CITY OF RALEIGH DEPARTMENT OF CITY PLANNING

CAPITAL BOULEVARD

CORRIDOR STUDY

ISSUES, OPPORTUNITIES, AND CONSTRAINTS DRAFT REPORT

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CAPITAL BOULEVARD CORRIDOR STUDY

1 Introduction

1.1 PROJECT OVERVIEW

The Capital Boulevard Corridor Study is an in-house effort by the City of Raleigh to craft a vision and strategy for the revitalization, redevelopment, and renewal of Capital Boulevard from Downtown to I-440. The lead agency for the study is the Department of City Planning, and the effort is being supported by technical staff from Public Works, Public Utilities, and Parks and Recreation. An intergovernmental working group has been formed with representatives from Wake County and the State agencies with jurisdiction and land ownership in the Corridor, and an extensive outreach effort will ensure meaningful input from business interests, property owners, neighbors, and any interested citizens. (See Figure 1.1 – Study Area.)

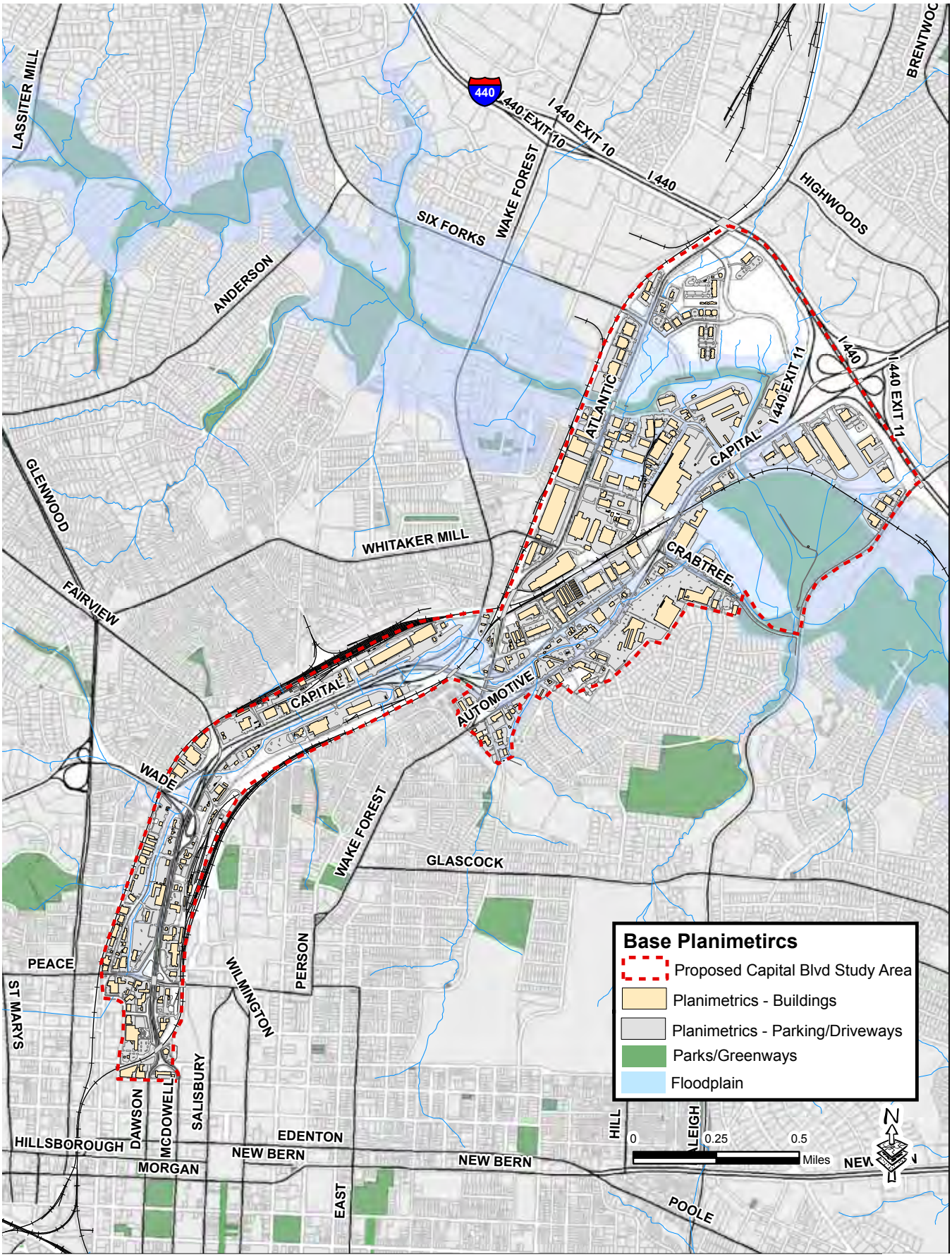
1.2 PURPOSE AND SCOPE

This *Issues, Opportunities, and Constraints Report* is the result of a detailed inventory and analysis conducted by City staff and State and County stakeholders and is informed by input gathered at the public workshop held in late June. Additional sources for the inventory include existing maps, plans and studies; interviews with officials at NCDOT and elsewhere; and Wake County property records.

Inventory activities included the following general physical elements on the corridor:

- Transportation
- Environmental
- Utility infrastructure
- Land use

Sights along Capital Boulevard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- Economic conditions
- Urban design and public realm conditions

Taken together, analysis of the inventory examined the issues, opportunities, and constraints that promote or hinder possible options and solutions over the short- and long-term.

The *Issues, Opportunities, and Constraints Report* also lays the foundation for a forthcoming public design workshop at which time participants will have the opportunity to discuss and map ideas for the corridor at topic-specific tables. They will then synthesize topics into conceptual plans that incorporate the groups' best ideas. Following the public design workshop, a design charrette will be held to fine-tune ideas and map a set of conceptual solutions for short-term, low-cost actions; mid-term changes; and long-term undertakings.

1.3 SUMMARY OF PAST PLANS

This is not the first study undertaken for Capital Boulevard. The corridor has been the subject of numerous initiatives regarding traffic and beautification since first opening in the late 1950s. However, this is perhaps the first effort to take a comprehensive look at the intersection of land use, transportation, and environmental/ecological factors within the study area. Below is a summary of planning recommendations for the corridor from the past three decades.

1979 Comprehensive Plan

Capital Boulevard, referred to as Downtown Boulevard at the time, was identified as a *Metro Focus Corridor* in the 1979 Comprehensive Plan. Land uses recommended along the corridor included commercial and industrial concentrations with several pockets of institutional uses such as the Devereux Meadows site. Clustered land uses were encouraged at a size and intensity that would serve residents from the entire city.

1987 Bicentennial Boulevard Project

Recognized nationally and locally as an eyesore, the visual enhancement of Downtown Boulevard was a gift to Raleigh for its 200th birthday and was included in the 1992 Bicentennial celebration. The goal of the project was to give Raleigh a major entranceway worthy of its status as the state capital and the City of Oaks. The project recommendations generated by six teams of over 40 design professionals supported by the Appearance Commission and the Planning Department included a streetscape master plan featuring an oak tree lined boulevard. Implementation of the plan included the removal of over 50 billboards, the undergrounding of overhead utilities, the installation of new street lights, and the planting of over 500 trees and 200,000 perennial bulbs with donations of labor and money from citizens and civic organizations. To further commemorate the Bicentennial, Downtown Boulevard and North Boulevard located north of the Beltline were renamed to Capital Boulevard.

1989 Comprehensive Plan

The 1989 Comprehensive Plan established an Urban Form typology and identified physical locations for the designations to guide zoning and development. The section of Capital Boulevard between Downtown and Atlantic Avenue was included in the Downtown Regional Center which was intended to accommodate the highest intensity of mixed use development in the city. The remainder of the corridor was identified as a Gateway Corridor with three Retail Area designations. A Gateway Corridor designation is typical of an entry road like Capital Boulevard where appearance, traffic and access considerations are important. The Retail Area designations were intended to encourage the clustering of retail uses in order to coordinate access points and reduce traffic impacts on the adjacent arterial roadway.

2030 Comprehensive Plan

The Growth Framework map of the 2030 Comprehensive Plan takes another look at Raleigh's urban form and includes the Capital Boulevard corridor to Atlantic Boulevard in a Downtown Regional Center, incorporating much of the study area into the future limits of the City's urban core. The remainder of the corridor to I-440 is identified as a Multi-Modal Corridor with an emphasis on supporting a variety of travel modes including transit and a built environment to accommodate pedestrian movement. Land use policies reflect the Growth Framework concepts and recommend at a parcel level the future land use patterns and provide a logical framework for future zoning and development. High intensity mixed-use development is recommended for the majority of the Capital Boulevard corridor with extensive open space and park areas within the Crabtree Creek floodplain.

1.4 SUMMARY OF FIRST PUBLIC WORKSHOP

The first public meeting for the Capital Boulevard Corridor Study was held on June 24, 2010. This meeting corresponds to Task 1.4 in the Scope of Work, and was the final task of the first phase of the project. The focus of the first phase was project scoping, and included meetings with a working group of City departments and an intergovernmental stakeholders meeting with State, County, and City representatives. A Briefing Book was prepared during Phase 1 as means to identify issues and provide background information to the participants in the first workshop.

A complete summary report on the workshop results is available on the project website. The following bullets represent a distillation of the major themes that emerged from the analysis of the public input. The list is by no means exhaustive, but it hopefully captures the most important points that the project team needs to keep in mind as the project moves forward.

- **Connect the neighborhoods.** The neighborhoods adjacent to Capital Boulevard are cut off from the uses in the corridor and from each other. New vehicular, pedestrian, and bicycle access points are needed.

- **Bridge the canyon.** Between Peace Street and Atlantic Avenue, there is no means for pedestrians or cyclists to get from one side of the corridor to the other. This issue can be addressed through either new facilities (i.e. a bridge) or redesigns of existing facilities (e.g. interchanges).
- **Improve the interchanges.** Most of the interchanges in the corridor are geometrically substandard, have inadequate or missing provisions for pedestrians and cyclists, have poor sight lines, and are confusing to navigate. As these facilities age out, there is a major opportunity to replace them with new designs.
- **Put water at the center.** The Pigeon House Branch, even in its degraded state, resonates as an organizing element in the corridor. It should be daylighted, cleaned up, and made accessible. New development should incorporate the stream as an amenity, rather than treat is as a storm sewer to be hidden.
- **Deal with flooding.** Much property within the corridor is at continual risk of flood damage. Meaningfully dealing with the flooding problem and improving water quality will require restoring lost floodplain functionality and improving stormwater management on both public and private property. A holistic approach can create new open space and greenway opportunities at the same time.
- **Complete a greenway.** Along with the Pigeon House Branch, a greenway corridor from the Crabtree Creek to Downtown can be an organizing element that unites the different segments of the study area.
- **Emphasize multimodal transportation.** Designed exclusively for cars, the corridor needs better transit service and quality facilities for bikes and pedestrians. At the same time, the study must remain mindful of the steady traffic volumes that use the roadway and the corridor's role as a major vehicular gateway to a growing Downtown.
- **Attract new uses.** Local residents feel that the current uses in the corridor have little to offer them. Fortunately, the large amount of underutilized land and buildings provides opportunities for new uses if a suitable physical and economic environment can be provided.
- **Help existing business and property owners**. While the aesthetics of Capital Boulevard do not receive much praise, it remains a place where people earn their livelihoods. The existing business and property owner community should be encouraged and assisted in reinvesting and upgrading their assets.
- **Be visionary.** The issues identified in the study area are not amenable to incremental tinkering. Rather, bold plans for major investments will be needed to make a significant difference to the environmental, transportation, and land use challenges that are the focus of the study.
- **Be realistic.** At the same time, a visionary plan that is not backed by the implementation and funding tools necessary to carry the vision forward is of little use. The final plan needs to look forward to the future while also working backwards from implementation to ensure that proposed projects and improvements can actually be built.

Public workshop June 24, 2010

Public workshop June 24, 2010

CAPITAL BOULEVARD CORRIDOR STUDY

2 Issues, Opportunities, and Constraints

This report contains the results of a detailed inventory and analysis of the following topic areas: transportation, environmental conditions, utility infrastructure, land use, economic conditions, urban design and public realm conditions, and historic and cultural resources. Each chapter contains a set of conclusions. This chapter summarizes the report's findings in the form of three topical lists:

- Issues that the Corridor Study needs to recognize and engage
- Opportunities that the Corridor Study can leverage to instigate positive change
- Constraints that the Corridor Study either needs to overcome or work around

2.1 ISSUES

- The study area is characterized by fast-moving traffic through a largely unobstructed auto-centric corridor, making it is a space to move through rather than a series of destinations.
- The speed and design of the road makes it difficult to identify or access businesses, greenways, or other assets adjacent to the roadway.
- Buildings are not located adjacent to the street but are separated from the street by extensive parking lots and/or swales, contributing to a placeless character.
- There are no public parks within the study boundary. A portion of the greenway is located on the corridor.
- The public realm is hostile to pedestrians and there is limited sidewalk infrastructure.

Rail corridor

Traffic ca. 1960

- There is a proliferation of curb cuts along portions of the corridor. Existing access roads form an incomplete and disconnected system.
- Neighborhoods on either side of the study area are disconnected from each other and from uses within the corridor. South of Atlantic Avenue, there are few places for cars to cross the corridor, and fewer still for cyclists and pedestrians.
- Unprotected bus stops are located within a few feet of the traffic corridor and typically lack benches, shelters, or paved sidewalk connections.
- The vast areas of impervious surfaces close to streams and tributaries have been built without modern stormwater controls, promoting erosion and flash flooding, and degrading water quality.
- Pigeon House Branch, Crabtree Creek, and Cemetery Branch are considered impaired by the NC Division of Water Quality (DWQ).
- There is frequent flooding in the study area.
- Natural streams historically have been culverted underground or converted to urban stormwater conveyance channels.
- Invasive plant species are prevalent in the corridor and require labor-intensive hand removal to eradicate.
- Overhead utility wires have stunted natural growth of large maturing trees.
- Many sewer mains are aging and corroded and in need of replacement.
- There are many underutilized or obsolete properties, high vacancy rates, and subpar leasing rates.
- The study area meets few, if any, of the City of Raleigh Urban Design Guidelines.
- The pervasive heavy industrial zoning is no longer reflects the preferred use pattern along the corridor and is in conflict with the Land Use element of the 2030 Comprehensive Plan.

2.2 OPPORTUNITIES

- There is space to install a highly diverse and sustainable urban landscape with a goal of providing the resources necessary for large maturing trees to thrive for 30 years or more.
- The City is in the process of repairing much of the watershed, particularly the western portion of Pigeon House Branch. Opportunities exist to enhance buffers and revisit landscape classification in order to protect and rebuild the waterways.
- There is an opportunity to modify and even relocate portions of these two streams provided the existing stream segments are considered degraded by regulatory authorities and further provided that any alterations would result in ecological improvement to the stream and adjacent riparian buffers. Such modifications might be integrated into proposed realignments of roadway corridors or other proposed improvements within the study area.
- Adequate riparian buffers would improve water quality and control stormwater runoff.
- While expensive, numerous smaller stormwater controls installed throughout the watershed would cumulatively work to improve water quality. The water quality retrofit projects currently underway in the city on public and private property on the corridor can be expanded.

- The new Unified Development Code (UDO), once adopted, will provide a new set of zoning tools for implementing the land use recommendations of the 2030 Comprehensive Plan, as potentially amended as a result of this corridor study.
- The combination of zoning, transit investment, and public realm improvements can help set the stage for new mixed-use development in appropriate locations.
- Key sites within the study area are underutilized and many have been privately assembled, setting the stage for private-sector led redevelopment and reinvestment.
- Continued residential growth citywide and in the surrounding neighborhoods provides the opportunity for a share of that growth to be captured within the study area.
- The corridor planning process provides the venue to work with local, State, and Federal entities to take advantage of funding opportunities and technical assistance to holistically approach economic and environmental revitalization and restoration. The wide variety of issues within the study area means that multiple public benefits can be obtained from projects, and multiple funding sources can be tapped.
- A design approach on the corridor that encompasses Raleigh Urban Design Guidelines and sustainable development can create both economic and environmental value. Incorporate green roofs on buildings, increase tree cover, and adopt low-impact design standards.
- Pending bridge replacement projects provide the opportunity to redesign existing interchanges to connect both sides of the corridor, facilitate bicycle and pedestrian access, and improve traffic safety and functionality.
- The Federal Emergency Management Agency (FEMA) provides funding for the public acquisition of floodplain lands. This is not only the most direct way to deal with flood prone properties, but also is a means of creating new open spaces and amenities in the corridor.
- The City has a Cost Share program that provides 75 percent of the cost of approved stormwater projects.
- Brownfield assessment and cleanup can jump start revitalization and redevelopment. There are several available local, State, and Federal tools and incentives.
- Relocating or undergrounding utilities would increase the available frontage for large street tree plantings.
- National Historic Landmark designations for buildings along the corridor provide access to rehabilitation incentives for adaptive reuse. This is an opportunity to emphasize the historic and cultural resources that give a community a unique identity and sense of place. Historic preservation also is a sustainable form of redevelopment.

2.3 CONSTRAINTS

- Efforts to improve multi-modal accommodations in the corridor must keep in mind existing traffic volumes and projections for significant future growth in traffic.
- There are no easy or cost effective short-term solutions to flooding issues in the study area. Federal and State stream protections prohibit construction of regional stormwater controls. Uses that remain in the floodplain can anticipate damage from future flood events.
- The rail lines and yards create hard edges along the corridor that are difficult and expensive to cross.
- Southeast High Speed Rail (SEHSR) requires a sealed corridor. Current at-grade crossings, where vehicular and train traffic intersect, must be replaced by grade-separated crossings (e.g. bridge or underpass) or road closures.
- There is both perceived and probable contamination along the rail lines and on private properties, complicating redevelopment.
- Zoning code standards support high impervious percentages. Special legislative action is required to encourage sustainable solutions.
- Right-of-way is limited in the southern portion of the corridor. Access lanes would require additional right-of-way acquisition.
- As “Waters of the US,” all perennial and some intermittent streams and wetlands fall under State and Federal jurisdiction.
- The Division of Water Quality regulates 50 foot buffers along all “Waters of the State,” which complicates greenway planning and urban development.
- The significant amount of retail competition nearby likely limits the potential for significant retail development in the study area.

CAPITAL BOULEVARD CORRIDOR STUDY

3 Transportation

3.1 ROADWAYS

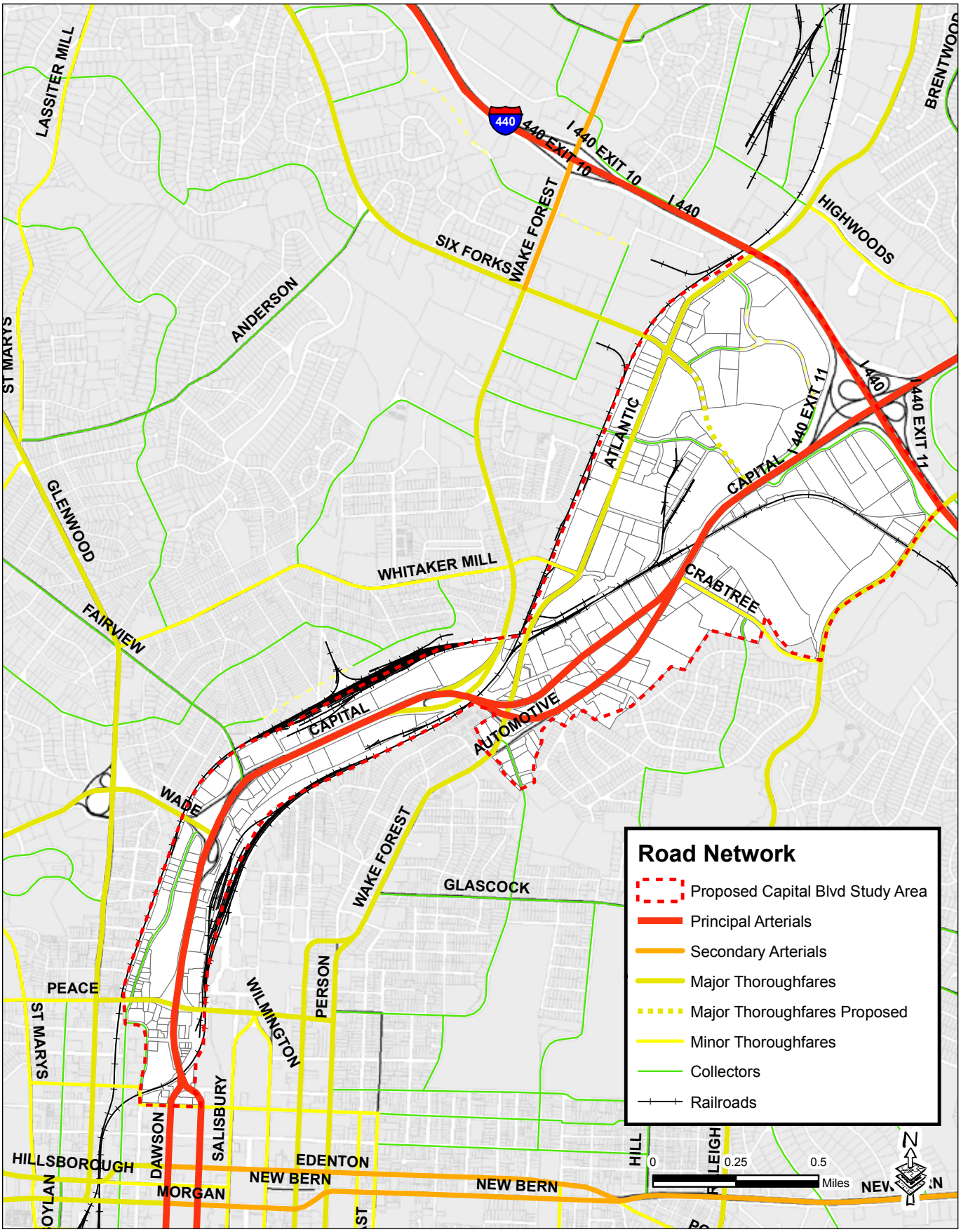
Traffic Volume

Capital Boulevard, initially referred to as "Downtown Boulevard," opened to traffic in 1955 from Fairview Road to downtown Raleigh. Three years later in 1958, the section between Fairview Road and Wake Forest Road (then US 1) was completed. In 1957 Capital Boulevard carried average daily traffic (ADT) of 27,000 vehicles per day (VPD), and by 1970 traffic increased 100 percent to 54,500 VPD. In May of 1970, Capital Boulevard was distinguished as the busiest highway in the State of North Carolina. In 1974 traffic volumes on Capital Boulevard between Wade Avenue and Peace Street peaked at 64,000 VPD. In 2009, however, the average daily traffic along this same segment of Capital Boulevard was 54,000 VPD. See Figure 3.1: Road Network.

Today, Capital Boulevard is classified as a principal arterial in the Raleigh 2030 Comprehensive Plan and is the only street inside the I-440 Beltline with this designation. Capital Boulevard still remains the most dominant north-south commuting route into the downtown area. Average daily traffic (ADT) volumes along the corridor within the study area vary from 41,000 VPD to 54,000 VPD. Over the last 25 years, traffic growth along Capital Boulevard has remained flat, which could be attributed to relatively unchanged land use within downtown and periodic shifts in the economy. Subsequently traffic within the corridor is forecasted to increase an average of 47 percent by

Heading north on Capital Boulevard

Limited bike/pedestrian opportunity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the year 2035 based on projections by the Capital Area Metropolitan Planning Organization (CAMPO). The tables below illustrate the modest shifts in traffic volumes between 1984 and 2009 and significant increases in traffic anticipated between 2009 and 2035.

Figure 3.2: Average Daily Traffic Volumes in 1984 and 2009

Corridor Segment	1984 ADT (VPD)	2009 ADT (VPD)	% Change
I-440 to Crabtree Boulevard	32,700	38,000	16.2%
Crabtree Blvd to Wake Forest Road	30,800	33,000	7.1%
Wake Forest Road to Fairview Road	45,500	49,000	7.7%
Fairview Road to Wade Avenue	49,000	50,000	2.0%
Wade Avenue to Peace Street	53,200	54,000	1.5%
Peace Street to Lane Street	37,000	41,000	10.8%

Source: NCDOT

Figure 3.3: Projected Average Daily Traffic Volumes in 2035 Table

Corridor Segment	2009 ADT (VPD)	2035 ADT (VPD)	% Change
I-440 to Crabtree Boulevard	38,000	63,909	68.2%
Crabtree Blvd to Wake Forest Road	33,000	51,490	56.0%
Wake Forest Road to Fairview Road	49,000	67,706	38.2%
Fairview Road to Wade Avenue	50,000	67,833	35.7%
Wade Avenue to Peace Street	54,000	76,745	42.1%
Peace Street to Lane Street	41,000	57,697	40.7%

Source: Capital Area MPO

Functional Alignment

Capital Boulevard is constructed as a six-lane, median-divided roadway and functions as a bifurcated one-way pair from Crabtree Boulevard to just south of Wake Forest Road. At full build-out, Capital Boulevard could be constructed as an eight-lane, median-divided roadway with curb and gutter and sidewalks on both sides. The northbound segment of Capital Boulevard from Atlantic Avenue to south of Crabtree Boulevard is already constructed with four through lanes. The City's bicycle plan calls for Capital Boulevard to provide wide outside lanes for bicycle accommodations.

Two notable deficiencies associated with the corridor are: (1) limited opportunities for pedestrian crossings; and (2) multiple driveway access points, which can create conflicts for motorists, pedestrians, cyclists, and transit vehicles.

There are currently no crosswalks located at any signalized intersections within the corridor, including the portions of the corridor served by bus transit. Some properties along the corridor are accessed by a frontage road which helps to avoid turning movements directly onto Capital Boulevard.

Interchanges and Bridges

There are six interchange locations, one bridge over Crabtree Creek, and three rail overpasses along Capital Boulevard within the study area. The North Carolina Department of Transportation (NCDOT) allocates $12 million annually for bridge inspections, which are conducted on a two-year cycle. NCDOT maintains all overpasses and underpasses within the corridor with the exception of the rail overpasses, which are maintained by CSX and Norfolk Southern. NCDOT inspects rail overpasses to ensure there is a minimum of 14 feet of clearance. The bridges within the corridor were built between 1937 and 1961 and are noted by NCDOT as being either structurally deficient or functionally obsolete. Each bridge is assigned a structural sufficiency score from 1 to 100, which is based on factors like the age of the bridge, the traffic volumes, the percentage of heavy vehicles, and upon the findings of a structural inspection. Bridges with a score of 50 or below are eligible for federal funds for repair or replacement. Attached is information on all the bridges, overpasses, and interchanges within the corridor. NCDOT plans to replace the bridges at Peace Street and at Wade Avenue with the following funded projects:

Project information:
Capital Blvd bridge over Peace Street; Bridge # 227
Project # B-5121
Funded: Yes
Project Status: Preliminary Design
Anticipated Project Timeframe: Begin construction in 2015; project completion by 2017
Cost: $12,000,000

Project information:
Wade Avenue bridge over Capital Blvd; Bridge # 213
Project # B-5317
Funded: Yes
Project Status: Preliminary Design
Anticipated Project Timeframe, Begin construction in 2017; project completion by 2019
Cost: $6,878,000

Both projects provide the opportunity to redesign the associated interchanges instead of simply replacing the existing condition. Further, the need to maintain traffic flow on these busy facilities will likely mandate changes in alignment and design. Both projects represent major opportunities for the study area.

Accident History

Based on an NCDOT Accident Strip Analysis Report, there were a total of 783 crashes within the corridor from Lane Street to I-440 within a three-year period between July 2007 and June 2010. Most of the accidents involve motor vehicle accidents with other automobiles at or near intersection locations. During this three-year period, two accidents involved cyclists and one involved a pedestrian. Of the total number of crashes, 242 accidents occurred within 150 feet of the I-440 interchange and 103 of the accidents occurred within 150 feet of the Peace Street overpass. The volume of crashes at these two intersections ranks these locations within the top 20 out of nearly 1,700 intersections evaluated citywide during this three-year timeframe.

Crash severity is established as the equivalent of the most serious injury sustained by any individual involved in a crash. The severity index of a street is calculated by determining the total equivalent property damage of all accidents in a corridor divided by the number of crashes during a given period of time. The average severity index for the City of Raleigh between 2007 and 2010 was 2.89. Seven intersections within the corridor had a higher than average severity index during this time period, including Crabtree Boulevard, Fenton Street, Hodges Street, Wade Avenue, Fairview Road, Johnson Street, and Dortch Street. A copy of the full accident analysis for the corridor is located in Appendix A – NCDOT Traffic engineering Accident Analysis System Features Report. See Figure 3.5: Accident Locations.

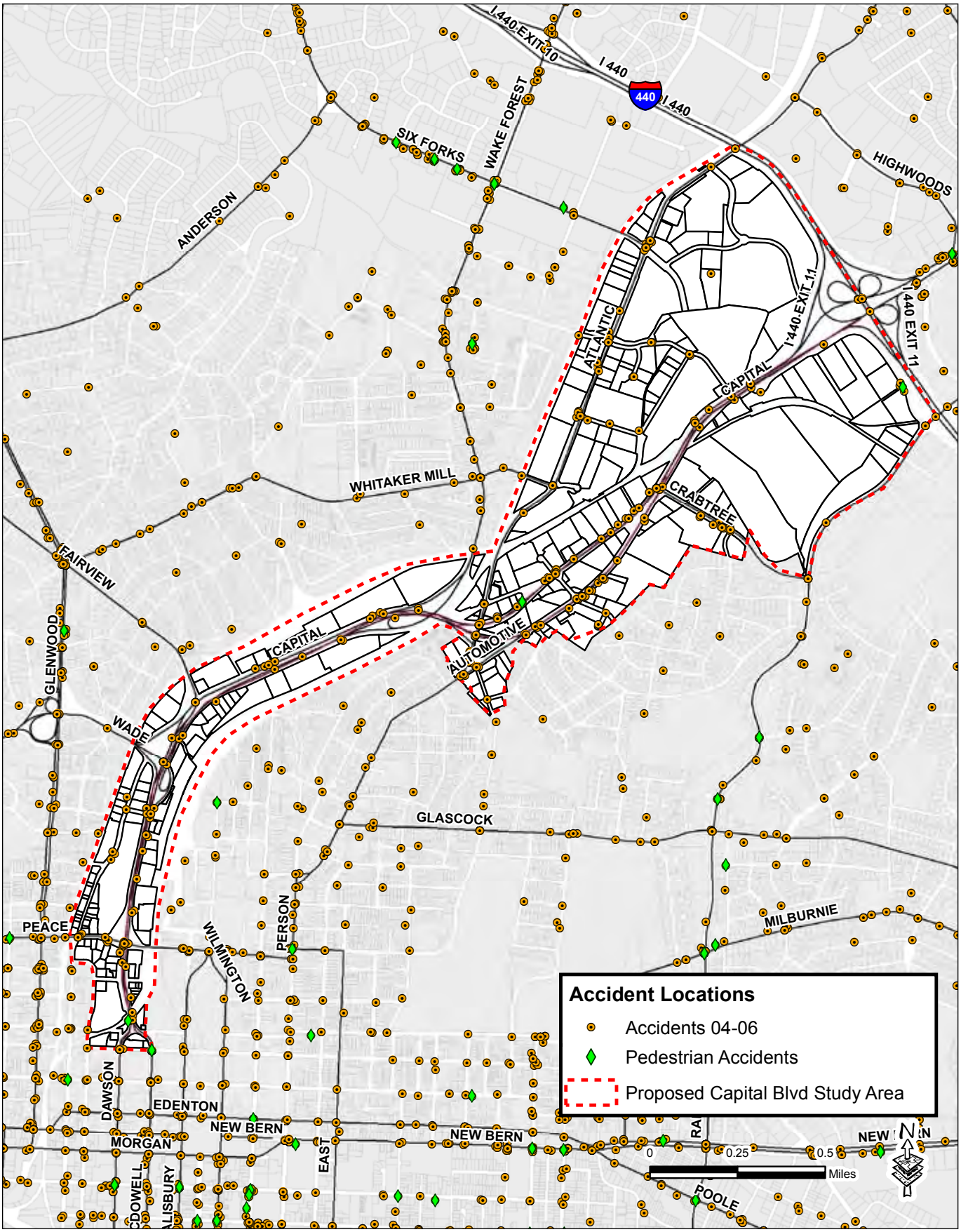
Planned Roadway Improvements

The following projects are planned street extensions and realignments as identified in the Raleigh 2030 Comprehensive Plan:

Figure 3.4: Planned Roadway Improvements Table

Street	Project Description
Six Forks Road (Major Thoroughfare)	Extend from Atlantic Ave to Hodges Street/Capital Boulevard
Whitaker Mill Road (Minor Thoroughfare)	Extend from Atlantic Ave to Capital Boulevard
Gavin Street (Collector Street)	Extend to Hanover Street
Meadow Wood Boulevard (Collector Street)	Extend to Mellow Field Drive
Ratchford Drive (Collector Street)	Extend to Mellow Field Drive
Mellow Field Drive (Collector Street)	Extend to Ratchford Drive

Most of the projects are unfunded at this time and the construction schedule is therefore unknown.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3.2 TRANSIT

Local Bus Service

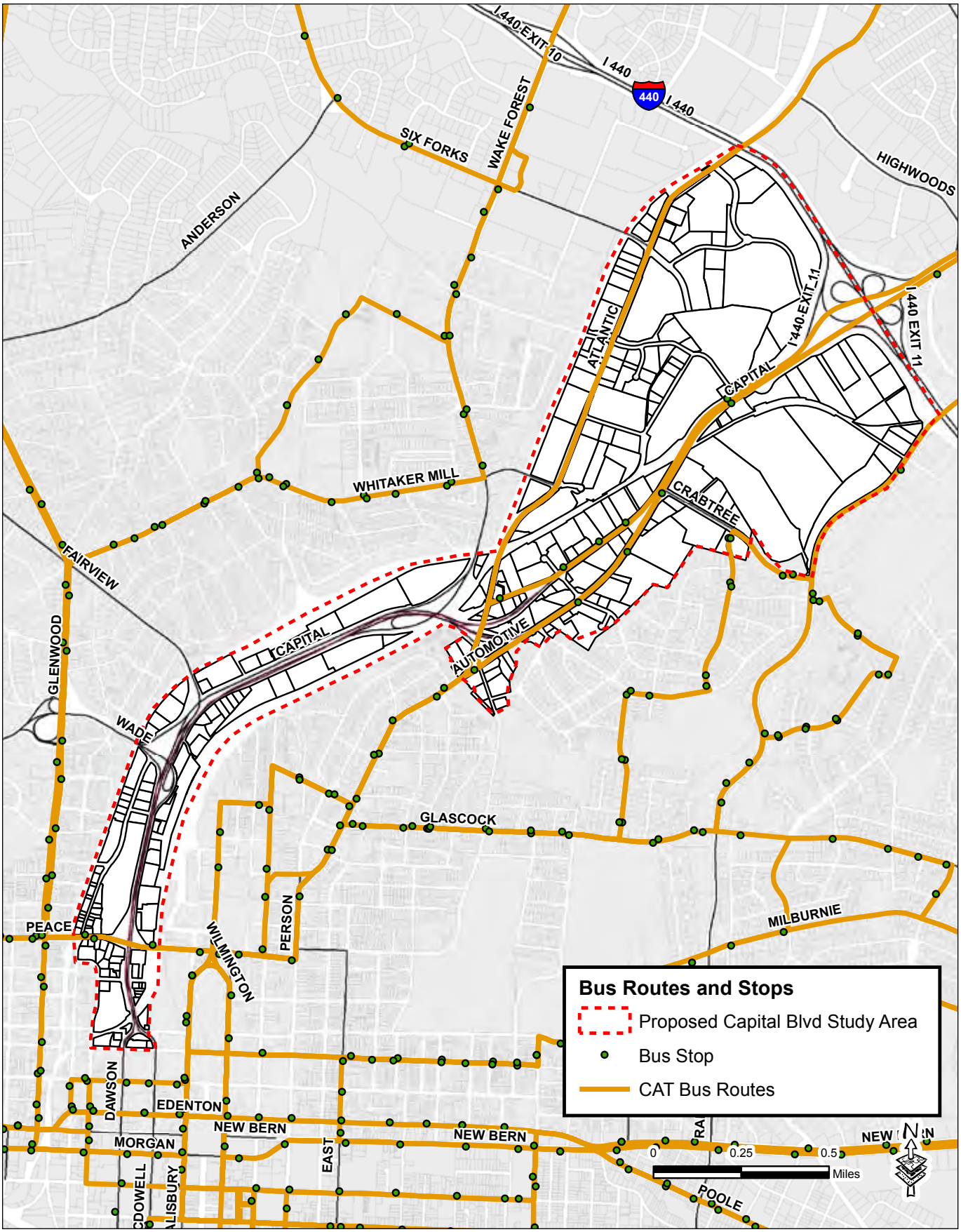
Currently, there are two CAT bus routes serving the Capital Boulevard Study area: Route 1 and Route 2. Route 1 is considered to have the highest productivity and often has the highest ridership on any given day within the entire CAT bus system. Average weekday ridership is 1,825 passengers, with 51 passengers per service hour. Route 1 service runs from Moore Square Transit Station in downtown Raleigh to Triangle Town Center serving Capitol Park, Peace College, Highwoods, Tarrymore Square, and Mini City along the route. The majority of the route is along Capital Boulevard north of Wake Forest. Weekday peak hours are served every half-hour from 5:45 a.m. to 6:15 p.m. (e.g. 30-minute headways) and service for Saturday, Sunday, and off-peak workday hours are roughly once an hour (e.g. 60-minute headways).

The Route 2 service runs from Moore Square Transit Station to Bent Tree Shopping Center on Falls of the Neuse Road south of 540 and serves Five Points, Duke Raleigh Hospital, and Quail Corners Shopping Center along the route. The Route 2 service runs along Capital Boulevard from Jones Street to Whitaker Mill as an express route with no stops (e.g. “closed-door” service only). This route has similar level of service with weekday peak buses running every half-hour and off-peak service at once an hour. See Figure 3.7 :Bus Routes and Stops.

The two routes, although heavily travelled, are lacking in many amenities. See Figure 3.9: Bus Amenities.

Figure 3.6: Bus Amenities

Data/Amenities	Route 1	Route 2
Total Route Length (in miles)	3.26	1.65
Total number of Stops	67	105
Total Number of Stops within Study Boundary	11	1
Number of Stops with Bus Shelters (entire route)	12	10
Number of Stops with Benches (entire route)	12	27
Number of Stops lacking amenities (no shelter or bench) within Study Boundary	9	1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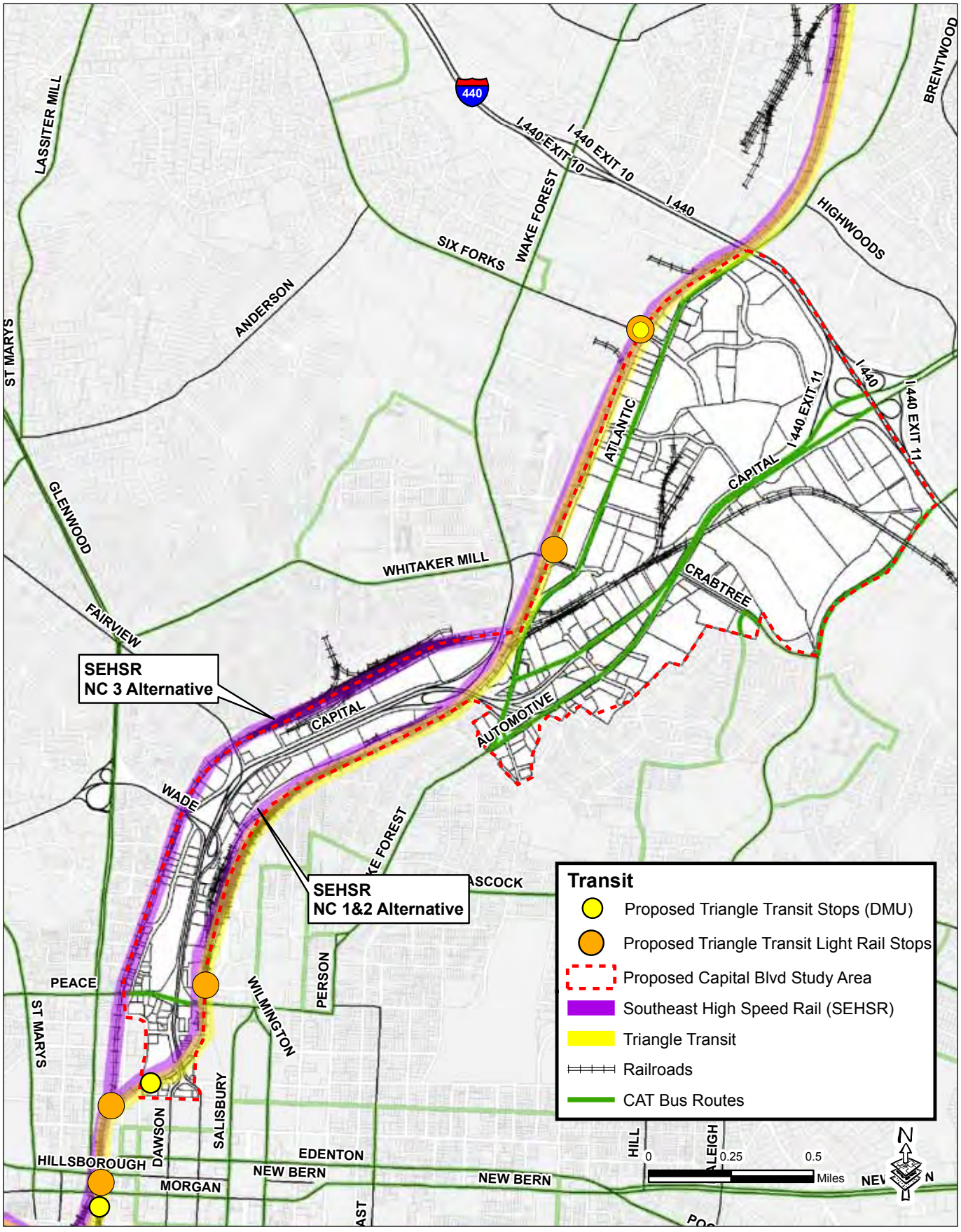
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Planned Bus Service Improvements

There are a series of both short-range and long-range improvements planned for the Capital Boulevard corridor.

Short-range improvements will include continued local bus service along the length of the corridor, with plans to operate at a higher frequency of every 15 minutes during peak rush hour, and every 30 minutes at midday. If other routes operate on the inner corridor portion, such as a Wake Forest Road route, this frequency could increase proportionally. The commuter service from the Town of Wake Forest will continue to operate on the inner portion, but will not stop within the southern portion of the corridor.

Increased ridership and development is projected for the Highwoods area, just north of the study boundary. Current recommendations include increased service in this area, possibly connecting Highwoods to the Duke Raleigh Hospital.

Long-range improvements are to be addressed in the 2030 Bus Transit Plan. This study is a joint effort by the City of Raleigh and the Capital Area Metropolitan Planning Organization (CAMPO). This recently initiated study will provide CAT planners with bus transit scenarios for the next 20 years (2011 – 2030) and will provide CAMPO the data for the upcoming comprehensive Long Range Transportation Plan. In addition, the study will help determine the selection of bus transit services that could be deployed as part of the Wake County Transit Project.

Current options include three alternate schemes for the expansion of bus services in the study area. These options are dependent on the introduction of additional transit options in the City, namely Commuter Rail and/or Light Rail:

1. **No action**: Service levels remain as they are with or without Commuter or Light Rail options.
2. **Increased service to compliment commuter rail service**: If a commuter rail service were to begin to serve the City from Durham and points west, this service would likely terminate at a multi-modal station, Union Station, in downtown Raleigh. Bus service would intensify in many of the corridors from Union Station to points north, including increased service along Capital Boulevard. Increased service in the corridor would aim to lower existing 30-minute headways to 15 minutes all day.
3. **Conversion to Circulator**: If a light rail type service were to begin operation in the City, the CAT system would operate as a circulator bus system. In this scenario, the Light Rail service becomes the primary means of transit-based commuter travel with the CAT bus system functioning as a feeder system. Current understanding of potential light rail station locations could locate four stations from Union Station north to the beltline along the rail corridor, which roughly parallels Capital Boulevard and Atlantic Avenue. The Mid-Range Bus Plan will provide the service which links all of the various rail stations to the other modes of transportation.

Opportunities for Additional Bus Services

Additionally, there is potential to include Bus-Rapid Transit (BRT) as a transportation choice within Raleigh. The Capital Boulevard corridor is one of many possible locations for this type of service, and may be particularly appropriate as the corridor combines high ridership with long service runs.

The level of service of a BRT system is similar to that of a Light Rail system, with fixed routes and a larger investment in the infrastructure at "station" locations. The service stops less frequently than a typical bus circulator or inter-city bus system, with station spacing similar to that of a standard commuter bus route. A BRT system may include a dedicated bus lane along portions or the entirety of its route, but may also run in mixed traffic.

Southeast High Speed Rail

The Southeast High Speed Rail Corridor (SEHSR) is one of five originally proposed high-speed passenger rail corridors designated by the US Department of Transportation (USDOT) in 1992. The corridor was designated as running from Washington, DC, through Richmond, VA, and Raleigh, NC, to Charlotte, NC, with maximum speeds of 110 mph. It is part of an overall plan to extend service from the existing high speed rail on the Northeast Corridor (Boston to Washington) to points in the Southeast.

The Federal Railroad Administration and the Federal Highway Administration issued a Record of Decision on the initial environmental studies in 2002, confirming and approving the route for the SEHSR. On January 28, 2010 it was announced that Virginia and North Carolina would receive substantial funds to make incremental improvements in the Southeast High Speed Rail Corridor. Initial funds are slated for projects that are significantly advanced in terms of planning and engineering between Washington, DC, and Richmond, VA, and between Raleigh and Charlotte, NC.

The project is currently in the second environmental study phase (Tier II EIS) that includes more specific analysis along the preferred route between Richmond, VA, and Raleigh, NC. This Final Tier II EIS (Environmental Impact Study) should be completed by early 2011, with the Record of Decision expected in mid-2011.

Routing Alternatives

In North Carolina, the corridor continues along the inactive S-line through Warren County to the Town of Norlina, NC, where the S-line returns to an active freight railroad (CSX). From Norlina, the SEHSR study corridor follows the active freight line into Vance County and through the towns of Middleburg, Henderson, and Kittrell, NC, before crossing the Tar River, and on into Franklin County; the corridor then passes through Franklinton and Youngsville before entering into Wake County.

In Wake County, the corridor passes through the Town of Wake Forest, NC, before crossing the Neuse River, and then into the City of Raleigh. In Raleigh, the southern ten miles of the study corridor includes

right-of-way recently purchased by Triangle Transit (TT) for planned regional commuter rail service, which would be operated on a separate rail system.

On the north side of downtown Raleigh near Capital Boulevard, the study corridor again splits into two alternatives: (1) the western branch follows the existing Norfolk Southern (NS) NS-line through Glenwood Yard, the NS switching yard, and continues south; and (2) the eastern branch continues to follow the CSX S-line south through Capital Yard, the CSX switching yard. The two branches re-join near Jones Street in downtown Raleigh. From Jones Street, the study corridor continues south for two blocks along the S-line to the Boylan Wye on the railroad, near Boylan Avenue. The Boylan Wye represents the southern terminus of the study corridor.

The three routing alternatives through Raleigh are:

1. NC-1: East Side of Capital Boulevard on CSX line
2. NC-2: East Side of Capital Boulevard on CSX line, alternate
3. NC-3: West Side of Capital Boulevard on NCRR line

Roadway Impacts

Changes to the transportation network are among the impacts of the SEHSR project. For safety purposes, high-speed rail service must run in a sealed corridor. Current at-grade crossings, where vehicular and train traffic intersect, must be replaced by grade-separated crossings (e.g. bridge or underpass) or road closures.

The following table summarizes the changes to the roadway network in the study area:

Figure 3.10: Roadway Network Changes from SEHSR

Route:	NC-1	NC-2	NC-3
Impacts:	▪ Closes Harrington Street (ped crossing) ▪ Closes West Street intersection ▪ 1300 foot Jones Street bridge; cuts Harrington ▪ Short Hargett Street bridge	▪ Closes Harrington Street (ped crossing) ▪ Closes West Street intersection ▪ 1300' Jones Street bridge; cuts Harrington ▪ Long Hargett Street bridge	▪ Closes Fairview Road ▪ Closes Jones Street (possible pedestrian crossing) ▪ Short Hargett Street bridge

Regional Rail

In collaboration with the Metropolitan Planning Organizations and Local Governments, Triangle Transit is leading an Alternatives Analysis study to determine how and where transit can best serve our region. These efforts are currently focused on the Triangle Regional Transportation Program (TRTP) Alternatives Analysis. The Alternatives Analysis (AA) process is required by the Federal Transit Administration for projects where fixed guide-way transit is being considered and Federal funding may be pursued. The purpose of an AA is to analyze and compare all reasonable transportation alternatives for addressing defined mobility problems or achieving specific goals in the corridor.

In the spring of 2011 the Alternatives Analysis will end with the determination of a Locally Preferred Alternative (LPA). The LPA defines the preferred transit alignment or route, the locations of all stops or stations, and the recommended vehicle technology (e.g. light rail, commuter rail, bus rapid transit, and bus). The LPA is the most likely candidate to receive federal funding.

Proposed Alignments and Stations

At this time, the Alternatives Analysis process is not at the stage to propose station locations. For the purposes of this document, the station locations from the previously generated Triangle Transit plan (Phase I Regional Rail System Preliminary Engineering/Environmental Impact Statement 1998) will be assumed.

The initial regional rail project proposed Diesel Multiple Unit (DMU) locomotives operating within the existing rail corridor. The DMU commuter rail plan planned for stations in the following locations (within/adjacent to the Capital Boulevard study boundary):

- Downtown Raleigh: at Hargett Street, within and adjacent to the railroad wye
- Government Center: between Harrington and Dawson Streets north of Lane Street
- Six Forks/Highwoods: near the intersection of Six Forks and the rail corridor, near the Highwoods Office Park

Other than the locations within Downtown (Downtown and Government Center), the remainder of the station locations suffer from a lack of street interconnectivity, few opportunities for cross-track connections, very little infrastructure, and are proposed on under-developed (and potential "brownfield") industrial lands with little residential catchment areas. Access to the stations is limited for bicycles and pedestrians and it is nearly impossible to cross the tracks to reach the platform in many locations.

Opportunities

A number of opportunities exist to capitalize on existing ridership potential and future development potential. By connecting to existing residential pockets and easily redeveloped parcels a number of areas throughout the study area could support fixed guideway transit. With the inclusion of Light Rail as a technology choice for regional rail, stations can be located in closer proximity due to different operating requirements for acceleration and deceleration. Additionally, these vehicles are more nimble than the DMU locomotives and have the ability to "street run" on the existing roadway network with some retrofit to existing infrastructure.

Other opportunities include providing service to Union Station, the Downtown multi-modal hub proposed by the City of Raleigh. In this recently completed study, the City determined the feasibility of locating SEHSR, Amtrak, commuter rail, Greyhound, and local buses at one facility adjacent to the railroad Boyland Wye. Including a light rail connection at this location could benefit all of the modes of transportation.

Potential light rail stations could include:

- Union Station (Multi-Modal Center) – within the blocks bound by the rail line to the west, West Street to the east, Morgan and Martin Streets to the north and south, respectively, as a street-running light rail
- Seaboard Station – north of Peace Street at the existing Seaboard Station development
- Glenwood South – between Jones and Lane Streets
- Whitaker Mill – along the rail corridor near the intersection of Whitaker Mill and Atlantic Boulevard
- Six Forks – along the rail corridor near the intersection of Six Forks Road and Atlantic Boulevard

3.3 BICYCLES AND PEDESTRIANS

Bicycle Plan Routes within the Study Area

One bicycle route traverses the Capital Boulevard Corridor along Lane Street as it crosses Dawson and McDowell Streets. There are also number of bicycle routes that run parallel to the corridor. These routes are designated along Raleigh Boulevard, Aycock Street, Brookside Drive, and Midwood Drive.

The City's Bicycle Plan does not recommend bicycle accommodations on Capital Boulevard beyond providing wide outside lanes. But there are a number of improvements planned along adjacent and parallel routes. Below is a listing of the bicycle infrastructure treatments as currently recommended:

Figure 3.11 : Bicycle Infrastructure Treatments table

Street	From	To	Facility Type	Recommended Method	Programmed for Installation
West Street	Peace Street	Fairview Road	Sharrow	Stripe	No
Fairview Road	Capital Boulevard	Wade Avenue	Sharrow	Stripe	No
Whitaker Mill Road	Wake Forest Road	Atlantic Avenue	Bicycle Lane	Road Diet/Stripe	No
Atlantic Avenue	Old Louisburg Road	I-440	Bicycle Lane	New Construction	No
Wake Forest Road	Automotive Way	Six Forks Road	Bicycle Lane	Road Diet/Stripe	No
Brookside Drive	Glasscock Street	Wake Forest Road	Bicycle Lane	Restripe	No
Yonkers Road	Capital Boulevard	Raleigh Boulevard	Bicycle Lane	Restripe	No

Greenways

The Capital Area Greenway Plan includes a 'connector' that is shown to extend from Crabtree Creek to the Downtown area. Currently, there is no specific route identified to complete this connection. This connection is especially desirable because it would provide a non-vehicular means of transportation from the north Raleigh residential areas into the businesses located downtown. The development of a bicycle pedestrian route becomes possible in conjunction with storm water improvements to Pigeon House Branch.

A major constraint is the roadway infrastructure. The existing interchanges were not designed to include pedestrian and bicycle facilities. These interchanges act to block the possible development of non-vehicular routes. The redesign and new construction of these facilities must include provisions for pedestrians and bicycles in the future.

Finally, the Capital Boulevard Corridor is located in a valley with vibrant neighborhoods located on either side of the valley. There is a desire and opportunity to connect these neighborhoods with pedestrian bicycle facilities that either span the valley or are incorporated within the new roadway infrastructure that is noted earlier.

Sidewalk Inventory

There is limited sidewalk connectivity within the Capital Boulevard corridor. Within the 3.4 mile corridor, approximately 1.2 miles are connected by continuous sidewalk on either side. There are sidewalks on both sides of Capital Blvd from Lane Street to Fairview Road, but there are no continuous sidewalks north of Fairview Road that extend beyond two blocks in length. Sidewalks segments are also constructed along Capital Boulevard north of Tillery Place, on the south side of Wicker Drive, at the corner of Crabtree Boulevard, and along Whitaker Mill Road near Atlantic Avenue. While there is limited sidewalk connectivity along Capital Boulevard, there is an adequate network of sidewalks within the adjacent neighborhoods such as Mordecia and Five Points.

Below is a listing of all the City initiated sidewalk projects which have been prioritized for funding within the study area:

Figure 3.12: Sidewalk Projects

Street	Project Description
Atlantic Avenue	Six Forks Road to Highwoods Boulevard, west side
Atlantic Avenue	Whitaker Mill Road to Six Forks Road, both sides
Raleigh Boulevard	Crabtree Boulevard to Westinghouse Blvd, both sides
Crabtree Boulevard	Capital Boulevard to Timber Drive, both sides

Accommodations at Intersections and on Existing Bridges and Underpasses

There are currently few accommodations for pedestrians and bicyclists at intersections and on existing bridges. Pedestrian travel is limited across Capital Boulevard. Peace Street is the only location that allows full-pedestrian access.

3.4 CONCLUSIONS

Capital Boulevard is an important automotive arterial that continues to suffer from past compromises and poor alignments that predate modern standards for highway design. While the corridor continues to move a significant amount of traffic, it has several problematic locations from a traffic safety perspective, and provisions for other modes such as biking, walking, and buses riding are largely absent or substandard. In spite of this, significant opportunities remain to remake the facility in a way that makes it safer and more accessible for all users. The following is a summary of the major conclusions of this section:

- Traffic growth on Capital Boulevard has been flat to modest, but is projected to increase significantly out to 2035. Based on these projections, capacity within the corridor needs to be maintained even as other modes are accommodated.
- Two funded bridge replacement projects at Peace Street and Wade Avenue provide the opportunity to rethink the interchange design to improve safety and bicycle and pedestrian connectivity.
- The most dangerous crash locations in the study area correspond to the I-440 and Peace Street interchanges. Several other at-grade intersections score higher than average on a crash severity index.
- CAT's Route 1 combines the highest ridership with the highest productivity in the local bus system. This demand for transit, combined with the length of the route, makes it an appealing candidate for potential future BRT investment.
- There are several Regional Rail stations planned for the study area, and the City is considering proposing additional stations should the system utilized Light Rail technology. These stations could help spur transit-oriented development and redevelopment in the study area.
- Should rail service be implemented, local bus service would be significantly redesigned to serve as a feeder for the rail trunk route.
- Southeast High Speed Rail will impact the study area by closing some streets (Fairview, in one alternative) and grade separating others (Whitaker Mill). SEHSR represents both a constraint and an opportunity, as it may provide funding for a variety of improvements.

4 Environmental Conditions

4.1 WATERBODIES IN THE STUDY AREA

Description Pigeon House Branch, Crabtree Creek, Cemetery Branch

The Capital Boulevard Corridor Study Area includes one major stream, two smaller streams, and two significant wetland areas. Crabtree Creek, the second largest stream in Raleigh with a drainage area of over 145 square miles, flows southeast through the northernmost portion of the study area. The two smaller streams consist of Pigeon House Branch, a tributary to Crabtree Creek, which flows to the northeast along the length of the study area from downtown to a point where it intersects Crabtree near the Beltline; and the Cemetery Branch, a tributary to Pigeon House Branch, which flows from the south and intersects Pigeon House Branch near the Wake Forest Road intersection. The combined drainage area of these two streams is about 4.5 square miles or 2,900 acres.

The two wetland areas are limited to the northeast portion of the study area between Capital Boulevard and Raleigh Boulevard. The larger of the two (about 30 acres) is located north of Crabtree Creek and adjacent to Raleigh Boulevard and is actually a man-made wetland which was established as mitigation for environmental impacts resulting from the construction of Raleigh Boulevard. This wetland is located on City-owned land. The other smaller (about 10 acres) wetland is located primarily on private property on the opposite side of Crabtree Creek from

Wetlands

the large wetland. This wetland is a naturally occurring and is likely the result of flat topography coupled with frequent flooding associated with Crabtree Creek.

In order to accommodate development, Pigeon House Branch and to a lesser extent, Cemetery Branch, were substantially modified through relocation, channelization, and burying the stream in concrete, metal and, in some cases, masonry culverts. Such actions were common in the past when water was considered a common "enemy" and most efforts were directed towards removing water from the land and efficiently conveying it elsewhere or relocating streams and burying them to create more useable land area. Even worse, many of these low lying areas were considered undevelopable and were relegated to dumping grounds for trash from domestic and commercial sources. As a result of these channel modifications and development of the upstream watersheds, Pigeon House Branch and, to a lesser extent, Cemetery Branch may now be better described as urban stormwater conveyances as opposed to the natural streams they once were. (See Figure 4.1)

Water Quality

As a result of the habitat impacts of these past practices and water quality degradation from the numerous pollutants which wash off of the urban watersheds that feed these streams during storm events, all three streams are now considered impaired by the NC Division of Water Quality (DWQ) based on both elevated levels of certain pollutants and adverse impacts to the benthic macro invertebrate populations (small organisms that live in the streams). Details of these impairments can be found in the State's 303(d) report which lists all the impaired water bodies in the state and the presumed causes of the impairment: http://portal.ncdenr.org/web/wq/ps/mtu/assessment.

Some of the specific impairments include elevated levels of copper, pathogens (bacteria), and sediment deposition in the lower reaches of the streams which adversely impacts habitat for fish and other aquatic life. The impairment associated with these streams is typically attributed to the cumulative effects from the contributing 4.5 square mile watershed as a whole as opposed to local stream impacts. Unfortunately, this means it will be challenging to achieve meaningful water quality improvement in these streams as improvements throughout the watershed will be required. However, there is room for limited local water quality improvements through construction of stormwater best management practices, stream habitat enhancements, and through control of specific pollutant sources.

As "Waters of the US," all perennial and some intermittent streams and wetlands fall under State and Federal jurisdiction and, as such, have been protected by a number of regulatory programs for the past 20- to 30-years. Prior to that, both streams and wetlands in non-coastal areas of the state generally could be extensively modified and even completely filled in. Under the authority of the Clean Water Act, the US Army Corps of Engineers currently limits the extent of impacts allowed in wetlands and streams. While major impacts are still possible, persons wishing to alter the stream or wetland must demonstrate

that there are no other practical alternatives and, in most cases, provide compensatory mitigation for any negative impacts. Under State authority, DWQ provides similar protection for streams and wetlands. In the Neuse River Basin, which includes all of Raleigh, DWQ also regulates 50-foot buffers on either side of streams and around wetlands, ponds, and other bodies of water that are classified as Waters of the State. While both the State and Federal programs limit adverse impacts to streams and wetlands, both sets of regulations do allow for restoring and enhancing eroding and otherwise degraded streams provided the improvements are approved and proper permits obtained prior to the start of work.

4.2 FLOODING

Extent of the 100-year Floodplain

Portions of the Capital Boulevard Corridor Study area are subject to significant flooding during heavy rainfall events. The major flooding sources include Crabtree Creek, Pigeon House Branch and, to a lesser extent, Cemetery Branch. Flood events are typically described by how often a particular level of flooding will be experienced. For example, a 100-year storm would describe the severity of flooding expected to occur on the average of once every 100 years or, in other words, would have a 1/100 (1 percent) chance of occurring in any given year. The 100-year storm is traditionally used as the basis for the regulation of most development and when one refers to “the floodplain” they are most often referring to the area expected to be inundated once every 100 years.

Flood History, Flash Flooding

The Pigeon House / Cemetery Branch watershed, which is bounded by Oberlin Road to the North, Hillsborough Street to the west and State Street to the east, encompasses approximately 4.5 square

Pigeon House Branch

Invasive plants and stormwater infrastructure in the Pigeon House Branch

miles (2,900 acres). These two streams intersect and form a relatively narrow floodplain in the low-lying area adjacent to much of Capital Boulevard. Crabtree Creek, on the other hand, which originates in Cary, has a 145 square-mile watershed and has formed a very broad floodplain by the time it reaches the northeastern most portion of the study area. These naturally occurring flat floodplain areas are the result of streams leaving their channels and depositing water borne sediments during times of flooding. During large storm events, all three streams rise out of their banks and inundate their respective floodplains as they have done historically.

In undeveloped watersheds, such flooding occurs on the order of once every two years. However, in this highly urbanized watershed, where the percentage of impervious surfaces is large, infiltration is low, and most rainfall is converted directly to runoff, such flooding occurs far more frequently. It is common for portions of Pigeon House Branch to flood several times a year. The “flashy” nature of the flooding is also influenced by the amount of development. In a highly urbanized watershed such as Pigeon House Branch, floodwaters may rise and recede within a matter of an hour or two. This makes flooding in these areas more challenging as there is little time to react and remove people and property from harms way. Crabtree Creek, with its much larger watershed, is far slower to rise and may take from 12- to 24-hours to rise and fall. This allows more time to react but the duration of flooding can create difficulties where roadways and structures are inundated for extended periods. During the largest storms Crabtree Creek’s floodwaters back up into the lower reaches of Pigeon House Branch exacerbating the flooding in this portion of the watershed.

As the study area developed, the railroad tracks and most residential development were sensibly located on the high ground on either side of the floodplain. However, the Capital Boulevard roadway system and many commercial developments were later established in the floodplain areas alongside of Pigeon House Branch.

Flood Control Options

Typically, it is impractical to try to reduce flooding in watersheds of this size. Detailed watershed studies have been conducted to evaluate the possibility of constructing large stormwater controls in the form of ponds and wetlands to attenuate flooding in Pigeon House Branch. It has been determined that the costs of such controls would far exceed any resulting benefits. Also, current environmental regulations would preclude the construction of such controls. Consequently, reducing flood impacts will likely have to take the form of reducing stormwater discharges throughout the watershed.

Other options include the construction of expensive smaller stormwater controls, improving the flood carrying capacity of the streams, or simply moving man-made improvements out of the floodplain and harms way. This last option becomes more attractive since the Federal Emergency Management Agency (FEMA), which oversees flood insurance, provides incentives for the purchase and removal of both residential and commercial structures which experience repetitive flooding. Such a program might

provide financial assistance for converting some of the development in flood-prone areas into park, open space, or other undeveloped land. This program is voluntary and City staff has had little success in convincing owners to participate. The option of improving the conveyance of the streams in the study area has several serious limitations.

As noted in the next section on Waterbodies, these streams are Waters of the US and, as such, are protected by several layers of environmental regulation. The option of reducing flooding through the implementation of numerous smaller stormwater controls throughout the contributing watershed is a viable option. It will take many years to install enough of these smaller practices to see a measurable improvement. Due to poor economics of scale, this option also will prove expensive. The implementation of numerous smaller stormwater controls, however, likely will provide the added benefit of water quality improvements which are a high priority in this water quality impaired watershed.

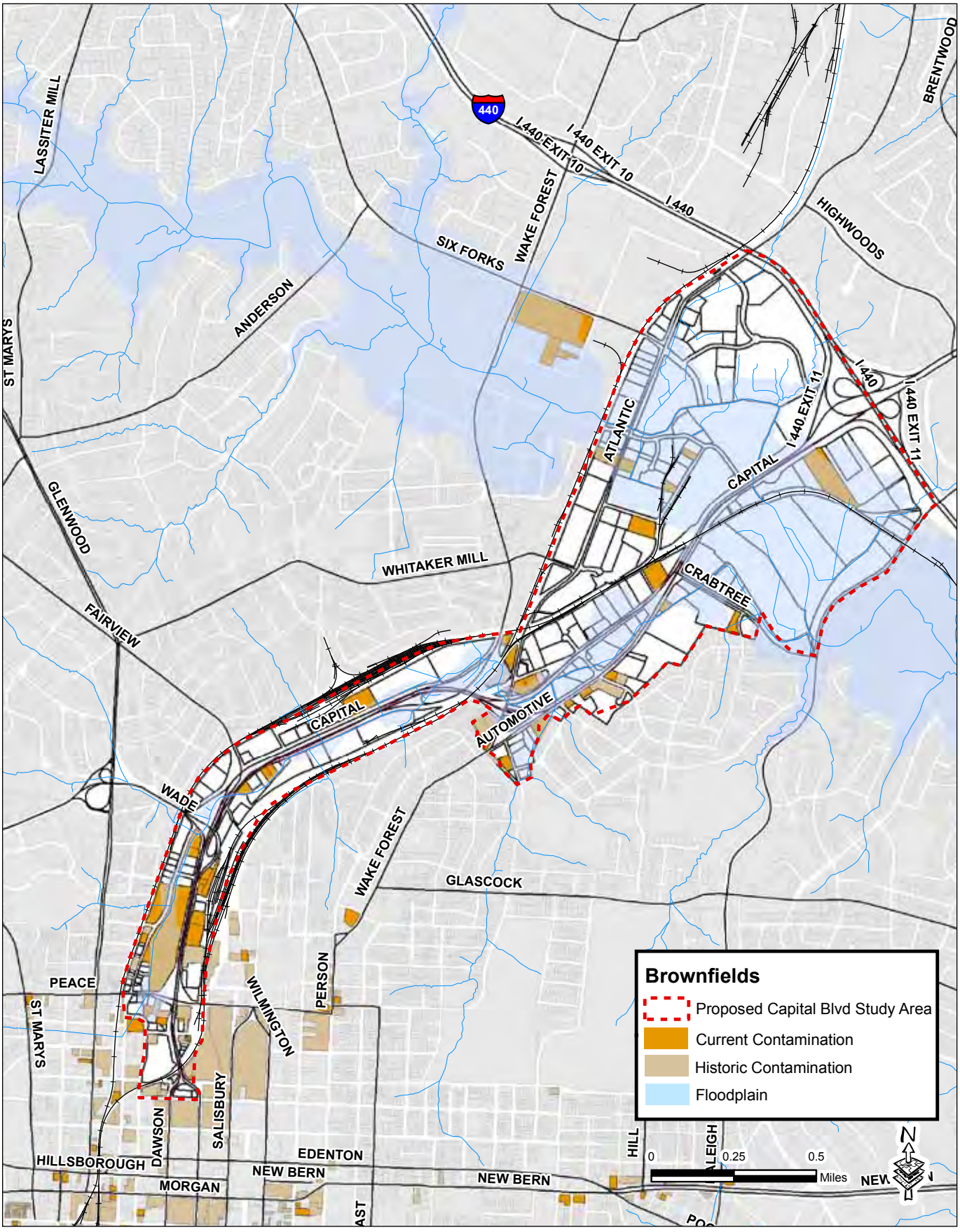
4.3 ENVIRONMENTAL CONDITIONS

Environmental Contamination

Real or perceived environmental contamination can be a hindrance to revitalization and economic viability. The Capital Boulevard Corridor Study Area contains numerous properties that may be environmentally contaminated. In an effort to distinguish which portions of the study area may have environmental contamination from those that have less potential of being contaminated, research was conducted to identify potential Brownfield properties within the area. A 'Brownfield' is an abandoned, idled, or underused property where the perceived or actual threat of environmental contamination has hindered its redevelopment.

Potential Brownfield Properties

In order to identify potential Brownfield properties within the study area, available fire insurance map (Sanborn Map) information and the current and historic land uses were reviewed. The results of that research revealed that approximately 17 percent of the properties within the study area are potentially Brownfields, which translates into approximately 49 out of the 290 properties. (See Appendix B – Potential Brownfield Properties.) See Figure 4.1: Potential Brownfields. They do not necessarily pose a serious health or environmental threat, but likely represent properties that pose an economic or social threat. Assessments of the properties that have been identified as potential Brownfields would need to take place in order to verify the actual number and severity of contamination. The benefits of Brownfield assessments would be two fold: (1) they would remove the perceived threat of contamination where there is none; and (2) they would provide the information necessary to mitigate properties that are contaminated.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Proposed Capital Blvd Study Area
Current Contamination
Historic Contamination
Floodplain
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Typical Contamination Found Along Rail Corridors

In addition to the potentially contaminated properties within the Capital Boulevard Corridor Study Area, there is also potential for environmental contamination along the Norfolk Southern and CSX rail lines that are within this area. Studies have shown that typical contamination along rail lines can include metals, pesticides (such as lead arsenate), and constituents of oil or fuel (petroleum products). Increased levels of arsenic may also be present in the soil along the right-of-way from old railroad ties that have been treated with an arsenic solution. Lubricating oil and diesel may have dripped from trains, leading to petroleum product along the rail corridor. There may also be, among other contaminates, a presence of cleaning solvents. Much like the properties that may be contaminated by their current or historic use, environmental assessments would be the only method for determining whether there is any type of residual contamination along the rail corridor.

Brownfield Opportunities

Determining whether there is contamination, and determining the type and extent of contamination would provide valuable insight into what measures would need to take place to mitigate the properties and make them viable for an increased variety of land uses. Redevelopment of Brownfield sites often initiates the revitalization of an entire area, and in many ways is one of the most sustainable forms of development. Reusing Brownfields offers the opportunity to use existing infrastructure, improve the environment, and reduce sprawl. It should be noted that there are quite a number of local, state, and federal tools and incentives that may be utilized for the environmental assessment, mitigation, and redevelopment of Brownfield properties.

4.4 TREE CANOPY AND SIGNIFICANT TREES

The following section contains a basic overview of the existing tree conditions in this corridor. A more extensive environmental impact assessment is recommended as part of the detailed planning for future capital projects within the corridor.

Tree Canopy and Significant Trees

Large maturing trees currently exist on sections of Capital Boulevard. It is important to install large maturing trees when replacing and or supplementing this landscape. Large maturing trees are hugely beneficial to an urban environment because they amplify the environmental, social, and economic benefits trees provide. Large trees provide more of the functions that improve air and water quality, reduce energy costs, and increase property values. For more information see http://www.urbanforestrysouth.org/resources/collections/large-trees-small-trees/

Existing Conditions

Capital Boulevard medians are predominantly turf. The section at Crabtree Boulevard is composed of Hollies and multistem Crapemyrtles cultivar ‘Tuscarora.’ This cultivar is dark fuchsia. The median near

Wade Avenue is composed of Saucer magnolia and Viburnum (a variety of Snowball).

Capital Boulevard shoulders include formal planting of Sawtooth oak (Quercus acutissima), Pin oak (Quercus palustris) and Crapemyrtle (Lagerstroemia indica 'Tuscarora') are approximately 15- to 20-years old. The oaks range in size from 12- to 16-inches DBH (diameter at breast height) and 30- to 50- feet tall. The Crapemyrtles are 12- to 15-feet tall and multistemmed. The oaks that were planted beneath power lines have been significantly deformed by pruning for clearance. Other species planted as landscape plants include varieties of red oak such as Nuttall oak (Quercus nutallii), Willow oak (Quercus phellos), English oak (Quercus robur) and Crapemyrtle Lagerstroemia indica 'Sarah's Favorite'. Wooded areas exist in blocks of varying size. They contain species similar to the riparian areas listed below. These areas are unmaintained other than to prevent encroachment into the right-of-way. There is a significant presence of invasive plants.

Riparian, greenway, and boardwalk areas are largely naturalized. There is a mixture of bottomland hardwoods and early successional species. Species include, but are not limited to, River birch, Oaks (several species), Tulip poplar, Red maple, Sugar maple, Loblolly pine, Sweetgum, Sycamore, and various understory species. There is significant presence of exotic invasive plant species.

Off ramps and cloverleaves support slightly more decorative landscaping, and include but are not limited to Elephant ear, Saucer magnolia, hollies, and viburnum. A variety of evergreen trees and shrubs are present including Waxmyrtle hedges, Cryptomeria, Deodar cedar, Leyland cypress, and Loblolly pines.

Issues

Issues along the corridor concern new trees, invasive species, and power lines. Capital Boulevard is restricted by the State Guidelines for Planting within Highway Right-of-Way. The guidelines restrict planting large maturing trees within 20 feet on the shoulders of a 45-mph street. See the document below for more information. http://www.ncdot.org/doh/operations/dp_chief_eng/roadside/design/plantGuidelines/

Invasive species are prevalent in all of the 'natural' and riparian/wooded areas. Attempts to control invasive plants are limited due to proximity to water and Neuse River buffer rules. Using herbicide is problematic. Staff is not available for labor intensive hand removal. The species include but are not limited to Kudzu, English ivy, Privet (Ligustrum), Chinaberry, Japanese honeysuckle, Japanese stilt grass, Tree of Heaven, Mimosa, and Princess tree(botanical names can be provided upon request).

Overhead power lines restrict the installation of large maturing trees. It is desirable but generally expensive to put lines below ground.

Opportunities

This is an excellent space to install a highly diverse and sustainable urban landscape. The goal should be to provide the resources necessary for large maturing trees to thrive for 30 years or more. Capital Boulevard has the opportunity to be the most spectacular and innovative gateway to the City of Oaks and serve as a model of aesthetics and environmental functionality to other cities across the country. Ideally, the City would create shoulders with significantly wide planting strips between the sidewalk and the curb to plant large maturing trees. A minimum of 8 feet would be sufficient but an area in excess of 12 feet wide would accommodate long-lived, large maturing trees such as an oaks or elms. Soils should be amended and prepared for improved tree vigor. Medians should be significantly wide to plant large maturing trees.

If the trees must be installed in hardscape then an underground root expansion system should be installed. These systems provide the necessary resources for a sustainable urban tree. A typical large maturing tree requires a minimum of 1000 cubic feet of uncompacted soil to reach a healthy diameter of 12- to 14-inches. For an oak this tree would be approximately 40 feet tall. There are several options to achieve this and technology is changing rapidly. Commercially available engineered crates (such as Silva Cell™) provide a volume of un-compacted high quality soil with structural ability to support sidewalks and streets. Other alternatives include structural soils, suspended pavement, pervious pavement, and root pathways.

Diversity is key to avoid insect and disease issues associated with a monoculture. This is a good opportunity to create a diverse palate of plant material. Trees should be selected for urban tolerance, superior disease and insect resistance, superior form, aesthetics, and seasonal interest. All trees should be selected from nurseries where they are grown specifically for urban sites.

4.5 HABITAT & ECOLOGY

The ecology of the corridor area dramatically illustrates both environmental impairment and resilience. Like most of Raleigh's land area, the present-day corridor was once mainly woodland. Early in Raleigh's history, farming converted much of the study area to pasture and crop land. As the value of ridge tops along Pigeon House Branch to transportation emerged, construction of railroads and their associated yards, depots, and maintenance facilities brought significant impacts to the area environment including cut and fill recontouring, point-source pollution, and impacts to air quality. Years later, the building of Downtown (Capital) Boulevard even more radically transformed the landscape.

Pigeon House Branch, previously a meandering stream bordered by meadows, was undergrounded or rechanneled and subsequent urban development fragmented or eliminated many wildlife areas altogether. New impervious surfaces increased erosion and flooding pressures. Sediment, heavy metals and other pollutants in stormwater degraded stream quality. Today, the prevalence of non-native, invasive species (particularly kudzu) provides additional indication of the loss of the corridor's ecological

integrity. As noted elsewhere in this report, concern over these impacts, paired with recent legislative mandates, has spurred remediation measures. Projects aimed at improved water quality, beginning with the western headwaters of Pigeon House Branch, have been noteworthy components of Raleigh's Capital Improvement Program (CIP) funding in recent years. The studies behind these efforts suggest that much remains to be done.

The Natural Environment

Despite decades of change, hints of the corridor's original ecology are still evident. Habitats roughly fall into three interconnected zones: (1) stream courses, (2) wetlands, and (3) upland areas.

The condition of the corridor's streams provides a ready measure of the impacts of increased urbanization. Pigeon House Branch has long been recognized as one of the most environmentally degraded waterbodies in the region, with the viability of aquatic species extremely compromised. Recent mitigation efforts at headwater tributaries are aimed at reversing this trend. Research has long established the importance of maintaining riparian buffers to assuring water quality and, thereby, restoring aquatic habitats. Historically, minimal regard was paid to such buffers by adjacent corridor development. The channelization of Pigeon House Branch, and attendant stream bank fill, created steep slopes with limited stormwater mitigation capability. At the same time, increased impervious surfaces have exacerbated flooding and erosion. The definition and establishment of adequate riparian buffers represents one of the greatest challenges and opportunities for corridor redevelopment and improving stream ecology. The economic case for relocation of development out of floodplain areas makes streamside buffers all the more compelling.

In contrast, the wetland areas along Crabtree Creek demonstrate a degree of environmental resilience. Even to the casual observer, the wetlands near Raleigh Boulevard and Atlantic Avenue display an abundance of plant and animal life. Beavers have located lodges in the shallow waters and herons and egrets can frequently be spotted, along with migratory waterfowl and several species of turtles. Shrub and tree species provide a variety of wildlife food sources. The City has capitalized on these conditions in the construction of the Middle Crabtree Greenway trail. A boardwalk traversing the largest of the wetland areas provides the public with direct access to this environment.

Gullies and swales formed by tributary streams provide travel corridors for terrestrial wildlife into the study area's higher ground. The presence of slopes and flood-prone soils have precluded development in many of these areas, often allowing native trees to reach mature heights, and in turn providing habitat to numerous woodland animals. These corridors also sometimes channel such ambling species as raccoons and opossums into nearby neighborhoods.

The Designed Environment

Intentional plantings dot the study area, from the oaks and crape myrtles lining Capital Boulevard's

southern section, to the variety of shrubs and other decorative plantings at associated interchanges, to site landscaping planted in compliance with City development ordinances. Some of these plantings may be of wider ecological benefit (i.e., shade, wildlife food sources and/ or shelter) and some may be problematic (i.e. introduction of invasive plant species, such as fescue grasses).

4.6 IMPERVIOUS COVERAGE

Within the study area, the percentage of ground covered by impervious surfaces varies somewhat with topography and land use. Generally speaking, however, undeveloped ground is more the exception than the rule.


Snapping Turtle

The development of most parcels occurred long before present Best Management Practices (BMPs) for stormwater runoff and water quality were created, or City landscaping ordinances enacted. The predominant development pattern, large-footprint industrial buildings and associated large parking lots, most of which are paved, typically has relegated unbuilt spaces to marginalized lands that include stream banks, low ground, steep slopes, and planted streetyards and parking lot islands.

The greatest concentration of undeveloped land remains the roughly square space between Crabtree Creek, Atlantic Avenue, I-440, and Capital Boulevard, which is mostly hilly terrain above a large wetland area. During the past decade, though northwest portions of the area have been transformed into multi-family development. The other major open spaces including the wetlands near Raleigh Boulevard, are mostly owned by the City and maintained as a constructed wetland mitigation site, and thus can be expected to remain unbuilt.

Outside these areas, corridor parcels typically display high percentages of build out. The property at 1313 Capital Boulevard, for example, is nearly 89 percent impervious; that at 1827 Capital Boulevard, which includes a 300 foot section of Pigeon House Branch, is 77 percent impervious. The property at 1920 Capital Boulevard, which edges the branch for 625 feet, is 87 percent impervious. In addition to their stormwater and water quality impacts, such high proportions of hardscape also act to increase heat island effects. Some buildings are roofed in low-albedo (i.e., light-color) materials, many others are not,

and all exposed asphalt is subject to heat absorption and retention.

4.7 SOILS AND TOPOGRAPHY

Topography

The Capital Boulevard Corridor Study Area is located near the eastern edge of the North Carolina piedmont, just west of the coastal plain region. As noted on Figure 4.2: Topography and Steep Slopes, this section of the State is characterized by rolling terrain eroded by weather, creeks and rivers into hilltops and ridges, with slopes ranging from gentle to severe. Land development has often modified natural topography to accommodate construction, especially in urbanized settings.

The predominant feature of the area's southern three-quarters is the valley formed by Pigeon House Branch, which runs southwest to the northeast to meet the waters of Crabtree Creek. Crabtree Creek shapes the study area's northernmost quarter, following a zigzag course essentially perpendicular to Pigeon House Branch. Two smaller tributaries flow into the study area from the south. Cemetery Branch meets Pigeon House Branch just east of Wake Forest Road, and Bridges Branch meets Crabtree Creek just downstream from where the waters of Pigeon House Branch enter, near Raleigh Boulevard.

The high point within the study area is approximately 327 feet above sea level, at the area's southernmost point on W. Lane Street. The lowest point in the study area is approximately 182 feet where Crabtree Creek passes under Raleigh Boulevard.

Capital Boulevard Crepe Myrtles

Geology

The primary underlying formation of the study area is the metamorphic Raleigh Terrane, which mostly consists of Raleigh Gneiss. Portions of this bedrock lie exposed in segments of Pigeon House Branch and above Crabtree Creek. Alluvial deposits of gravel, sand, silt and clay line much of the stream courses, forming terraces and bars in sections less disturbed by development.

Soil types

Soils associated overlying these strata primarily consist of various loams and silts. Those in low-lying areas often display sandy textures. A rock-laden band, the Wake-Waterlee complex, circles the base of the hills between Atlantic Avenue and I-440, north of Crabtree Creek.

USDA Natural Resource Conservation Service ratings note the physical limitations of native soils for

various construction purposes. Favorable soils for pad-built one- to three- story commercial structures are very limited within the area, located mainly in the northeast portion between the railroad and Capital Boulevard, the "Edgeton diamond" where the tracks cross near Atlantic Avenue, and atop hills near I-440.

Most of these same locations are identified as prime areas for dwellings with below-grade floors. Conversely, soils in and near stream courses, while often of very moderate slope, is noted as being of limited value for construction. FEMA mapping corroborates this assessment, identifying most soils bordering study area streams as flood prone.

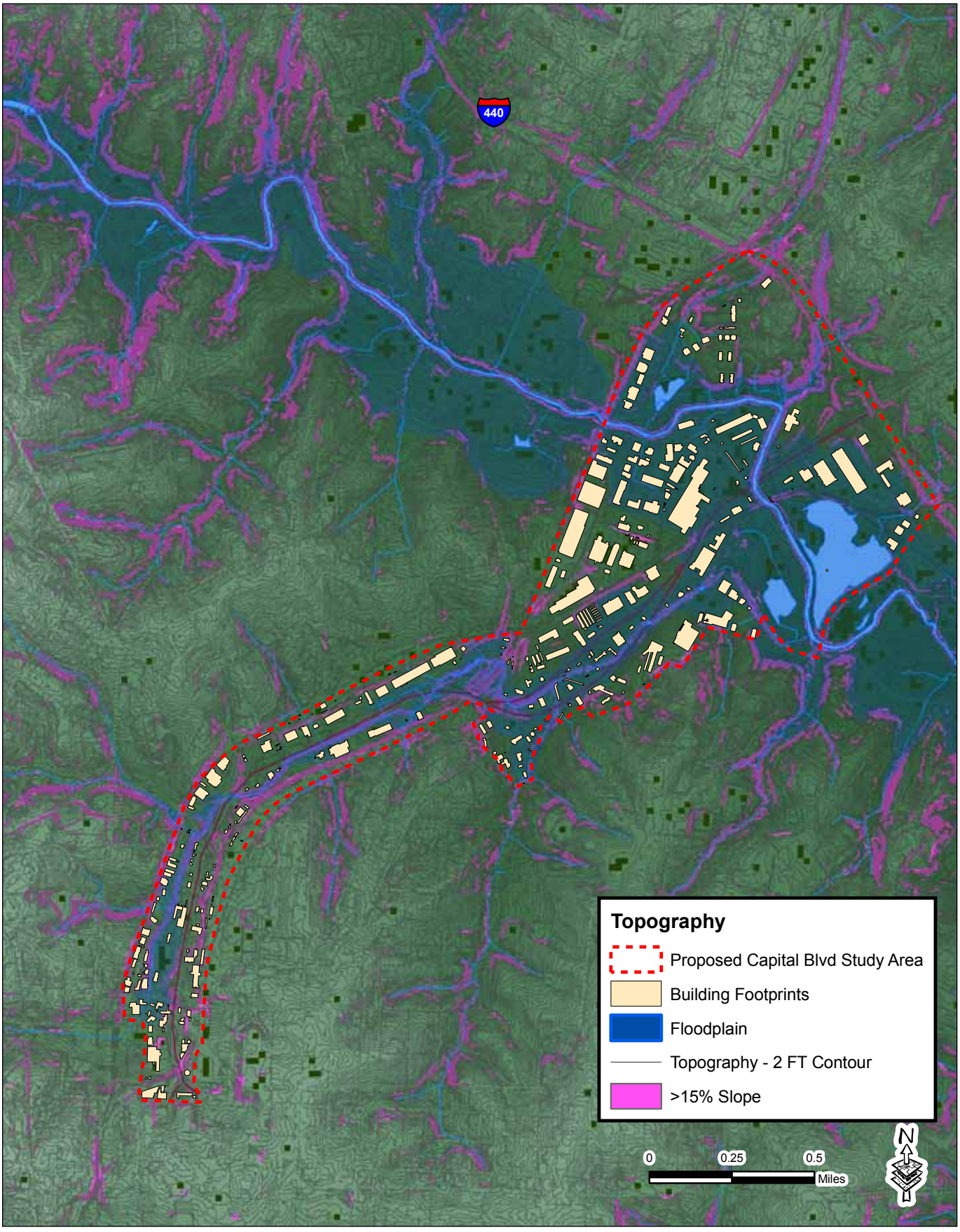
Steep Slopes

Slopes of 15 percent or greater are found in many parts of the study area, most often associated with stream banks, rock outcrops, and construction. Natural steep slopes line much of the banks of Pigeon House Branch and Crabtree Creek, as well as some hillsides in the northernmost section of the area, just south of where I-440 crosses Atlantic Avenue. Steep manmade contours are most often associated with transportation along the railroad tracks framing and then crossing the study area, and segments of Capital Boulevard, particularly at the Peace Street interchange, Fairview Road flyover, Wake Forest Road interchanges, and along I-440. Steep slopes are sometimes found where grading for the construction of large-footprint buildings has taken place, mainly between Atlantic Avenue and the Norfolk & Southern tracks. (See Figure 4.2: Topography and Steep Slopes.)

4.8 CONCLUSIONS

Environmental and ecological concerns were not significant considerations at the time Capital Boulevard was designed and built, or when most of the development along the corridor was constructed. The resulting legacy is a badly degraded environment that continues to put private property at risk from flooding, yet one that still manages to support some tenacious wildlife and some mature trees. Repairing and restoring natural functions within the study area can provide multiple benefits and create a different dynamic for new development.

- Since much of Pigeon House Branch and portions of Cemetery Branch are considered degraded, there may be opportunities for improvements and even relocations provided the final outcome results in an environmentally superior product.
- The cost of constructing large stormwater controls in the form of ponds and wetlands to attenuate flooding in Pigeon House Branch far exceeds the resulting benefits. Also, current environmental regulations would preclude the construction of such controls. Consequently, reducing flood impacts will likely have to take the form of reducing stormwater discharges throughout the watershed and relocating property out of harm's way. The implementation of numerous smaller stormwater controls, while time consuming and expensive, will provide the added benefit of water quality improvements which are a high priority in this water quality impaired watershed.


440
Topography
Proposed Capital Blvd Study Area
Building Footprints
Floodplain
Topography - 2 FT Contour
>15% Slope
0
0.25
0.5
Miles
N

- Determining whether there is contamination, and determining the type and extent of contamination would provide valuable insight into what measures would need to take place to mitigate the properties and make them viable for an increased variety of land uses
- The surprising amount of public land within the study area provides the opportunity create a more sustainable urban landscape, one that supports large maturing trees that can thrive for 30 years are more. Plans to redesign the roadway alignment should take the needs to tree health and growth into account. Improving the ecological viability and diversity of the study area will be an important test of the City's long term sustainability.
- In considering the future of the corridor study area, it will be important to define and pursue opportunities for improving ecological viability and natural diversity. As noted in the 2030 Comprehensive Plan, throughout Raleigh "there is a need for greater sensitivity for wildlife and natural habitat protection." Both are ready indicators not only of environmental health, but also the City's long-term sustainability.
- Seeking a more viable balance between urban uses and the natural environment represents one of the chief challenges of corridor redevelopment. Conversion of impervious areas to water-permeable surfaces, especially in areas within FEMA-designated floodplains, offers one of the best hopes for achieving that balance. Development standards which would reduce surface parking requirements and limit building footprint areas could be part of the solution. Other opportunities lie in the use of green roofs on buildings, increases in tree cover, and adoption of low impact design standards for redevelopment. Under present zoning code standards, current impervious percentages could remain grandfathered with redevelopment, and may require special legislative action.
- Water quality is a significant issue, as the Pigeon House Branch is the city's most degraded stream. The City is in the process of repairing much of the watershed, particularly the western portion of Pigeon House Branch. Opportunities exist to enhance buffers and revisit landscape classification in order to protect and rebuild the waterways.

Mighty gneiss outcrop

CAPITAL BOULEVARD CORRIDOR STUDY

5 Utility Infrastructure

5.1 STORMWATER INFRASTRUCTURE

Pipes and Culverts

Prior to its development, stormwater runoff was conveyed through the study area via a natural stream system. As recently as the 1920s, most of the study area's drainage system still consisted of open stream channels. However, as the area urbanized, portions of the streams were buried in culverts to accommodate road crossings or land development. At that time, water was considered a "common enemy" and most efforts were focused on efficiently collecting and conveying the stormwater away from developed lands and roadways. As a result of this mindset, many of these natural streams have been "culverted" underground or converted to urban stormwater conveyance channels with vertical concrete or masonry walls and bottoms. Unfortunately, there were no regulations in place until the 1980s to protect streams from such alteration. The current drainage system consists of roadway curbs and gutters that convey runoff to street catch basins (curb inlets); yard inlets that capture water from yards, parking lots, and other areas outside of roadways; and pipes and other types of underground culverts which convey the water to the nearest stream channel, and the streams themselves. (See Figures 5.1: Utility Infrastructure and 5.2: Hydrology and Stormwater Infrastructure)

Crabtree Creek

It may come as a surprise to the average reader but most of the drainage system falls on private property

and is privately-owned and maintained, even the streams themselves. The City owns and maintains only those portions that fall on City owned property including street rights-of-way. Portions falling within NC Department of Transportation rights-of-way, such as Capital Boulevard, are maintained by the State. Most of the drainage system in the study area is in fair to good condition but there are, and will always be, portions of the system in need of repair or upgrade.

Stormwater controls on private property

Over time, it was recognized that stormwater runoff posed both a flooding and water quality concern. Consequently, Federal, State, and local authorities established regulations that required some level of control of the runoff from new development. In most cases, stormwater controls are designed and installed by the developer on private property to capture the runoff, hold it for a period of time, and either release it at a slow rate or allow it to infiltrate into the ground or evaporate into the air. This reduces downstream flooding and provides for the removal of some of the pollutants picked up by the stormwater as it washes over the land. Unfortunately, most of the study area was fully developed prior to the institution of these stormwater requirements and so there are very few stormwater controls in place at this time.

Proposed stormwater controls

In order to mitigate the lack of stormwater controls, Raleigh has conducted detailed studies of the drainage system and contributing watershed to identify existing flooding, erosion, and water quality problems and to determine the best locations for stormwater control retrofits to mitigate these problems. Locating attractive sites for these retrofits has proven challenging for two major reasons. First, the majority of the watershed is “built out” and there is limited remaining undeveloped land for placement of stormwater controls. Second, most of the remaining open space is located on or adjacent to streams protected by Federal and State regulations that make it nearly impossible to construct stormwater controls.

Prior to the institution of regulations, Raleigh had proposed and evaluated the possibility of constructing a large regional stormwater control pond on Pigeon House Branch in the vicinity of what was then the Raleigh Bonded Warehouse. The proposed pond would capture and detain stormwater runoff thereby reducing downstream flooding and also improve water quality by settling out sediment and other pollutants. However, current Federal and State stream protections would prohibit the construction of this proposed regional stormwater control.

As an alternative to constructing large-scale stormwater controls in the streams themselves, Raleigh has recently initiated smaller scale projects focused on constructing stormwater controls on upland areas that drain to the streams. The purpose of these retrofit projects is to reduce stream bank erosion, reduce downstream flooding, and improve downstream water quality. To date, most of these efforts have taken place on City-owned property but it is anticipated that retrofit projects will eventually include private property as well.

Recent projects

The City has recently conducted numerous stormwater system improvements and repairs in the study area. Many of these projects involved routine upgrades to undersized portions of the drainage system or repairs to failing portions of the system.

Additionally, Raleigh has completed, or is nearing completion, a number of projects designed to address water-quality concerns associated with Pigeon House Branch and Cemetery Branch. One water quality-related project, not directly associated with the stormwater system itself but deserving mention here due to its potential to provide significant water quality benefits, involves the replacement and upgrade of substantial portions of the sanitary sewer mains in the study area. These aged sewer mains are subject to leaking and likely are a significant contributor to the bacterial (fecal coliform) contamination in Pigeon House Branch. The NC Division of Water Quality has determined that the levels fecal coliform in the stream exceed State standards and have resulted in the State imposing a Total Maximum Daily Load (TMDL) on this stream. This means that the stream does not currently meet state water quality standard for this pollutant and that steps must be taken to reduce the daily load of fecal coliform discharged to this stream to bring the water quality into compliance. The State also has imposed a TMDL on Pigeon House Branch for copper since regular sampling has indicated water quality standard violations for this pollutant as well. Other recently completed water quality retrofit projects include: the installation of “packaged wetlands” at the City Sanitation Department parking lot off Peace Street; bioretention (rain garden) installations at both the City Vehicle Fleet Services facility and Street Maintenance equipment yard of West Street, the construction of a water garden (constructed wetland) at Fred Fletcher Park off Glenwood Ave., and stream stabilization and enhancement projects at Smallwood and Edna Metz Wells Parks just below Cameron Village Shopping Center.

Planned and proposed stormwater controls

Currently, the City has two additional water quality projects planned for the study area. One involves a stream stabilization and enhancement project in the vicinity of Cowper Drive. It is anticipated that this project will be completed in 2011. The second project is a joint effort between the City and NCDOT and involved the stabilizing and enhancing a section of Pigeon House Branch in the vicinity of the Wade Avenue and Capital Boulevard interchange. It is anticipated that this project also will include the construction of bioretention areas to capture and filter stormwater runoff from Wade Avenue and the adjacent development.

Potential projects

There are two other potential stormwater control projects that warrant discussion. The first involves the possibility of the purchase and removal of repetitively flooded structures located in the floodplain. Such a program is supported by the Federal Flood Insurance Program (FEMA) and could provide multiple benefits including reducing the public cost of repairing flood damaged structures, creating open space for establishment of parkland and possibly greenway trails, increasing the flood carrying capacity of the

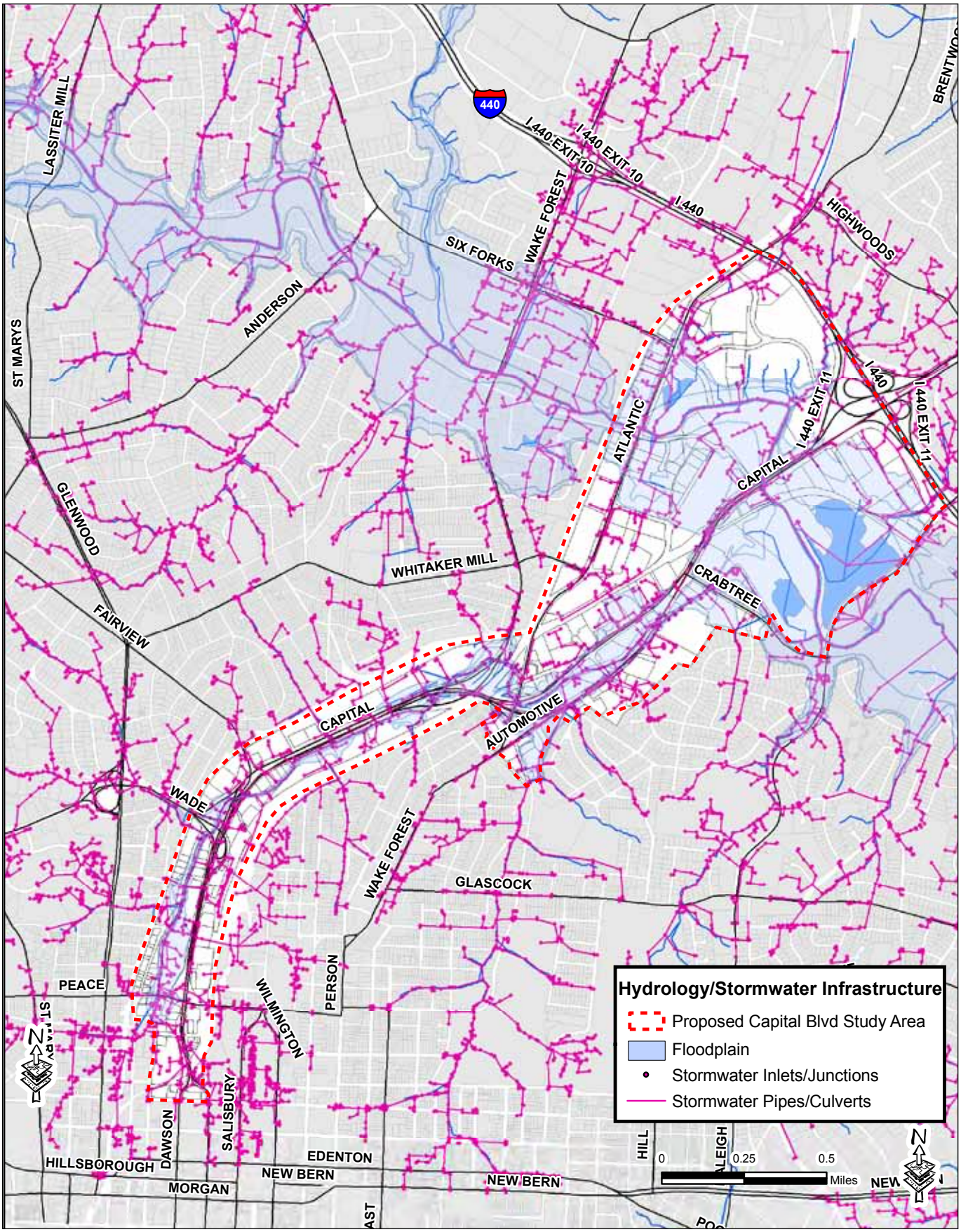
floodplain, and providing the opportunity for re-establishing riparian buffer areas and other potential water quality improvements adjacent to the streams. A second potential opportunity involves large scale improvements to degraded segments of Pigeon House Branch and Cemetery Branch. While most modifications to streams under Federal and State jurisdiction are prohibited, there is an opportunity to modify and even relocate portions of these two streams provided the existing stream segments are considered degraded by regulatory authorities and further provided that any alterations would result in ecological improvement to the stream and adjacent riparian buffers. Such modifications might be integrated into proposed realignments of roadway corridors or other proposed improvements within the study area.

5.2 WATER AND WASTEWATER INFRASTRUCTURE

Extensive potable water and sanitary sewer infrastructure exists within the Capital Boulevard Corridor study area. The infrastructure locations are shown on Figure 5.1: Utility Infrastructure. The water and sewer infrastructure within the study corridor is summarized below:

- At the northern end of the corridor, the parallel Crabtree Sewer Interceptors cross Capital Boulevard are perpendicular at Crabtree Creek. There are two 30-inch sewer mains on the south side of Crabtree Creek (South Bank Interceptors) and one 36-inch sewer main on the north side of the Creek (North Bank Interceptor).
- The 24-inch Pigeon House Sewer Interceptor follows Pigeon House Creek and meanders with the creek from Peace Street to Crabtree Boulevard where it connects to the Crabtree Creek Interceptors.
- The 18-inch Cemetery Branch Sewer Interceptor connects to the Pigeon House Sewer Interceptor from the south east near the confluence of Pigeon House Creek and Cemetery Branch
- Throughout the corridor, 8 - to 15-inch sewer collection lines extend out from the interceptors: some perpendicular and some parallel to Capital Boulevard to provide service to the neighborhoods east and west of Capital Boulevard.
- A 12-inch water main extends along Capital Boulevard from McDowell Street to Atlantic Avenue generally along the west side.
- A 16-inch water main extends along the east side, while an 8 inche water line runs along west side between Atlantic Ave and Crabtree Blvd (the divided section).
- A 16-inch water main runs along the north side of Capital Boulevard from Crabtree Boulevard to the end of the study area.
- A 12-inch water main runs along the south side of Capital Boulevard from I-440 to the end of the study area.
- 6-, 8-, and 12-inch water distribution mains extend out perpendicular from the from the 12-inch and 16-inch mains all along the corridor.


Utility Infrastructure
Proposed Capital Blvd Study Area
Sewer Manhole
Fire Hydrant
Water Manhole
Sewer Main
Water Main
0
0.25
0.5
Miles
N
1
2
3
4
CAPITAL
WHITAKER MILL
FAIRVIEW
GLENWOOD
ANDERSON
SIX FORKS
WAKE FOREST
I 440 EXIT 10
I 440
HIGHWOODS
ATLANTIC
I 440 EXIT 11
CRABTREE
AUTOMOTIVE
WADE
GLASCOCK
PEACE
WILMINGTON
PERSON
SALISBURY
DAWSON
HILLSBOROUGH
MORGAN
EDENTON
NEW BERN
EAST
HILL
POOLE


440
I 440 EXIT 10
I 440 EXIT 10
I 440
LASSITER MILL
WAKE FOREST
HIGHWOODS
SIX FORKS
ANDERSON
ST MARYS
ATLANTIC
I 440
I 440 EXIT 11
I 440 EXIT 11
CAPITAL
GLENWOOD
WHITAKER MILL
CRABTREE
FAIRVIEW
CAPITAL
AUTOMOTIVE
WADE
WAKE FOREST
GLASCOCK
PEACE
WILMINGTON
PERSON
SALISBURY
DAWSON
HILLSBOROUGH
MORGAN
EDENTON
NEW BERN
NEW BERN
Hydrology/Stormwater Infrastructure
Proposed Capital Blvd Study Area
Floodplain
Stormwater Inlets/Junctions
Stormwater Pipes/Culverts
0
0.25
0.5
Miles

Infrastructure age and condition

The water and sewer infrastructure within the corridor varies in age and condition. The 24-inch Pigeon House Branch sewer interceptor between Fenton Street and Crabtree Creek is new, having been replaced within the last five years. The 18-inch Cemetery Branch interceptor within the corridor also is new since it was installed in 2010. The remainder of the sewer collection pipes and water mains range in age from 25- to 100-years old.

Replacement of the 24-inch Pigeon House Branch interceptor that meanders along the corridor from Fenton Street to Peace Street currently is under design and is scheduled to be funded for construction in phases over a three-year period in Fiscal Years 2013 – 2015.

Planned and proposed projects

The 36-inch North Bank Crabtree interceptor currently is under design for rehabilitation with a cured in place liner with construction scheduled to begin in Fiscal Year 2012. The 30-inch South Bank Interceptor parallel/replacement currently is under design and is scheduled for construction beginning in Fiscal Year 2012, and will extend over a two-year period. Construction disturbance for this project is expected to be considerable within the corridor area.

The water mains along the north side of Capital Boulevard appear to be experiencing corrosion issues from corrosive soils in the vicinity from Fenton Street to Crabtree Creek. Replacement of these mains and services should be scheduled in conjunction with the proposed Capital Boulevard improvements. Replacement of the 24-inch Pigeon House Branch Interceptor that meanders along the corridor from Fenton Street to Fairview Avenue is under design and is scheduled to be funded for construction in phases over a three-year period in Fiscal Years 2013 – 2015. Some portions of the interceptor are located “down the middle” of Capital Boulevard, but the plan is to relocate the interceptor to the service road west of Capital Boulevard (the service road in front of the warehouses). Side sewers that serve areas east of Capital Boulevard (e.g. Mordecai, Seaboard Station, etc.) will remain and pass perpendicularly under Capital Boulevard.

Pigeon House Branch Interceptor replacement south of Fairview Road to Peace Street is expected, but is not planned or funded at this time. An engineering feasibility study to determine the cost and possible location of a relocated sewer from Fairview Avenue to Peace Street however, will be completed in 2011.

Additional planned work includes cured in place lining of existing sewers tributary to the Pigeon House Branch Interceptor. Generally, the proposed lining work involves the 8- to 15-inch side sewers from areas east and west of Capital Boulevard. Some of this sewer rehabilitation work, specifically between Fenton Street and Fairview Avenue, is funded and included in Fiscal Years 2013 – 2015. The feasibility of cured in place lining of side sewers south of Fairview Avenue to Peace Street will be included in the engineering study to be completed in 2011.

5.3 CONCLUSIONS

While significant progress has been made in improving the stormwater system and water quality in the study area, significant work remains. Many of the future improvements will need to occur on private property where little in the way of stormwater management is installed, and likely will only occur as part of the redevelopment of these properties. Two large-scale public opportunities include the acquisition and clearance of flood-prone properties within the study area, and larger scale modification of the stream corridors to provide ecological improvements.

Ongoing public utility projects within the corridor need to be coordinated with the overall program of improvements. Utility replacement is typically disruptive. To the extent that it can be combined with other needed roadway and capital projects, the cumulative impact of that disruption can be minimized.
Coordination with any planned widening of Capital Boulevard also requires coordination. Areas where proposed landscape improvements are suggested on the sides of Capital Boulevard would also require coordination with sewer easements such that the easements remain clear for maintenance access.

Wetlands

CAPITAL BOULEVARD CORRIDOR STUDY

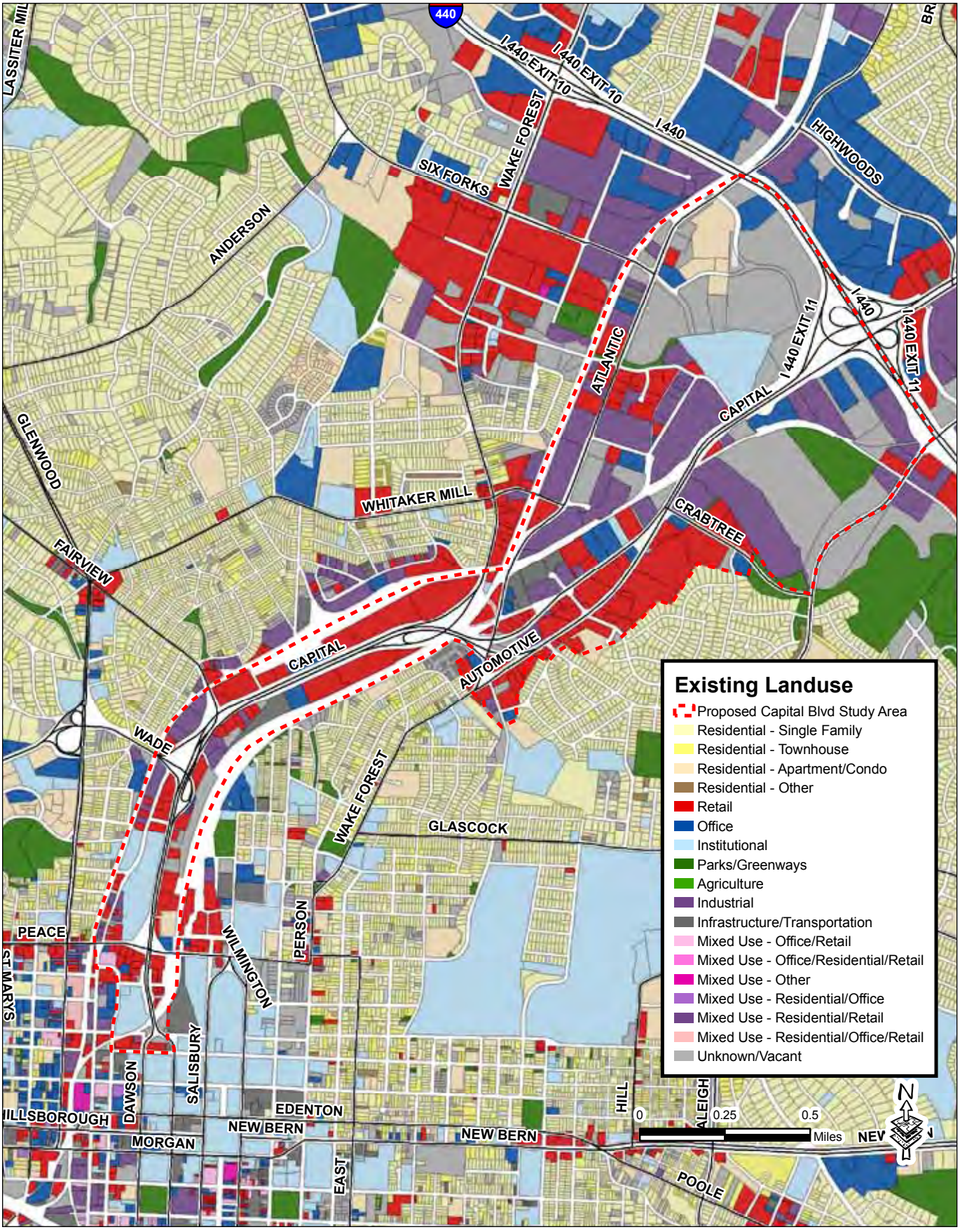
6 Land Use

6.1 EXISTING LAND USES

The conditions most influential to the existing land uses within the study area are the two railroads bordering each side of the corridor, the prevalence of Industrial-2 zoning, and the roadway design used to access downtown Raleigh (see Figure 6.1—Existing Land Use). The earliest uses were oriented to the railroads to utilize the transportation opportunity for shipment of both raw materials and intermediate and finished goods. The Cotton Mill and Raleigh Bonded Warehouse are good examples of these early land uses. During the 1950s zoning of the corridor to Industrial-2 and construction of Downtown Boulevard led to the dominating land uses of warehouse distribution and auto-oriented retail development. For more information: www.raleighnc.gov *search for 'zoning handbook*.'

This early industrial/commercial mix of uses has more recently included small office uses scattered along the corridor north of the Atlantic Avenue crossing. A concentration of medium-to high-density residential uses has developed over the last decade in the vicinity of Atlantic Avenue and the Six Forks Road extension. There are plans to develop the remaining vacant land in this immediate area for high density housing. The residential density being established on the east side of Atlantic Avenue will help to support a local/regional rail transit station that is proposed within quarter-mile on the west side of Atlantic Avenue. The remaining percentage of

Crabtree Creek


Existing Landuse
Proposed Capital Blvd Study Area
Residential - Single Family
Residential - Townhouse
Residential - Apartment/Condo
Residential - Other
Retail
Office
Institutional
Parks/Greenways
Agriculture
Industrial
Infrastructure/Transportation
Mixed Use - Office/Retail
Mixed Use - Office/Residential/Retail
Mixed Use - Other
Mixed Use - Residential/Office
Mixed Use - Residential/Retail
Mixed Use - Residential/Office/Retail
Unknown/Vacant
0
0.25
0.5
Miles
N
440
I 440 EXIT 10
I 440
I 440 EXIT 11
SIX FORKS
WAKE FOREST
HIGHWOODS
ANDERSON
ATLANTIC
CAPITAL
GLENWOOD
WHITAKER MILL
CRABTREE
FAIRVIEW
AUTOMOTIVE
WADE
GLASCOCK
PEACE
PERSON
WILMINGTON
SALISBURY
DAWSON
MORGAN
EDENTON
NEW BERN
EAST
HILL
POOLE

vacant land located primarily along Crabtree Creek will most likely remain vacant due to the extensive floodplain in the area.

6.2 EXISTING ZONING

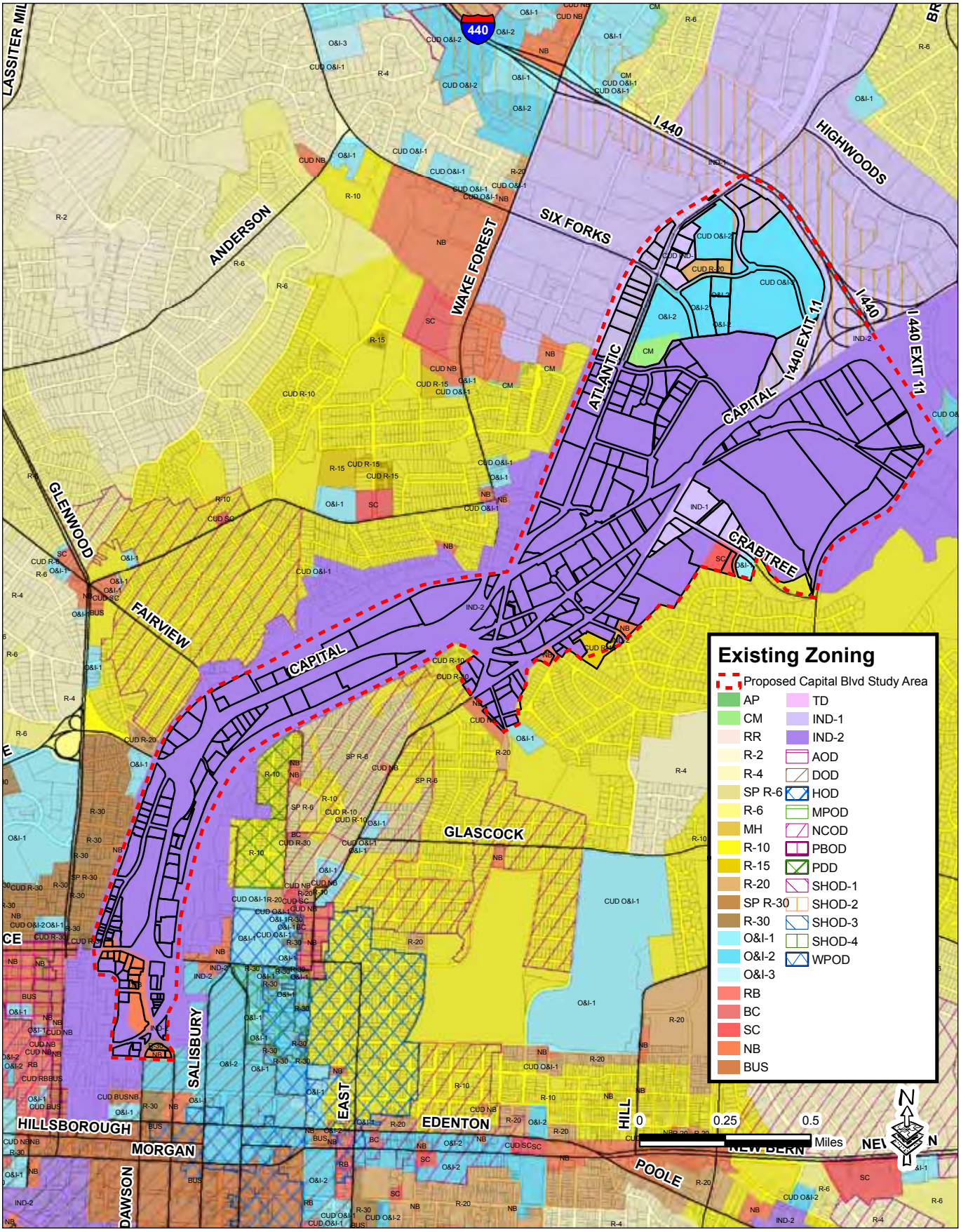
The study area's zoning is dominated by the Industrial-2 zoning districts throughout (Figure 6.2—Existing Zoning). The northern portion of the study area also contains a significant amount of Office and Institutional-2 zoning. There is also a significant amount of Industrial-1 zoning scattered in the northern reaches of the study area. There is a pocket of land in the study area that contains Neighborhood Business zoning. Other small pockets of Neighborhood Business, Shopping Center, and Conservation Management are scattered throughout the study area. Lastly, a few sites in the study area have high-density residential zoning districts (R-20 and R-30) and round out the remainder of the existing zoning districts.

The majority of properties just outside of the study area to the north contain Industrial (1 and 2) zoning whereas the mid-section of the study area borders Residential-6 and Residential-10 zoning districts to the east and west. The southern portion of the study area borders Industrial-2 zoning and shares a border with Residential-30 zoning to the west.

Currently, the Industrial zoning districts generally allow for manufacturing, wholesaling, warehousing, transportation terminals, and other industrial uses as well as retail sales and offices and hotel/motel uses. The Industrial zoning districts prohibit residential uses unless part of the Downtown Overlay District or a Pedestrian Business Overlay District, neither of which currently exist within the study area except for a small portion in the southern end near Seaboard Station. The City's new Unified Development Ordinance, which is still being crafted as of the release of this document, may modify both the zoning map in the study area as well as the uses permitted in specific districts.

6.3 AGE OF BUILDINGS

Buildings in the study area span a 120-year period. The Cotton Mill, a textile mill built around 1890, is the area's oldest building and now contains residential condominiums. Only a few tracts contain industrial or warehouse buildings built between 1900 and 1949; one example is the Raleigh Bonded Warehouses. The majority of buildings in the study area date from the twenty-year span from 1950 to 1969. Buildings that date from the 70s, 80s and 90s round out the remaining mix in relatively equal proportions. Very few buildings have been built in the study area since 2000 with the exception of the northernmost reaches which have seen significant building activity in the area of medium- and higher-density housing. The majority of buildings are single story though there are a few two- and three-story buildings scattered throughout the study area.


Existing Zoning
Proposed Capital Blvd Study Area
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R-4
SP R-6
R-6
MH
R-10
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R-20
SP R-30
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O&I-2
O&I-3
RB
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SC
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BUS
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EAST
HILLSBOROUGH
MORGAN
EDENTON
POOLE
HILL
DAWSON
NEW BERN

6.4 RECENT DEVELOPMENT (SINCE 2000)

This region of the city was a heavy industrial corridor from 1900 – 1970. Consequently, the majority of the properties in this region have been developed for industrial buildings, many oriented around the railroad and served by rail spurs. Turnover has provided the opportunity for businesses to occupy existing, abandoned buildings as a change of use. A good example of this was an old Cotton Mill built in 1890, flanked by Capital Boulevard on the west and a rail line on the east, which was converted into residential condominiums. Although located in an industrial zone, the Cotton Mill falls within the Downtown Overlay District that permits housing. (see Figure 6.3—Recent Development Since 2000)

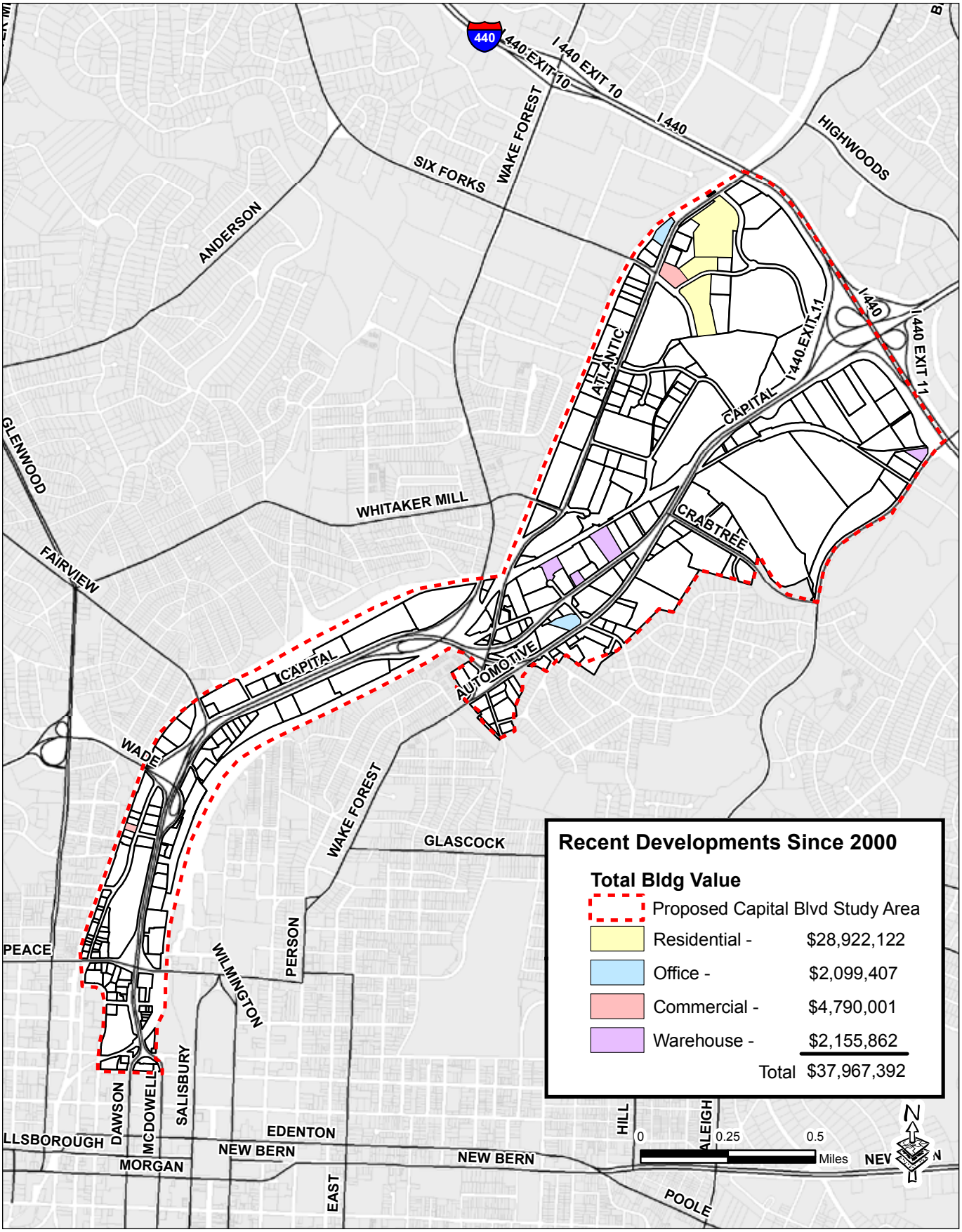
Traveling north along this corridor, about 25 acres between Atlantic Avenue and Capital Boulevard were rezoned in 2006 to a Planned Development District in order to develop into what is today Windsor Manor, a mixed use development. This development contains a 350,000 square foot, four-story vertical mixed use building consisting of 339,000 square feet for 298 residential units, 11,000 square feet for office/retail and a five-story structured parking deck within the center core of the building.

6.5 FUTURE LAND USES

The Future Land Use map (see Figure 6.4—Future Land Use) and associated policies recognize the existing land uses within the corridor while providing a vision for their evolution over the next 20 years. The Future Land Use policies extend the Central Business District up the Capital Boulevard corridor to the Wade Avenue interchange to support the redevelopment of underutilized sites with a mix of high-intensity office, retail, housing, government, and institutional uses. The maximum residential density is 320 units per acre, with densities tapering off towards the edges of established single family neighborhoods, but not falling below 40 units per acre. This mixed-use policy continues to extend up the corridor, though at a reduced intensity, with the designation of the Regional Retail Mixed Use land use category from Wade Avenue to Wake Forest Road. The intent of this category is to identify major retail and service hubs that draw customers from across the city. This area may include high-density housing, office development, hotel, and region-serving retail uses.

The Community Retail Mixed Use category covers the corridor area from Wake Forest Road to Crabtree Creek with the exception of a Business & Commercial Services category north of Wicker Drive between Atlantic Avenue and Capital Boulevard. The Community Retail category includes medium-sized shopping centers with uses that draw from multiple nearby neighborhoods. Development intensities could include mid-rise as well as low-rise buildings and residential densities generally between 14- to 28-units per acre. A higher residential density of up to 70 units per acre would be appropriate around proposed transit stations of which a local/regional rail transit stop is proposed at Whitaker Mill Road.

A Neighborhood Retail Mixed Use designation is shown west of the CSX railroad and transit stop to Wake Forest Road to support a pedestrian-oriented retail district to serve the existing neighborhoods to the west. Two additional Neighborhood Retail Mixed Use designations are included within the study area: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POOLE
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Recent Developments Since 2000
Total Bldg Value
Proposed Capital Blvd Study Area
Residential - $28,922,122
Office - $2,099,407
Commercial - $4,790,001
Warehouse - $2,155,862
Total $37,967,392
0
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(1) at the Wake Forest/Atlantic/Automotive Drive intersection just north of the Mordecai neighborhood; and (2) at the proposed local/regional rail transit stop located in the vicinity of Atlantic Avenue and Six Forks Road. All three of these neighborhood scaled land-use designations reflect existing development, but encourage a greater mix of uses with a stronger pedestrian orientation.

To support the Atlantic/Six Forks rail transit stop, a High-Density Residential land use category is designated from Six Forks Road to I-440 between Atlantic Avenue and Capital Boulevard. This designation includes apartment and condominium buildings generally four stories or more with a density of 28 units per acre or more. Crabtree Creek and its associated floodplain, designated Public Parks and Open Space, is located to the south of this residential area and provides a strong buffer between the residential and higher impact heavy commercial uses to the south of Hodges Street. The Public Parks and Open Space category extends through the entire northern section of the study area along Crabtree Creek. A General Industrial land use category is designated north of the Crabtree floodplain along Yonkers Road with access to I-440 and the Norfolk Southern railroad to serve the freight delivery and shipping needs of these industrial uses.

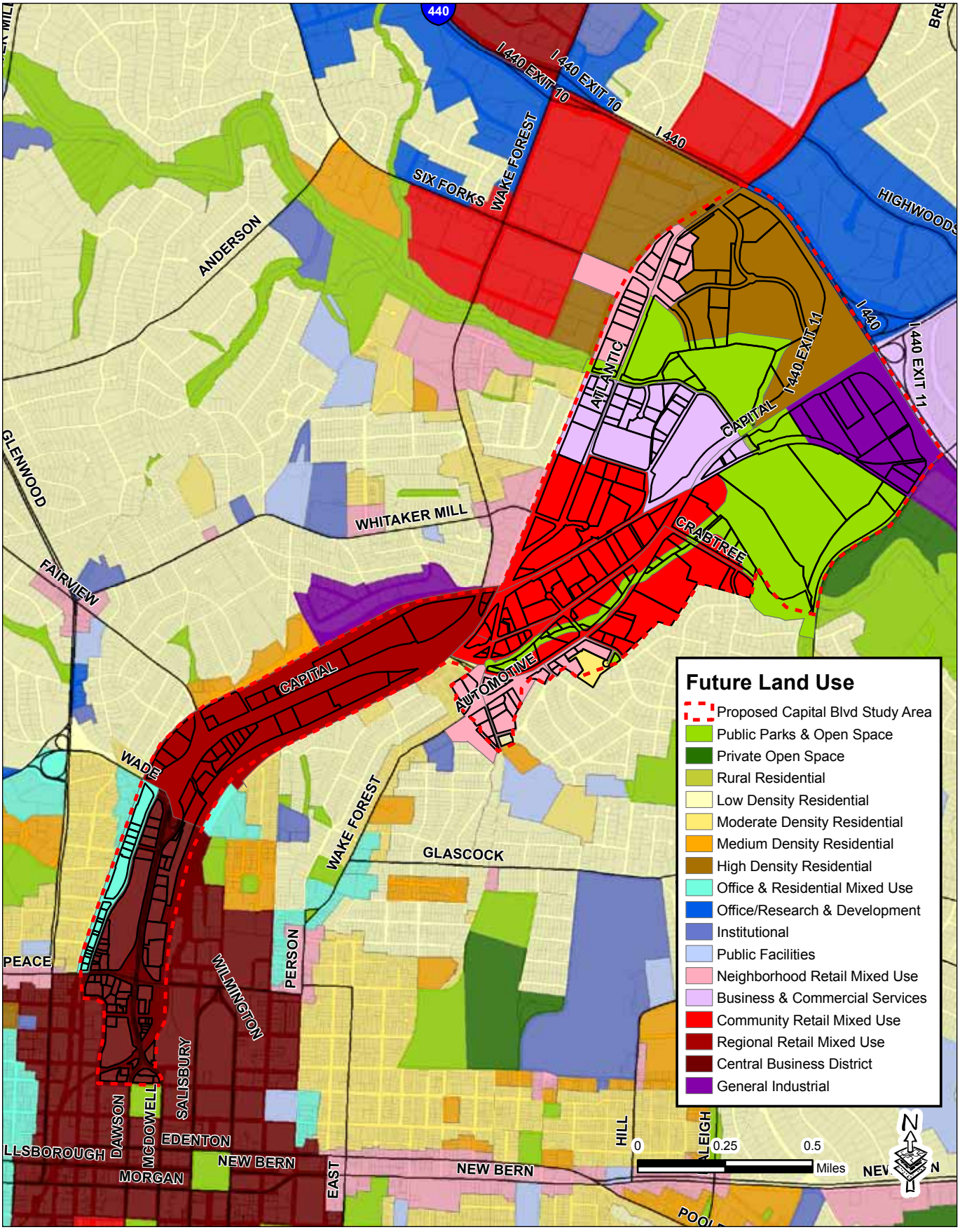
6.6 PROPERTY CONDITIONS

The majority of properties within the study area were developed between 1950 and 1979. Due to changes in property values and in commercial market needs since that time, many of these properties are underutilized or obsolete as indicated by a Soft Site analysis described in the Market Conditions chapter. Maintenance has fallen behind on those properties that may have been most challenging to rent. The recent economic challenges have also impacted the leasing rates for properties that were formerly occupied by small businesses. Redevelopment opportunities are clearly a possibility along the Capital Boulevard corridor with the proper vision and economic stimulus for which this study intends to explore.

Generally, the properties in the northern half of the study area tend to be larger in size and more recently developed with buildings that are more flexible in accommodating a variety of uses and in better condition. This includes a cluster of flex-space buildings on the west side of Capital Boulevard between Atlantic Avenue and Crabtree Boulevard. Property conditions are excellent in the most recent development area on the east side of Atlantic Avenue between Six Forks Road and I-440. This area includes medium-high density residential, office, and small stand-alone retail uses.

6.7 CONCLUSIONS

The land use pattern within the study area was largely set by two waves of post-war development. The first was dominated by industrial and distribution uses, and occurred from 1950 – 1979, spurred by the combination of roadway and rail access. The second, which also occurred in the 50s and 60s, was a wave of highway commercial uses such as fast food, motels, and auto dealers, the remnants of which are still visible in the corridor north of Atlantic Avenue. Subsequent development filled in smaller and oddly-shaped parcels with small car lots, car repair, and gasoline service stations.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Future Land Use
Proposed Capital Blvd Study Area
Public Parks & Open Space
Private Open Space
Rural Residential
Low Density Residential
Moderate Density Residential
Medium Density Residential
High Density Residential
Office & Residential Mixed Use
Office/Research & Development
Institutional
Public Facilities
Neighborhood Retail Mixed Use
Business & Commercial Services
Community Retail Mixed Use
Regional Retail Mixed Use
Central Business District
General Industrial

CAPITAL BOULEVARD CORRIDOR STUDY

7 Economic Conditions

Capital Boulevard is a secondary arterial roadway carrying traffic volumes ranging from 37,000 to 60,000 vehicles per day, depending upon the segment. Such volumes are usually sufficient to attract a broad range of uses from retailers to multi-family complexes, which benefit from the access and visibility. However, this is not the case within the study area, where the real estate generally is considered under-performing. Although Capital Boulevard was once at the leading edge of the post-war wave of auto-oriented commerce, it was unable to sustain this market-leading position and now suffers from a generally negative public image and lack of investment. This chapter looks at the study area from the standpoint of its economic potential, considering both the existing economic conditions and some discussion as to what uses the surrounding demographics may be able to support.

New residential development on Six Forks near Atlantic

7.1 ECONOMIC GENERATORS

The entirety of Capital Boulevard from Downtown to I-440 is lined with commercial and industrial use, ranging from small businesses to larger concerns. This section describes the characteristics of the major categories of non-residential land use—commercial, industrial, and retail—and highlights the larger establishments within each category.

Commercial land uses

The corridor study area contains almost no traditional office uses save for government offices. State Government is the largest single office tenant in the area,

with various buildings housing facilities for the Department of Corrections, the Lottery, the Department of Energy, Department of Cultural Resources, and Disaster Management.

Auto sales and service are found throughout the study area. The largest such use is Bobby Murray Chevrolet, a full service dealership offering sales and service of both new and used cars. Bobby Murray is located in the northern third of the study area near Fenton Street. There are numerous small used car lots up and down the boulevard, mostly occupying small and/or irregularly-shaped parcels of land, as well as a large dealership near I-440 on. In sum, there are 19 car lots of various sizes and shapes within the study area.

The study area also is home to a number of auto service and repair businesses, providing tires, general mechanical repair, and auto body work and painting. Many of these uses have been in the area for a long time.

The study area contains two lodging establishments—the Milner Inn and the Capital Inn. Both were originally constructed in middle of the century as modern auto court motels benefiting from a location on a major highway just north of Downtown. While once desirable places to stay, both have reached a state where they are no longer appealing to the family or business traveler, and instead have become known for a variety of irregular activity. The Milner has attached to it a strip club called the Foxy Lady, in business for about 40 years; and the Capital Inn is home to a nightclub called Club Zanzibar. Both establishments have been the site of frequent law enforcement activity.

Industrial and distribution uses

The northern part of the study area is home to Raleigh's first industrial park, developed by J. Willie York coincident with the design and construction of Capital Boulevard. This industrial park is mostly located in a triangle formed by Atlantic Avenue, Capital Boulevard, and the Crabtree Creek, although industrial uses have spilled out beyond this boundary. The area is still active today, with a wide variety of wholesaling, warehousing, and distribution activity occupying the buildings, as well as some specialty light manufacturing. However, there is a significant amount of vacancy in the industrial property within the study area, and many of the buildings are beginning to show their age.

The majority of the industrial uses can be characterized into three main categories: (1) general wholesaling and distribution; (2) wholesaling specifically to the construction trades; and (3) specialty manufacturing and fabrication including electronics. Other industries within the study area include waste transfer and concrete batching.

One of the largest distribution uses in the area is located at the corner of Capital Boulevard and Hodges Street. This vast warehouse of a half-million square feet was built for Colonial Distribution, a modern food distribution facility complete with a dedicated railroad siding. The property was acquired in 1979

by Harris Teeter for distribution use, and was sold again in 1996. It currently is occupied by Mutual Distributing Co., a wholesale distributer of wine and beer. Like many of the industrial buildings in the area, its rail siding is no longer used and has become overgrown.

There are a large number of businesses that wholesale to the construction trades. Among the items sold in the study area include tiling and flooring, HVAC ductwork and equipment, and general building supplies. These businesses are generally located off of Hodges Street and along Yonkers Road.

Two examples illustrate the broad spectrum of manufacturing within the study area. At one end is Electroswitch, a manufacturer of specialty electrical switches used in industries from electrical utilities to aviation to military applications. At the other end is the Big Boss Brewery, a producer of craft-brewed beers sold at restaurants and retail outlets throughout the region and beyond.

In summary, while the study area remains a viable location for industry, the overall industrial base has been in decline, as witnessed by the numerous vacancies in the area. While it can be expected that industry will continue to find a home in the study area, it is also likely that some industrial sites and buildings will be increasingly attractive for new uses as development pressures spread to the area. The need to accommodate redevelopment, while preserving viable job-producing industries, will be a major issue in future land use and zoning policy within the study area.

Retail inventory

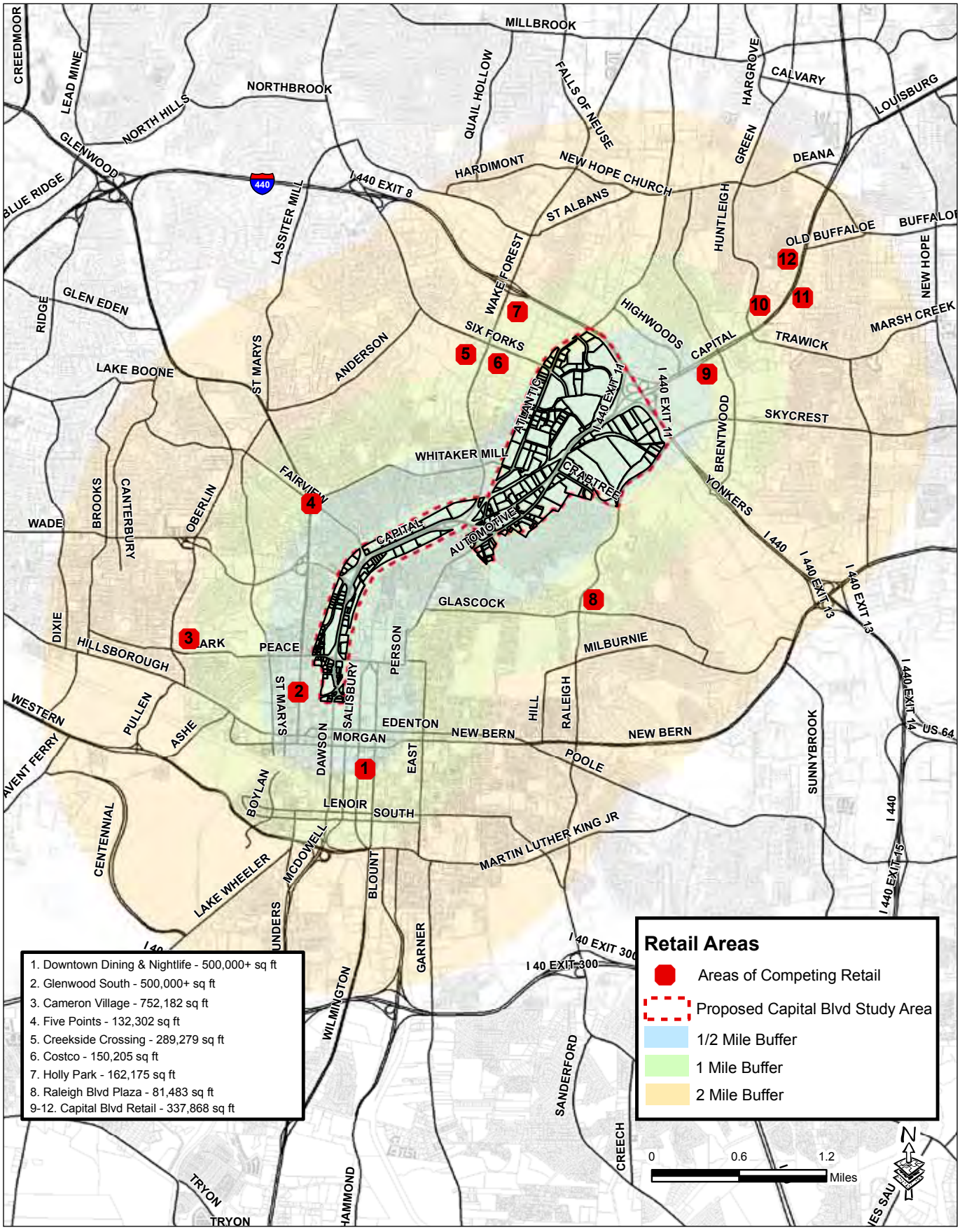
Capital Boulevard has no modern retail developments or coordinated retail areas along its length within the study area. Retail within the study area is characterized by disconnected and disparate uses primarily occupying stand-alone buildings. The presence of a number of pawn shops and adult bookstores indicates a lack of demand for space from more mainstream tenants and a lack of concern from landlords about the overall image of the area. None of the existing retail creates the kind of critical mass that would make Capital Boulevard a destination.

During the heyday of Capital Boulevard, the retail economy was anchored by Gateway Shopping Center located on the east side of Capital Boulevard south of Crabtree Boulevard. The major tenants in this shopping center were an Arlen department store located in the building that is now home to the Raleigh Flea Market Mall, and a Winn-Dixie located in the associated strip mall at the corner of Capital and Crabtree Boulevards, which is now occupied by a large second-hand store. Dining existed in the form of fast food and a Shoney's Big Boy. Limited dining options remain in the study area. An attempt at a Bar-B-Q and live music venue at the corner of Capital and Crabtree did not succeed and has been vacant since 2008.

Competing retail areas

Several significant new or recently rehabilitated shopping centers and commercial areas are located outside of the study area but within close proximity. Nearby retail offerings include full-line and specialty grocers; office supplies; books; dining; and membership discount warehouse shopping. Collectively, they will offer steep competition for any new retailers in the Capital Boulevard area offering similar merchandise. A description of each of the major shopping centers is provided below, and keyed to Figure 7.1: Retail Areas.

1. **Costco** is a membership discount warehouse store offering a wide range of merchandise ranging from furniture, to soft goods such as apparel, groceries, housewares, and appliances. It is located at the southeast corner of Six Forks and Wake Forest Roads.
2. Just north of Costco is the recently refreshed Holly Park shopping center, located at the northeast corner of Six Forks and Wake Forest Roads. Raleigh first **Trader Joe's** is located within this complex. Other major tenants include an **Overton's** boat and marine supply store. The tenant mix in this center is eclectic.
3. **Creekside Crossing** at the southwest corner of Wake Forest and Six Forks Roads is anchored by three large-format retailers—a super-sized **Kroger's** grocery store, **Borders Books**, and **Staples** office supply store. Outparcel tenants include **Discount Tires**, fast casual dining such as **Qdoba**, and a wireless store. Combined with the other two centers described above, there is approximately 600,000 square feet of retail at the corner of Six Forks and Wake Forest Roads.
4. While not a currently shopping destination, **Downtown Raleigh** has emerged as a major dining and nightlife destination. The Downtown Raleigh Alliance estimates that there is about 1.2 million square feet of ground floor space in the downtown including Glenwood South and, while much of that is either vacant or used for non-retail purposes, Downtown clearly has the space to absorb more retail should demand grow.
5. North of the study area is a string of strip malls lining Capital Boulevard. Some of these, such as **Starmount** and **Stony Brook**, have become ethnic shopping areas catering to an Asian clientele. One retains a traditional grocery store anchor (**Food Lion**), along with special retailers such as a **Sam Ash** musical instrument store. Others further up Capital Boulevard have non-traditional anchors and eclectic tenant mixes, such as the **Ashton Square** and **Tarrymore** shopping centers. The centers located south of Old Buffaloe collectively total around 340,000 square feet.
6. The grocery needs of portions of southeast Raleigh are met at the **Raleigh Boulevard Plaza**, a neighborhood center anchored by a **Food Lion** supermarket.
7. Raleigh's first suburban shopping center, **Cameron Village**, is located less than a mile from the southern end of the study area, and offers a healthy mix of convenience goods (Harris Teeter, Rite Aid), comparison goods (fashion, outdoor clothing and equipment), and casual dining. Arrayed on several blocks, Cameron Village totals over 750,000 square feet, placing it in the size range of a regional mall.


1. Downtown Dining & Nightlife - 500,000+ sq ft
2. Glenwood South - 500,000+ sq ft
3. Cameron Village - 752,182 sq ft
4. Five Points - 132,302 sq ft
5. Creekside Crossing - 289,279 sq ft
6. Costco - 150,205 sq ft
7. Holly Park - 162,175 sq ft
8. Raleigh Blvd Plaza - 81,483 sq ft
9-12. Capital Blvd Retail - 337,868 sq ft
Retail Areas
Areas of Competing Retail
Proposed Capital Blvd Study Area
1/2 Mile Buffer
1 Mile Buffer
2 Mile Buffer
0
0.6
1.2
Miles
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MILLBROOK
NORTHBROOK
CREEDMOOR
LEAD MINE
NORTH HILLS
GLENWOOD
BLUE RIDGE
QUAIL HOLLOW
FALLS OF NEUSE
HARGROVE
CALVARY
LOUISBURG
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DEANA
HARDIMONT
NEW HOPE CHURCH
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WAKE FOREST
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RIDGE
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WHITAKER MILL
CRABTREE
FAIRVIEW
YONKERS
BROOKS
CANTERBURY
OBERLIN
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CAPITAL
AUTOMOTIVE
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HILLSBOROUGH
PEACE
PERSON
MILBURNIE
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PULLEN
ASHE
SALISBURY
ST MARYS
EDENTON
NEW BERN
HILL
RALEIGH
NEW BERN
SUNNYBROOK
AVENT FERRY
DAWSON
MORGAN
EAST
POOLE
BOYLAN
LENOIR
SOUTH
I 440
CENTENNIAL
MARTIN LUTHER KING JR
MCDOWELL
BLOUNT
LAKE WHEELER
I 440 EXIT 15
GARNER
I 40 EXIT 300
WILMINGTON
SANDERFORD
CREECH
TRYON
HAMMOND

In summary, about 1.6 million square feet of suburban-style retail space are located within a short drive of the project study area, with offerings in a wide variety of categories that will directly compete with any new retail on Capital Boulevard inside the Beltline. Another million square feet of pedestrian-oriented space is located in the downtown area, with a tenant mix heavily oriented to dining and nightlife, with a significant share of the space either vacant or used for non-retail uses. Vacancy rates and marginal tenants along Capital north of I-440 indicate that the area is likely oversupplied for retail space. This inventory suggests that retail within the study are should be thought of as a supporting amenity for other uses rather than a primary economic driver. However, there may be the opportunity to serve a particular segment of the market not served nearby, such as home improvement.

7.2 PROPERTY MARKET CONDITIONS

Property values

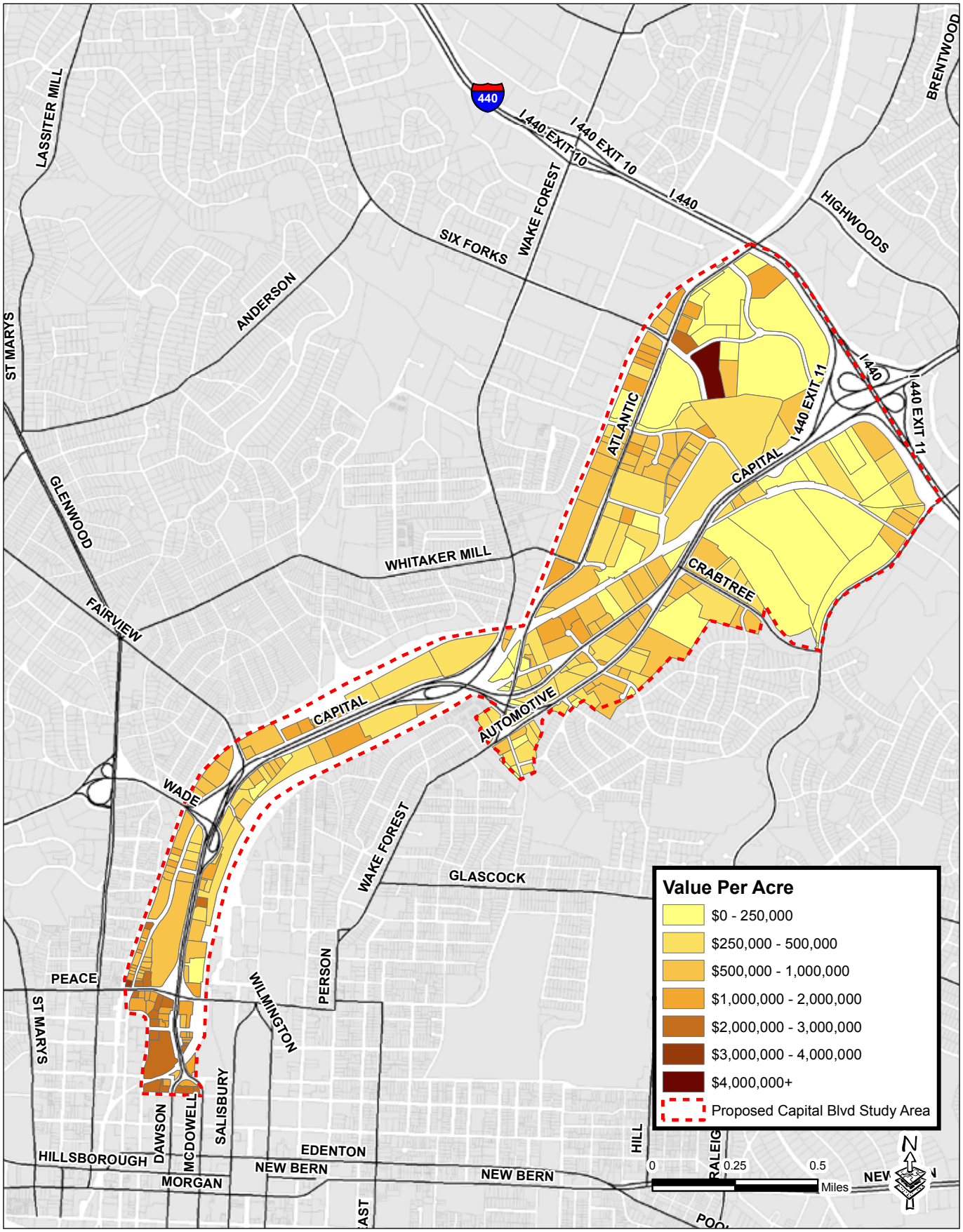
The ratio of assessed land values to land area is illustrated for all parcels in the study area on Figure 7.2: Value Per Acre. Land values rather than the full assessed values are used so that vacant and improved lots can be compared. The maps show that most parcels fall within a range of under $500,000 per acre. Land values in excess of this figure are found in two places. One is in the southern end of the study area, where proximity to downtown and the presence of the Downtown Overlay District supports property values in excess of $1 – 2 million per acre. The second is in the vicinity of the new residential cluster at Six Forks and Atlantic Avenue. These higher-value parcels are currently developed either for commercial use or dense multi-family.

Recent property sales

Fewer than 50 parcels within the study have changed hands since 2000, as shown on Figure 7.3: Real Estate Sales. Transactions of note include the following:

- A 130,000 square foot warehouse south of Whitaker Mill Road on Atlantic Avenue changed hands in 2006 for $3.9 million, or approximately $30 per square foot.
- Another warehouse of similar size a little north on Atlantic Avenue was sold in 2007 for $3.8 million, or a little under $30 per square foot.
- 10.3 acres of land approved for multi-family construction on Atlantic Avenue was sold for $2 million in 2008, or about $200,000 per acre. Portions of the property are already developed for multifamily condominiums, but the property is not fully built out.

The two warehouse sales are consistent with a building producing less than $3 per square foot in net rent, typical for older warehouse space. While these properties may have been bought with future land value as much or more in mind as current income potential, the prices paid do not reflect the impact of land speculation.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Value Per Acre
$0 - 250,000
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$500,000 - 1,000,000
$1,000,000 - 2,000,000
$2,000,000 - 3,000,000
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$4,000,000+
Proposed Capital Blvd Study Area
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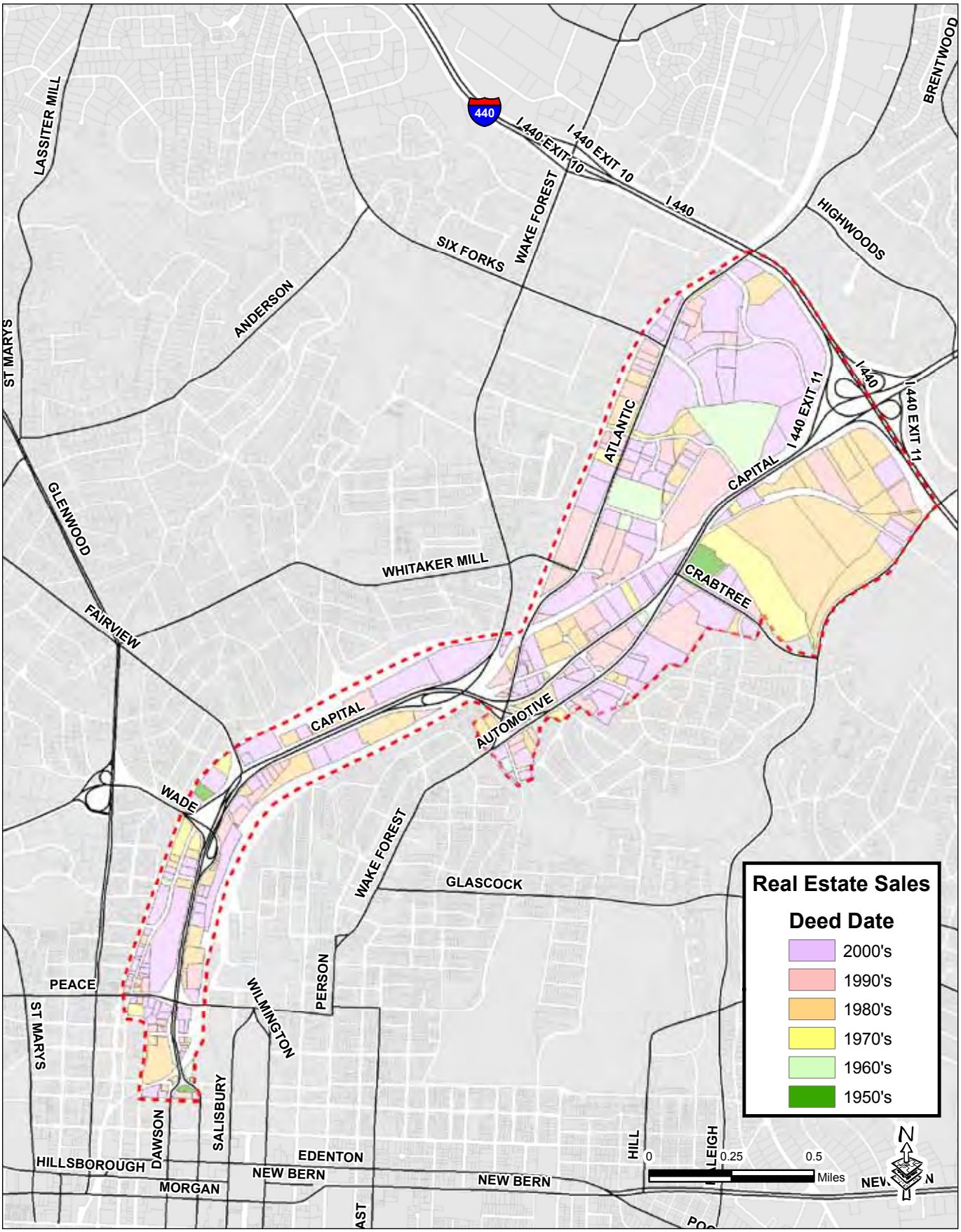
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NEW BERN
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Real Estate Sales
Deed Date
2000's
1990's
1980's
1970's
1960's
1950's
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Miles
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7.3 SOFT SITE ANALYSIS

Soft sites are parcels or groups of parcels that have a reasonable likelihood of being redeveloped if public sector actions and/or market trends conspire to raise the value that can be realized through new development versus maintaining the status quo. Soft sites include vacant sites, sites which are "under built," and sites with vacant or deteriorated structures. The identification of soft sites leads to a better understanding of the redevelopment potential of an area. However, it should be understood that many soft sites may not actually redevelop due to idiosyncratic factors such as property owner preferences, brownfield conditions, or other characteristics not knowable without more detailed investigation.

Figure 7.4: Soft Site Analysis shows the results of a soft site analysis for Capital Boulevard. The colored parcels are either vacant or developed with a structure that is worth less than the underlying land or is in a deteriorated condition. The heavy lines show large areas of contiguous ownership, which is useful for understanding how much property within the study area has already been assembled, or could be assembled through negotiations with a limited number of owners.

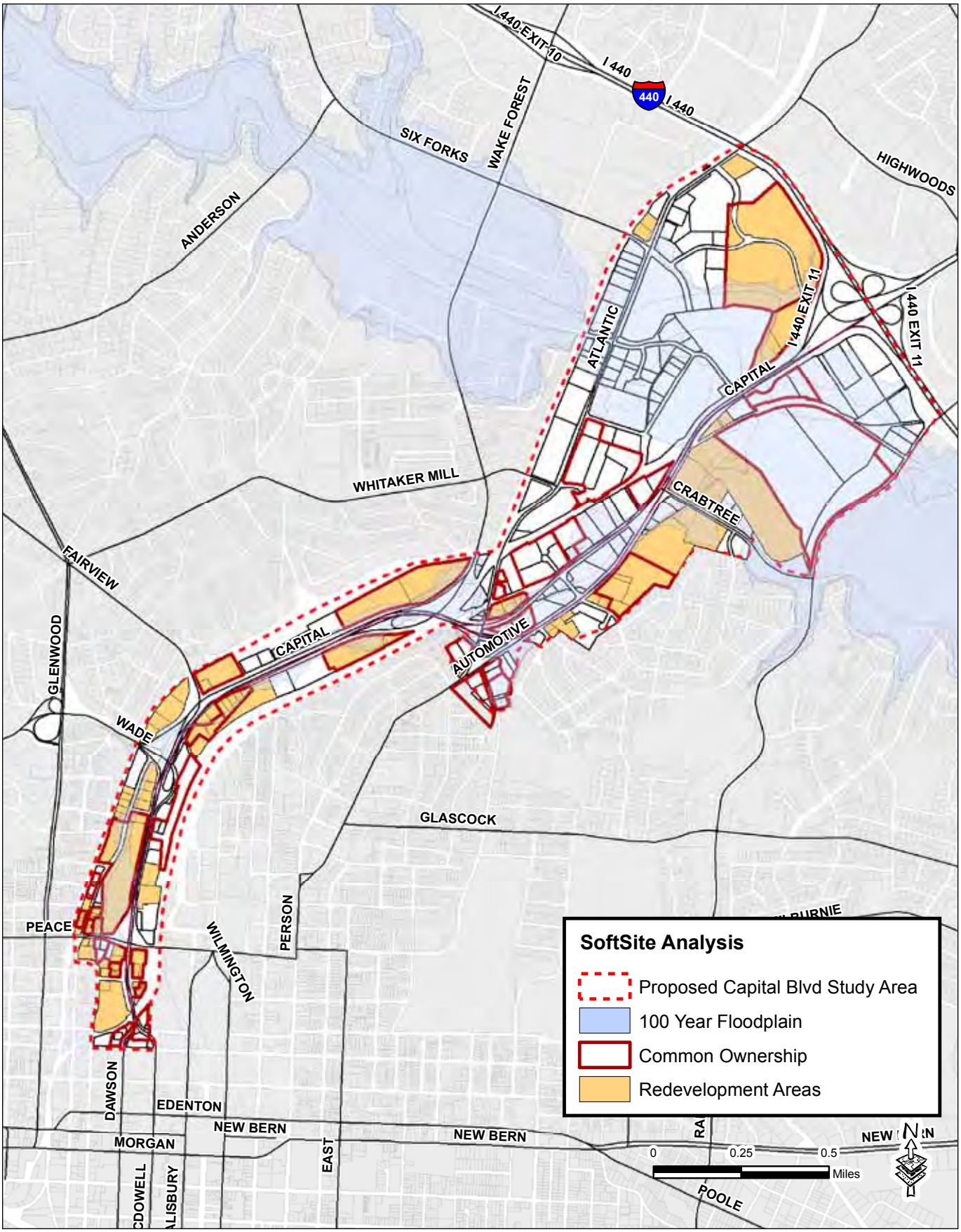
As can clearly be seen on the map, there is a large amount of potential development and redevelopment opportunity within the study. The soft sites cumulatively account for 225 acres of land, or 35 percent of the total property area in the study area. Several key property assemblages have already been privately assembled or could be assembled with relative ease compared with many urban locations. The map is consistent with the hypothesis that much of the land within the study area is in a holding pattern, held by owners taking a long term "wait and see" approach to new development. The right catalytic public investments could potentially have significant payback in terms of future private sector investment.

7.4 SOCIO-ECONOMICS

A socio-economic analysis has been undertaken for two reasons: (1) to understand how a retail business might view the demographics of the corridor; and (2) to better understand recent trends in the surrounding neighborhoods. The data used in this section are from a private demographic reporting service that provides current year demographic updates for small areas down to the block group level based on census data projected forward using proprietary models. While the ultimate accuracy of these updates cannot be independently verified, they provide more current data than are available at this time from official sources, and are also the same data that a retail site selection specialist would order for her own, proprietary market study.

Trade area definition

The size of a trade area varies based on driving distance and time and the size of the destination. A corridor as long as the Capital Boulevard study area will not have a single trade area. As a useful approximation, data have been obtained for areas corresponding to a two- and three- mile driving distance from an address roughly at the center of the study area—1505 Capital Boulevard, the Raleigh Bonded Warehouses. These areas are shown in Figure 7.5.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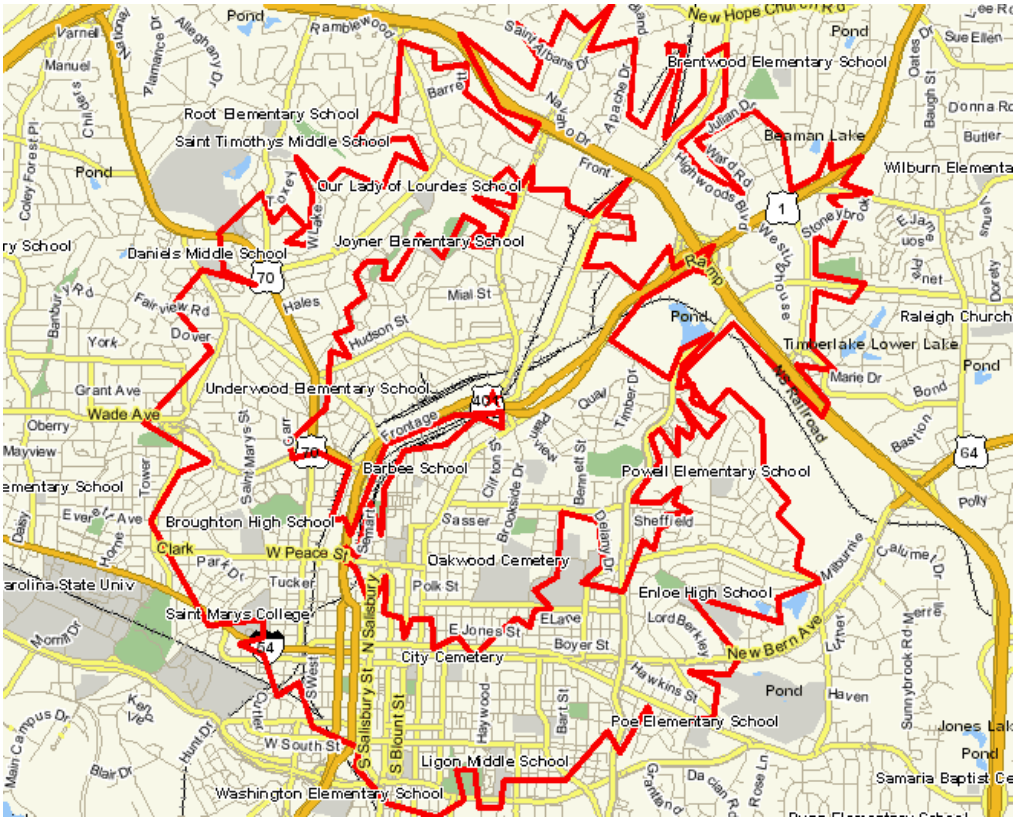
NEW BERN
MORGAN
NEW BERN
EAST
POOLE
SoftSite Analysis
Proposed Capital Blvd Study Area
100 Year Floodplain
Common Ownership
Redevelopment Areas
0
0.25
0.5
Miles
N

Figure 7.5: Two- and Three-Mile Driving Distances



Household Characteristics

The two- and three-mile trade areas (referred to as the Primary and Secondary) are home to 6,800 and 20,400 households respectively in 2010, up from 5,400 and 16,000 in 1990. These trade areas are projected to grow into the figure. The primary area will add another 1,000 households by 2015, and the secondary area will welcome another 3,000 households. As the trade areas grow, they will be able to support a greater quantity and variety of retail and services.

Figure 7.6**: Household Growth in the Trade Areas**

	Primary	Secondary
2015 Projection	7,799	23,299
2010 Estimate	6,828	20,378
2000 Census	5,419	16,002
APGR (2000 - 2010)	2.3%	2.4%
APGR (2010 - 2015)	2.7%	2.7%

Source: The Nielson Company, 2010

The trade areas are very diverse, and encompass some of Raleigh most affluent and poorest neighborhoods. Average and median household incomes are lower than the city average in both trade areas. Figure 7.9: Median Household Income in Dollars shows the range of median household income in 2010 by Census Block Group. In general, the more affluent portions of the trade areas are located to the west of Capital Boulevard in such neighborhoods as Roanoke Park and Hayes Barton.

In terms of household composition, the trade areas have a lower proportion of family households, and a higher proportion of single-person households, compared with the city as a whole. Accordingly, the average household size is smaller than the city norm. These smaller households will have different buying habits than family households, generally spending less on household items and more on dining and entertainment.

Figure 7.7: Characteristics of Households

	Raleigh		Primary		Secondary	
2010	**Number**	**%**	**Number**	**%**	**Number**	**%**
Family Households	84,956	54.85	3,007	44.04	9,465	46.45
Nonfamily Households	69,942	45.15	3,821	55.96	10,913	53.55
1-person household	50,171	32.39	2,992	43.82	8,760	42.99
Est. Average Household Size	2.34		1.98		2.1	

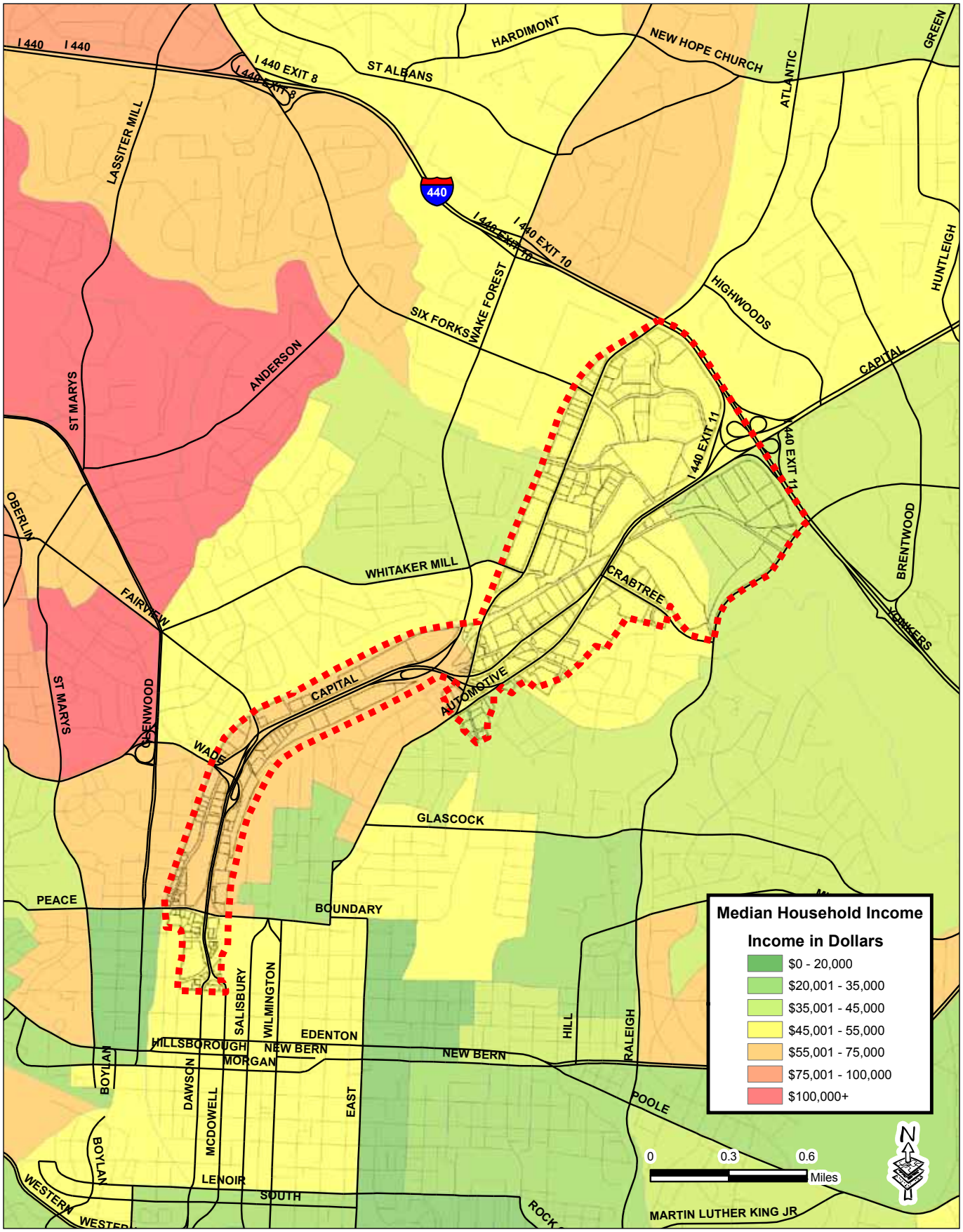
Source: The Nielson Company, 2010

A crude estimate of spending power can be made by multiplying the number of households by median household income and dividing by three, based on the rough estimate from the Consumer Expenditures Survey that about a third of total gross income is spent on retail goods and services. Dividing by average sales per square foot figures compiled by the Urban Land Institute (ULI) and International Council of Shopping Centers (ICSC) provides an estimate of the amount of retail that can be supported by the spending of households within the trade area.

Figure 7.8: Estimated Spending Power

	Primary	Secondary
2010 Households	6,828	20,378
Median Household Income	$44,218	$42,606
Spending Power	$100,640,000	$289,408,000
Sales per SF	$275	$275
Retail space	366,000	1,052,000

Sources: The Nielson Company, 2010; The Dollars and Sense of Shopping Centers (ULI & ICSC)


I 440
I 440
I 440 EXIT 8
I 440 EXIT 9
HARDIMONT
ST ALBANS
NEW HOPE CHURCH
ATLANTIC
GREEN
LASSITER MILL
440
I 440 EXIT 10
HUNTLEIGH
HIGHWOODS
SIX FORKS
WAKE FOREST
ANDERSON
ST MARYS
CAPITAL
I 440 EXIT 11
OBERLIN
WHITAKER MILL
CRABTREE
BRENTWOOD
YORKERS
FAIRVIEW
CAPITAL
AUTOMOTIVE
GLENWOOD
WADE
GLASCOCK
PEACE
BOUNDARY
SALISBURY
WILMINGTON
EDENTON
HILLSBOROUGH
NEW BERN
MORGAN
NEW BERN
HILL
RALEIGH
BOYLAN
DAWSON
MCDOWELL
EAST
POOLE
BOYLAN
LENOIR
SOUTH
WESTERN
MARTIN LUTHER KING JR
Median Household Income
Income in Dollars
$0 - 20,000
$20,001 - 35,000
$35,001 - 45,000
$45,001 - 55,000
$55,001 - 75,000
$75,001 - 100,000
$100,000+
0
0.3
0.6
Miles
N

These estimates suggest that the trade areas are already well-supplied with retail, based on the amount of square footage available in nearby retail areas. Likely only limited opportunities for locally-serving retail within the study area exist.

7.5 POPULATION CHARACTERISTICS

As with households, the population within the trade area has grown and is projected to continue to grow in the future. The growth rates have been lower that the city's overall growth rate of 3.4 percent, which would be expected due to the largely built-out nature of much of the area.

Figure 7.10: Population Growth in the Trade Areas

	Primary	Secondary
2015 Projection	16,394	52,694
2010 Estimate	14,524	46,382
2000 Census	11,731	36,861
APGR (2000 - 2010)	2.2%	2.3%
APGR (2010 - 2015)	2.5%	2.6%

Source: The Nielson Company, 2010.

The age distribution within the trade area is similar to the city as a whole with two exceptions: (1) there are fewer college-aged persons, consistent with the lack of student-oriented housing in the area; and (2) there are more retirement-aged persons, consistent with the age of the neighborhoods.

Figure 7.11: Age Distribution in the Trade Areas

	Raleigh		Primary		Secondary	
2010 Estimates	**Number**	**%**	**Number**	**%**	**Number**	**%**
Age 0 - 17	85,402	22	3,165	22	10,162	22
Age 18 - 24	44,321	12	1,368	9	4,861	10
Age 25 - 34	66,053	17	2,571	18	7,619	16
Age 35 - 44	59,618	16	2,441	17	7,144	15
Age 45 - 64	90,674	24	3,410	23	11,054	24
Age 65 and over	34,822	9	1,568	11	5,541	12

Source: The Nielson Company, 2010.

Compared with the city and the primary trade area, the secondary trade area has fewer whites and a greater number of African-Americans, as the secondary area takes in some of the historically black neighborhoods of Southeast Raleigh. In both trade areas, these two racial categories account for over

90 percent of the population. The proportion of Hispanics in the trade areas is lower than the city as a whole.

Figure 7.12: Race & Ethnicity in the Trade Areas

	Raleigh		Primary		Secondary	
2010 Estimates	**Number**	**%**	**Number**	**%**	**Number**	**%**
Pop by Single Race Class	380,890		14,524		46,382	
White Alone	225,058	59	8,762	60	22,906	49
Black or African American Alone	107,275	28	4,708	32	19,623	42
Asian Alone	14,761	4	139	1	504	1
Some Other Race Alone	23,307	6	515	4	2,132	5
Two or More Races	10,489	3	400	3	1,218	3
Hispanic or Latino (any race)	45,842	12	1,123	8	4,447	10

Source: The Nielson Company, 2010.

7.6 CRIME HOTSPOTS

A review of police calls within the study area reveals that a significant number of crimes have occurred in the 1600 – 1800 blocks of Capital Boulevard and adjacent side streets, roughly the area north of Wake Forest Road north to just past the Milner Inn. The reported crimes include auto theft, burglary, larceny, drug possession, robbery, and assault.

In addition to the public safety impacts, crime and the perception of crime are a quality of life issues and a drag on investment. It is difficult for any area to revitalize until it is perceived as safe and inviting. Addressing criminal activity, as well as projecting a clean and safe appearance, is essential to inviting new uses and attractions to the area.

7.7 CONCLUSIONS

Based on the forgoing data and analysis, the following five conclusions can be drawn regarding the economic conditions and potential of the study area:

1. Industrial uses—warehousing, distribution, and business-to-business sales for the construction trades—remain the major economic generators in the area. Both the retail and commercial property sectors remain weak. Current industrial vacancy rates suggest that some of this property may turn over to other uses in the future. Preserving viable industry while facilitating higher and better uses will be a significant land use policy challenge.
2. The significant amount of competing retail in close proximity to the study area, combined with relatively modest spending power in the surrounding neighborhoods, means that retail is

unlikely to be the major driver of new investment in the study area. That does not mean that there is no room for retail, but that retail development should support and provide amenity value for other uses. The exception would be a specialized retail use that draws from a much larger trade area and is not represented nearby.

3. Property values show two hotspots—the area close to Raleigh's rapidly revitalizing downtown, and the area along Atlantic Avenue near Six Forks, where residential development has taken advantage of a location convenient to downtown, major transportation facilities, and shopping.
4. A soft site analysis shows that the study area is poised for private sector-led redevelopment. Many existing properties are in a holding pattern, already assembled and awaiting new uses. Public investment that helps solve access, image and amenity issues could help spur a wave of private investment.
5. Projected growth in the surrounding neighborhoods speaks to the future demand for housing in the area. Those portions of the study area suitable for residential development could capture some of this future growth.

Ample Storage Capital Boulevard

City Warehouse

CAPITAL BOULEVARD CORRIDOR STUDY

8 Urban Design and Public Realm Conditions

8.1 INTRODUCTION

Analysis of the urban design conditions of the Capital Boulevard Corridor project area was completed by comparing existing conditions to applicable elements found in the City of Raleigh Urban Design Guidelines and three specific topical methodologies: (1) cognitive mapping; (2) landscape typology; and (3) public realm that dissected the urban design context and structure of the project area. For more information: www.raleighnc.gov *search for 'urban design guidelines.'*

Urban Design Guideline Comparison

By looking at the project area through the lens of good urban design practice, several key elements have been identified that can be used as a benchmark for the current condition of the project area. While it is desired that any future design solution would address all 24 key elements found in the Urban Design Guidelines, an analysis of the existing condition of the corridor can be limited to nine key elements. Others are generally addressed in separate sections of the report. Each of the nine key elements are noted to illustrate the extent to which the corridor meets or does not meet the intent of the guidelines.

- **Transitions to surrounding neighborhoods:** The transition between the industrial land use of the corridor and surrounding residential development is distinct and immediate. The building types

Capital Boulevard roadway

Parking on Capital Boulevard

associated with an industrial development pattern in the southern portion of the corridor are mitigated from residential by the significant elevation different slope between those uses. Significant vegetative buffering, as well as the presence of the railroad corridor also contributes to the transition. In the northern section of the site, industrial building patterns transition to commercial and retail development.

- **Block, the street, and the corridor:** The road network serving this corridor, connecting it to adjacent districts is limited. The interconnectivity between districts to the east and west of the corridor is highly limited. The corridor is narrow to the south (roughly 1000 feet), which limits the ability to create a desirable block structure unless realignment of Capital Boulevard is undertaken to increase the depth of available land on either side of the corridor. North of the Atlantic Avenue intersection, while the depth of the corridor increases, interconnectivity is still lacking. Block faces, where present, are nearly double the recommended 660-foot maximum length.
- **Building placement:** Buildings are universally located behind and surrounded by significant surface parking areas. This characteristic limits the ability of architecture to contribute to the character or structure of the corridor. While traffic volume will limit the ability to make all areas of this corridor pedestrian friendly streets, future development should maximize the street frontage of buildings and minimize the frontage of parking lots.
- **Urban Open Space:** Urban open space, one of the most important aspects of pedestrian-friendly urban design, is generally non-existent along the corridor and within the project area. Impromptu usage of parking lots (as in the flea market) and the garden/courtyard area associated with the Wake County Administration Building are two examples. A more in-depth analysis of urban open space and the public realm are described in that section.
- **Public Art:** The integration of public art in the corridor is limited to the installation of the Power and Light Tower located in the median of the southern section of the corridor. The significance of this corridor to Raleigh's industrial past could be used to inform the inclusion of public art in any future development.
- **Site Landscaping:** While discussed more thoroughly in the landscape typology section, landscaping in the corridor must be expanded to include more features that provide safety and comfort to pedestrians, as well as ecological restoration/regeneration. Existing attempts are largely limited to buffering and beautification for vehicular travel.
- **Automobile Parking:** The amount, design, and location of parking areas within the project boundaries is the single most dominant factor in contributing to (or in this case, destroying) the urban fabric of the existing development pattern. Future solutions must reduce the amount of and locate parking areas where they do the least amount of harm to the urban form.
- **Spatial Definition:** Existing spatial definition of the corridor is well in excess of a 1:6 height-to-width ration. This condition is caused by excessive building setbacks, parking and low single story industrial building types (See Figure 8.1: Figure Ground Study). An average ratio of 1:3 would be a desirable goal for potential solutions.

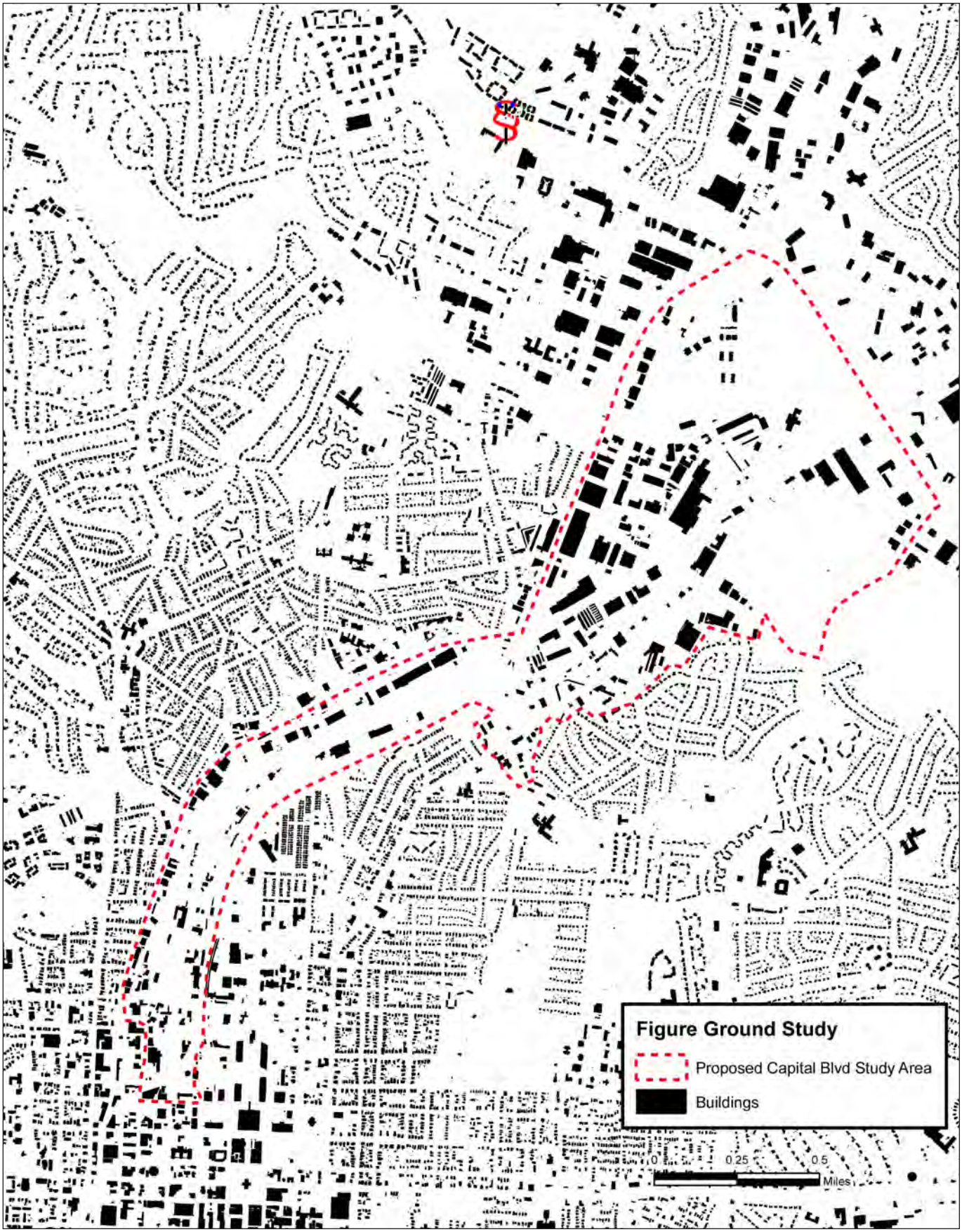


Figure Ground Study
Proposed Capital Blvd Study Area
Buildings
0
0.25
0.5
Miles

8.2 LANDSCAPE TYPOLOGY

Introduction

The landscape that comprises the natural infrastructure of the Capital Boulevard corridor can be described and categorized into five typologies based on the form and function of the landscape. The five typologies are:

- **Natural Transitional:** This describes those landscapes where through planned conservation or simply through neglect has largely been unmanaged or managed as unprogrammed open space. This would include open space parkland vacant lands where the plant communities in these areas are in some stage of natural succession. These areas offer rich and varied wildlife habitat.
- **Riparian:** The riparian landscape is found along water courses, drainage ways and water body edges. It is characterized by wetland and water loving plants and is a critical landscape in terms of protecting the quality and stability of the water resources within the study area.
- **Invasive:** Areas in the landscape that have been overrun by invasive non-native plant species such as kudzu and bamboo. In most cases, diversity in these areas has been destroyed by the infestation of the invasive. A management plan for the eradication of these species is paramount to halt the spread.
- **Buffer:** These landscapes are largely planted or natural managed landscapes meant to screen views and limit access between properties, parking lots, other visually objectionable uses and the pubic right of way.
- **Streetscape:** A traditional street tree and tree lawn planting that adds structure, rhythm, aesthetic, safety and shade to both vehicular and pedestrian travel (where sidewalks are present).

Corridor beautification has been undertaken by both the City of Raleigh and NCDOT over the years. Ornamental landscape features such as flowering trees and shrubs planted in the median and along the corridors, such as those installed as part of the Bicentennial Boulevard Project, serve to add visual interest and aesthetic enhancement.

Analysis

A field survey was used to inventory, categorize, and apply a specific typology to the landscape of the corridor. See Figure 8.2: Landscape Typology**.** Landscapes internal to existing development were not classified but can largely be grouped in the Ornamental typology. A large percentage of the landscape within the project site is low-level planting or lawn and significant contributors to the area. The intent of this analysis is to identify areas where the landscape contributes to the natural or built ecology of the corridor, where larger patterns might inform future character of the corridor and where significant features should be preserved. The conclusions are illustrated on the following figure.


Legend
Capital Blvd Study Area
Natural/Transitional
Buffer
Ornamental/Decorative
Streetscape
Riparian
Invasive

8.3 PERCEPTION AND EXPERIENCE (COGNITIVE MAPPING)

Introduction

Cognitive Mapping (See Figure 8.3: Perception and Experience) is an inquiry method that helps interpret the experience of public space—how it is perceived and how it is used by individuals and the community. The perception and use of public space creates a mental map, thus establishing 'legibility,' or an understanding of the layout of the place. The mental map is influenced by emotional, social, technological, economic, and ideological factors as part of individual experience. The five generally understood elements in the layout that informs the mental map include (1) districts, (2) paths, (3) edges, (4) nodes, and (5) landmarks. *(Image of a City, Kevin Lynch, 1960)*

History

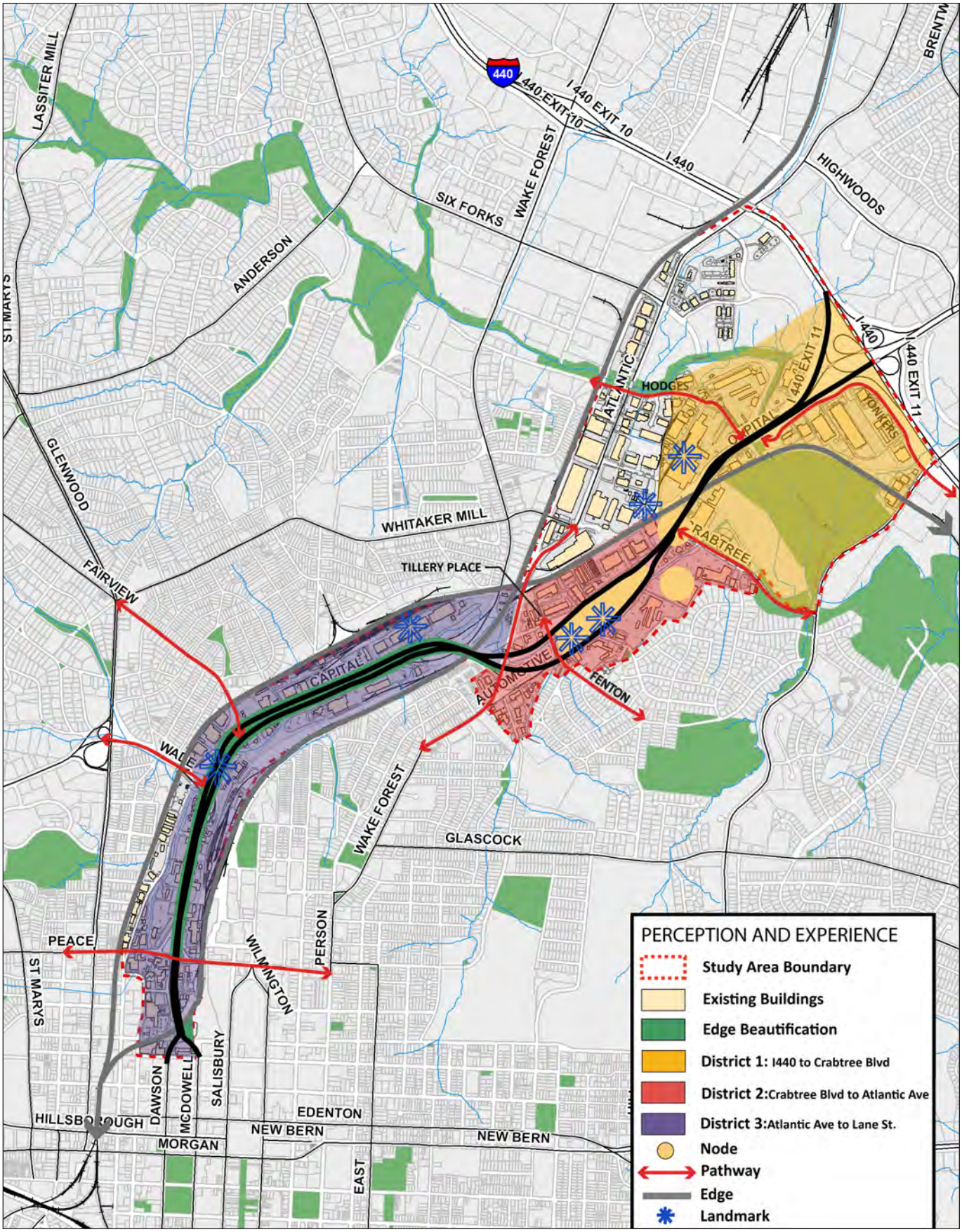
In the 1950s and 1960s Capital Boulevard was conceived and built and has since been perceived and used as a major thoroughfare for automobile drivers into and out of Downtown Raleigh. The current perception and experience of the place is largely unchanged from the 1960s. To the casual observer, the corridor remains a five-mile strip of fast-moving traffic. The area is a hodge-podge of building types due to private and government ownership of individual parcels and changing building uses through the years. Despite its sometimes dismal façade, the corridor is home to a multitude of businesses, some in place for 30+ years.

Capital Boulevard Corridor Districts, Paths, Edges, Nodes, and Landmarks

That said, for mental mapping purposes of individual perception and experience, the corridor can be reviewed as three distinct districts. 'Districts' are sections which the observer mentally enters and which usually have some identifying character. In the case of Capital Boulevard, identifying characteristics include several interchanges and overpasses, built-environment traits, and differing land uses that have

Green space

Ornamental landscaping


LASSITER MILL
ST MARYS
ANDERSON
SIX FORKS
WAKE FOREST
I 440 EXIT 10
I 440
HIGHWOODS
BRENTW
I 440 EXIT 11
HODGES
YONKERS
GLENWOOD
WHITAKER MILL
FAIRVIEW
TILLERY PLACE
RABTREE
FENTON
GLASCOCK
PEACE
WILMINGTON
PERSON
SALISBURY
MCDOWELL
DAWSON
HILLSBOROUGH
EDENTON
NEW BERN
MORGAN
EAST
PERCEPTION AND EXPERIENCE
Study Area Boundary
Existing Buildings
Edge Beautification
District 1: I440 to Crabtree Blvd
District 2:Crabtree Blvd to Atlantic Ave
District 3:Atlantic Ave to Lane St.
Node
Pathway
Edge
Landmark

and continue to shape the experiences and perceptions of users. Based on these considerations, the following districts are proposed:

- District 1: I-440 to Crabtree Boulevard
- District 2: Median at Crabtree Boulevard to Wake Forest Road
- District 3: Wake Forest Road to Lane Street

All three districts share four common organizing elements (1) paths, (2) edges, (3) nodes, and (4) landmarks. 'Paths' include how people move on streets, walkways, transit lines, and railroads. Cars have always dominated the perception of the Capital Boulevard experience. Lifetime residents claim to never have walked to and through the corridor. Today, people are rarely seen walking, and it is even more rare to see bicycling on the corridor. Bus stops are placed intermittently along the corridor on both sides, and riders can occasionally be seen walking to and waiting at the stops. The road has few stop lights which leads to excessive vehicular speed well above the posted speed limit. Atlantic Avenue a second major vehicular travel alternative is used as an alternative to the conditions on the corridor. Despite being crowded with cars, the corridor makes for a generally unobstructed fast drive into and out of the city and residents in surrounding communities have only the experience of driving long distances to cover actual short distances when the need arises.

'Edges' are linear elements, not used or considered as paths by the observer. Generally 'edges' differ from 'paths' in that they are not used for walking. The experience of Capital Boulevard includes the Norfolk Southern Secondary and CSX-S rail lines that border it high above the flood plain. The railroad tracks create hard edges on either side of the corridor. In most cases along the corridor, the rail delineates commercial and industrial land uses from residential areas.

People congregate on the corridor. 'Nodes' are centers of attraction and activity. While not immediately obvious, there are several junctions and places of convergence that can be recognized as centers. 'Landmarks' are points of reference or prominent visual features. Distinctive nodes and landmarks are highlighted in the following districts discussion.

Walkway beneath Capital Boulevard bridge

District 1: I-440 to Crabtree Boulevard

The observer enters the corridor by exiting I-440 at the Capital Boulevard. On the corridor, commuters head south towards Downtown, whose skyline is clearly seen. The first sign as commuters approach downtown is the RBC Tower visible on the horizon. On the northbound side,

several faded structures house current businesses including a furniture outlet. Two traffic lights in quick succession greet the commuter at Yonkers and Hodges Streets. The former Farmer's Market off Hodges Street is a strong memory for many associated with the corridor—from the area and around the region. The NC Department of Corrections facility has taken its place on site today. The Farmer's Market was an activity node that supported two small bank locations, an eye doctor, and used car dealership. Big Ed's, a popular downtown restaurant at historic City Market, was originally located at the Farmer's Market. People familiar with this area of the corridor can see the Greenway entrance to the boardwalk and a glimpse of Crabtree Creek.

Identifying characteristics include low-rise business and manufacturing structures. For many long-time residents and commuters, 'Industry' was the context and marker for this and other districts, providing a deep connection to a litany of business owners and manufacturers through the years. For example, the large Wyatt building on the east side of the corridor at Crabtree Boulevard is the last remnant of one of the oldest companies in Raleigh with a long family history of business ownership on the corridor. Today in the same vicinity an adult entertainment superstore advertises with large signage outside its location in a former warehouse. Further south, on the east side, the Raleigh Flea Market provides a 'node' or center of activity. The flea market is a major weekend destination for the largely Hispanic customer base. From dawn to dusk, vendors sell fruits and vegetables, holiday consumer goods, and shoes and clothes. The outdoor flea market is complimented by an indoor arcade of shopping and fast food. Throngs of people move among the vendors and indoor arcade enterprises.

Today's Flea market is accessible along the northbound side of Capital Boulevard at three entrances/exits. Customers also can enter and exit from Crabtree Boulevard at the Gateway shopping center. The shopping center is experiencing a high-vacancy rate. It is downtrodden, gray with large signs that designate the offices and businesses located there, including a dry cleaners, beauty supply shop, pawn and thrift shops, restaurant and the Institute of Divine Meta Research. Fronting the corridor is an active Bank of America branch.

District 1 terminates at the beginning of the median at Crabtree Boulevard.

District 2: Median at Crabtree Boulevard to Wake Forest Road

In this section, the corridor splits and encircles a median. A separation in the corridor begins for southbound and northbound traffic. The median can be described as a node or area of activity and attraction. The edges of the node are constrained and narrow at this juncture. Across the corridor, on either side, the land sweeps upwards to high ground from the floodplain where the entire median is situated.

Despite being in a floodplain, the median is home to many long-standing businesses, some on site for 30+ years, and several new businesses. During its heyday, the Capital Inn was known as the most

attractive motor court lodge on the east coast. It hosted Johnny's Super Club and provided a renowned music venue. Rather than the used car lots that line the corridor today, it was 'attractive,' with many service stations for the expanding car population. 'It was the Glenwood South of its day; all driving, no pedestrians.' Today, the median is known as an unsafe place, to be avoided after dark especially. Attached to the Milner Inn is a landmark, Foxy Lady. Entering its fortieth year in business, the place itself is non-descript, but a source of community dismay.

Signage for Tillery Place dominates the south bound side of the corridor directly across from Fenton Street. A bus shelter is located there and is frequented by workers in the area. But at this site and other bus stops lack of sidewalks and close proximity to cars driving 50+mph is a frightening experience. Upland from the median, and next to the flea market, to the east Bobby Murray Chevrolet has operated for 25+ years. The car lot, its showroom, and maintenance facility extend along the corridor, overlooking the floodplain down below and to the west.

Flea Market

Looking west across the corridor from the median stand several businesses. A business owner pointed out impressive improvements made recently to the buildings by their owners.

District 3: Wake Forest to Lane Street

After the business median, the corridor split continues, and the road becomes parkway-like. The center median is green and the road gently curves to the west. Historic beautification efforts survive today with crape myrtles lining the road and daylily plantings sporadically adorning the roadway edges.

The Time and Light Tower in the median provides a landmark for commuters to the city. Historically, this public art has been viewed by some as an absurdity, but many seek it out to enjoy the quality of light it displays. Dense foliage surrounds the landmark indicating the start of the results of the Bicentennial Beautification efforts. Trees line the corridor edge.

Suddenly, the road breaks open again and southbound and northbound traffic face the other, with only a guardrail separating them. The Quorum and the Clarion Hotel are clearly visible on the horizon.

Raleigh bonded warehouses border the corridor on the west side. The warehouses, historic sites (*circa 1920*), are remembered as old style, vibrant, vital places. Several are brightly colored, with extensive parking along the frontage, embracing a new life that includes an art studio that participates in Raleigh's First Friday events and a Furniture retail outlet, Antiques shop. This stretch of the corridor is dominated on both the southbound and northbound sides by used car lots interspersed with low-rent business enterprises. From the warehouses one can see the Pigeon House Creek, another landmark along the corridor, though the landscape is overgrown with kudzu.

South of Wake Forest Road, the corridor is dominated by one-story warehouses and car dealerships. The structure of this section is consistent because access roads set back and orientation to the rail was central to development in the 50s and 60s. This area has the distinction of being closer in to downtown, but it also carries the distinction of being the 'low-rent district' and hosts old, industrial building stock that observers suggest may be uninhabited.

From the Fairview flyover, the area seems busier. There is an increase in the number of businesses. Buildings are increasingly downtrodden and the landscape is choppier and constricted. The closer in to downtown, the more dilapidated the buildings. People find the flyover dangerous and would like it dismantled and rebuilt in a way that creates more opportunities for walking and bicycling. Immediately following Fairview, drivers can exit the corridor at the Wade Avenue exit that leads to RTP and Hwy 40. Aside from Fairview and Wade, there is no way to exit the corridor and there are no traffic lights.

There are no visual cues to signal that southbound Capital Boulevard is transitioning from a highway to downtown streets. Drivers are presented with two sharp turns and then a traffic light at Lane Street. In addition to the unexpected turns, the Days Inn signage and lush landscaping welcome commuters to the edge of Downtown.

Time and Light Tower

Leaving Downtown and driving north, many commuters enter Capital Boulevard from the Peace Street overpass. The drive is straightforward along the concrete barricade that divides north and southbound traffic. To the east low structures and the Wilco gas station line the corridor. The observer then enters District 2, which is described in that section.

8.4 PUBLIC REALM

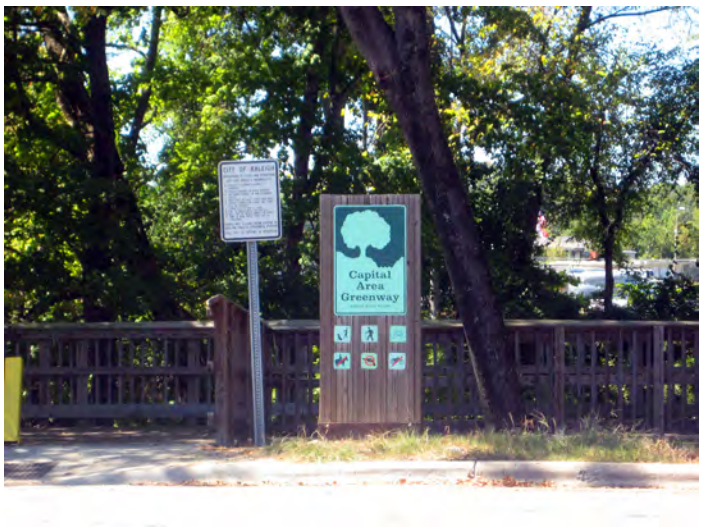
Introduction

While Capital Boulevard is typically thought of as a space to move through, there are places within the study area that give Capital Boulevard's public ream an identity (see Figure 8.4: Public Realm). To understand that identity it is helpful to focus the different types of places contained within the study boundaries. The Capital Boulevard study area consists of three public realm designations:

1. Publicly owned lands
2. Streets
3. Privately owned but publicly accessed gathering spaces

Publicly owned lands

There are no parks within the study boundary. There is a portion of greenway, however, at the northern end of the site running adjacent to Crabtree Creek. While there is an entrance to the greenway adjacent to Capital Boulevard, the signage is not readily visible from the street. Similarly, there are parks located within close proximity to the study area, but the signage directing visitors to them is small and limited in number.



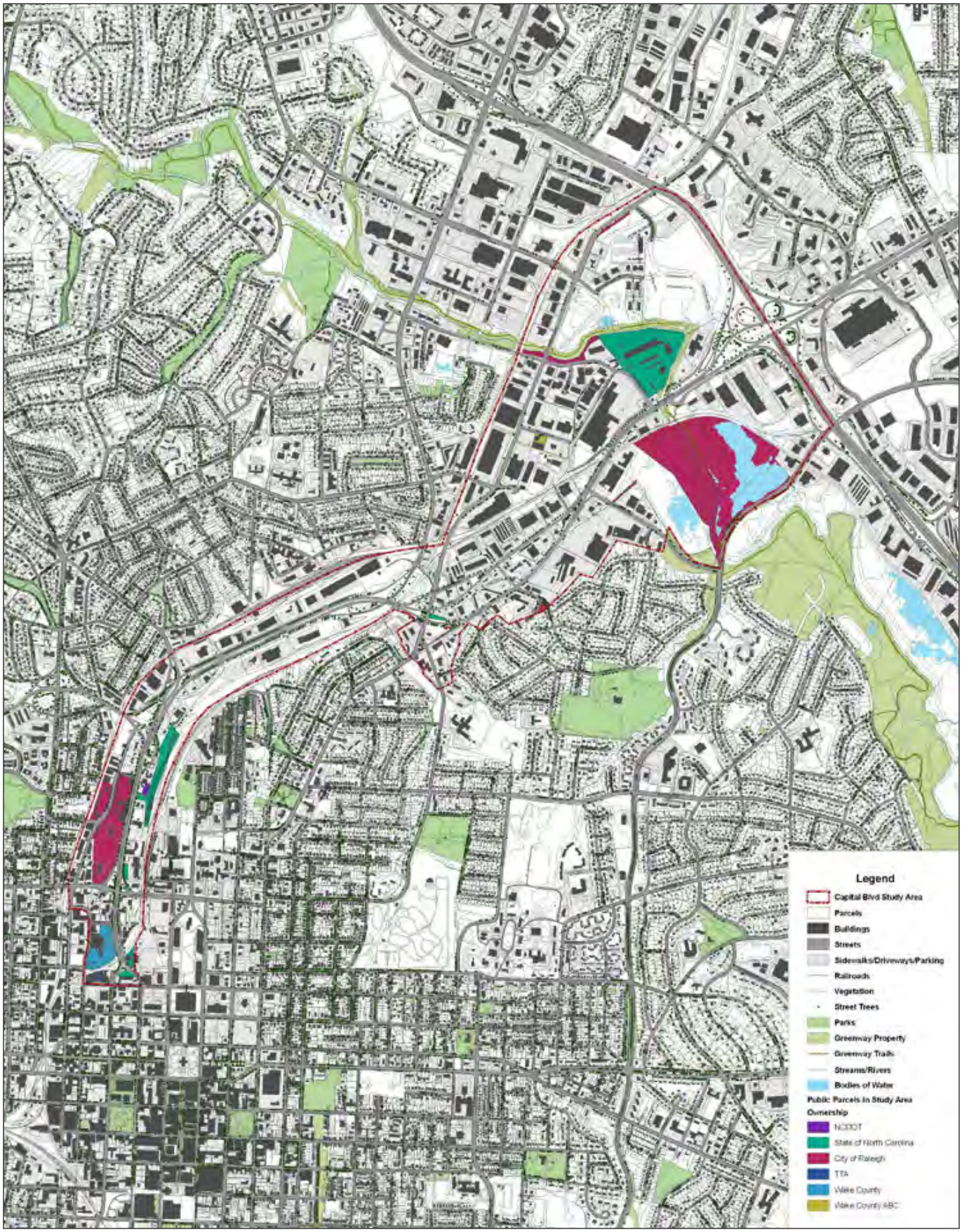
Greenway sign

There are several government-owned parcels within the study boundaries. All are used for offices or service yards. While the Wake County building features a formal forecourt and the City's Solid Waste Services facility features bioretention areas, these amenities are not visible from the right-of-way and therefore contribute little to the public realm of the study area.

Streets

Capital Boulevard's streetscape changes throughout the corridor, from a limited access road with jersey barriers to a boulevard with businesses in the median and infrequent cross streets and businesses on both sides. Side streets within the study area are generally two four-lane sections with no on-street parking and often no curb and gutter.

Similarly, sidewalk infrastructure is limited (Figure 8.5: Sidewalk Infrastructure), with the bulk of the sidewalks located south of Wade Avenue where the corridor is the most space-constrained. Where present, sidewalks are generally five feet or less in width, with no plantings other than an occasional small grass strip separating pedestrians from high speed traffic. The sidewalks are frequently interrupted


Legend
Capital Blvd Study Area
Parcels
Buildings
Streets
Sidewalks/Driveways/Parking
Railroads
Vegetation
Street Trees
Parks
Greenway Property
Greenway Trails
Streams/Rivers
Bodies of Water
Public Parcels in Study Area
Ownership
NCDOT
State of North Carolina
City of Raleigh
TTA
Wake County
Wake County ABC

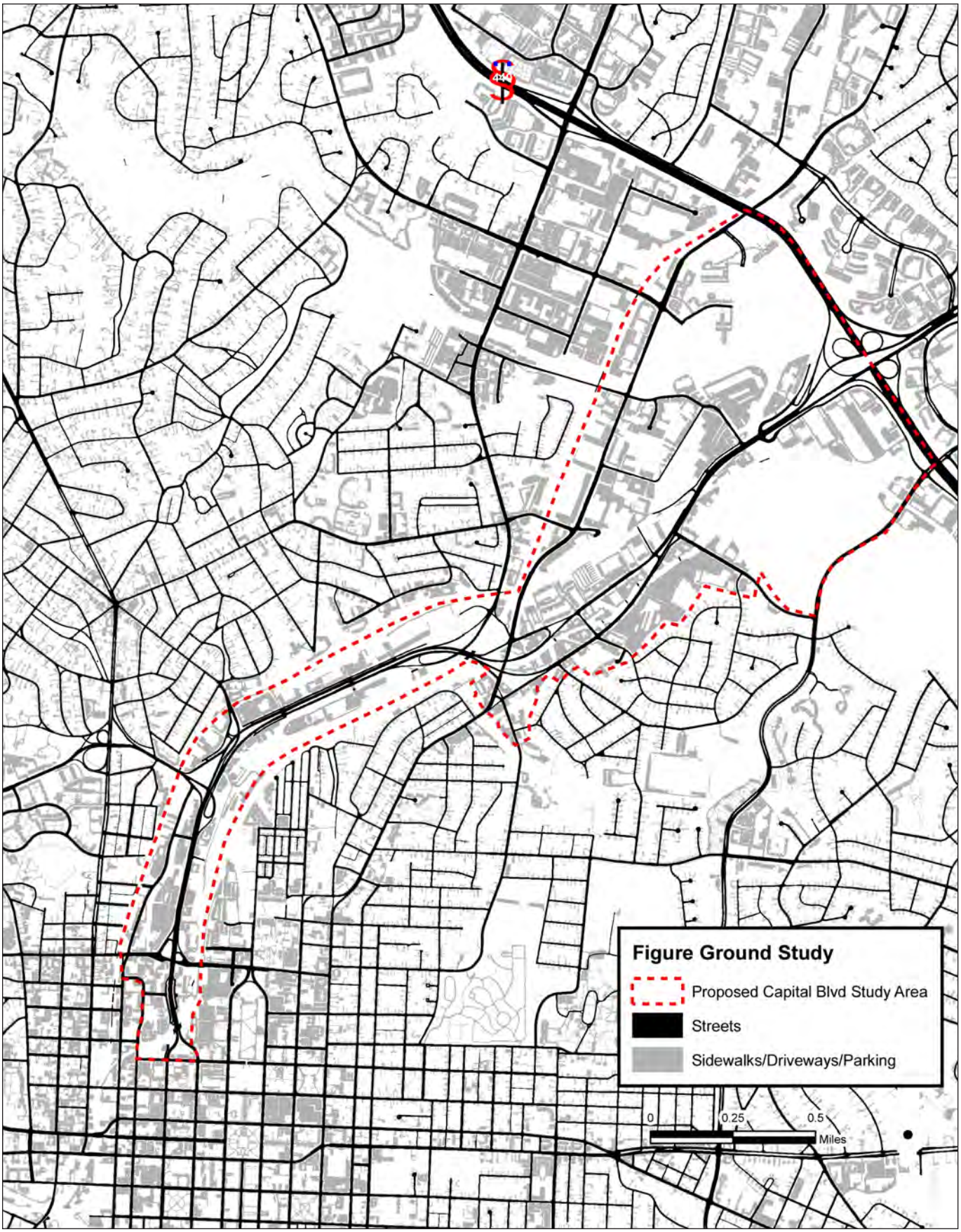


Figure Ground Study
Proposed Capital Blvd Study Area
Streets
Sidewalks/Driveways/Parking
0
0.25
0.5
Miles

by driveways and are in spots in poor condition. There are no striped crosswalks in the corridor, and many of the intersections are lacking ADA facilities.

There is evidence of "desire lines" in the study area, with multiple dirt paths along the side of the road, or evidence of where pedestrians have chosen a route that may be more direct or perceived to be safer than the sidewalks.

Sidewalk blocked by backhoe

Even in areas where sidewalks are located, the public realm is hostile to pedestrians. The majority of the public realm is a roadway desired to accommodate high speed, high volume through traffic as is evidenced through the width of pavement, use of jersey barriers and grade separated interchanges, use of highway-type road signage (as well as ground-mounted business signage) and lack of pedestrian and bicycle facilities.

While there are street trees throughout the corridor, their placement is not in a formal pattern, their location does not provide a buffer to pedestrians, and their size is not sufficient to provide shade or a sense of enclosure to the street. This may be due to tree planting requirements from the NCDOT as well as the presence of overhead utility lines.

Buildings in the study area are generally not located adjacent to the street and are separated from the street by parking lots and/or swales. Where buildings are pulled up to the street their entrance is often not accessible or legible from the right of way. The wide roadbed plus the setback buildings leads to a lack of sense of enclosure (in some places the distance from buildings on the east side to the west side is over 400' (equivalent to a city block), and the speed and design of the road makes identifying businesses, greenways or other assets adjacent to the street difficult. This leads to Capital Boulevard being perceived as more of a space to move through rather than a series of destinations.

8.5 PRIVATELY OWNED GATHERING SPACES

There are several private parcels within the study area that are used as temporary quasi-public gathering spaces, including the Flea Market, site of a weekend flea and farmers market, and AH Peele, site of an occasional market and party called "traffic jam." Other occasional uses, such as fish fries or informal gatherings also have been observed, and like the two markets mentioned, also occur in parking lots that are somewhat removed from the traffic and noise of Capital Boulevard.

8.6 CONCLUSIONS

Landscape Typology

Due to the long history of industrial use and development, the landscape of the Capital Boulevard corridor is characterized by three main typologies: (1) buffers, (2) ornamental, and (3) riparian. The presence of two major rail corridors, in conjunction with the proximity to adjacent established residential neighborhoods, has created the necessity (or desire) for buffers. The dominant typology (although not readily evident) is the riparian landscape. The Pigeon House and Crabtree Creek riparian corridors are quite distinct and unifying elements along Capital Boulevard and the edges of the study area to the north. The final dominant typology is the result of the Bicentennial Boulevard Project, a concerted effort to beautify the corridor and the streetscape/ornamental plantings resulting from that plan have been the most significant attempt to use landscape as a visually mitigating intervention.

While the ornamental value of the Bicentennial Project is evident, the extent to which it succeeded in creating a unified streetscape is less evident. There are small pockets of significant large canopy street tree plantings that provide spatial structure but the limited extent along the corridors in the project area. Overhead power lines have limited street tree plantings to small flowering trees in many areas. These have been classified as ornamental plantings because of their limited ability to create structure in very wide and open corridors. Underground utilities should be considered to increase the available frontage for large street-tree plantings.

Traffic jam poster

Perception and Experience

In the future the perceptions and experiences may change. A transformation is expected that will have people walking and bicycling in the vicinity of the corridor, possibly along parallel access roads. Traffic may be altered to accommodate more connection between the communities bordering the corridor on either side. The area may become more competitive as zoning is changed to accommodate housing and mixed-uses, thereby attracting investment and creating a new and improved place.

Public Realm

While there is very little useable public space within the study areas, efforts to make the existing assets more visible and to separate pedestrian and gathering spaces from the travel corridor will make these spaces more useable as well as help to give the Capital Boulevard an identity as a place rather than a space to move through.

CAPITAL BOULEVARD CORRIDOR STUDY

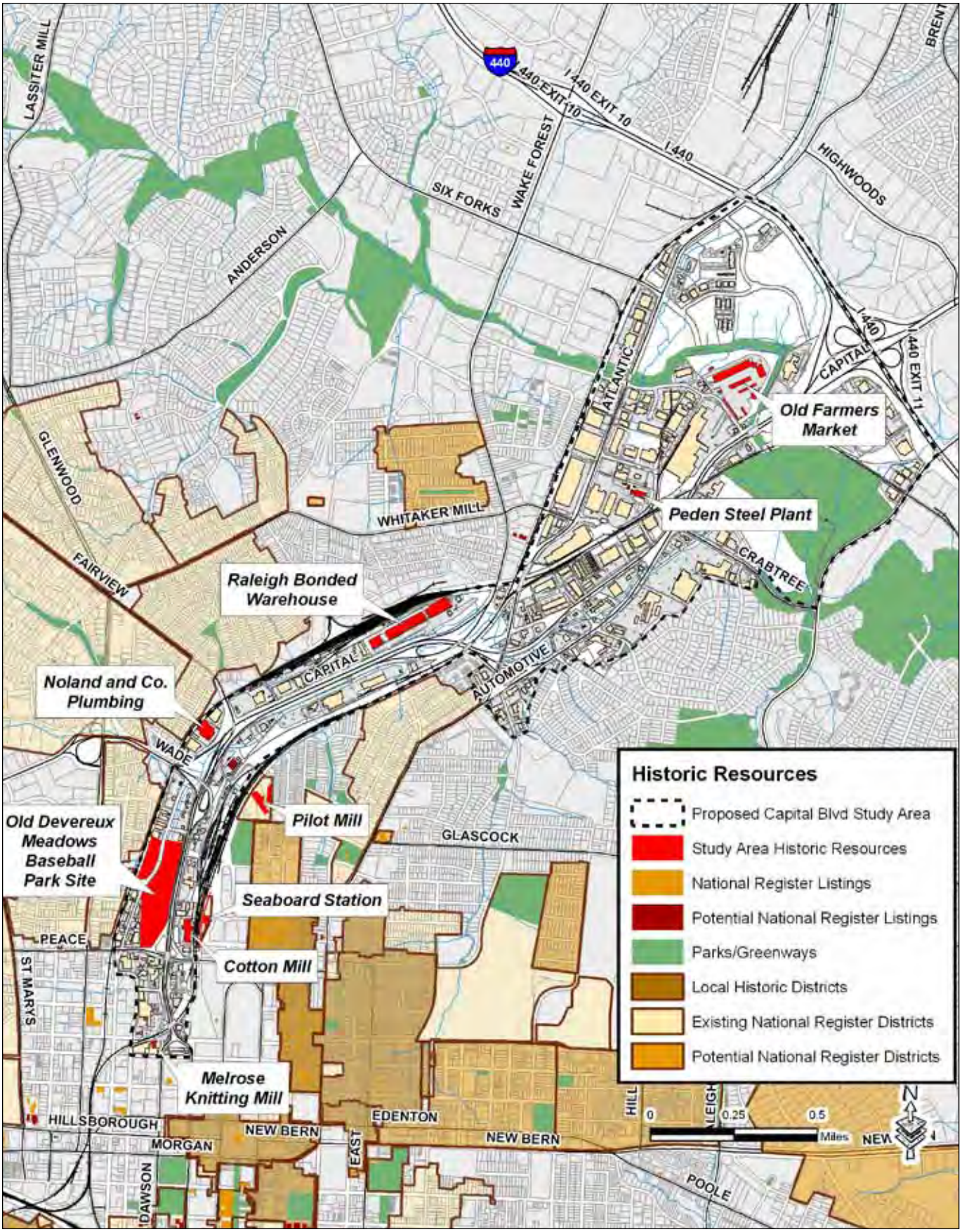
9 Historic and Cultural Resources

9.1 BACKGROUND

While the Capital Boulevard corridor itself has undergone several phases of transformation since its origin in 1955, a few landmarks still exist, holding their testimony to the fading historical and cultural values contributed by this corridor towards Raleigh's growth and development during the industrial era of the late nineteenth century (see Figure 9.1: Cultural and Historic Resources). The remnants of cotton mills, rail station, warehouses, and industrial buildings present along the corridor signify its prominence during Raleigh's industrial growth as a major route serving the trade, commerce and business of manufacturing industries.

This chapter discusses four categories of resources. Locally-designated landmarks are the only class of resources receiving special protection from demolition or inappropriate alternation. Any such changes require a certificate of appropriateness from the Raleigh Historic Districts Commission (although denial of such a permit can only delay, but not prevent, eventual demolition). National Register landmarks have achieved an honorary designation that also makes rehabilitation activities conforming to federal guidelines eligible for National Register Historic Rehabilitation Tax Credits, which can be a power financial tool making the reuse of historic buildings economically feasible. National Register-eligible landmarks have not yet been designated, but are candidates for future designation. Both National

Entrance to Cotton Mill


LASSITER MILL
440
I 440 EXIT 10
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WAKE FOREST
SIX FORKS
HIGHWOODS
ANDERSON
ATLANTIC
CAPITAL
I 440 EXIT 11
Old Farmers Market
GLENWOOD
WHITAKER MILL
Peden Steel Plant
FAIRVIEW
CRABTREE
Raleigh Bonded Warehouse
AUTOMOTIVE
Noland and Co. Plumbing
WADE
Pilot Mill
GLASCOCK
Old Devereux Meadows Baseball Park Site
Seaboard Station
PEACE
ST MARYS
Cotton Mill
Melrose Knitting Mill
HILLSBOROUGH
MORGAN
NEW BERN
EDENTON
EAST
DAWSON
POOLE
Historic Resources
Proposed Capital Blvd Study Area
Study Area Historic Resources
National Register Listings
Potential National Register Listings
Parks/Greenways
Local Historic Districts
Existing National Register Districts
Potential National Register Districts
0
0.25
0.5
Miles
N

Register listings and eligible landmarks receive protection from negative impacts resulting from projects receiving federal funds, such as rail or highway projects. Lastly, some sites of local cultural significance are highlighted.

9.2 LOCALLY-DESIGNATED LANDMARKS IN THE STUDY AREA

The Raleigh Cotton Mill. Constructed in 1890 and enlarged in 1895, this 80,000 square feet Raleigh Cotton Mills building is significant as Raleigh's first cotton mill, playing an important role in the City's attempt to become a center of manufacturing and industry in the late nineteenth and early twentieth centuries. Located at a major entrance to Downtown Raleigh near the busy intersection of Capital Boulevard and Peace Street, the building is prominently sited on a hill and positioned on a north south axis along the western edge of the Seaboard Air Line railroad track, so its western façade faces Capital Boulevard. The building also holds architectural significance for the use of vernacular Italianate style in industrial architecture of the period exhibited in the fenestration and decorative brick and millwork. The well-designed industrial architecture building, with its prominent arched windows, displays the key elements of a mill design. Fire prevention was an important consideration in mill design that resulted in standard brick constructions. Facades were lined with large, multi-paned arched windows to provide light and ventilation for the workers.

In 1904, the Raleigh Cotton Mills consumed 1,750,000 pounds of cotton making hosiery yarn in its spinning factory. However, the upcoming depression forced its shutdown in late 1920s. Built during the city's building boom of the 1880s and 1890s, the latter years saw the decline of industries. The Cotton Mill, no longer needed for cotton production, was adapted for warehousing in 1932. In 1996, the building adaptively converted to 50 condominium units with a parking garage and also received its designation as a Raleigh Historic Landmark.

Pilot Mill, located between the CSX railroad tracks and the historic Mordecai neighborhood was established in 1892. Built in three phases, with each building named after the year it was constructed, Pilot Mill consists of the 1892 Building, the 1903 Building and the 1910 Building. In 1910, Pilot Mill's 425 looms, 11,000 spindles and 300 workers transformed 5,000 bales of cotton into 8 million yards of cloth. Production continued until the late 1970s. The cotton mill closed in 1982. After significant renovations, the 1903 building presently houses condominiums and the 1910 building presently houses a charter high school as well as office spaces. As one of the first projects in the area, the Pilot

Pilot Mill

Mill renovation helped stabilize the area and encourage successful redevelopment and revitalization of the adjoining residential area.

9.3 NATIONAL REGISTER LANDMARKS IN THE STUDY AREA

The Raleigh Bonded Warehouse. Originally built in 1923 for Norman Edward Edgerton's cotton distribution business, this site now comprises of three warehouses, an office, a packing building and a weigh station, strategically located next to the NSRR train tracks for efficient operations. The first Ca. 1923 warehouse, a two-story concrete structure with twelve storage bays, heavy timber framing, metal casement windows, and over a million cubic feet of storage space, is one of the earliest, largest, and best preserved commercial warehouses in Raleigh. In late 1940s and early 1950s two additional concrete block warehouses were added. The Ca.1949 concrete block packing building and the Ca.1950 tiny weight station are adjacent to the warehouse. The warehouse with its reinforced concrete construction signifies the innovations in structural engineering of factory and warehouse designs of the early twentieth century industrial era.

Piedmont was the heart of the textile manufacturing in North Carolina in the late nineteenth and early twentieth centuries. Located to the east of Piedmont, between textile manufacturing cities of the west and cotton manufacturers of the eastern counties, Raleigh attempted to develop itself as a cotton market. Cotton was shipped to Raleigh from the cotton belt of eastern North Carolina, stored in the Raleigh Bonded Warehouse, and then transferred to various textile mills in the region. There were half a dozen textile mills in Raleigh, including the Raleigh Cotton Mill and Pilot Mill, both located to the north of the city along railroad tracks. The Bonded Warehouse was built in response to a proposal by the Raleigh Chamber of Commerce in 1920 to build a large cotton storage warehouse.

Since 1930s, as production of cotton waned, the warehouse structures primarily served the business of moving and crating of merchandise[1]. From 1940 through 1960, the warehouse had become the exclusive local agent of Aero Mayflower Transit Company for long-distance moving and later of Allied Van Lines and Bekins Van Lines[2]. One significant service provided by the Bonded warehouse was moving and storage of household goods for military families while they were deployed at military bases such as Fort Bragg and Jacksonville. Legend[3] has it that the most unusual items stored were piece of the Berlin Wall after it came down in 1990. In 2005, Empire Properties purchased the property and currently Carolina Tiffany, Furniture Source and Revival Antiques and Accessories are among the businesses located at this prime location. The Bonded warehouse, with its history as a primary storage space of durable merchandise, holds commercial significance in Raleigh's industrial growth history. The Bonded Warehouse also received its National Historic Landmark designation in 2006.

1 Raleigh City Directory, 1926. Advertisement on front inside cover.
2 Alton B.Smith, Jr., interview with the author, June 21,2005; Raleigh city directories.
3 Alton Smith Jr. interview.

9.4 POTENTIAL NATIONAL HISTORIC LANDMARKS WITHIN THE STUDY AREA

A few landmarks buildings within the study area have been identified as potential National Historic Landmark listings. Further study and evaluation will be needed before filing official nominations.

Noland & Co. Plumbing, built in 1959 at 1117 Capital Boulevard, is a one-story International Style steel and glass building designed by Edwards, McKimmon, and Etheredge. The glass curtain wall functions provide a good view of the bathtubs, sinks and other bathroom fixtures in the showroom area. Next door, Graybar Electrical is a 1959 one-story warehouse with Moderne features that call attention to the office area.

The Melrose Knitting Mill is one of Raleigh's few remaining former textiles buildings. Located at 309 North Dawson Street it is was the former home of the Melrose Knitting Mill, which was a local manufacturer of underwear. The space currently is being transformed into a nightclub and office space.

The Peden Steel Plant, 1815 Capital Boulevard, was built in 1956. Its 1962 office, designed by Leif Valand, is a significant two-story International Style building with an exposed steel frame that showcased the company's product.

Although not in the study area, **Seaboard Station** was built in 1942 along the current CXS rail track and presently houses the Logan Trading Company and several other retail uses. It is listed as a potential National historic Landmark site. It holds significance in Raleigh's history as the first station built on the CSX rail line, and which has been adaptively reused to add value to the community.

Seaboard Station

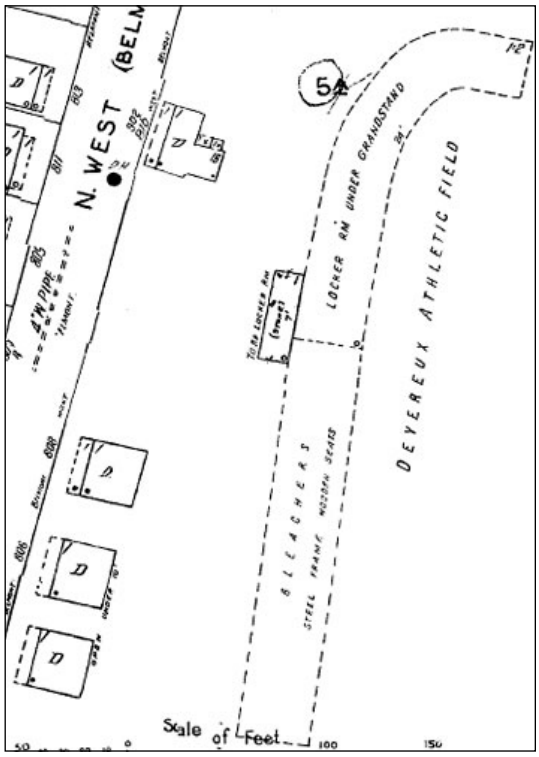
9.5 SITES OF CULTURAL SIGNIFICANCE

Old Devereaux Meadow Baseball Park. Located between the western edge of Capital Boulevard and the northern edge of Peace Street and, this narrow 16.8 acres site of the former Devereaux Meadow Baseball Park was once owned by the Devereaux family who occupied a huge mansion on a hill above the meadow where the Glenwood neighborhood now stands. The baseball park was completed in 1939 and demolished in 1979. For decades, the park was the only full-sized, fully-lit baseball field in Raleigh. The site presently houses the City's Solid Waste Department's vehicle fleet services operation. There are barely any remnants of the previous baseball park existence on the site. Yet, the cultural and historical significance of this old baseball park site is relived when Raleigh old-timers fondly cherish Devereaux Meadows, back in the late 1940 and early 1950s, with its dark green bleachers and the tall hemlocks

beyond the outfield wall, while going to watch Raleigh Capitals baseball team play during Carl Yastremski's first Pro team (before going to the Red Sox). Martin Jr. High and Morson Jr. High (now long gone) also played their home games there.

Old ballpark

During the 60s, the Raleigh minor league baseball team that played at Devereaux Meadows was at different times the affiliate of the Phillies, Pirates, and Cardinals. In 1968, the Durham Bulls merged with Raleigh to form the Raleigh-Durham Mets. The team played half its games in each of their respective cities and folded just before the start of the 1972 season. The pictured Sanborn Insurance Map section is dated 1949.



Sanford Insurance Map section 1949

The Pigeon House Branch once meandered through the meadow. When the stadium was built as a WPA project the creek was channelized. Today, the remains of the 1930s stonework of the channel are evident.

According to an old family lore, in 1860s, Thomas H. Briggs, the owner of the 145-year-old Raleigh landmark, exchanged his Confederate money for gold and buried it in the Devereaux Meadow to hide it from Sherman's Union Army. After the war, as the story goes, Briggs dug it up, and used it to open the store downtown in 1865.

Even decades after the demise of the old Baseball Park, this site still holds fond cherished memories of historical and cultural significance in the hearts of many older Raleigh residents. Thus, "Bring back the park," calls for the restoration of Devereaux Meadow near downtown Raleigh may seem noteworthy. The redevelopment potential of this old ball park site with its meandering stream and valued cultural heritage should be evaluated in the Capital Boulevard corridor study efforts underway.

Old Farmers Market on Hodges Street is a 17-acre site at 1401 Hodges Street, owned at the time by Jackie Watkins hold its cultural significance as the first State Farmers market site established in 1955. The market was created after the World War II era, in response to the need for a centralized location for wholesalers, truckers, and local farmers to display and sell their produce. In 1958, the NC Department of Agriculture leased a portion of the market and by 1961 bought control of the entire site. The North Carolina State Farmers Market was relocated in 1991 to a newly constructed facility on Agricultural

Street off Lake Wheeler Road. By the mid 1970s, the Hodge Street market grew beyond its capacity creating the need for expanded facilities. The North Carolina State Farmers Market was relocated in 1991 to a newly constructed facility on Agricultural Street off Lake Wheeler Road and Interstate-40 that was more conveniently located with better access and connectivity.

9.6 CONCLUSIONS

There are a few national historic landmark designations as well as a handful of potential ones scattered within the Capital Boulevard Corridor study area. Most of the prominent historic buildings have been adaptively reused to preserve their architectural and historical significance, while adding value and needed amenities to the community. These successfully rehabbed sites exemplify the benefits rendered through the preservation of and redevelopment of old historic and cultural resources within a community.

The old Devereaux Meadow baseball park site and the old Farmers market site hold great redevelopment opportunities. Given their cultural significance during bygone days, these sites offer opportunities to reestablish entertainment/cultural uses within, thus preserving and building upon their old cultural heritage value. The preservation of the existing historic and cultural resources, as well as other potential ones within the study area should be evaluated and encouraged with the adoption of appropriate policies and actions. The study should emphasize that historic and cultural resources lend a community a unique identity and sense of place that residents and others can easily relate to.

Old Farmers' Market