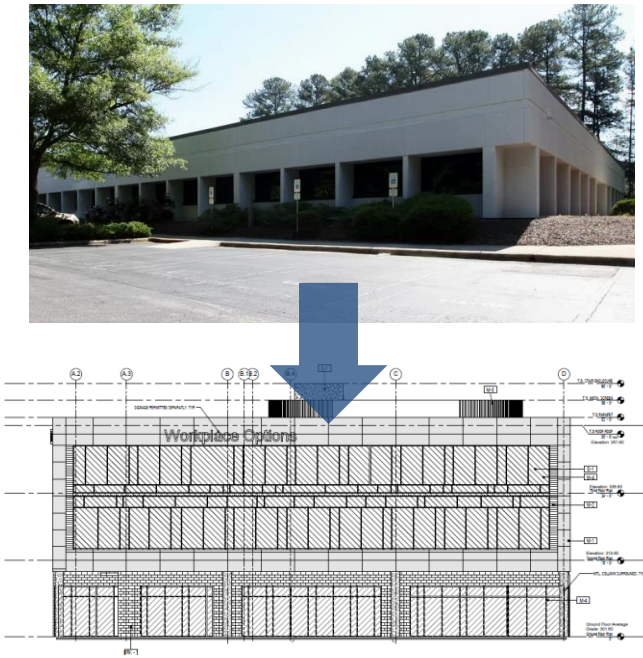


Along the Corridor, rents are most stable in the South, where more of the existing Class A office space is located. Notably high rent increases since 2006 have occurred in Central District, where rents on average have increase 66% in 10 years. This rise is despite no new office space delivered in the Central District, meaning this is attributed to higher rents for existing space. If demand for space causes these office rents to further increase, new office development or successful conversion/redevelopment to office space will become more likely.

Source: CoStar

While small redevelopment projects are planned along the Corridor, major planned projects in its vicinity show what future office development may hold.

Workplace Options Redevelopment

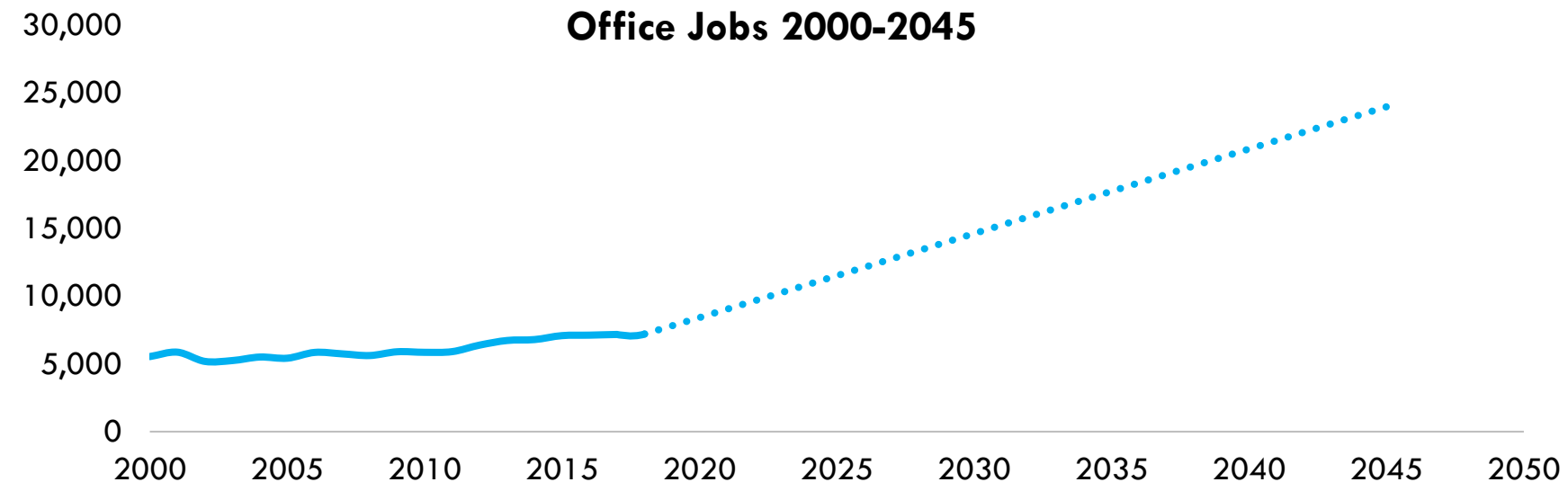


Raleigh Ironworks (Not in Study Area)

There are very few pipeline office projects in the Study Area. Currently, one redevelopment of Class B office space is planned on Highwoods Boulevard. This redevelopment will add a net of 71,000 square feet to the corridor's total office supply. Similar redevelopment of existing office space is a continued possibility if rents continue to increase. Substantial new supply to accommodate a growing workforce may be part of mixed-use renovation of industrial or retail spaces, as seen in developments currently underway just south of the study area. These potential references for future development include the Raleigh Ironworks development that will include 200,000 square feet of Class A office space.

Source: CoStar

Regional models anticipate 16,790 new office jobs along the corridor by 2045, with the growth anticipated to be spread evenly across the Corridor.

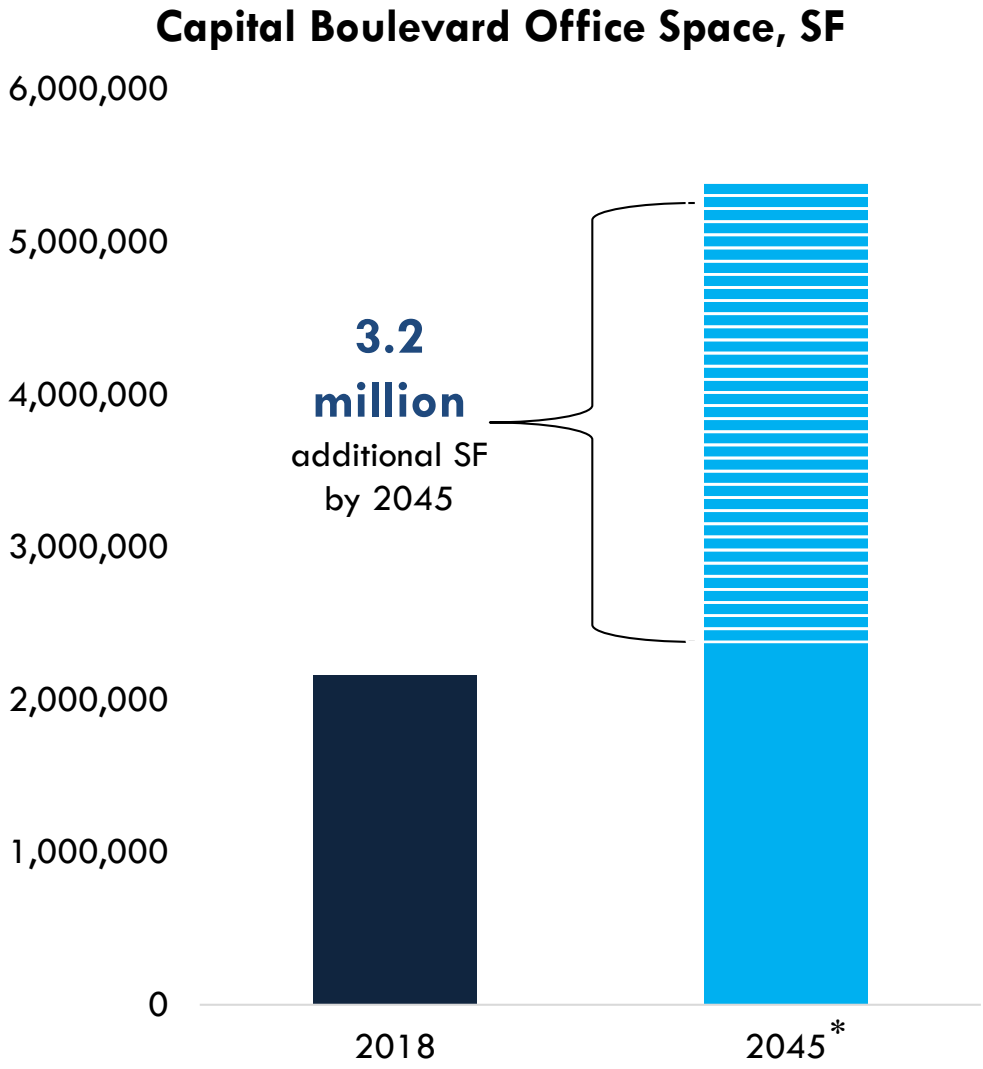


2013-2045 Total office Job Growth	SOUTH	CENTRAL	NORTH
	+6,200 (2% Annual Growth)	**+5,200** (10% Annual Growth)	**+5,750** (6% Annual Growth)

CAMPO projections for office workers are fairly even throughout the corridor. In total, these projections indicate that the Corridor can anticipate nearly 16,800 office jobs, reaching 24,000 workers by 2045. The areas with the lowest current office space are projected to grow substantially, with annual growth of 10% in the Central District and 6% in the North District. To realize this scale of employment growth, strong regional macroeconomic performance and intentional investments in infrastructure are required. If either of these elements do not come to fruition, HR&A anticipates fewer office jobs than CAMPO projects along the Corridor by 2045.

Source: LEHD, CAMPO

After accommodating for shifting preferences in workspaces, the Corridor may be home to 3.2 million additional SF of office space by 2045.



Source: LEHD, CAMPO

* Assumes 250 SF per employee

To accommodate the nearly 17,000 new office jobs projected by CAMPO in the study area by 2045, there would need to be a significant expansion in the existing office stock. With vacancies already at or below a stable point, new demand would be absorbed through new construction or conversion to office. New offices may have more efficient floorplates, meaning that more workers can fit into smaller spaces, but after accounting for these shifting preferences in workspace design, the Corridor would still need to more than double its current supply to nearly 5.4 million square feet. Absorbing 3.2 million additional square feet would present significant challenges in the space-constrained conditions of Capital Boulevard today. Rents for the foreseeable future will likely not be able to support structured parking. Redevelopment of horizontal uses like car dealerships and aging retail centers are the most likely avenue to accommodate this office growth, but market dynamics need to fundamentally change before redevelopment begins on a large scale. Public investments in transportation, placemaking, and other infrastructure can help guide the regional market towards making the substantial investments in office space needed to support projected job growth.

Office Findings and Implications

STRONG MARKET FUNDAMENTALS

Leasing activity, rent growth, and job creation regionally make for a strong office demand drivers along Capital Boulevard.

As vacancy continues to fall and rents rise in response, there may be increased interest in developing additional office space within or around existing office parks. New unanchored office parks would be challenging in today's market.

AGING OFFICE STOCK

Despite a robust market the existing product at all levels continues to age and lose market share, with no new office development currently in development.

Lack of developable sites will constrain office job growth along the Corridor. Regional tenants looking for space could move to similar corridors or pay a premium for space in faster developing submarkets.

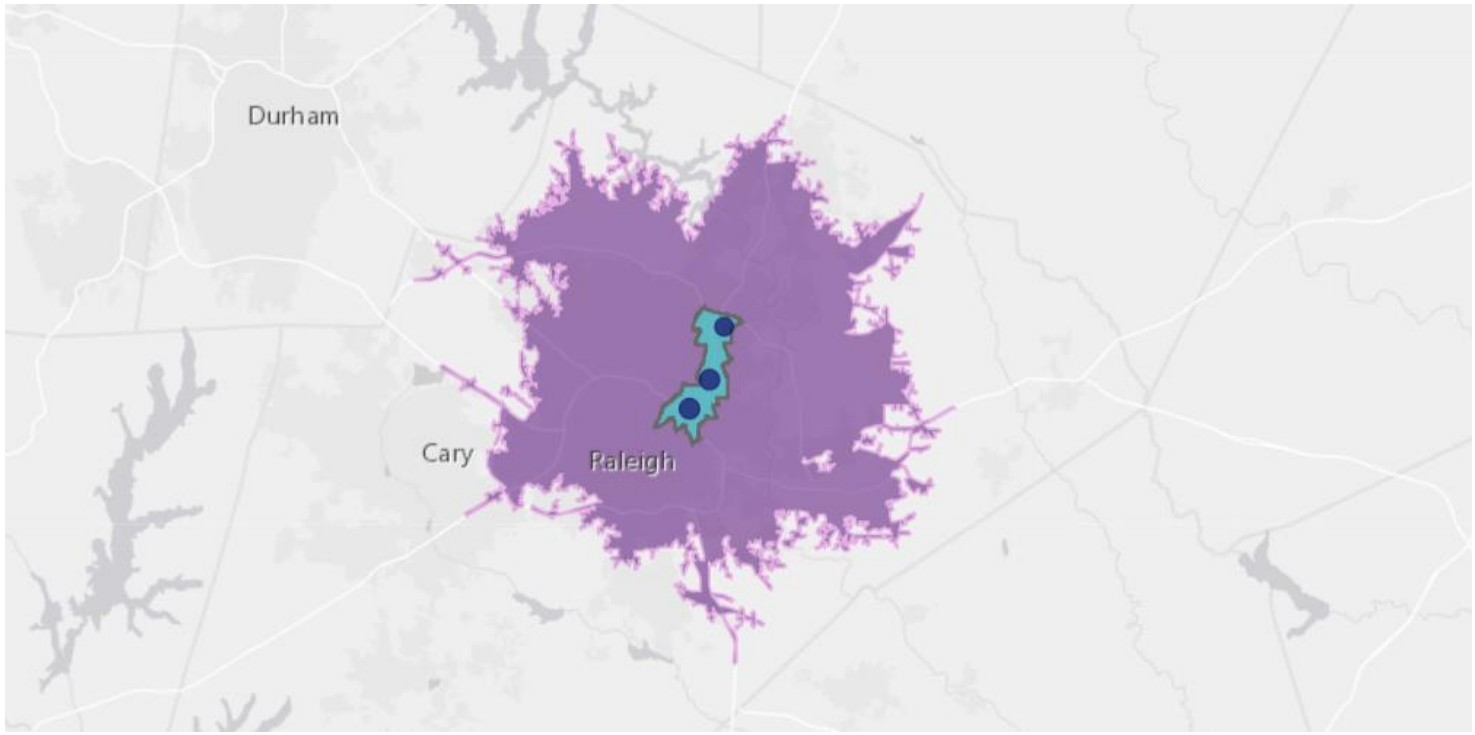
NEW OFFICE DEVELOPMENT

There are signs that redevelopment potential may be at a tipping point for office uses, however this may not yield substantially more space for new jobs.

To accommodate projected job growth, substantial public infrastructure and private capital investments are needed to enhance the attractiveness of the corridor as a place to deliver new surface parked office space.

Retail Market Analysis

As a major retail destination in the region, Capital Boulevard's retail trade area is a 15 minute drive from any of three major points along the corridor.



Convenience Trade Area Study: Primary Study Area

Comparison Trade Area: 15 min. drive

Today, Capital Boulevard North attracts shoppers from around the greater Raleigh area. HR&A's analysis focused on the potential for additional retail development based on retail demand generated in a Convenience Trade Area, consisting of the primary study area used throughout this study, and a Comparison Trade Area that includes a 15 minute drive from major points in each of the South, Central, and North Districts of the Corridor. The three points used in this determination were Tarrymore Square, Capital Crossing, and Triangle Town Center, respectively.

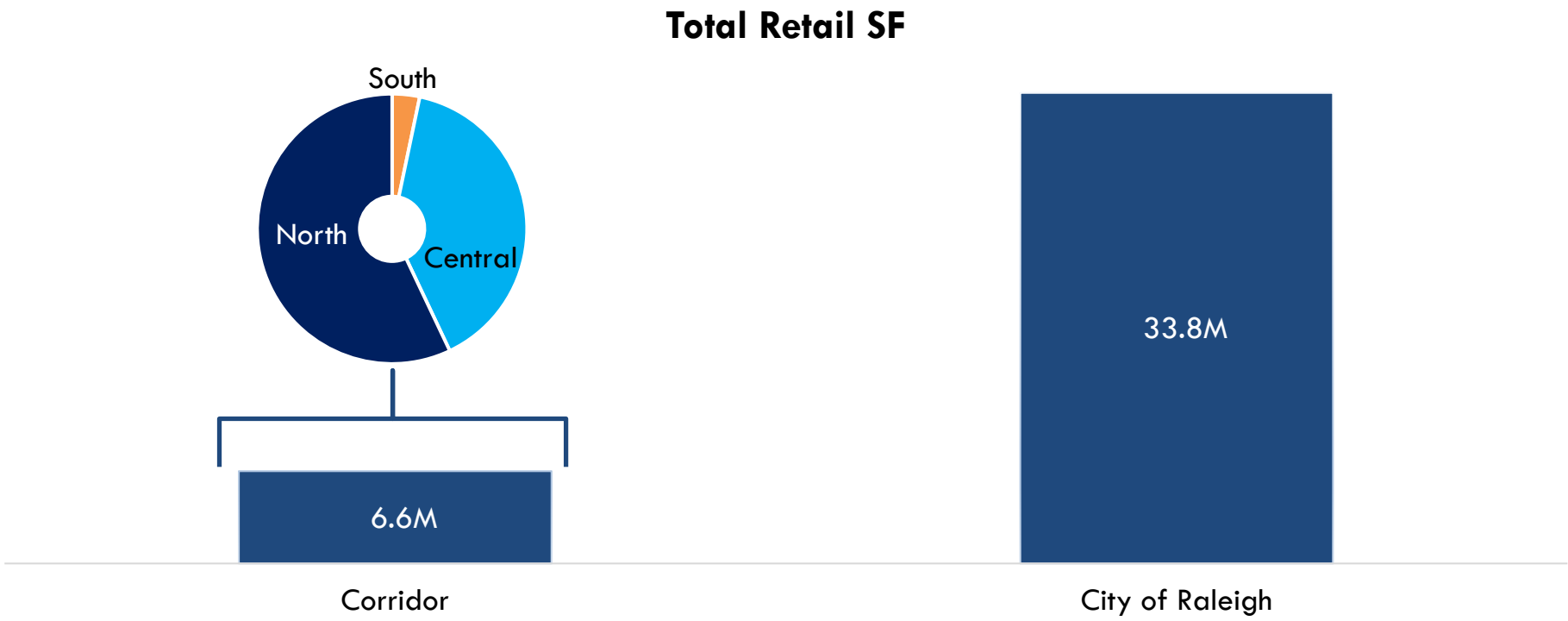
HR&A's retail analysis focused on a high level assessment of retail potential along the Corridor, as well as key areas of Convenience and Comparison retail.

Total Retail Potential			
Convenience Retail			Comparison Retail
Convenience Goods	**Grocery**	**Food & Beverage**	**Comparison Goods**
• Health and Personal Care Stores • Miscellaneous Retailers • General Merchandise	• Grocery Stores	• Restaurants • Bars and Drinking Establishments	• Furniture • Electronics and Appliance • Clothing • Sporting and Hobby Goods • Books and Music

To determine the highly-active, in-demand retail segments along Capital Boulevard in the future, HR&A assessed two broad types of retail: Convenience, and Comparison. Convenience Retail are those businesses that cater to local residents, passersby, and day-time workers and meet short-term needs. Example goods include health care supplies, groceries, and food and drinking establishments. Comparison Retail, in contrast, includes retailers whose primary customers may not be local and would travel to find the right product. These are often larger, more expensive or specialty purchases, including furniture, electronics, clothing, and books.

Source: ESRI

Consistent with its regional status, Capital Boulevard North holds nearly 20% of Raleigh's retail supply, largely concentrated in the North District.



Capital Boulevard North is a major part of the City of Raleigh's retail environment. It contains 6.6 million square feet across the study area, with a majority of that (3.7 million square feet) concentrated in the North. The Central District contains 2.6 million square feet and The South District has less retail, totaling 218,000 square feet. This significant amount of retail space dominates Capital Boulevard North's street frontage, and defines the character of Capital Boulevard.

Source: CoStar

The North District's concentration of regional malls and power centers stand in contrast to the older neighborhood-oriented retail to the south.

Plantation Point
2006, 380K SF

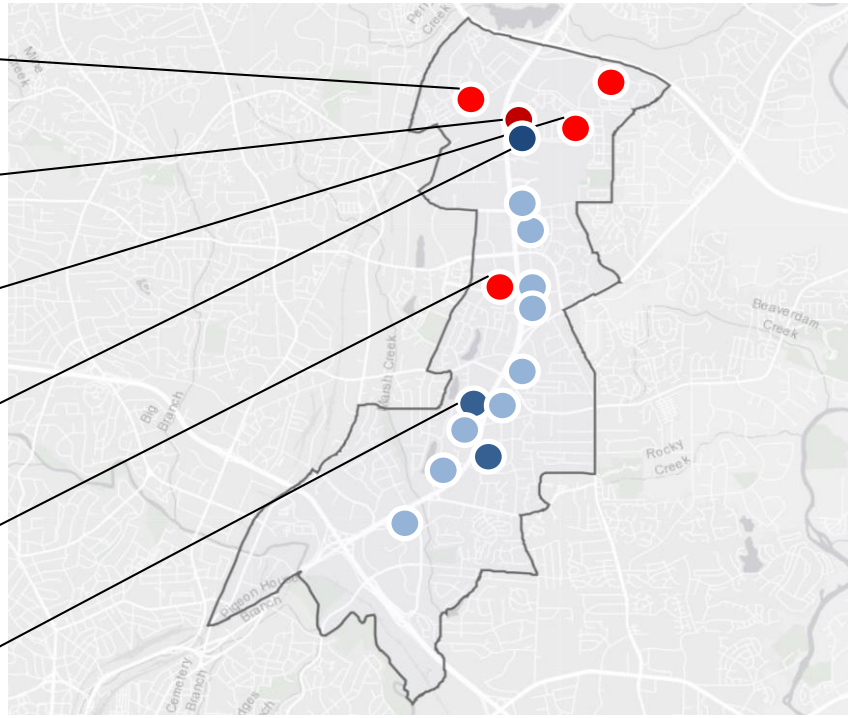
Triangle Town Center
2002 (2014 renovation), 1.2M SF

Poyner Place
2003, 435K SF

Triangle Commons
2004 (2017 renovation), 300K SF

Capital Crossing
1995, 463K SF

Tarrymore Square
1995, 256K SF

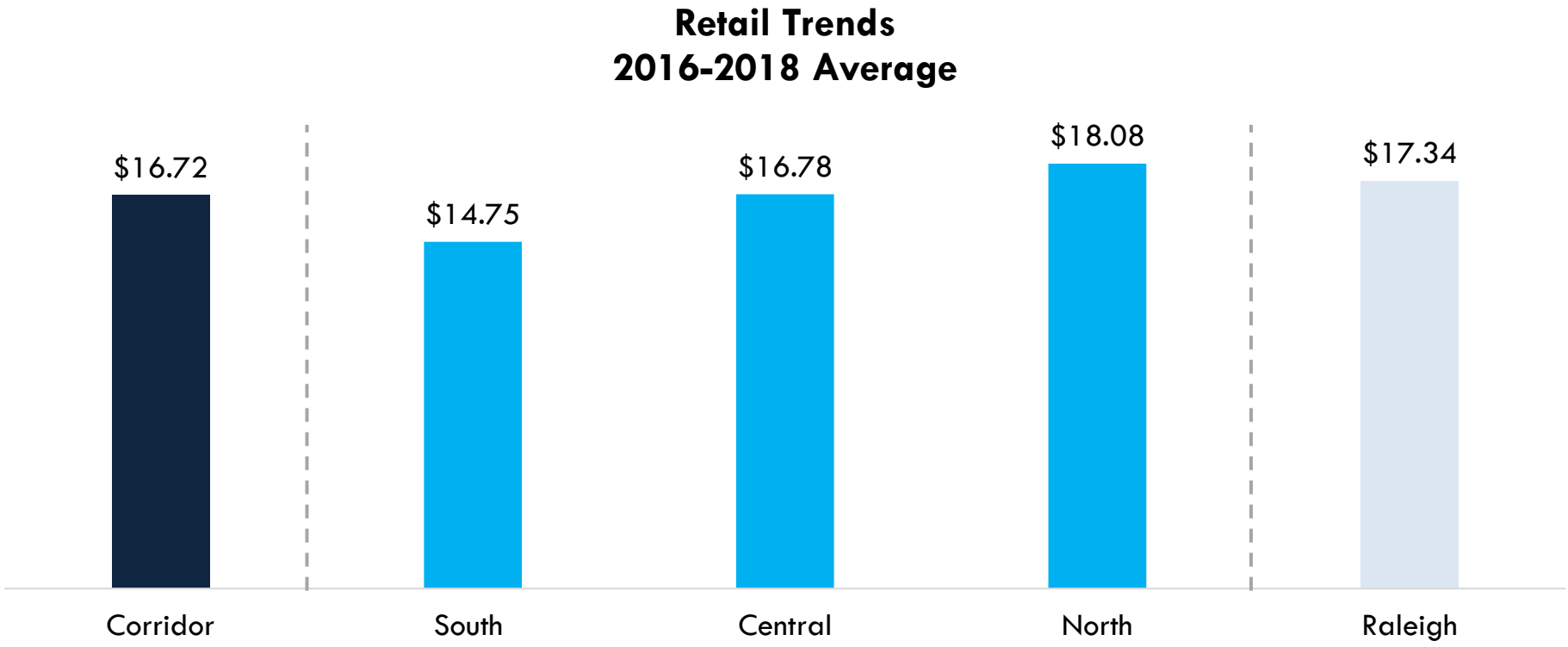


- **Lifestyle Center:** Upscale national-chain specialty stores with dining and entertainment in an outdoor setting.
- **Neighborhood/Strip Center:** Convenience oriented retail center.
- **Community Center:** Wider range of offerings than neighborhood centers.
- **Power Center:** Comparison-dominant anchors, with only a few small tenants.
- **Regional Mall:** Typically, enclosed with inward-facing stores connected by a common walkway.

Large retail centers along the corridor that offer both convenience and comparison shopping characterize the retail market. Triangle Commons is the only lifestyle center in the market, (the project itself is closely associated with the Triangle Town Center Mall). Whereas lifestyle centers have been the leading retail segment on the perimeter of urban markets in recent years, there have been few lifestyle deliveries on Capital Boulevard North. Community and Neighborhood Centers that line rest of the Corridor primarily serve local residents and are generally older. With established and growing customer bases these Convenience retail centers are successful despite their age; the Central District, and the rest of the corridor, are 96% occupied.

Source: ESRI Business Analyst

Rents and vacancies across the corridor are competitive with the city as a whole with the North District out-performing the rest of the Corridor.



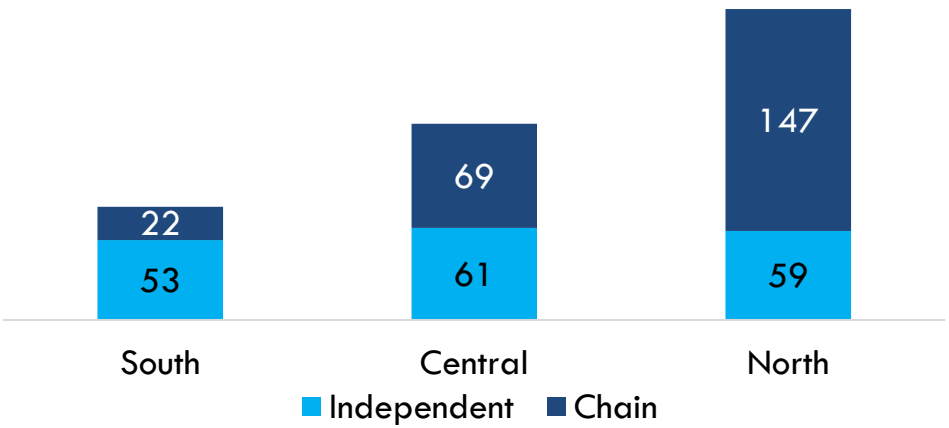
Retail rents along the corridor rise from an average low of $14.75 NNN ("triple net rent," meaning the tenant pay for most or all building expenses) in the South District, to a high of $18.08 NNN in the North District. The lower rents in the South and Central Districts are indicative of the older product that does not provide the high-quality spaces that newer retail centers in the North District provide. These more affordable spaces are an important supply of lower-cost space in a highly trafficked corridor with good access to customers. Average retail rents in Raleigh are slightly higher than the Corridor as a whole at $17.34 NNN, but this includes smaller expensive spaces in and around Downtown.

Source: CoStar

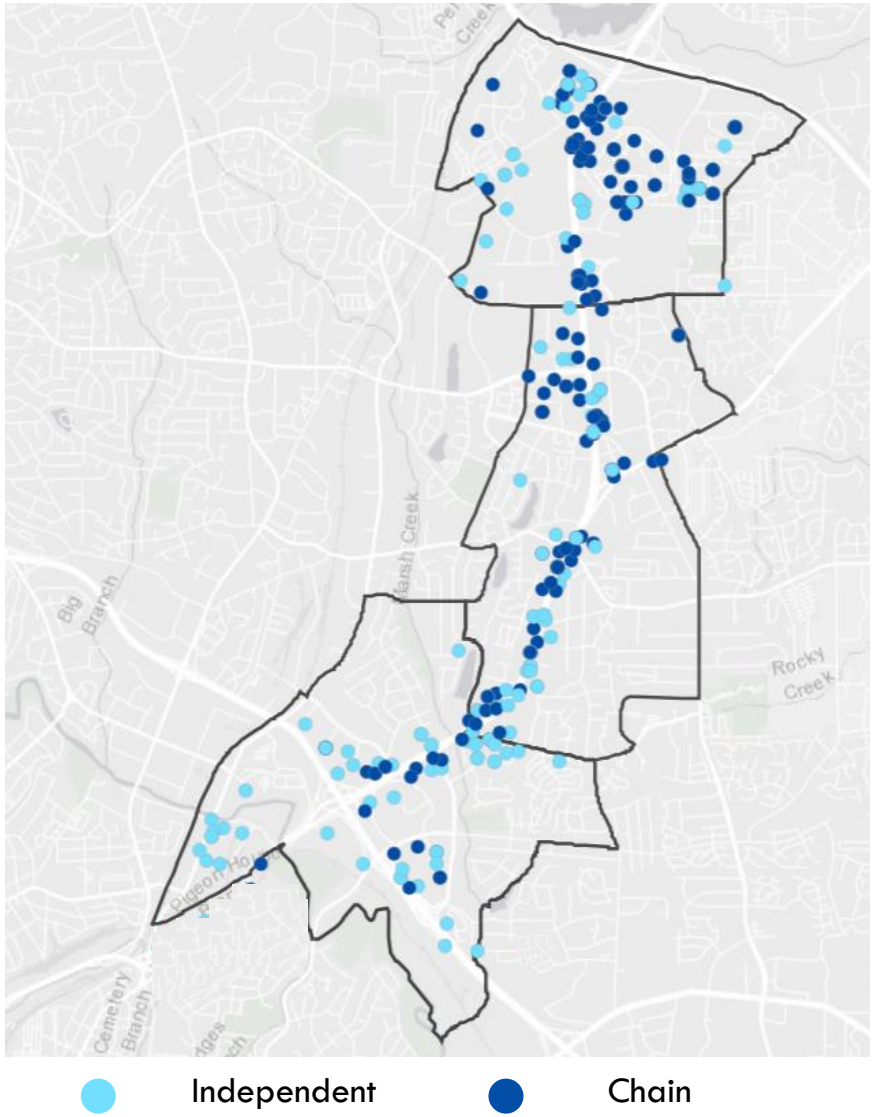
The Central and South Districts offer affordable rent options to independent— often minority— businesses, particularly in service and food-based retail.

Capital Boulevard has over 170 independent businesses spready roughly evenly across the Corridor. They make up the majority of retailers in the South District and almost half in the Central District where lower rents are more likely to support independent businesses. These business include local eateries—including restaurants serving Central American, Caribbean, Southeast Asian, and traditional southern cuisine—hardware stores, and barbers. These business are often minority-owned and serve nearby communities of color. Preserving the affordability of these spaces should be a focus of the strategies developed as part of the Corridor Plan.

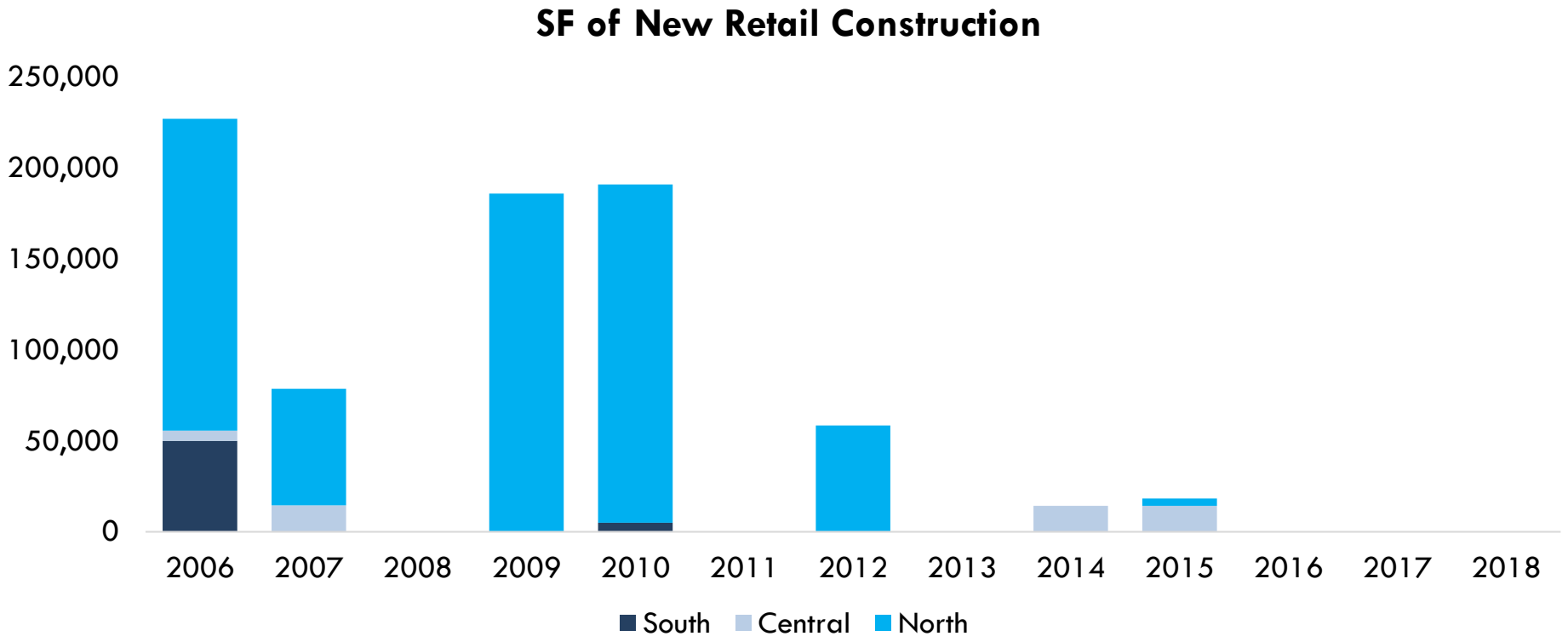
Concentration of Independent Retailers



Source: ReferenceUSA



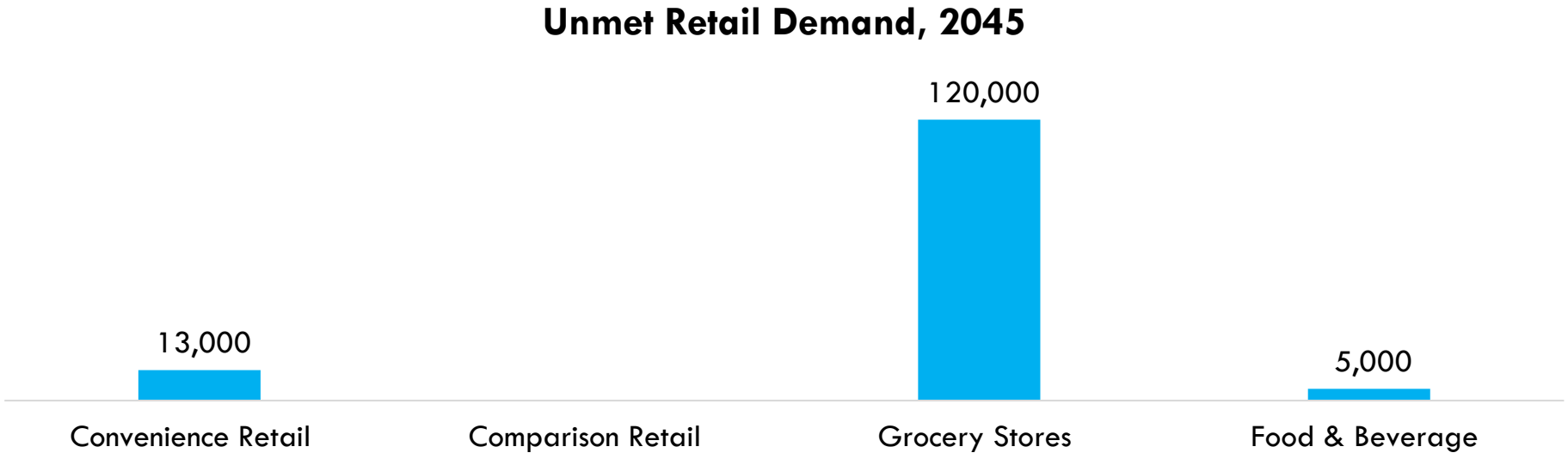
New retail construction across the corridor has been limited since 2010, showing signs that national retail challenges may be impacting Capital Boulevard.



While Capital Boulevard is an important retail center in the region, there have been few retail deliveries since 2010. As the North District built over the last decade and the market has shifted to become more residential, there is now more competition for large developable parcels on the Corridor. Adding to these pressures is the uncertain future of brick-and-mortar retail nationally. Since the Recession, traditional auto-oriented retail corridors like Capital Boulevard North and their "big-box" retail anchors have struggled to succeed in the face of competition from e-commerce retailers. Taken together, limited sites, more competition, and an industry struggling to adapt to change have limited new retail development for nearly a decade, despite the continued strength of many individual shopping centers along the Corridor.

Source: City of Raleigh

The Corridor is anticipated to demand additional grocery options by 2045 to support a growing residential and worker population.



As a major retail center, there is no current retail gap between demand and supply for Convenience, Comparison, or Food & Beverage goods. However, with the addition of over 38,000 residents and 16,700 workers projected on the Corridor by 2045, these new consumers will generate additional demand for all types of retail. Despite this substantial projected growth, the current supply continues to entirely meet this new demand in Comparison Retail, while only just allowing for a total of around 20,000 square feet of Convenience and Food & Beverage retail. With additional residents, however, there may be fairly substantial demand for additional grocery stores. 120,000 square feet in unmet grocery demand can accommodate one or two grocers, depending on their target market and size, and would be a valuable addition to a corridor that has few new grocery options. If redevelopment into mixed-use or residential uses does occur at existing retail centers along the corridor, the supply of Convenience retail may decline in the future, resulting in a larger gap between the supply of Convenience Retail and the spending potential associated with the growing residential population along the Corridor.

Source: LEHD, CAMPO

Retail Findings and Implications

MAJOR RETAIL CORRIDOR Capital Boulevard is a major retail corridor that serves much of the City of Raleigh. The Corridor specializes in comparison goods, but also serves provides convenience goods for nearby residents.	As a destination for retail, Capital Boulevard's northern retail segments must continue to redefine themselves to keep competitive with other more lifestyle-oriented retail around the region. The South and Central Districts may feel redevelopment pressures as its retail continues to age.
STABLE EXISTING MARKET Relatively stable rents and low vacancy throughout the corridor have not led to new retail development in recent years.	Re-positioning of existing assets and co-locating residential development with retail centers as part a transit-oriented development strategy for the corridor could support existing retail and facilitate the success of new retail concepts.
INDEPENDENT RETAILERS The South District serves as a valuable repository of affordable and accessible space for independent retailers to operate new businesses and incubate retail concepts.	As renovation and redevelopment of retail spaces to accommodate anticipated residential and office growth occurs, higher rents and fewer sites may threaten the viability of these smaller retailers. Strategies to stabilize rents or provide long-term affordable spaces should be considered.

CAPITAL BOULEVARD NORTH

MARKET ANALYSIS
NOVEMBER 2018

HR&A Analyze. Advise. Act.

HR&A Advisors, Inc.

Appendix F:
Multiway Renderings/Bike Crossings

Sections Plan Review

FIGURE 1. **TRAWICK AREA MULTI-WAY RENDERING**

FIGURE 2. STARMOUNT AREA MULTI-WAY RENDERING

FIGURE 3. BUFFALOE-NEW HOPE CHURCH AREA MULTI-WAY RENDERING

FIGURE 4. **LOUISBURG AREA MULTI-WAY RENDERING**

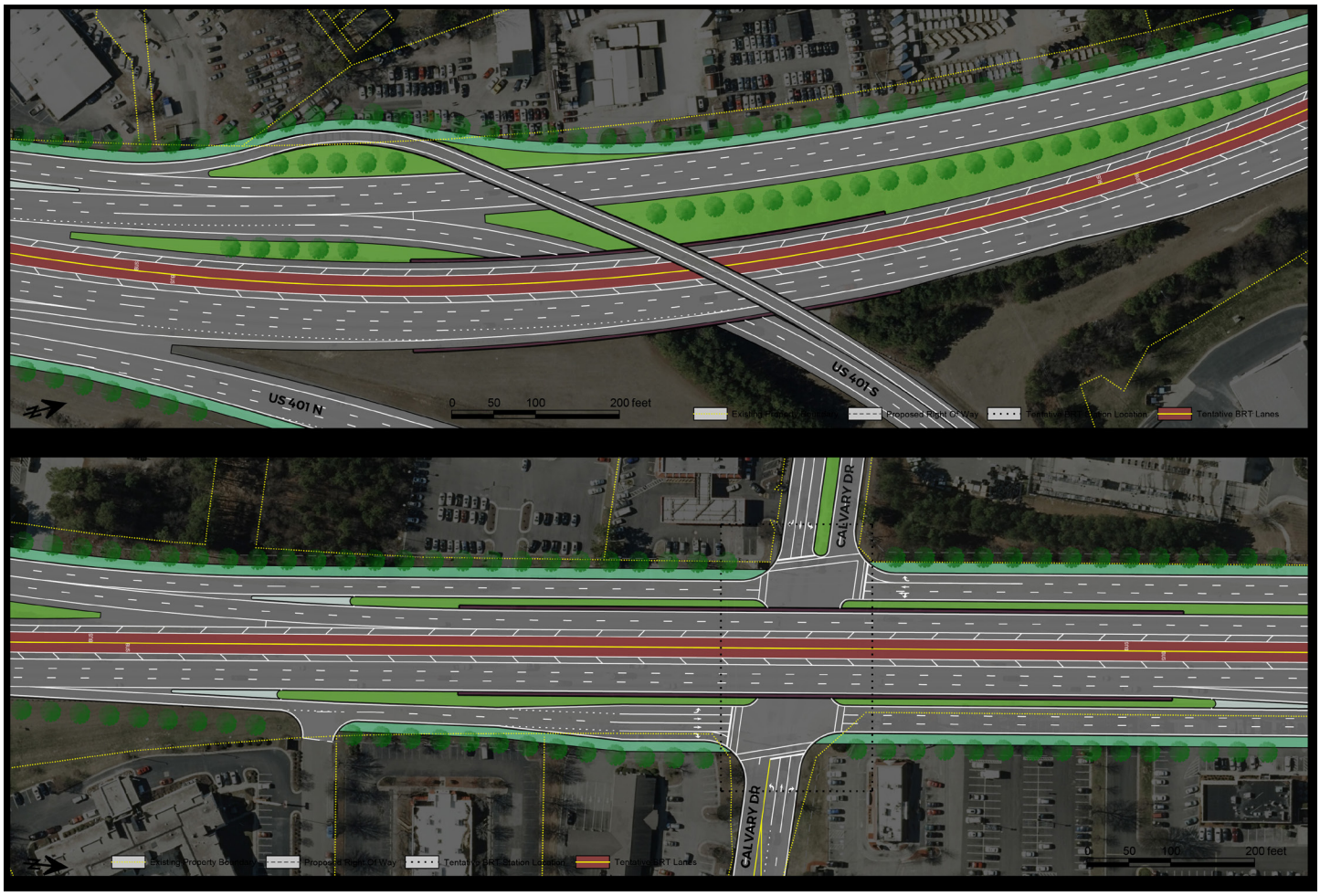


FIGURE 5. **NEW HOPE-MILLBROOK AREA MULTI-WAY RENDERING**

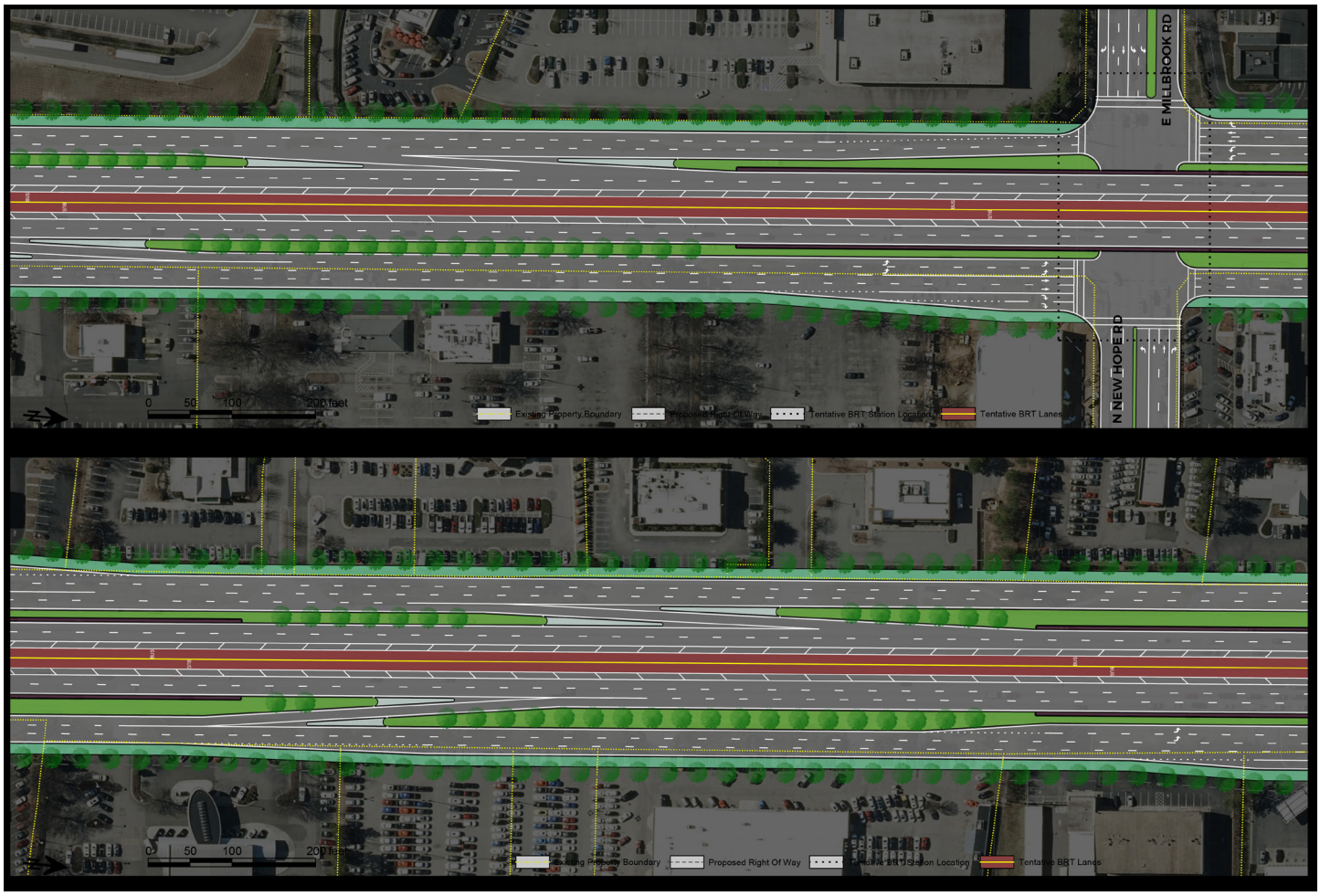


FIGURE 6. SPRING FOREST AREA MULTI-WAY RENDERING

FIGURE 7. SUMNER AREA MULTI-WAY RENDERING

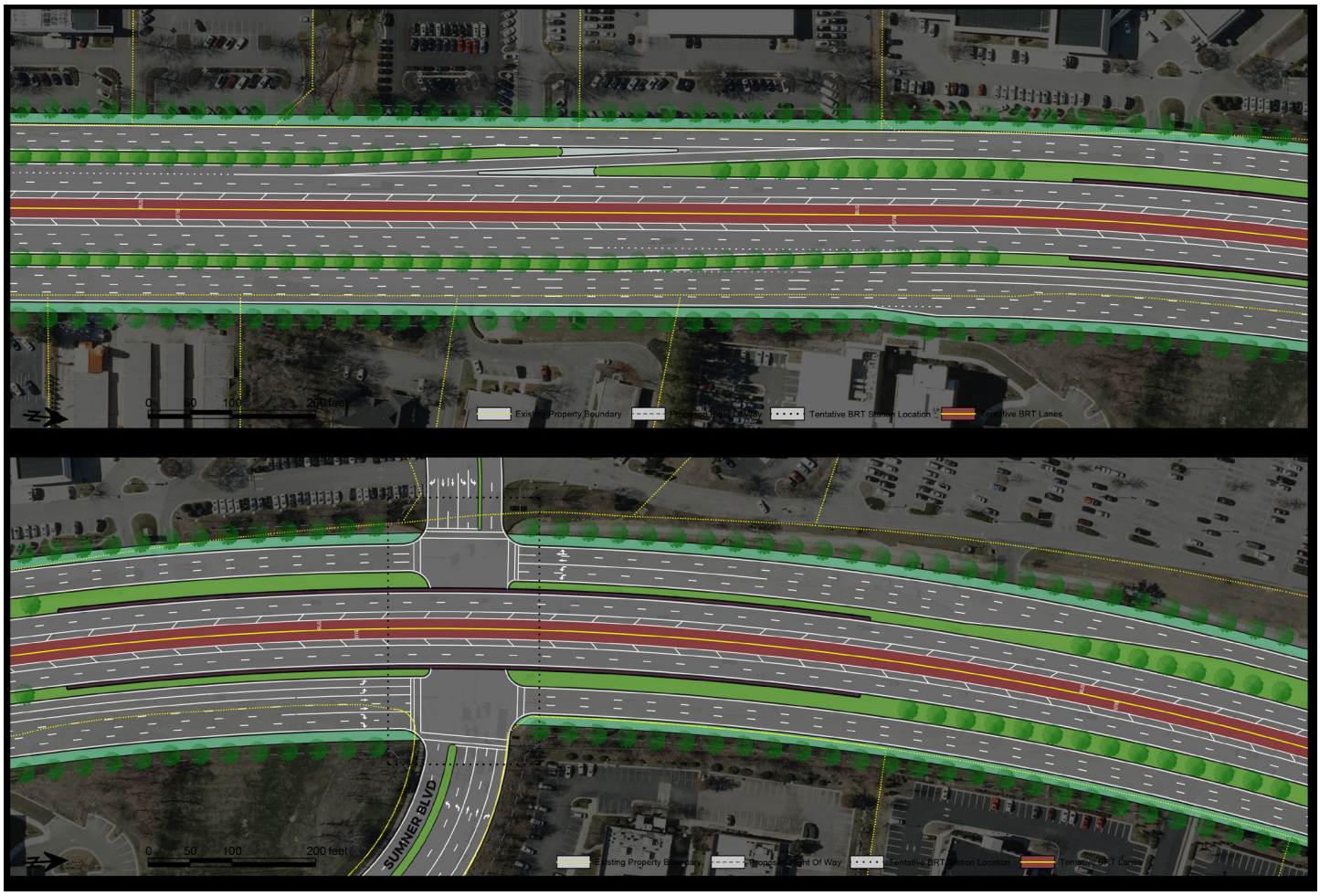


FIGURE 8. OLD WAKE FOREST AREA MULTI-WAY RENDERING

Interchanges Plan Review

FIGURE 9. **BUFFALOE-NEW HOPE CHURCH SPUI INTERCHANGE**

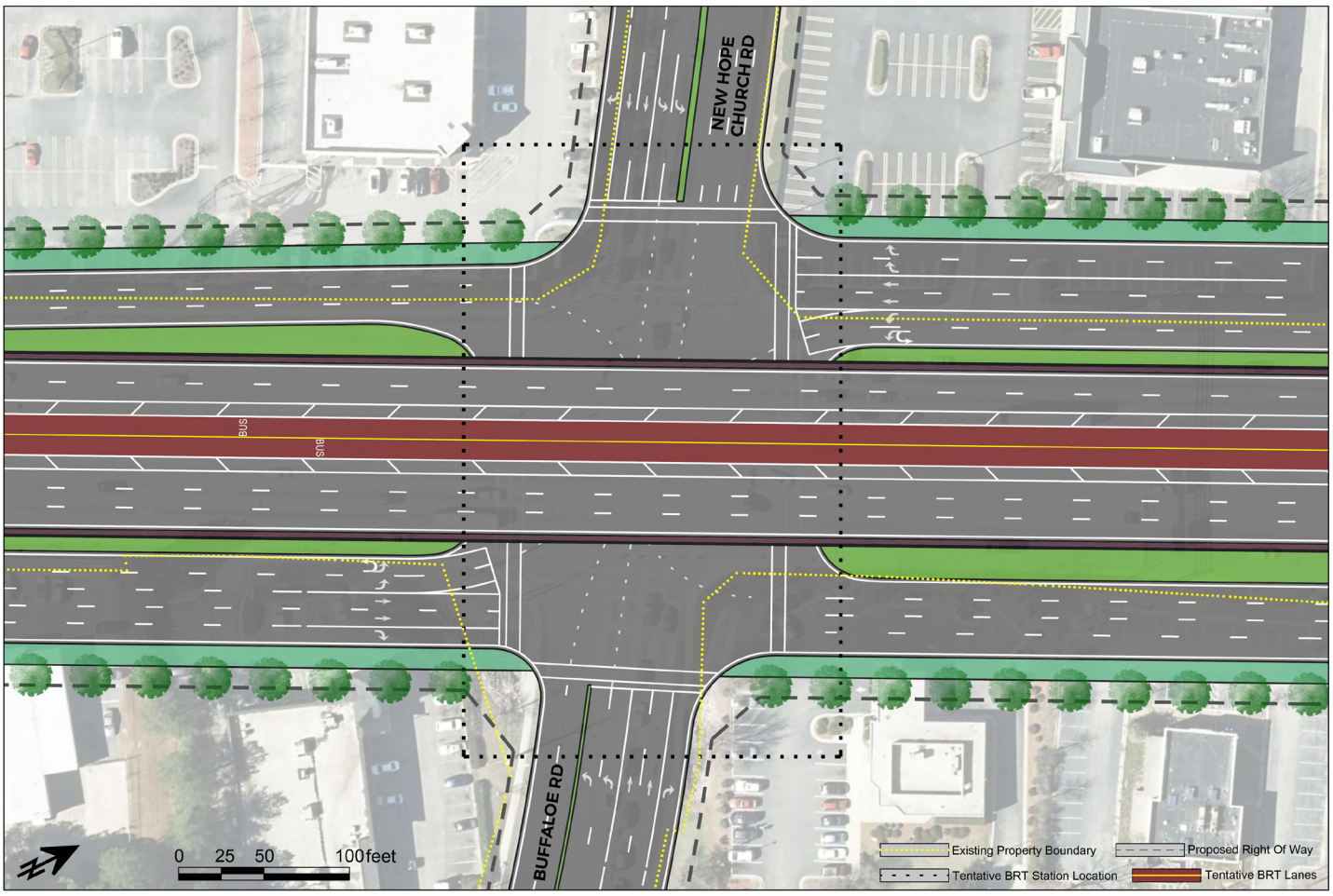


FIGURE 10. **NEW HOPE-MILLBROOK DIAMOND INTERCHANGE**

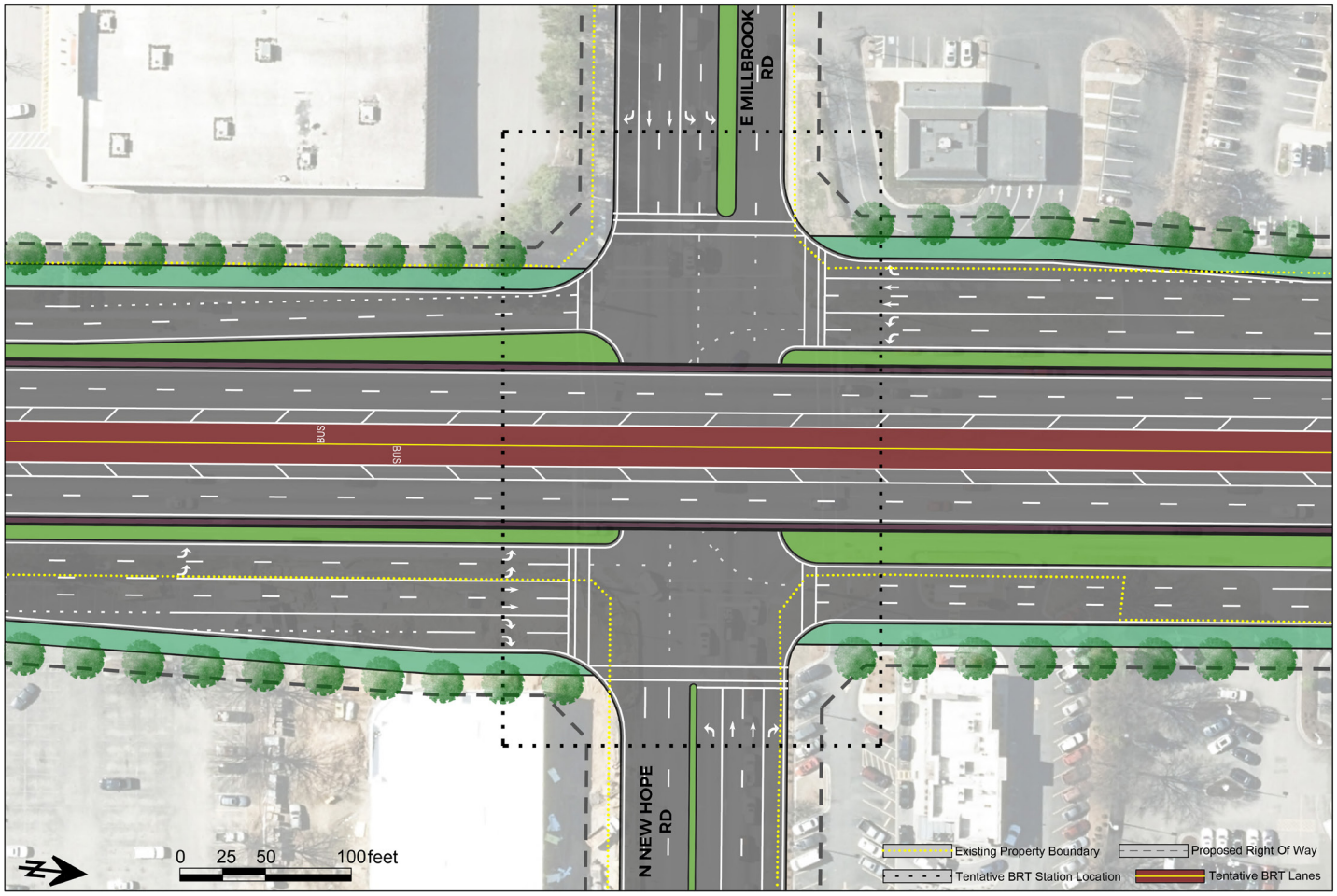
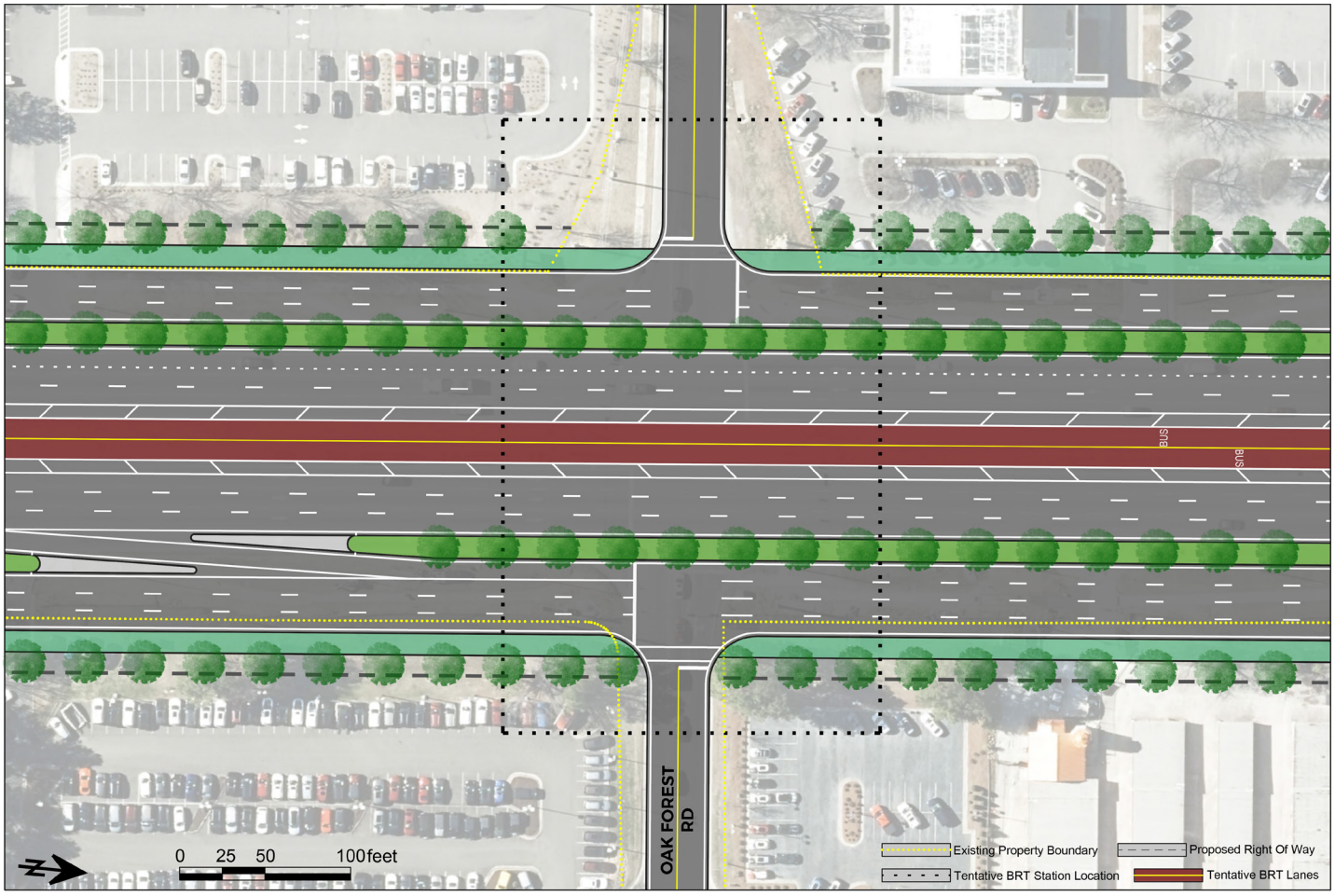


FIGURE 11. OAK FOREST RIRO INTERSECTION



Bicycle Crossings

FIGURE 12. **INTERCHANGE BICYCLE APPROACHES - DUAL PROTECTED**

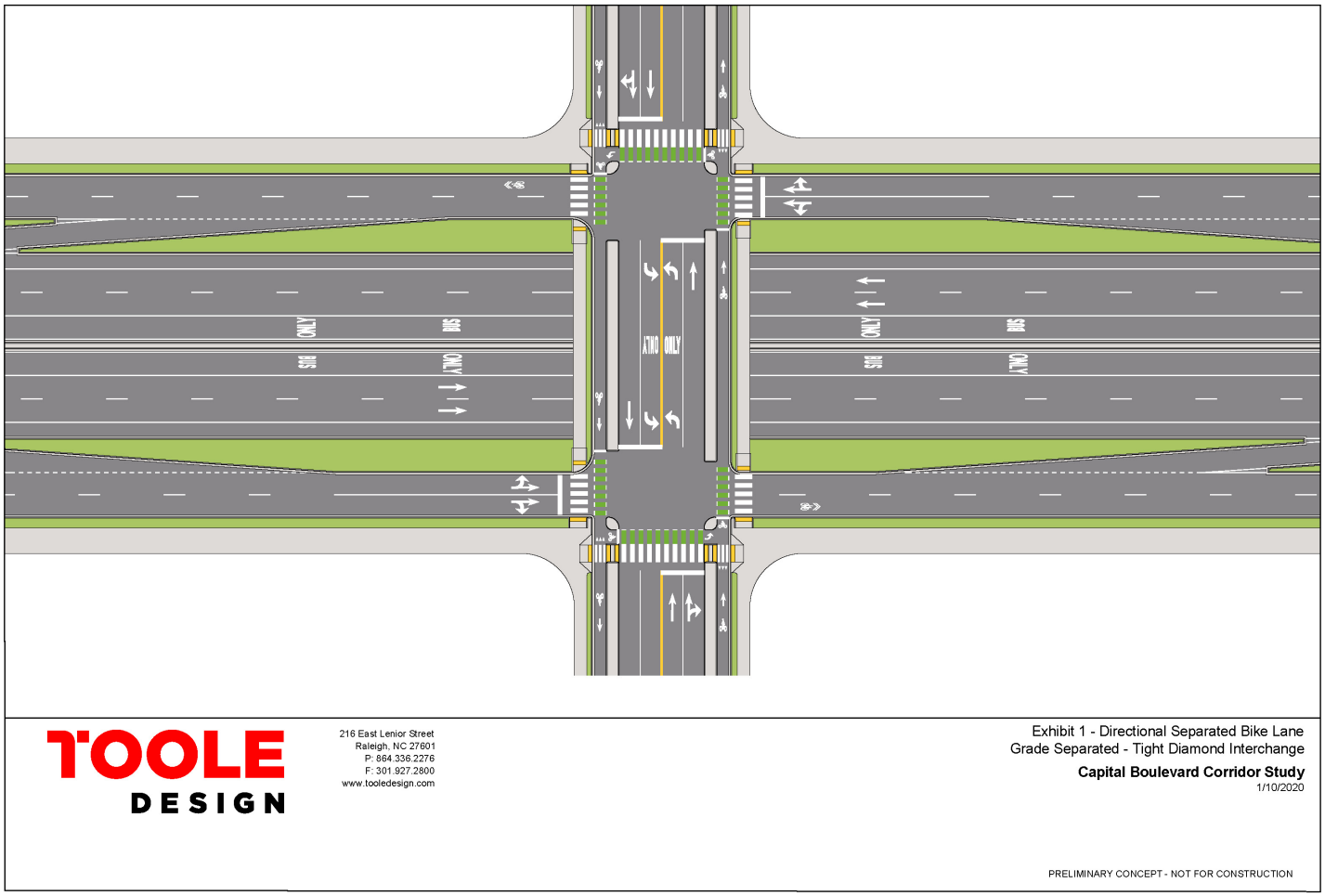
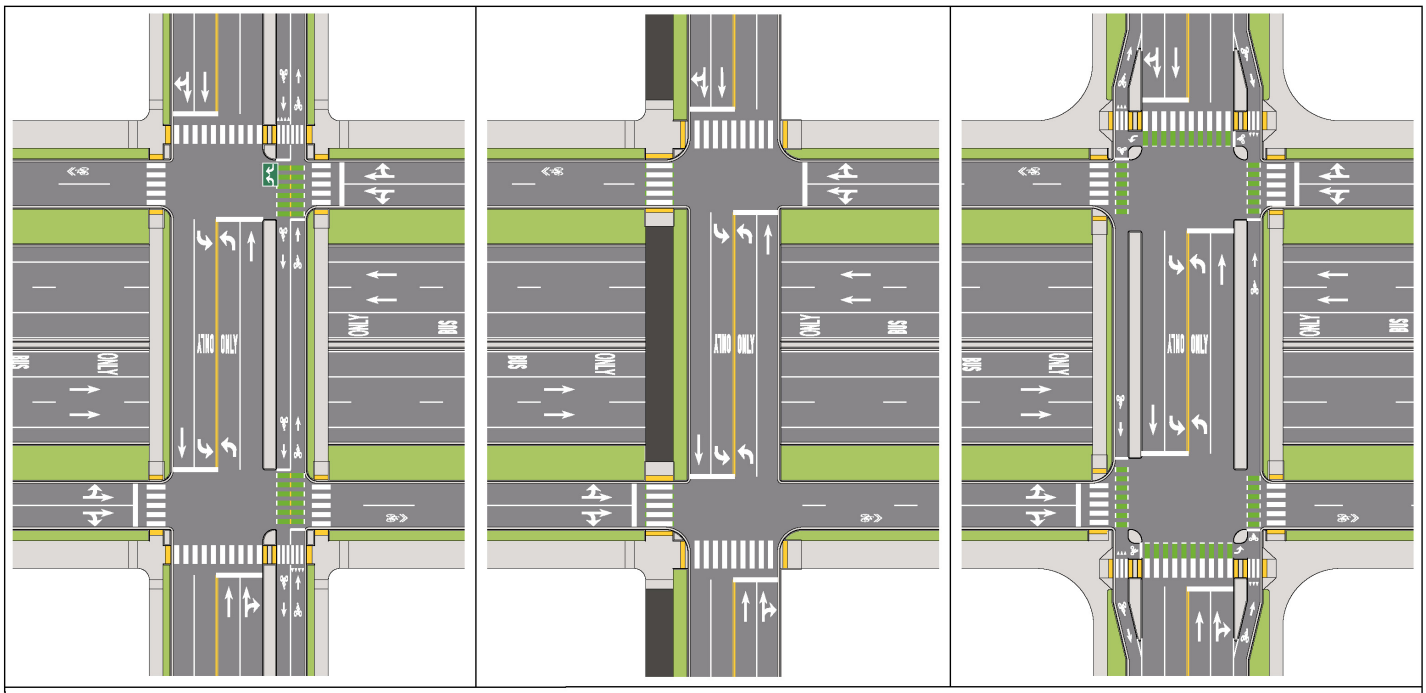


FIGURE 13. INTERCHANGE BICYCLE APPROACHES - ALTERNATIVES



Two-Way Separated Bike Lane

Shared Use Path

Transition to/from Bike Lanes
to/from Separated Bike Lanes at Interchange

TOOLE DESIGN

216 East Lenior Street
Raleigh, NC 27601
P: 864.336.2276
F: 301.927.2800
www.tooledesign.com

Exhibit 2 - Two-Way Separated Bike Lane, Shared Use Path, & Transition to/from Bike Lanes to/from Separated Bike Lanes at Interchange

Grade Separated - Tight Diamond Interchange
Capital Boulevard Corridor Study
1/10/2020

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

Appendix G:
Streetscape Concepts

RALEIGH URBAN DESIGN CENTER

REPORT 03:

CAPITAL BOULEVARD NORTH

SUMMER 2020

CAPITAL BOULEVARD NORTH

Summer 2020

PROJECT BRIEF

This study is part of a larger visionary plan for the portion of Capital Blvd. stretching from I-440 to I-540. The focus of the study was to visualize land use, density, and urban form. The study also made determinations for street type and street design for large district size developments using a new block prototyping method.

RALEIGH URBAN DESIGN CENTER

Joe Michael, AIA, Principal Urban Designer

Austin Bowman, Associate ASLA, Urban Designer

Karli Stephenson, Associate ASLA, Urban Designer

Charles Dillard, AICP, Urban Designer

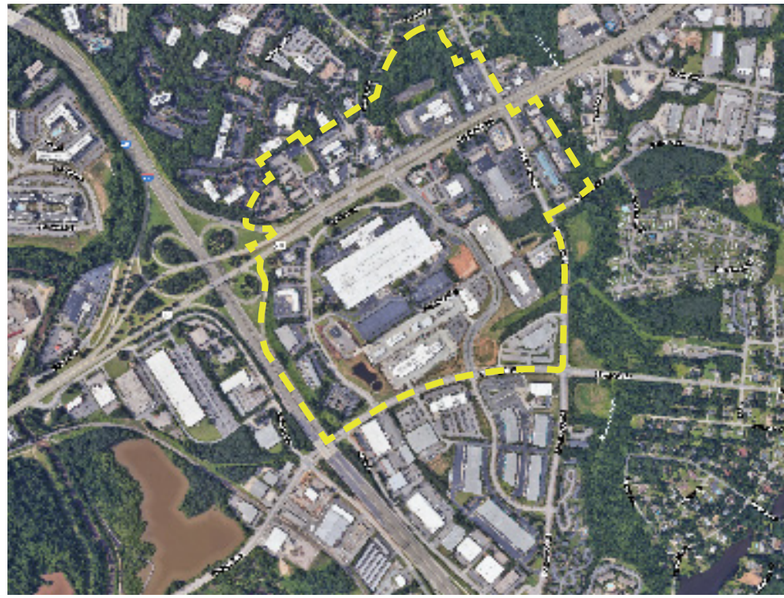
Beth Nooe, Associate AIA, Urban Designer

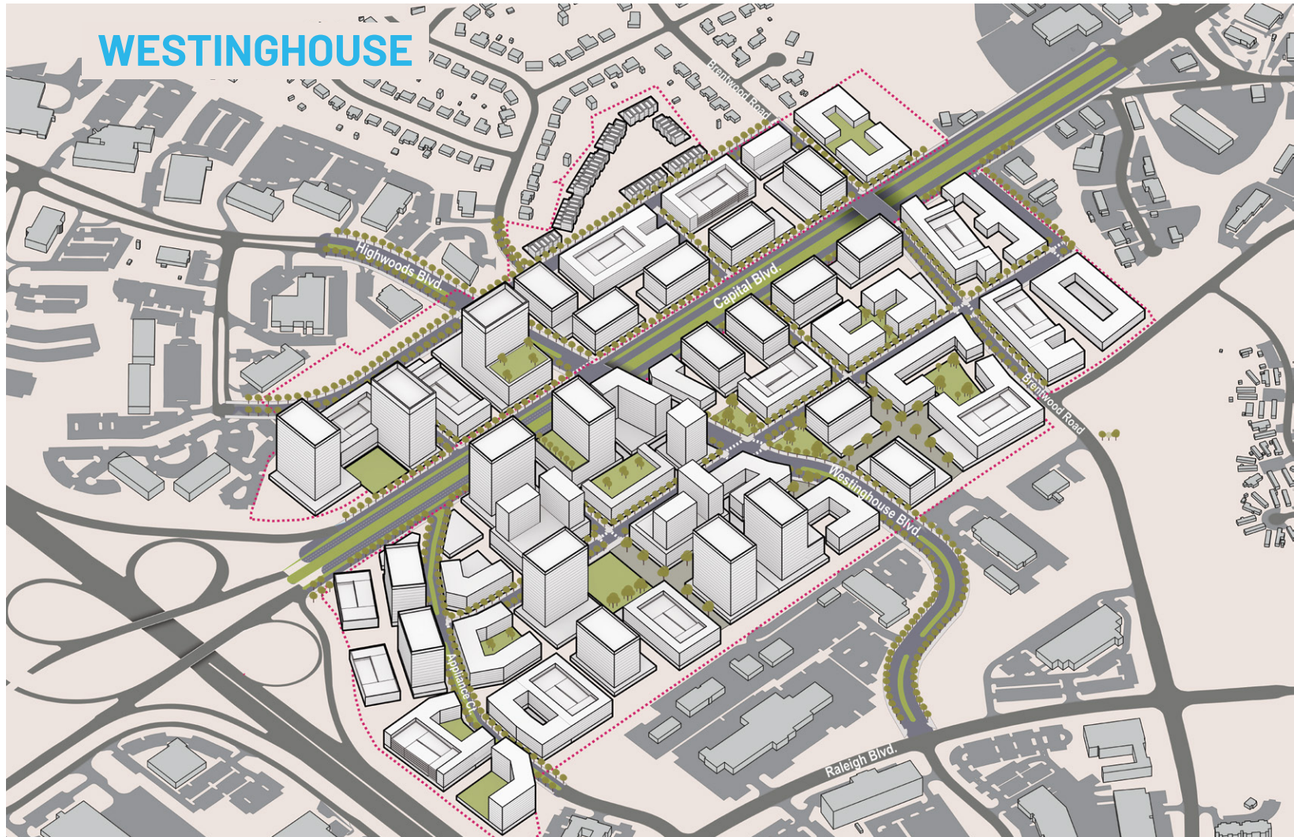
URBAN DESIGN REPORT

01. LAND USE + URBAN FORM

A Vision for Future Transit Oriented Districts

The Westinghouse District is located just on the eastern edge of I-440 with an eastern boundary along Brentwood Rd. The district is currently comprised primarily of primarily commercial development. The Planning study recommends medium density development with a mix of office and residential with strong retail inclusion at the ground level. As seen in the massings, the higher density areas are located between I-440 and Westinghouse Blvd. The area between Westinghouse Blvd. and Brentwood Rd. comprise lower density development with a small area of residential development at the northern edge of the district.

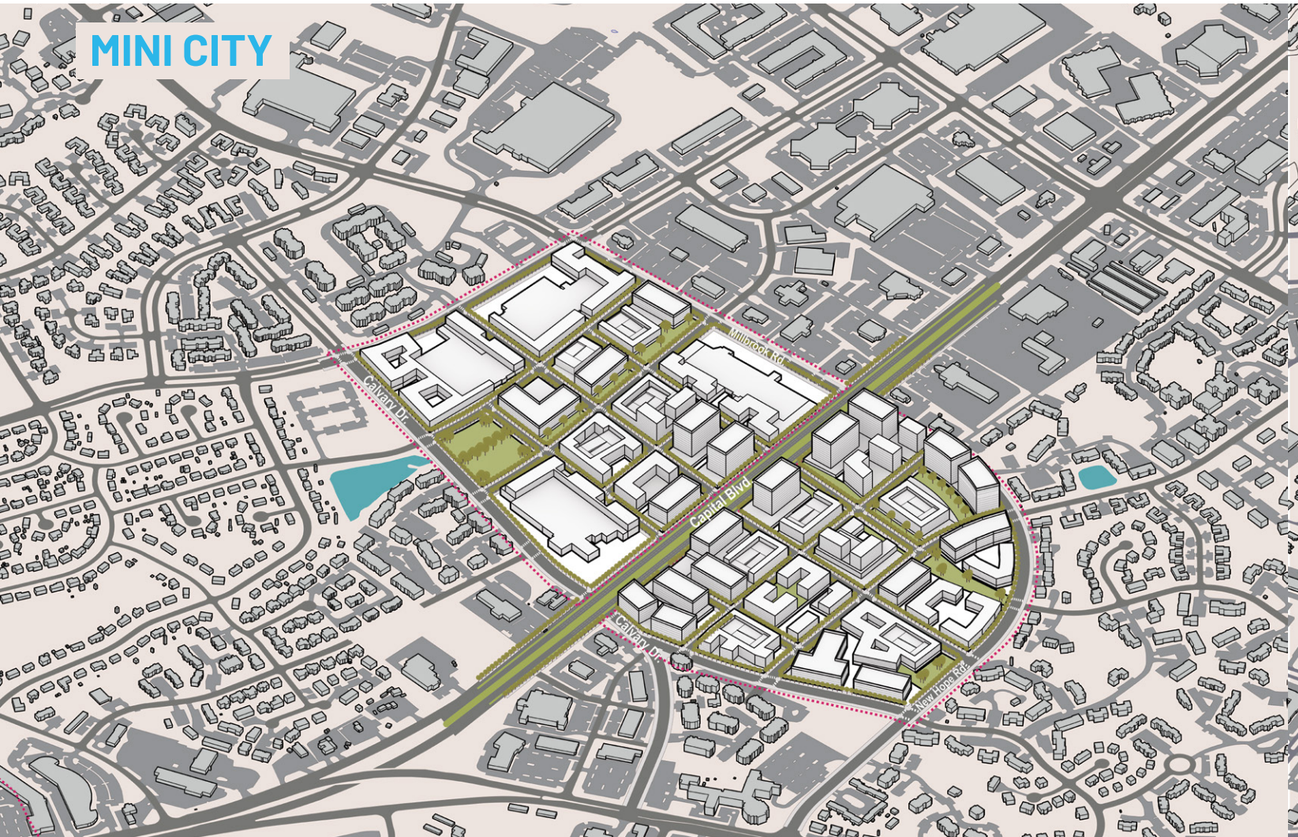




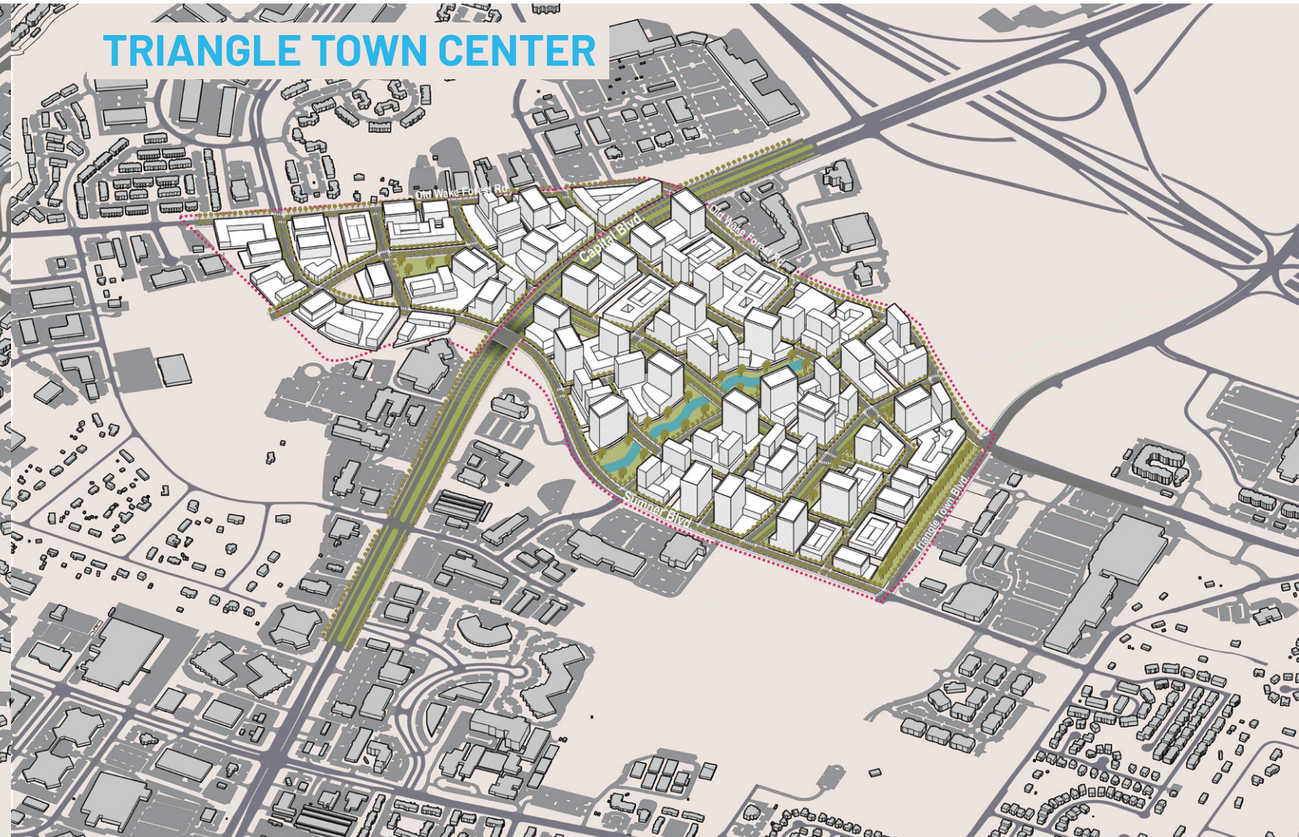
The Mini City District is bounded to the south by Calvary Dr. and to the north by Millbrook Rd. The district is currently composed of commercial development in the form of shopping centers. A fairly large portion is also comprised of multi-family housing. Overall, there is quite a bit of land devoted to surface parking. The Planning study visions this area as medium density mixed-use development ranging from 5-12 stories. The massing below shows a potential future with area devoted to open space and an opportunity to keep existing retail in place while allowing for outparcel development.

The Triangle Town Center District is bound to the north by Old Wake Forest Rd. and to the south by Sumner Blvd. The district is occupied primarily by the Triangle Town Center Mall. The largest district in the study and the most prime for redevelopment, the Planning study recommends high density development comprising primarily 20 story height limits. The land use would consist of mixed-use development and also calls for the restoration of currently buried streams under Triangle Town Center. This would provide an amenity area as well as an opportunity to improve the health of the watershed as a whole.

MINI CITY



TRIANGLE TOWN CENTER

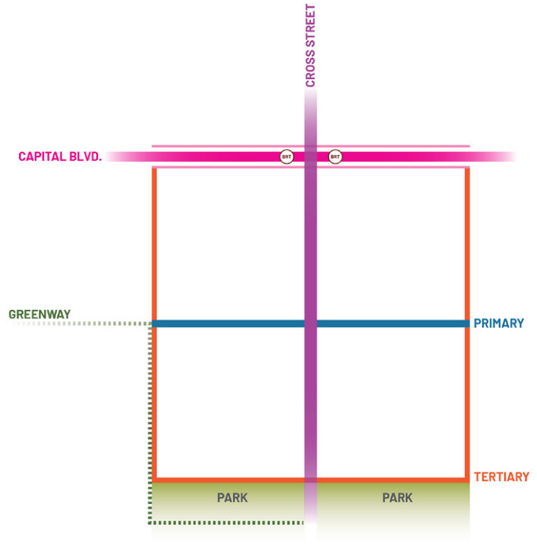


02. BLOCK PROTOTYPING

A Method for Improving the Public Realm

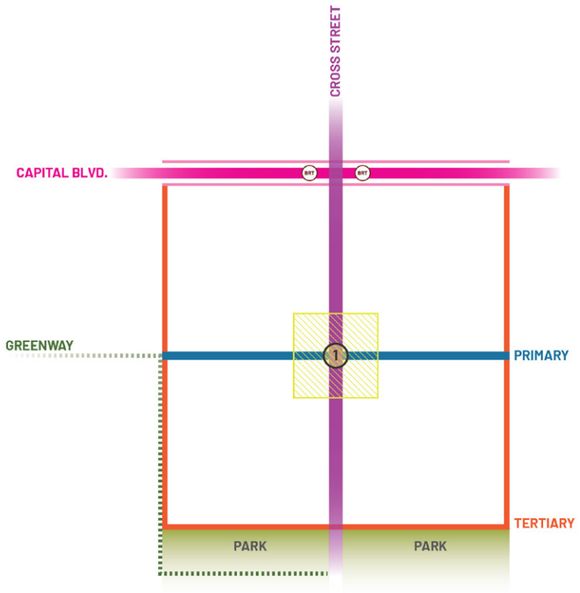
Each of these areas are quite large and if fully developed would add a sizeable amount of square footage into this area of the city. This is a long term plan and a visionary one. These areas are imagined as Transit Oriented Districts that would come online with the completion of the expansion of Bus Rapid Transit (BRT).

These districts are also fertile ground for the implementation of city policy and regulations being developed around Transit Oriented Development (TOD), affordable housing, and Performance-Based Zoning. Triangle Town Center in particular poses the opportunity for the continued expansion of ecological restoration efforts envisioned in other planning studies.



02.1: STREET PLAN VIGNETTES

Blocks Facing Primary + Cross Street(s)



FRONTAGES

PRIMARY: Shopfront (-SH)

CROSS STREET: Urban General (-UG)

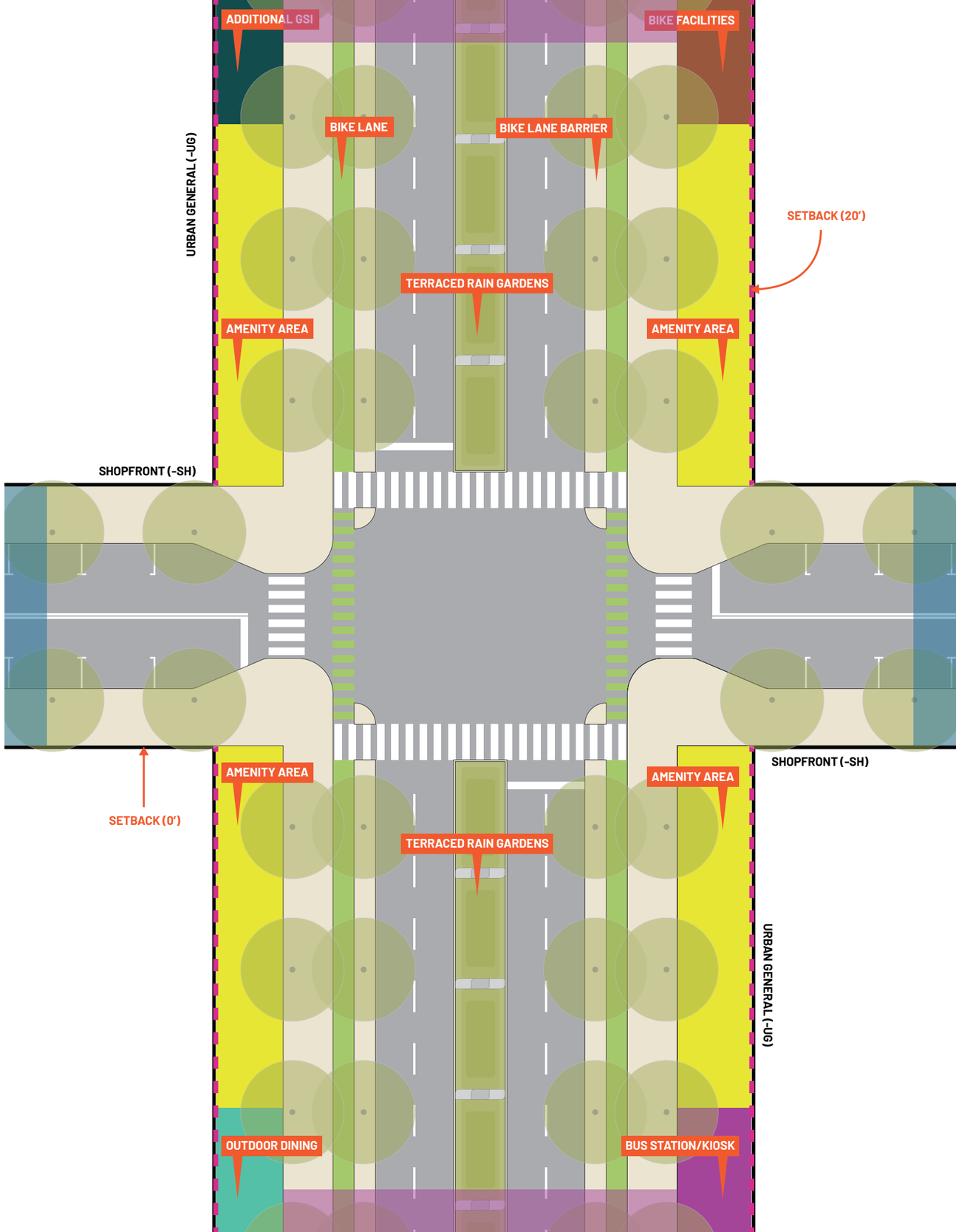
CONSIDERATIONS

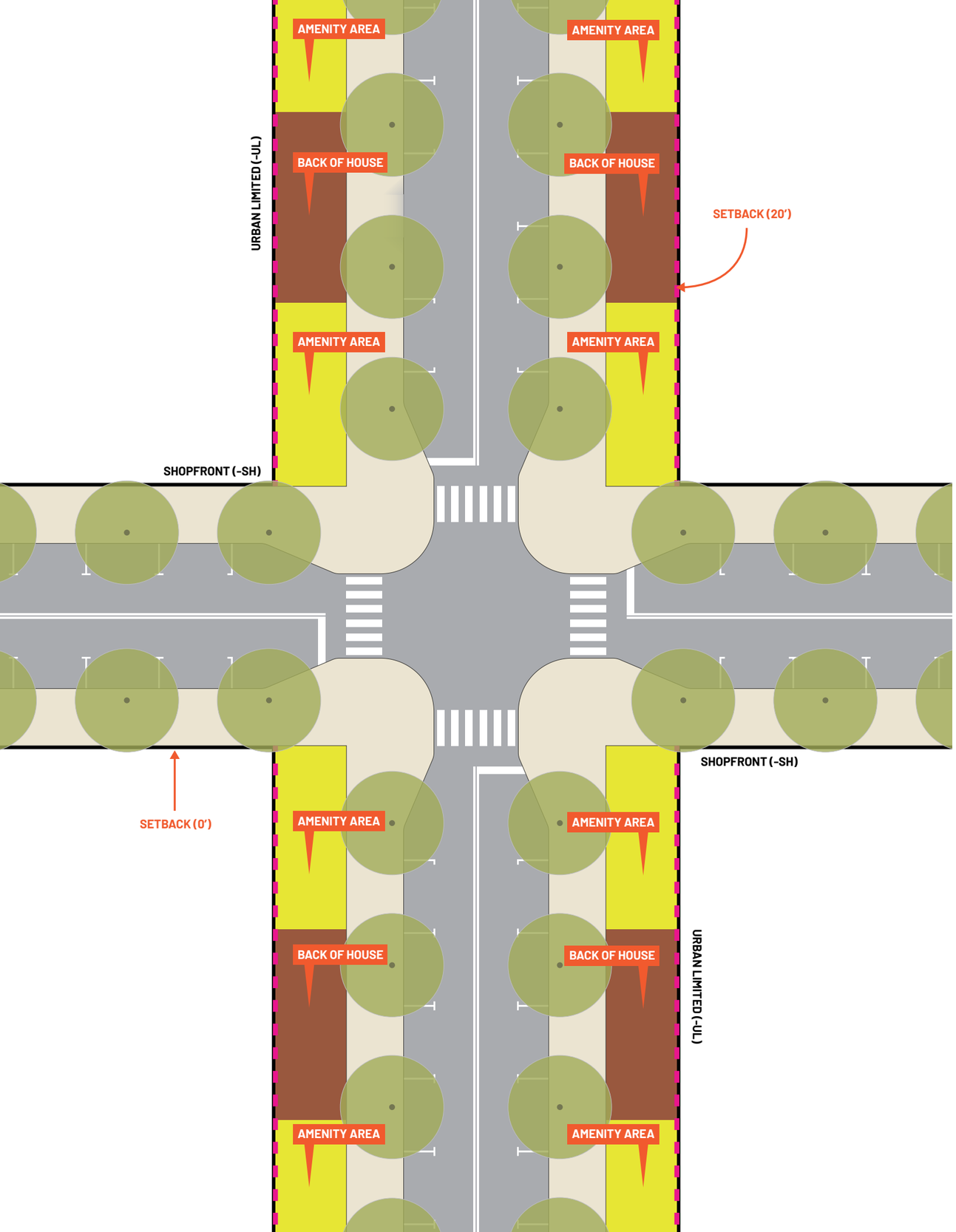
PRIMARY:

- Shopfront Frontage
- Most pedestrian oriented
- Minimum 16' sidewalk
- Minimize curb cuts
- Combine tree plantings with GSI
- 0'-5' Build To
- Intersection with cross street should include some corner amenity
- Dedicated bike lanes and protection can be added in lieu of parallel parking

CROSS STREET:

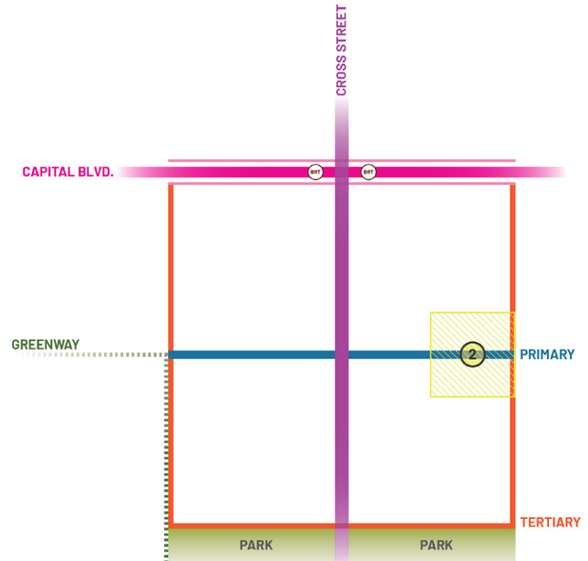
- Off street bike facilities
- Trees planted on sidewalk to achieve canopy effect
- Median devoted to GSI
- No curb cuts
- Setbacks are generous
- Intersection with primary parallel street should include some corner amenity





02.2: STREET PLAN VIGNETTES

Blocks Facing Primary + Tertiary Street(s)



FRONTAGES

PRIMARY: Shopfront (-SH)

TERTIARY: Urban General (-UG)

CONSIDERATIONS

PRIMARY:

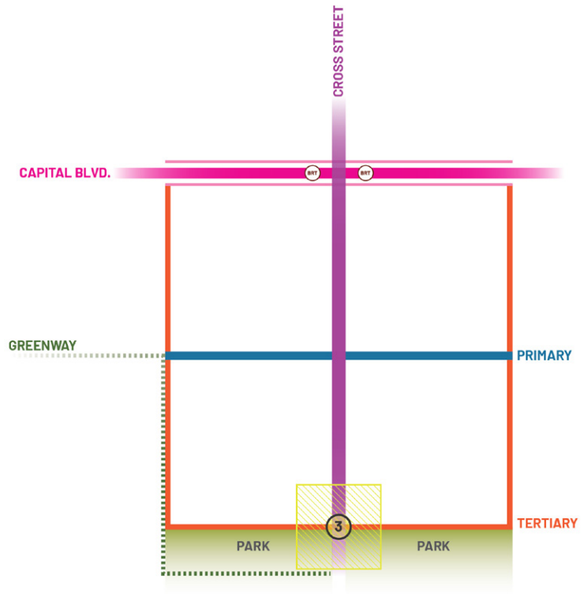
- Shopfront Frontage
- Most pedestrian oriented
- Minimum 16' sidewalk
- Minimize curb cuts
- Combine tree plantings with GSI
- 0'-5' Build To
- Intersection with cross street should include some corner amenity
- Dedicated bike lanes and protection can be added in lieu of parallel parking

TERTIARY:

- Urban General Frontage
- Standard streetscape requirements
- Main Street Angular or Parallel Parking
- Curb cuts should occur on these streets

02.3: STREET PLAN VIGNETTES

Blocks Facing Park + Tertiary + Cross Street(s)



FRONTAGES

PRIMARY: Shopfront (-SH)

CROSS STREET: Urban General (-UG)

CONSIDERATIONS

PRIMARY:

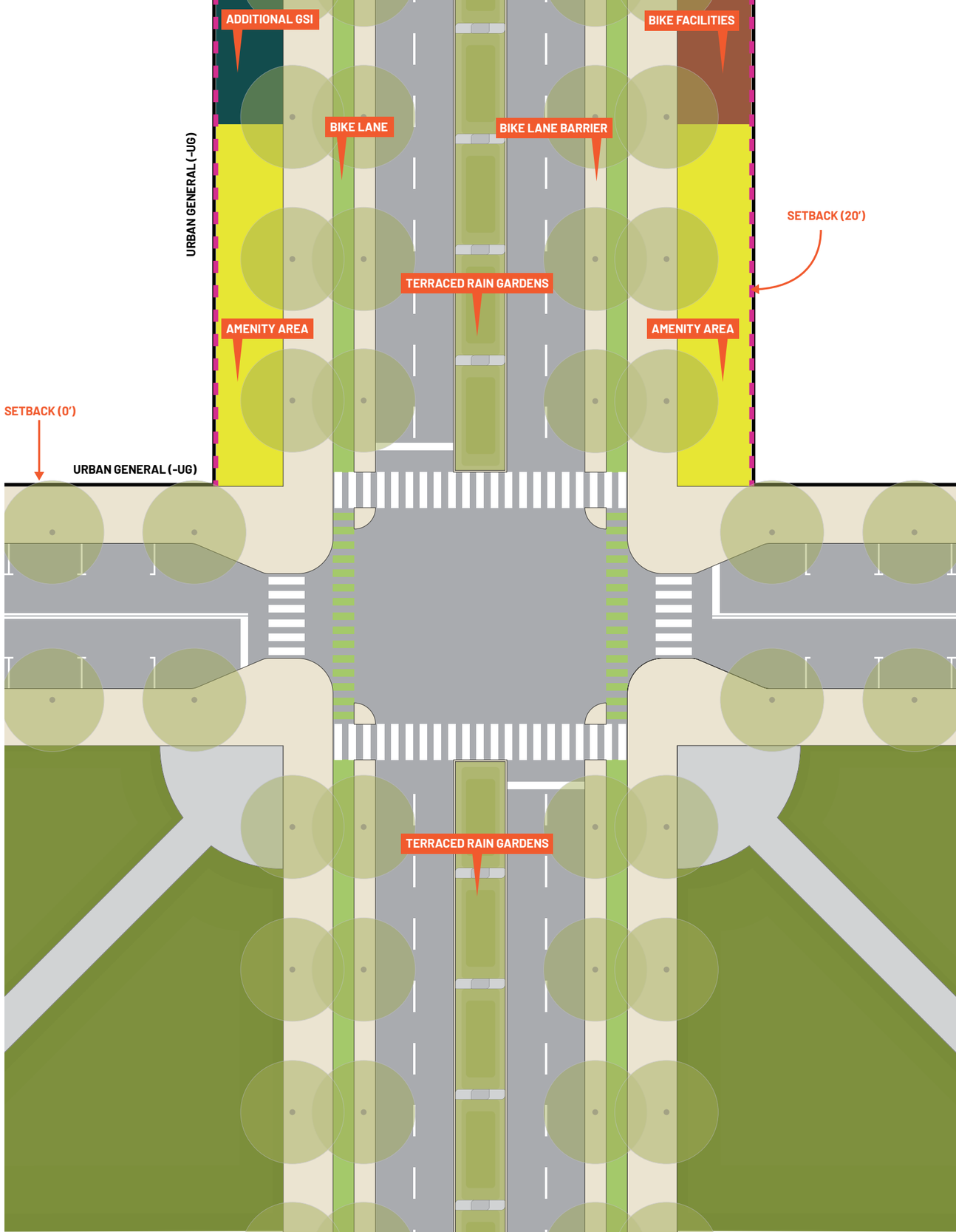
- Shopfront Frontage
- Most pedestrian oriented
- Minimum 16' sidewalk
- Minimize curb cuts
- Combine tree plantings with GSI
- 0'-5' Build To
- Intersection with cross street should include some corner amenity
- Dedicated bike lanes and protection can be added in lieu of parallel parking

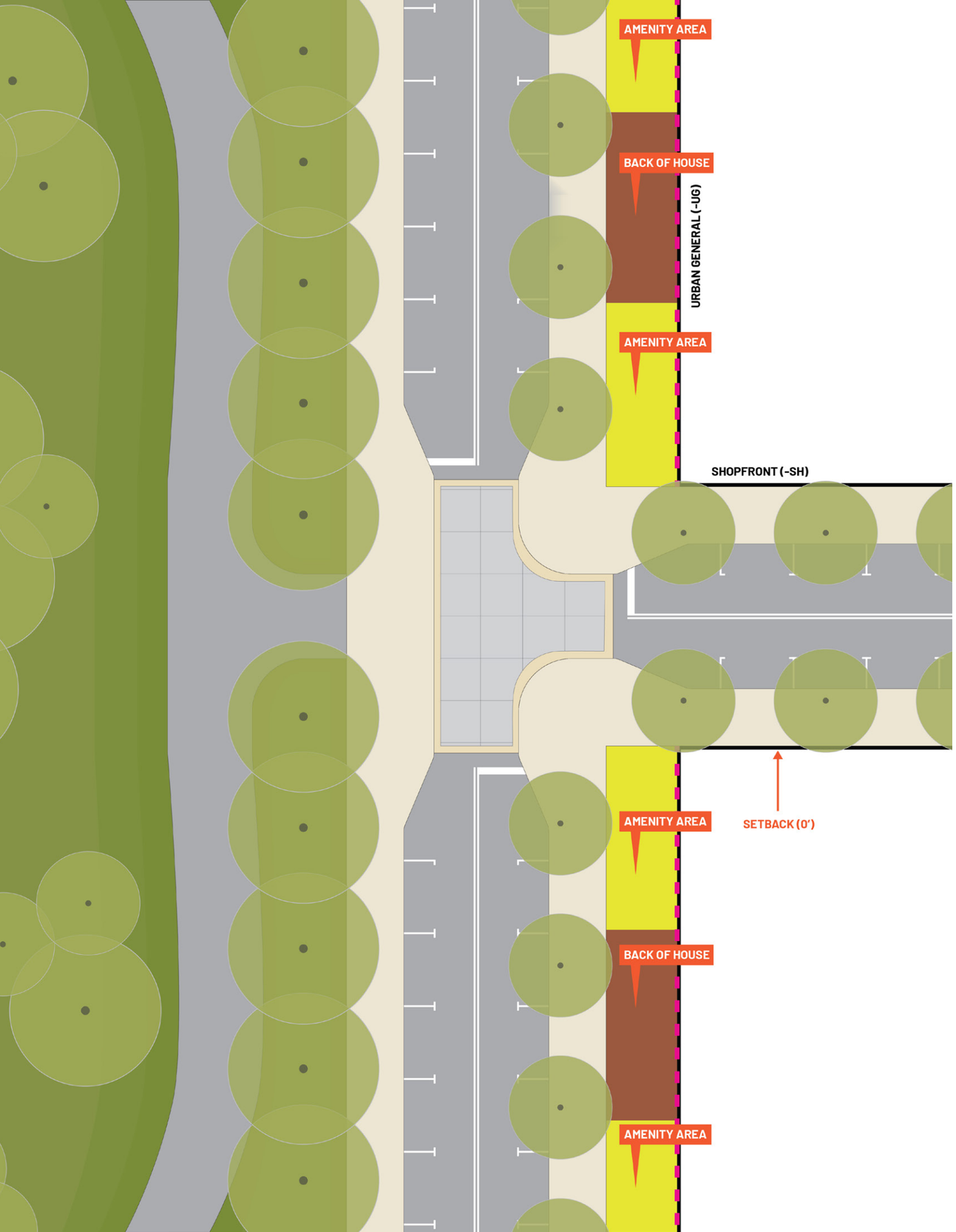
CROSS STREET:

- Off street bike facilities
- Trees planted on sidewalk to achieve canopy effect
- Median devoted to GSI
- No curb cuts
- Setbacks are generous
- Intersection with primary parallel street should include some corner amenity

PARK:

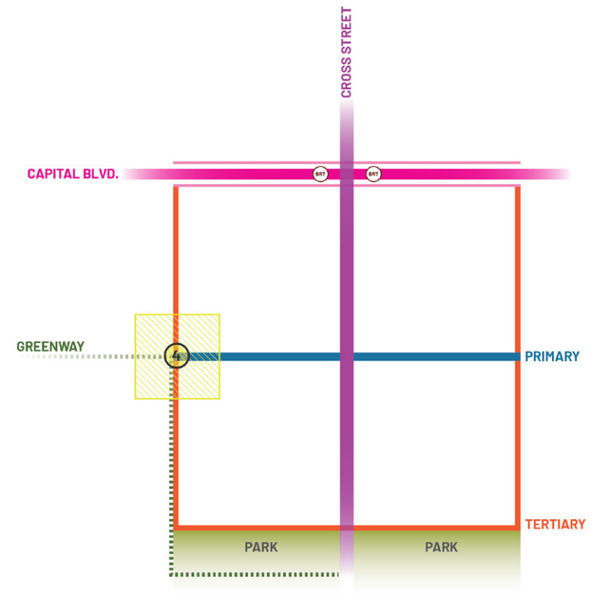
- Dense development
- BoH must not face public realm
- Dedicated access from park to district interior
- Performance based zoning
- Minimize negative impacts of building massing on park
- In lieu of amenity area, pay into open space fund
- Height bonuses in exchange for provisions of community services/amenities/affordable housing
- Institute a maximum length of uninterrupted frontage





02.4: STREET PLAN VIGNETTES

Blocks Facing Greenway + Primary + Tertiary Street(s)



FRONTAGES

PRIMARY: Shopfront (-SH)

TERTIARY: Urban General (-UG)

CONSIDERATIONS

PRIMARY:

- Shopfront Frontage
- Most pedestrian oriented
- Minimum 16' sidewalk
- Minimize curb cuts
- Combine tree plantings with GSI
- 0'-5' Build To
- Intersection with cross street should include some corner amenity
- Dedicated bike lanes and protection can be added in lieu of parallel parking

TERTIARY:

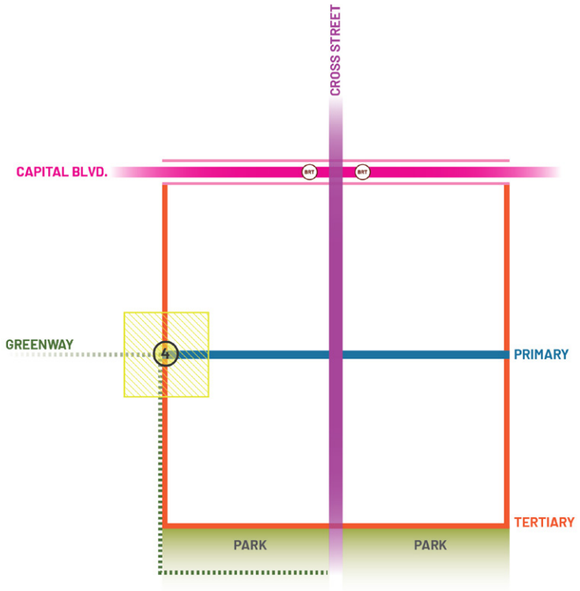
- Urban General Frontage
- Standard streetscape requirements
- Main Street Angular or Parallel Parking
- Curb cuts should occur on these streets

GREENWAY:

- Direct connection from development to the greenway for cyclists and peds
- Generous bike parking
- Green infrastructure / Alternatives to UDO planting
- CPTED Principles
- Lighting
- Scale
- Public accessway from greenway to development interior
- Public accessway from greenway to ped corridor and BRT Station

02.5: STREET PLAN VIGNETTES

Blocks Facing Greenway + Tertiary + Cross Street(s)



FRONTAGES

PRIMARY: Shopfront (-SH)

TERTIARY: Urban General (-UG)

CONSIDERATIONS

PRIMARY:

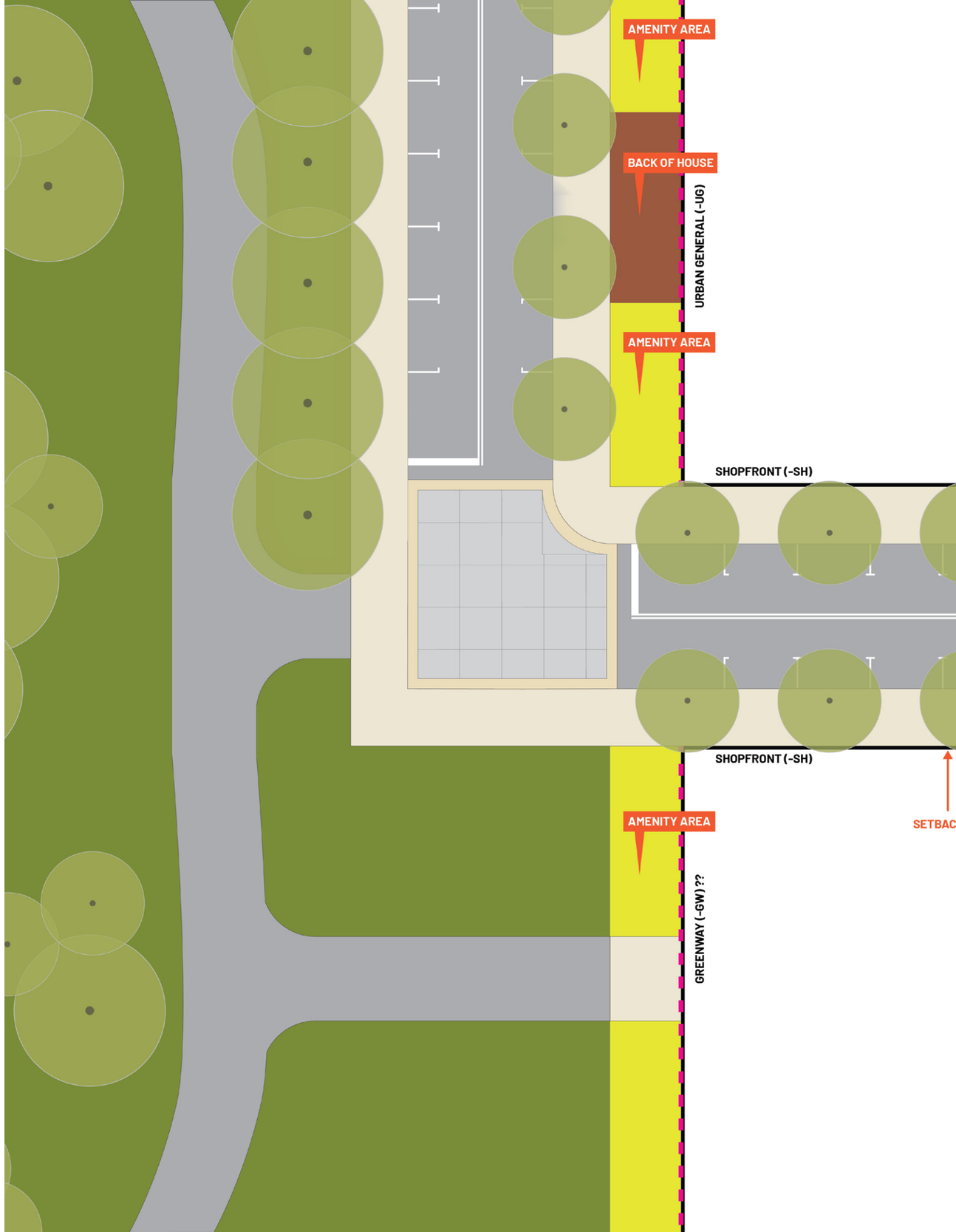
- Shopfront Frontage
- Most pedestrian oriented
- Minimum 16' sidewalk
- Minimize curb cuts
- Combine tree plantings with GSI
- 0'-5' Build To
- Intersection with cross street should include some corner amenity
- Dedicated bike lanes and protection can be added in lieu of parallel parking

TERTIARY:

- Urban General Frontage
- Standard streetscape requirements
- Main Street Angular or Parallel Parking
- Curb cuts should occur on these streets

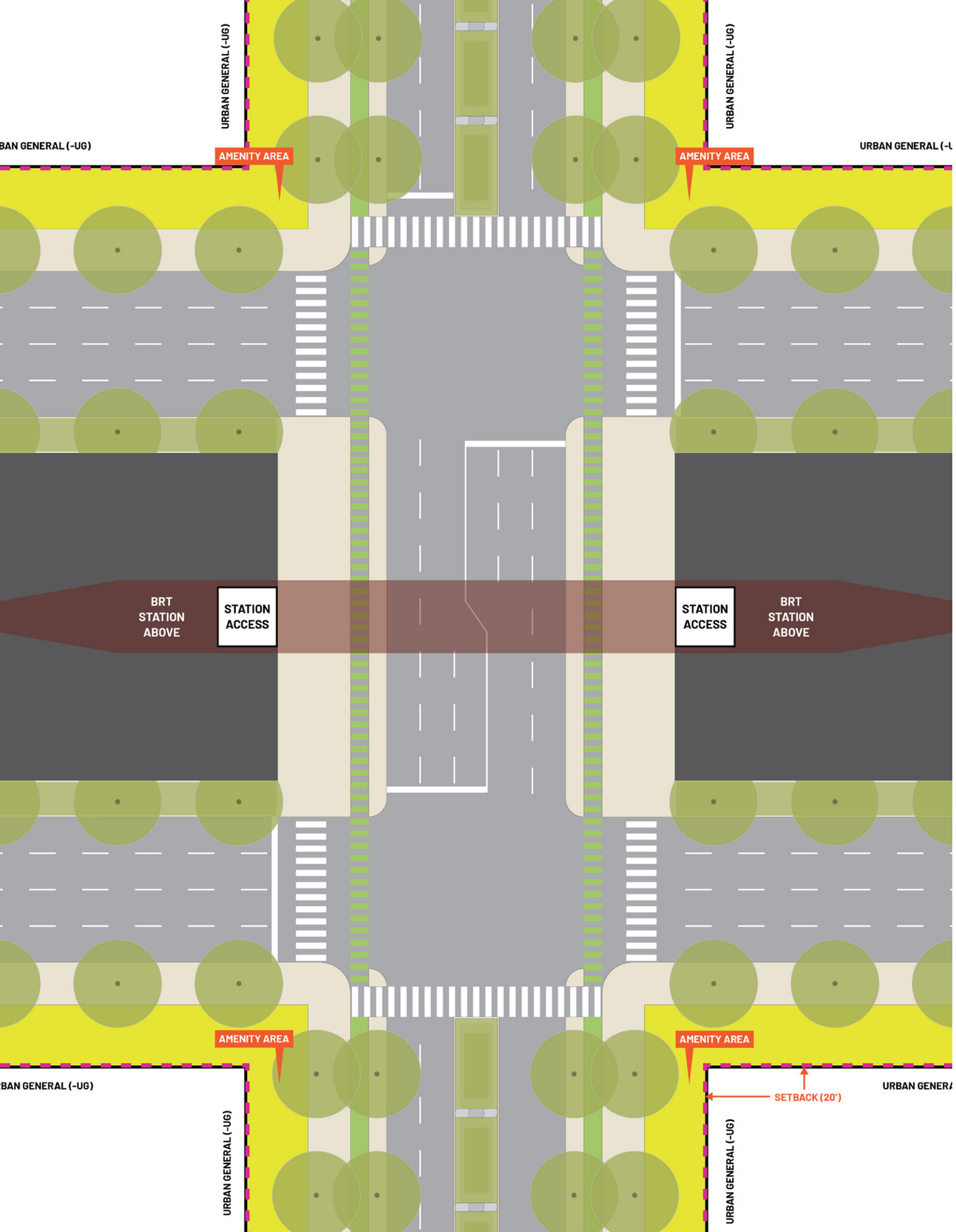
GREENWAY:

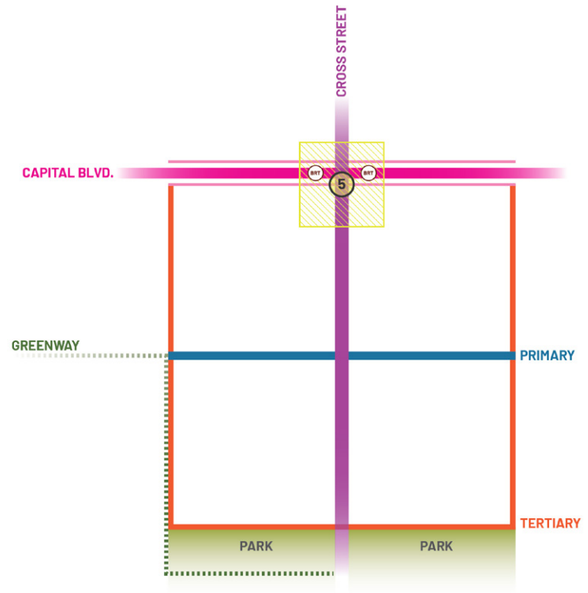
- Direct connection from development to the greenway for cyclists and peds
- Generous bike parking
- Green infrastructure / Alternatives to UDO planting
- CPTED Principles
- Lighting
- Scale
- Public accessway from greenway to development interior
- Public accessway from greenway to ped corridor and BRT Station



02.6: STREET PLAN VIGNETTES

Blocks Facing Capital + Cross Street(s)





FRONTAGES

CROSS STREET: Urban General (-UG)

CAPITAL: Urban General (-UG)

CONSIDERATIONS

CROSS STREET:

- Off street bike facilities
- Trees planted on sidewalk to achieve canopy effect
- Median devoted to GSI
- No curb cuts
- Setbacks are generous
- Intersection with primary parallel street should include some corner amenity

CAPITAL:

- Urban General Frontage
- Standard streetscape requirements
- Curb cuts should occur on this streets
- Should not be considered Primary Street

BRT STATION:

- Pedestrian space under bridge should be designed with CPTED Principles
- Adequate space to board and unboard under bridge
- Adequate space for infrastructure including elevators and stairs

03.1: DESIGN VIGNETTES

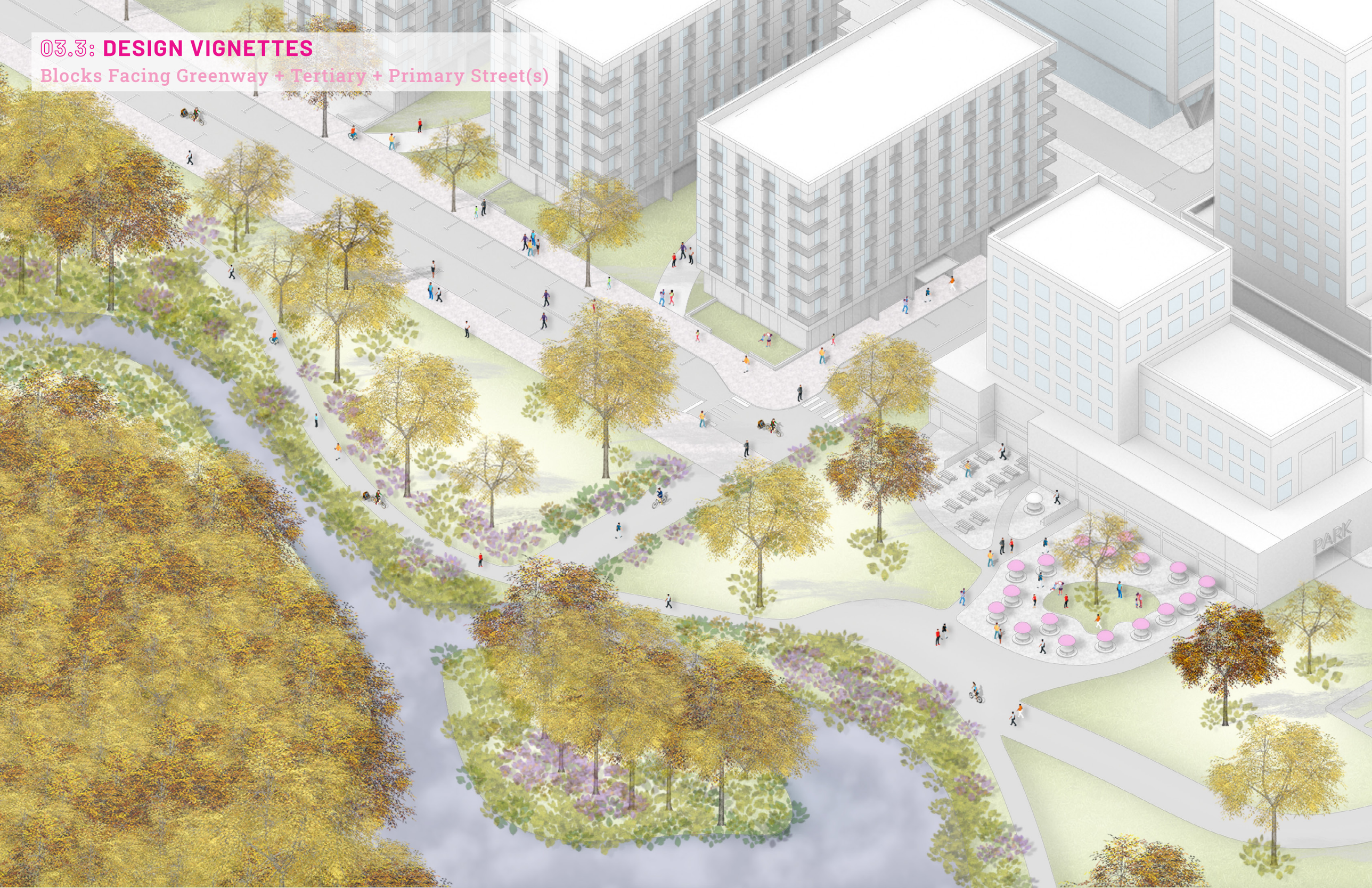
Blocks Facing Primary + Cross Street(s)

03.2: DESIGN VIGNETTES

Blocks Facing Cross Over + Tertiary + Park

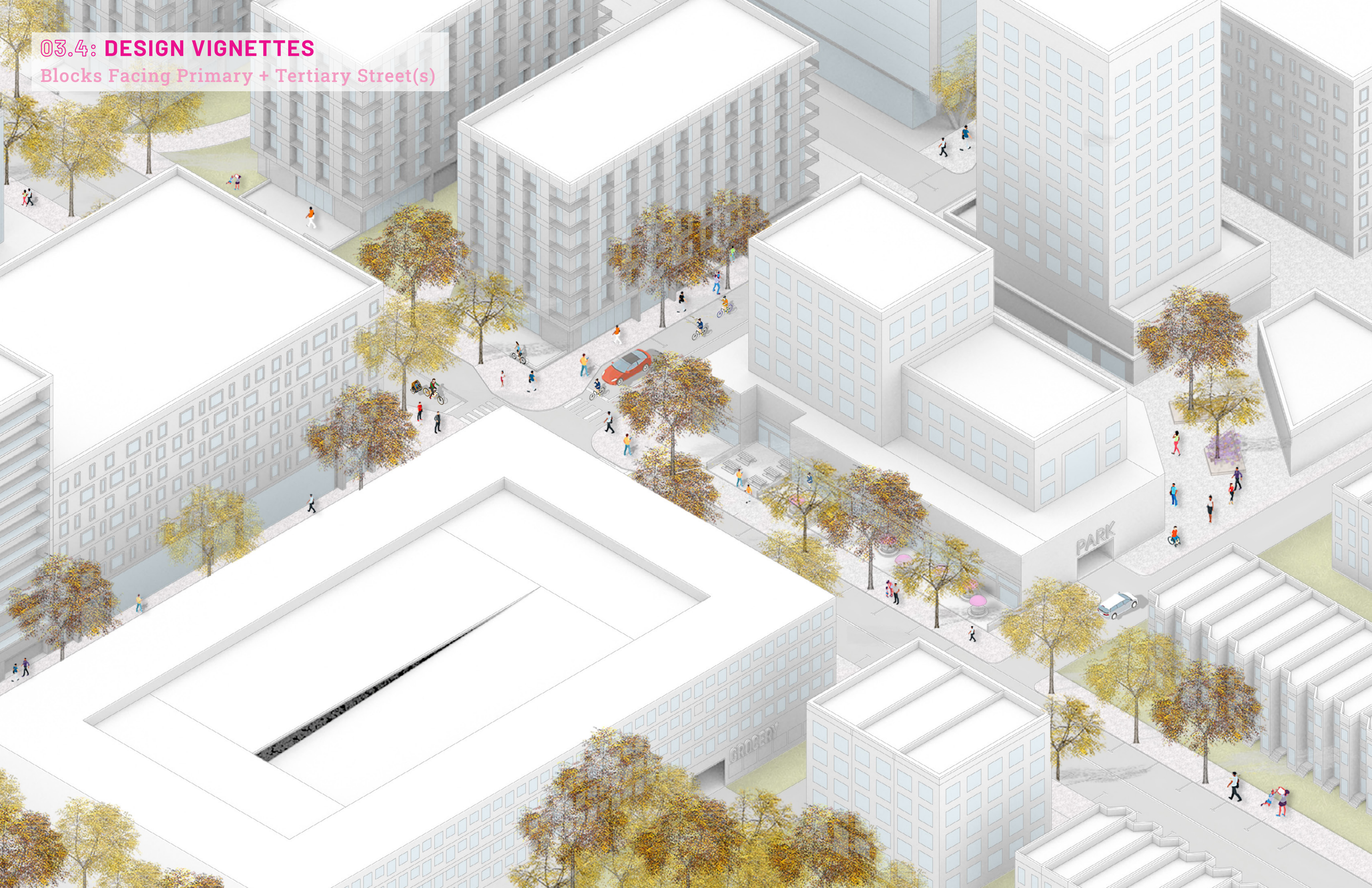
03.3: DESIGN VIGNETTES

Blocks Facing Greenway + Tertiary + Primary Street(s)



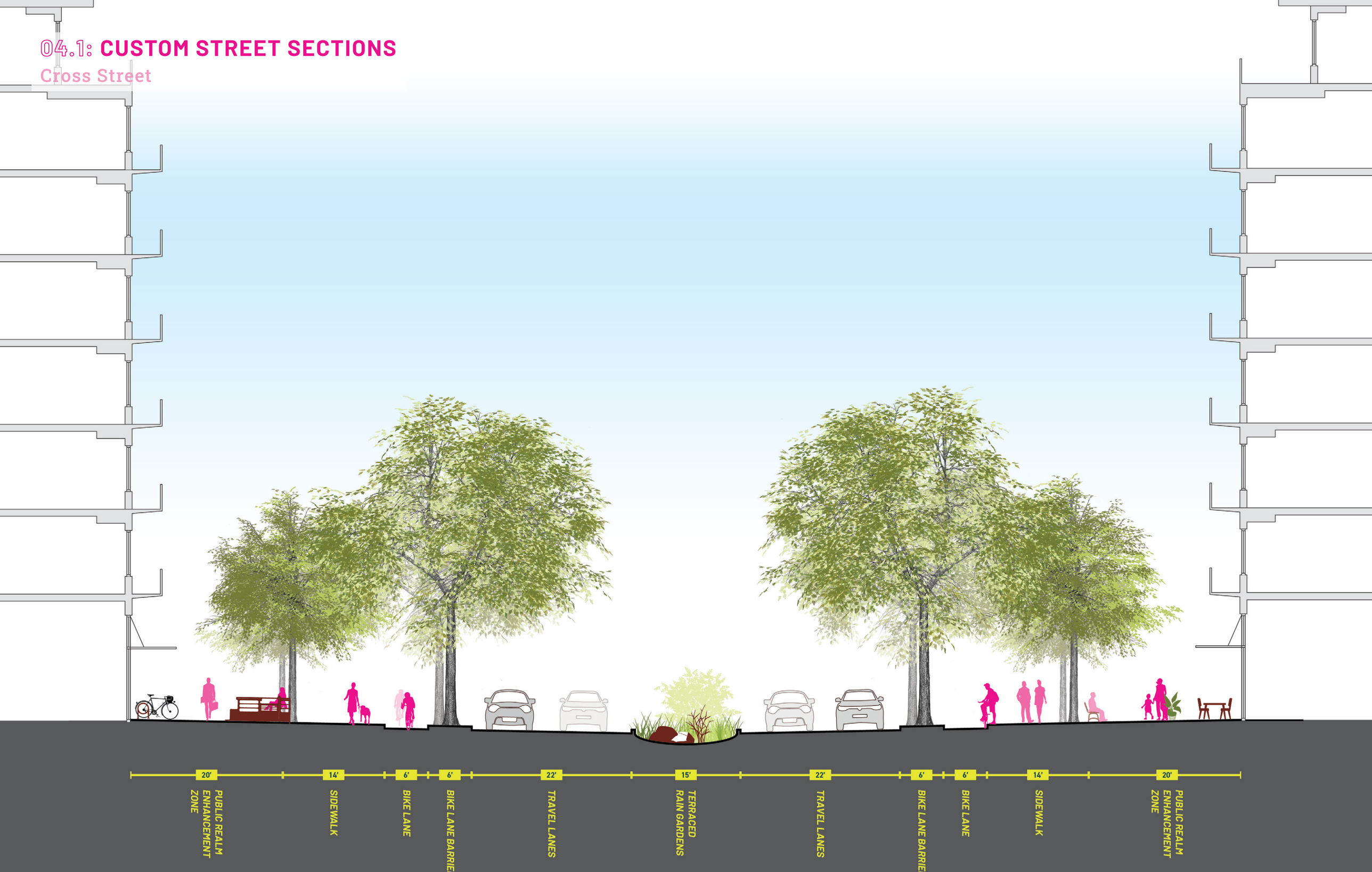
03.4: DESIGN VIGNETTES

Blocks Facing Primary + Tertiary Street(s)



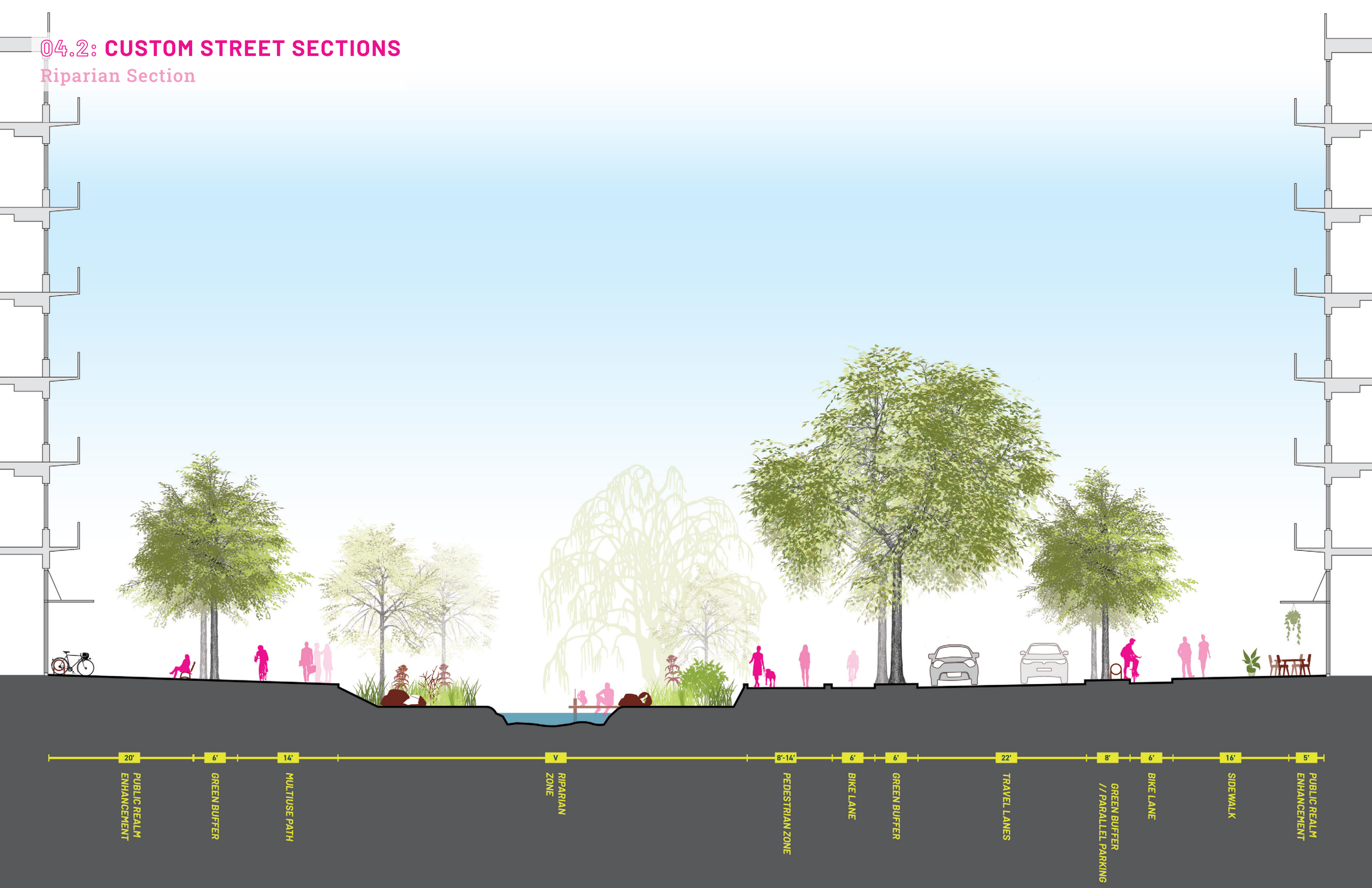
04.1: CUSTOM STREET SECTIONS

Cross Street



04.2: CUSTOM STREET SECTIONS

Riparian Section



Raleigh
Urban
Design