

Replacement of Bridge Nos. 227 & 213 on Capital Boulevard (US 70/US 401/NC 50)  
At Peace Street and Wade Avenue (US 70/NC 50) and Revise the Interchanges  
Wake County  
WBS No. 42263.1.1  
Federal-Aid Project BRNHS-0070(119)/BRSTP-0070(149)

**TIP Project B-5121/B-5317**

**ADMINISTRATIVE ACTION**

**ENVIRONMENTAL ASSESSMENT**

U.S. Department of Transportation  
Federal Highway Administration  
and  
N.C. Department of Transportation  
Division of Highways

Submitted pursuant to 42 U.S.C. 4332(2)C and 49 USC 303

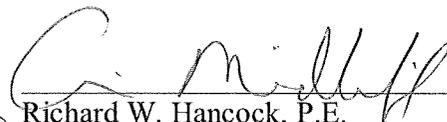


APPROVED:

12-30-13  
Date

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12-30-13  
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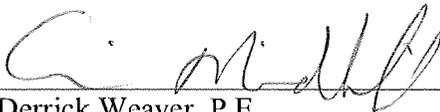
ENVIRONMENTAL ASSESSMENT



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## **PROJECT COMMITMENTS**

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Wake County

WBS No. 42263.1.1

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**TIP Project B-5121/B-5317**

All commitments developed during the project development and design phase are listed below.

### **NCDOT Hydraulics Unit:**

The Hydraulics Unit will coordinate with the NC Floodplain Mapping Program (FMP), to determine status of project with regard to applicability of NCDOT'S Memorandum of Agreement, or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

### **NCDOT Division 5:**

This project involves construction activities on or adjacent to FEMA-regulated stream(s). Therefore, the Division shall submit sealed as-built construction plans to the Hydraulics Unit upon completion of project construction, certifying that the drainage structure(s) and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.

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## SUMMARY

### A. Type of Action

This Environmental Assessment (EA) has been prepared for the Federal Highway Administration (FHWA) in accordance with the Code of Federal Regulations (CFR) 23, Part 771 for the purpose of evaluating the potential impacts of a proposed transportation improvement project.

### B. Description of Action

The North Carolina Department of Transportation (NCDOT) proposes to replace the bridges and revise the interchanges at two adjacent interchanges on Capital Boulevard (US 70/US 401/NC 50) approximately 0.7 mile apart: Bridge No. 227 at Capital Boulevard/Peace Street (Project B-5121) and Bridge No. 213 at Capital Boulevard/Wade Avenue (US 70/NC 50) (Project B-5317). The proposed projects are included in the NCDOT *2013-2023 Draft State Transportation Improvement Program (STIP)* and are programmed for right of way acquisition beginning in Fiscal Year (FY) 2015 and construction beginning in FY 2016. **Figure 1** shows the project vicinity. The primary purpose of Projects B-5121/B-5317 is to replace Bridge Nos. 227 and 213 in a timely manner since they are nearing the end of their design lives. Another desirable outcome is to improve the geometry of the interchanges.

Both bridges are deteriorating due to the age of the superstructure and substructure components. Bridge No. 227 carrying Capital Boulevard over Peace Street (Project B-5121) is a half-cloverleaf interchange built in 1948 with a Federal sufficiency rating of 43.9 out of a possible 100 (as of October 2013). Bridge No. 213 carrying Wade Avenue over Capital Boulevard (Project B-5317) is a trumpet interchange built in 1954 with a Federal sufficiency rating of 34.1 out of a possible 100 (as of November 2011). Both bridges are classified as “structurally deficient” due to age. Due to the cost and potential safety concerns of continuing to maintain the current bridges, the FHWA and NCDOT have identified a need to replace Bridge Nos. 227 and 213 through the FHWA Highway Bridge Program (HBP).

The geometry of the current interchanges is less than desirable. Potential improvements to the geometry may include increasing the radii of the interchange loops and ramps, lengthening the acceleration and deceleration lanes, lengthening the weave sections, improving grades on the ramps and loops, and increasing turn bay storage lengths.

### C. Alternatives Considered

Between the beginning of the project and selection of alternatives to carry forward for detailed study, a total of 10 alternatives have been developed at the Peace Street interchange, and nine alternatives have been developed at the Wade Avenue interchange.

Three conceptual options for the Peace Street interchange and four conceptual options for the Wade Avenue interchange were presented at the September 2011 public meeting. Following the meeting, functional designs of all seven alternatives were developed for the

purpose of estimating preliminary costs and impacts. Several new alternatives were proposed to minimize impacts to historic resources and businesses, and based on input from the public. Two alternatives for the Peace Street interchange and four alternatives for the Wade Avenue interchange were shown at the second public meeting in October 2012.

Following the public meeting comment period and a meeting with the State Historic Preservation Office in January 2013, three new alternatives were considered and several were eliminated. Preliminary designs were developed for the following four detailed study alternatives, which were presented at the November 2013 public meeting:

Peace Street Interchange

- **Alternative P-Base** – half cloverleaf
- **Alternative P5** – square loop/ramps

Wade Avenue Interchange

- **Alternative W-Base** – trumpet
- **Alternative W2c** – diamond/trumpet

The current detailed study alternatives are shown on **Figures 2a** through **2d**.

## **D. Summary of Environmental Effects**

**Tables S1 and S2** present a summary of the environmental effects of the current detailed study alternatives.

**Table S1 – Impacts of Detailed Study Alternatives – Peace Street Interchange**

Impact	Alternative	
	P-Base (Half Cloverleaf)	P5 (Square Loop/Ramps)
Business Relocations*	9	12
Impact to Business District	No adverse effect	No adverse effect because although businesses will be relocated, this alternative allows for redevelopment in SW quadrant
Effect on Development/ Land Use	No effect	Encourages redevelopment in SW quadrant because of potential driveway access from loops; City expects development in SW quadrant to be enhanced compared with alternatives that have a loop in the NW quadrant
Change in Vehicular Access	Will close Johnson Street at Capital Boulevard; will close some existing driveways on Capital Boulevard	Will allow for driveways from loops in SW quadrant; will close some existing driveways on Capital Boulevard
Change in Pedestrian Access	No change for pedestrians crossing ramps/loops; wider sidewalks on Peace Street	Improved access across square loop compared with half-cloverleaf ramps/loops; wider sidewalks on Peace Street and on square loop
Consistent with Local Plans	Not consistent with City of Raleigh’s <i>Capital Boulevard Corridor Study</i> , which recommends a square loop design. Consistent with LRTP and other local plans, which do not specify interchange type.	Consistent – partially matches design in local plan, allows City to retrofit interchange in the future
Change in Geometry	Slight increase in radius of ramp/loop in NW quadrant	Replaces southbound ramp/loop with square loop
Change in Traffic Operations	No change	Square loop is intended to function more slowly, like a street rather than an interchange ramp; adds traffic signal to northbound ramp movements
Impact to Parks	Decreases size of City’s planned park in NW quadrant	Square loop expected to have positive impact on use of City’s planned park
Historic Properties (Adverse Effect)	No Adverse Effect – Raleigh Cotton Mill (on the condition adequate access is provided) No Adverse Effect – Roundhouse**	No Adverse Effect – Raleigh Cotton Mill No Adverse Effect – Roundhouse**
Stream Impacts	Extend existing culverts for Pigeon House Branch by 20 linear feet	Extend existing culverts for Pigeon House Branch by 24 linear feet
FEMA Floodplains	1.6 acres affected; no FEMA coordination anticipated	2.0 acres affected; no FEMA coordination anticipated
Culvert Extension	1	1
Cost Estimate (in millions)		
Construction	\$10.8	\$12.0
Right of Way	\$10.8	\$17.7
Utility Relocation	\$3.8	\$8.3
Total Cost (Estimated)	\$25.4	\$38.0

\* No residential relocations are anticipated for any of the alternatives.

\*\* The Seaboard Air Line Turntable and Raleigh & Gaston Railroad HD and Roundhouse Site

Note: There were no impacts by any of the alternatives to forested areas, community facilities, wetlands, or federally protected species. There are no communities meeting the environmental justice criteria, and benefits and burdens resulting from the projects are anticipated to be equitably distributed throughout the community; therefore, there are no disproportionately high and adverse impacts to minority or low-income populations. The study area is in urbanized area as defined by US Census urbanized area maps, so a NRCS AD-1006 farmland forms for point projects are not required.

**Table S2 – Impacts of Detailed Study Alternatives – Wade Avenue Interchange**

Impact	Alternative	
	W-Base (Trumpet)	W2c (Diamond/Trumpet)
Business Relocations*	1	9
Impact to Business District	No adverse effect	No adverse effect
Effect on Development/ Land Use	No effect	Diamond ramps will improve access to businesses on east side of Capital Boulevard
Change in Vehicular Access	No change	Retains existing trumpet ramps but adds half-diamond ramps on the east side of Capital, providing access to properties on that side
Change in Pedestrian Access	No change	Improved access across diamond interchange compared with trumpet ramp
Consistent with Local Plans	Not consistent with City of Raleigh's <i>Capital Boulevard Corridor Study</i> , which recommends a diamond design. Consistent with LRTP and other local plans, which do not specify interchange type.	Consistent – partially matches design in local plan, allows City to retrofit interchange and extend West Street in the future
Change in Geometry	No change	Replaces flyover ramp with on/off ramps on east side
Change in Traffic Operations	No change	Convert northbound on/off ramps from free-flow movement to signal-controlled
Impact to Parks	No effect on existing or planned parks	No effect on existing or planned parks
Historic Properties (Adverse Effect)	No Effects	No Effects
Stream Impacts	No impact	Extend existing culverts for Pigeon House Branch by 34 linear feet
FEMA Floodplains	0.2 acres; no FEMA coordination anticipated	0.1 acres; FEMA coordination is anticipated
Culvert Extension	0	1
Cost Estimate (in millions)		
Construction	\$5.6	\$8.2
Right of Way	\$0.4	\$10.3
Utility Relocation	\$2.0	\$5.1
Total Cost (Estimated)	\$8.0	\$23.6

\* No residential relocations are anticipated for any of the alternatives.

Note: There were no impacts by any of the alternatives to forested areas, community facilities, wetlands, or federally protected species. There are no communities meeting the environmental justice criteria, and benefits and burdens resulting from the projects are anticipated to be equitably distributed throughout the community; therefore, there are no disproportionately high and adverse impacts to minority or low-income populations. The study area is in urbanized area as defined by US Census urbanized area maps, so a NRCS AD-1006 farmland forms for point projects are not required.

## E. Permits Required

In accordance with Section 404 of the Clean Water Act, permits will be required from the US Army Corps of Engineers (USACE) for any activities that encroach into jurisdictional wetlands or “waters of the United States.” In addition, Section 401 of the Clean Water Act requires each state to certify that state water quality standards will not be violated for

activities that: 1) involve issuance of a federal permit or license or 2) require discharges into “waters of the United States.” It is not anticipated that an Individual Section 404 permit will be required from USACE for encroachment into wetlands and water courses along the proposed project.

## **F. Other Highway and Non-Highway Actions**

**Residential and Commercial Development Projects.** There are numerous site-specific commercial and residential development plans for individual parcels in the vicinity of the projects that currently have either received permits or are in the application phase. Also, William Peace University (located two blocks east of the Peace Street interchange) has recently purchased the Seaboard development and has plans to continue to expand its facilities.

**City Development Project.** The City is in the process of vacating its existing operations center west of Capital Boulevard between Dortch and Peace Streets. At that time, the City plans to convert the 17-acre tract, much of which is in the floodway and floodplain, into a park with athletic facilities.

**City Utility Project.** The City of Raleigh plans to construct a new sewer interceptor at the Wade Avenue interchange, which will move the sewer lines out of the Capital Boulevard right of way. Also, the sewer lines from Wade Avenue to Peace Street are nearing capacity, and will need to be expanded. This expansion/relocation project is expected to be completed in 2016.

**Rail Project.** The proposed Southeast High Speed Rail corridor will cross Capital Boulevard between Wade Avenue and Peace Street. This project is not currently funded.

**Other Transportation and Infrastructure Projects.** The *Peace Street Visioning Study* (May 2011) proposed improvements to Peace Street between Glenwood Avenue and Person Street including bicycle and pedestrian facilities on Peace Street and West Street, redevelopment of underutilized properties, and a new transit station near the CSX bridge over Peace Street. According to local planners, the Peace Street East portion of this project was put on hold until NCDOT selected an alternative at the Capital Boulevard/Peace Street interchange, but the City expects to move forward again with that project later this year. The *Capital Boulevard Corridor Study* (August 2012) proposes extending West Street over Wade Avenue, but this project is not funded.

## **G. Coordination**

As part of the public involvement process, three public meetings and three local officials’ meetings were held. Public meetings were announced via newsletter/postcard and press releases.

The following federal, state and local agencies were contacted regarding the proposed project:

- US Army Corps of Engineers
- US Environmental Protection Agency
- US Fish and Wildlife Service
- NC Division of Water Quality
- NC Division of Parks and Recreation
- National Heritage Program
- NC Wildlife Resources Commission
- State Historic Preservation Office
- Capital Area Metropolitan Planning Organization
- City of Raleigh
- Wake County

## **H. Contact Information**

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## **I. DESCRIPTION OF PROPOSED ACTION**

### **A. General Description**

The North Carolina Department of Transportation (NCDOT) proposes to replace the bridges and revise the interchanges at two adjacent interchanges on Capital Boulevard (US 70/US 401/NC 50) approximately 0.7 mile apart: Bridge No. 227 at Capital Boulevard/Peace Street (Project B-5121) and Bridge No. 213 at Capital Boulevard/Wade Avenue (US 70/NC 50) (Project B-5317). **Figure 1** shows the project vicinity.

### **B. Historical Resume and Project Status**

The proposed projects are included in the NCDOT *2013-2023 Draft State Transportation Improvement Program* (STIP) as Projects B-5121 (Capital Boulevard/Peace Street) and B-5317 (Capital Boulevard/Wade Avenue) and are programmed for right of way acquisition beginning in Fiscal Year (FY) 2015 and construction beginning in FY 2016.

Originally, these two projects were on different schedules. Project B-5121 was scheduled in the 2009-2015 STIP. Project B-5317 was added in the draft 2011-2020 STIP, originally two years behind Project B-5121. In the final 2012-2020 STIP, both projects were given the same schedule for right of way acquisition and construction.

The current STIP description is to replace Bridge Nos. 227 and 213. However, NCDOT is in the process of changing the STIP description to allow for an expanded scope in coordination with the City of Raleigh. Both projects would be divided into two sections, with the following descriptions:

#### **B-5121**

*Current STIP description:* US 70/US 401/NC 50 (Capital Boulevard), Replace Bridge No. 227 over Peace Street in Raleigh

*Proposed STIP description:* US 70/US 401/NC 50 (Capital Boulevard), Replace Bridge No. 227 over Peace Street in Raleigh and Revise Interchange

- Proposed Section A: Replace Bridge No. 227 over Peace Street
- Proposed Section B: Revise Interchange at Capital Boulevard / Peace Street

#### **B-5317**

*Current STIP description:* US 70 Westbound/NC 50 Northbound (Wade Avenue), Replace Bridge No. 213 over US 401 (Capital Boulevard), in Raleigh

*Proposed STIP description:* US 70 Westbound/NC 50 Northbound (Wade Avenue), Replace Bridge No. 213 over US 401 (Capital Boulevard), in Raleigh and Revise Interchange

- Proposed Section A: Replace Bridge No. 213 over US 401 (Capital Boulevard)
- Proposed Section B: Revise Interchange at Capital Boulevard / Wade Avenue

If the City of Raleigh provides funding for either Project B-5121 and/or Project B-5317, the interchange improvements will likely be constructed in addition to the bridge replacements. If the City does not provide funding, only the bridge replacements (Alternatives P-Base and W-Base) will be constructed at this time.

### C. Cost Estimates

**Table 1** summarizes the estimated costs for the Project B-5121/B-5317 detailed study alternatives.

**Table 1 – Cost Estimate**

Item	Estimated Cost (in millions)			
	Project B-5121 (Peace Street)		Project B-5317 (Wade Avenue)	
	P-Base	P5	W-Base	W2c
Construction	\$10.8	\$12.0	\$5.6	\$8.2
Right of Way	\$10.8	\$17.7	\$0.4	\$10.3
Utilities	\$3.8	\$8.3	\$2.0	\$5.1
<b>Total</b>	<b>\$25.4</b>	<b>\$38.0</b>	<b>\$8.0</b>	<b>\$23.6</b>

The total cost for Project B-5121 (Peace Street interchange) included in the draft 2013-2023 STIP is \$6.1 million. This includes \$1 million for right of way acquisition and \$5.1 million for construction. The total cost for Project B-5317 (Wade Avenue interchange) included in the draft 2013-2023 STIP is \$6.8 million. This includes \$593,000 for right of way acquisition and \$6.3 million for construction.

The City of Raleigh has partnered with NCDOT during the planning and preliminary design phase of the project. Alternative P5 and Alternative W2c are the City’s preferred alternatives. Both alternatives are more expensive than the “base” alternatives. The City is considering providing funds towards right of way, utility relocation, and construction of this project. The City Council will decide whether or not to contribute funds toward Alternative P5 and/or Alternative W2c following approval of the Environmental Assessment. The final selected alternatives will be discussed in an anticipated Finding of No Significant Impact (FONSI). If the City approves the funds, the City and NCDOT will sign a Memorandum of Agreement.

## II. PURPOSE AND NEED FOR PROPOSED PROJECT

### A. Purpose for Project

The primary purpose of Projects B-5121/B-5317 is to replace Bridge Nos. 227 and 213 in a timely manner since they are nearing the end of their design lives. Another desirable outcome is to improve the geometry of the interchanges.

### B. Need for Project

**The bridges are nearing the end of their design lives.** Both bridges are deteriorating due to the age of the superstructure and substructure components. Bridge No. 227 carrying

Capital Boulevard over Peace Street (Project B-5121) is a half-cloverleaf interchange built in 1948 with a Federal sufficiency rating of 43.9 out of a possible 100 (as of October 2013). Bridge No. 213 carrying Wade Avenue over Capital Boulevard (Project B-5317) is a trumpet interchange built in 1954 with a Federal sufficiency rating of 34.1 out of a possible 100 (as of November 2011). Both bridges are classified as “structurally deficient” due to age. Due to the cost and potential safety concerns of continuing to maintain the current bridges, the Federal Highway Administration (FHWA) and NCDOT have identified a need to replace Bridge Nos. 227 and 213 through the FHWA Highway Bridge Program (HBP).

**The geometry of the current interchanges is less than desirable.** Existing turning radii of interchange loops and ramps are below current standards and some turn bay storage lengths do not accommodate queues during peak hours. Potential improvements to the geometry may include increasing the radii of the interchange loops and ramps, lengthening the acceleration and deceleration lanes, lengthening the weave sections, improving grades on the ramps and loops, and increasing turn bay storage lengths.

## 1. Description of Existing Conditions

### a) *Functional Classification*

Capital Boulevard is functionally a freeway, designated as a Principal Arterial in the Wake County Thoroughfare Plan. Peace Street is functionally a collector designated as a Major Thoroughfare. Wade Avenue is functionally a principal arterial designated as a Major Thoroughfare.

### b) *Physical Description of Existing Facility*

#### 1.0 Roadway Cross-Section

Capital Boulevard has six lanes with curb and gutter, plus an auxiliary lane northbound between Peace Street and Wade Avenue. A Jersey barrier with flat green barriers on top to block glare from oncoming traffic separates northbound and southbound travel lanes.



*Capital Boulevard facing north from the CSX railroad bridge toward Peace Street*

Peace Street has five lanes with curb and gutter and sidewalks on both sides. Clearance under the Capital Boulevard bridge is 14'2."



*Peace Street facing east toward the Capital Boulevard northbound ramps*

Wade Avenue has four lanes with curb and gutter separated by a 6-inch concrete median through this section.



*Wade Avenue ramp and loop facing south toward Capital Boulevard*

## 2.0 Right of Way and Access Control

Existing right of way through the study area is approximately 110 feet wide on Capital Boulevard between Wade Avenue and Peace Street, between 70 and 75 feet wide on Peace Street near Capital Boulevard, and 80 feet wide on Wade Avenue. Capital Boulevard has limited control of access, with interchanges and some driveways on Capital Boulevard and

on the on/off ramps at both interchanges. There is no control of access along Peace Street or Wade Avenue within the project limits.

### 3.0 Speed Limit

The posted speed limit on Capital Boulevard is 45 miles per hour (mph) from north of Wade Avenue to south of Peace Street. The speed limit on Peace Street and Wade Avenue is 35 mph.

### 4.0 Intersections and Interchanges

The Capital Boulevard/Wade Avenue interchange is a trumpet configuration. The Capital Boulevard/Peace Street interchange is a half-clover configuration.

Other streets that intersect Capital Boulevard include Old Williamson Road, Dortch Street, and Johnson Street. On the north end of the study area, West Street intersects the on-ramp from Wade Avenue to southbound Capital Boulevard. On the south end of the study area, West Street intersects Peace Street. Several other neighborhood and business district intersections are within the study area.

### 5.0 Structures

Built in 1948, Bridge No. 227 (Peace Street interchange) was inspected in October 2013. It is a steel continuous-girder bridge with a concrete deck. The existing bridge is 137 feet long and consists of three spans. It is approximately 81 feet wide with a roadway clear width of 68 feet. It crosses the road at a 12-degree skew, and carries six lanes of Capital Boulevard over four lanes of Peace Street. It has a vertical clearance of approximately 14.2 feet over Peace Street. The bridge is deteriorating due to the age of the superstructure and substructure components. The bridge is classified as “structurally deficient” due to deterioration. The deck has been assessed a condition rating of 4 (“poor”), and the superstructure and substructure are rated as 5 (“fair”).

Bridge No. 213 (Wade Avenue interchange) was inspected in November 2011 (an updated report will be available in early 2014). It is a reinforced concrete-deck girder bridge built in 1954. The existing bridge is 261 feet long and consists of six spans. It is approximately 42 feet wide, with a roadway clear width of 34 feet. It crosses the road at a 23 degree skew, and carries two lanes of Wade Avenue over six lanes of Capital Boulevard. It has a vertical clearance of approximately 14 feet over Capital Boulevard. The bridge is deteriorating due to the age of the superstructure and substructure components. The bridge is classified as “structurally deficient” due to deterioration. The deck has been assessed a condition rating of 5 (“fair”), and the superstructure and substructure are rated as 4 (“poor”). The bridge is currently posted at 23 tons for Single Vehicle Truck and 27 tons for Truck Tractors with Semi-Trailers.

Bridge inspection reports are included in Appendix C.



*Capital Boulevard  
bridge over Peace Street*



*Wade Avenue bridge  
over Capital Boulevard*

## 6.0 Bicycle and Pedestrian Facilities

On Capital Boulevard, 6-foot wide sidewalks are adjacent to travel lanes in both directions, including along the ramps at the Peace Street interchange. Sidewalks on both sides of Wade Avenue and Peace Street are separated from travel lanes by a narrow grass strip.

Pedestrian counts were performed in August 2013. Over a 24-hour mid-week period, the following were observed:

### **Wade Avenue interchange**

- 30 pedestrians on the sidewalks along the Wade Avenue flyover ramp and loop (5 westbound and 25 eastbound).

### **Peace Street interchange**

- 52 pedestrians on the sidewalks along Capital Boulevard near the northbound Capital Boulevard ramps/Peace Street intersection (16 on the west side and 36 on the east side).

- 325 pedestrians on the sidewalks along Peace Street near the northbound Capital Boulevard ramps/Peace Street intersection (178 on the north side and 147 on the south side).
- 20 pedestrians on the sidewalks along Capital Boulevard near the southbound Capital Boulevard ramps/Peace Street intersection (15 on the west side and 5 on the east side).
- 292 pedestrians on the sidewalks along Peace Street near the southbound Capital Boulevard ramps/Peace Street intersection (151 on the north side and 141 on the south side).

Pedestrian counts on Capital Boulevard were spread throughout the day, with one spike at 6:30 a.m. Counts on Peace Street were steady throughout the day, with only a slight decrease between midnight and 6:00 a.m. Counts on Wade Avenue ramps were spread throughout the day, with no discernible peaks.

There are no designated bike routes or bicycle facilities on Capital Boulevard, Peace Street, or Wade Avenue. However, Flythe Cyclery is located on Peace Street at West Street, two blocks west of the interchange. This business attracts many bicycle users for repairs, parts, and purchases. Bicyclists were observed in the area during the site visit.

## 7.0 Utilities

The following information is based on a preliminary assessment of existing utilities in the study area. A detailed utilities survey will be conducted prior to final design.

### **Peace Street interchange**

- Underground natural gas lines are along Peace Street under Capital Boulevard.
- Underground telephone and cable lines are along Capital Boulevard and Peace Street.
- An overhead transmission line crosses Capital Boulevard north of the existing bridge.
- North of the Peace Street interchange, sewer lines are under both Capital Boulevard northbound and southbound lanes. Sewer lines also are under the center of the westbound lane of Peace Street.
- Several stormwater pipes and structures cross Capital Boulevard between the railroad overpass to the U-Haul Storage Center.

### **Wade Avenue interchange**

- Underground gas lines are along Capital Boulevard and Wade Avenue.
- Underground telephone and cable lines are along Capital Boulevard and Wade Avenue. In addition, fiber optic cable lines cross over Wade Avenue northwest of the existing bridge, cross over Capital Boulevard north of the existing bridge, and run along Capital Boulevard southeast of the existing bridge.

- Overhead power lines run along Wade Avenue for both Capital Boulevard northbound and southbound on-ramps. Power lines also are along the west side of Capital Boulevard, south of the Wade Avenue ramp and along the east side north of the Wade Avenue ramp. A transmission line travels parallel to West Street prior to traveling along Fairview Road.
- Sewer lines run along the west side of Capital Boulevard and branch off into the grass between existing Wade Avenue and Fairview Road. They also run along the center of West Street and Dortch Street, south of Wade Avenue.
- Offset from Capital Boulevard are various stormwater inlets, primarily on the east side of the roadway.

**c) Transit**

Capital Area Transit (CAT) operates three routes in the study area. All three routes travel along Peace Street, and bus stops are located on both sides of Peace Street near the Capital Boulevard southbound ramps and on the north side of Peace Street near the northbound ramps.

**d) Traffic Carrying Capacity**

**1.0 Existing Traffic Volumes**

The observed average daily traffic volume (ADT) in 2011 along Capital Boulevard between Peace Street and Wade Avenue was 55,000 vehicles per day (vpd). Approximately 5% of the total traffic volume is comprised of trucks (delivery/box trucks and tractor-trailers). Existing traffic volumes in the project area are shown in **Figures 3a** and **3b**.

**2.0 Existing Levels of Service**

Level of service (LOS), as defined in the *Highway Capacity Manual 2010* (HCM), ranges from A to F and indicates progressively worse delay conditions. **Table 2** displays the LOS thresholds for signalized intersection delay values.

**Table 2 – LOS Criteria for Signalized Intersections**

Level of Service (LOS)	Delay per Vehicle (seconds per vehicle)	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10	0-10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	>25-35
E	> 55-80	>35-50
F	> 80	>50

Source: Highway Capacity Manual, 2010

Analyses were performed for signalized and unsignalized intersections in the project area to determine LOS and delay for each study intersection under existing conditions. The northbound movement at the unsignalized Peace Street/Vaughn Court intersection experiences longer delays during the peak hours. **Table 3** details the results of the intersection analysis.

**Table 3 – Existing (2011) Intersection Levels of Service and Delay (No Build)**

Location	LOS (Delay)	
	AM Peak Hour	PM Peak Hour
Peace Street at Capital Boulevard southbound ramps (unsignalized)	SB – F (121.8)	SB – C (16.8)
Peace Street at Capital Boulevard northbound ramps (signalized)	A (9.2)	B (18.0)
Peace Street at West Street (signalized)	A (9.8)	A (8.8)
Peace Street at Vaughn Court (unsignalized)	NB – E (37.8) SB – B (13.8)	NB – F (56.5) SB – C (17.0)
Peace Street at Halifax Street/Salisbury Street/Wilmington Street (signalized)	B (18.4)	C (22.7)
West Street at Harrington Street (unsignalized)	WB – B (10.2)	WB – B (10.3)
Harrington Street at Johnson Street (unsignalized)	WB – A (9.0)	WB – A (8.9)

Note: There are no existing intersections at the Wade Avenue interchange because the trumpet design includes all free-flow movements.

### 3.0 Future Traffic Volumes

The *Traffic Forecast Report* (June 2011) projects growth of approximately 1% per year on Capital Boulevard. The year 2035 projected traffic volume on Capital Boulevard is estimated to be approximately 69,000 vpd between Peace Street and Wade Avenue. **Figures 3c** and **3d** present projected future traffic volumes for the no-build scenario in the project area.

### 4.0 Future Levels of Service

**Table 4** summarizes the projected (2035) LOS and intersection delays for the study intersections. Both northbound and southbound movements at the unsignalized Peace Street/Vaughn Court intersection experience longer delays during the peak hours.

**Table 4 – Year 2035 Projected Intersection Levels of Service and Delay (No Build)**

Location	LOS (Delay)	
	AM Peak Hour	PM Peak Hour
Peace Street at Capital Boulevard southbound ramps (signalized)*	B (15.3)	A (9.5)
Peace Street at Capital Boulevard northbound ramps (signalized)	B (12.1)	C (33.8)
Peace Street at West Street (signalized)	B (11.1)	B (11.6)
Peace Street at Vaughn Court (unsignalized)	NB – F (232.4) SB – D (30.5)	NB – F (1271.1) SB – F (836.4)
Peace Street at Halifax Street/Salisbury Street/Wilmington Street (signalized)	C (24.1)	C (33.6)
West Street at Harrington Street (unsignalized)	WB – B (11.1)	WB – B (11.1)
Harrington Street at Johnson Street (unsignalized)	WB – A (9.0)	WB – A (9.0)

\* This intersection is currently unsignalized, but a traffic signal was assumed to be warranted in the 2035 No Build scenario based on traffic volumes.

**e) Accident Data**

A crash analysis was performed for the three-year period of February 28, 2008, to February 28, 2011.

**Capital Boulevard over Peace Street.** Ninety-five crashes occurred along the roadway segment over Peace Street. Crashes along Capital Boulevard over Peace Street were highly concentrated around the ramps, with 60 of the 95 total crashes occurring within 100 feet of the acceleration and deceleration ramp entrances. Thirty-five percent of collisions (33) occurred within 150 feet of the southbound on-ramp and the northbound off-ramp where there are no acceleration or deceleration lanes to assist motorists in making the transition from freeway speeds to low-speed, tight spiral ramps.

**Peace Street at the Capital Boulevard interchange.** A total of 128 crashes occurred along Peace Street at the Capital Boulevard interchange. Most collisions on Peace Street occurred at the intersections with West Street, Capital Boulevard northbound and southbound Ramps, and Vaughn Court.

**Wade Avenue ramp at Capital Boulevard.** Six crashes resulting in property damage only (no injuries or fatalities) occurred along the roadway segment on the Wade Avenue Ramp. This resulted in an Estimated Property Damage Only (EPDO) severity index of 1.0, the lowest possible. These collisions may have occurred because of the tight horizontal geometry of the ramp.

**f) Airports**

The nearest airport to the project is Raleigh-Durham International Airport, which is approximately 12 miles to the west.

**g) Projects in the Area**

**Residential and Commercial Development Projects.** There are numerous site-specific development plans for individual parcels in the vicinity of the projects that currently have either received permits or are in the application phase. William Peace University (previously Peace College) plans to continue to expand its facilities. William Peace University has recently purchased the Seaboard development, and a new development on the north end of the property is currently under review by the City and may include a combination of offices and high-density residences. Several large-scale commercial and residential developments also are planned for the area east of the Peace Street bridge. The closest of these to the interchange is the Blount Street Commons project, a residential and commercial development located four blocks east of the bridge that has been approved by the City but is only partially constructed.

**City Development Project.** The City is in the process of vacating its existing operations center west of Capital Boulevard between Dortch and Peace Streets. At that time, the City plans to convert the 17-acre tract, much of which is in the floodway and floodplain, into a park with athletic facilities.

**City Utility Project.** The City of Raleigh plans to construct a new sewer interceptor at the Wade Avenue interchange, which will move the sewer lines out of the Capital Boulevard right of way. Also, the sewer lines from Wade Avenue to Peace Street are nearing capacity, and will need to be expanded. This expansion/relocation project is expected to be completed in 2016. The City and NCDOT have been coordinating the schedule for these projects with the bridge replacement projects.

**Rail Project.** The proposed Southeast High Speed Rail corridor will cross Capital Boulevard between Wade Avenue and Peace Street. This project is not currently funded.

**Other Transportation and Infrastructure Projects.** The *Peace Street Visioning Study* (May 2011) proposed improvements to Peace Street between Glenwood Avenue and Person Street, including bicycle and pedestrian facilities on Peace Street and West Street, redevelopment of underutilized properties, and a new transit station near the CSX bridge over Peace Street. According to local planners, the Peace Street East portion of this project was put on hold until NCDOT selected an alternative at the Capital Boulevard/Peace Street interchange, but the City expects to move forward again with that project later this year. The *Capital Boulevard Corridor Study* (August 2012) proposes extending West Street over Wade Avenue, but this project is not funded.

**2. Transportation and Land Use Plans**

Several approved transportation and land use plans apply to the study area. To accommodate the vision of these plans, the replacement bridges would encourage safe pedestrian use along Peace Street and Capital Boulevard and accommodate pedestrian, commuter, and local access to downtown Raleigh. City planners also have requested that pedestrian facilities be upgraded on Peace Street and Wade Avenue and added to the Capital Boulevard/Wade Avenue interchange.

**a)      *Transportation Plans***

**Capital Area Metropolitan Planning Organization 2040 Long-Range Transportation Plan (May 2009).** The Long-Range Transportation Plan is the region’s guide for future investment in roads, transit services, and bicycle and pedestrian facilities to accommodate anticipated growth in the Triangle. It inventories existing infrastructure and transportation-related services and identifies future needs and potential funding sources. The Capital Boulevard corridor has been identified for light rail transit and commuter rail by 2030. It also has been identified for future bicycle accommodations. There are no roadway plans within the study area.

**Raleigh Bicycle Transportation Plan (April 2009).** The purpose of this plan is to increase mode share and safety for all levels of cycling and to provide a bicycle-friendly environment. It develops a program to address the short- and long-term needs for bicyclists and bicycle facilities, and promotes bicycling for recreation and commuting. Bicycle accommodations are recommended on Peace Street, West Street, and Fairview Road. These include shared lanes (“sharrows”) along West Street and Fairview Road, and a bicycle lane in combination with a road diet on Peace Street from Glenwood Avenue to Person Street. At a February 2011 meeting, local planners noted that although the plan calls for a road diet on Peace Street, they do not recommend this treatment between the ramps at the Capital Boulevard interchange. The remaining section of the proposed road diet is not funded.

**b)      *Land Use Plans***

**City of Raleigh Capital Boulevard Corridor Study Report (August 2012).** The City of Raleigh developed a study to “craft a vision and strategy for the revitalization, redevelopment, and renewal of Capital Boulevard from Downtown to I-440.” The study area for the bridge replacement projects is contained within the larger corridor study area. The report includes transportation recommendations for roadways, transit, greenways, sidewalks, and bicycle accommodations, as well as land use/development goals. Within the bridge replacement study area, the report proposes extending West Street over Wade Avenue, adding a greenway along West Street, replacing the Jersey barrier on Capital Boulevard with a planted median, and introducing light rail along Capital Boulevard. It supports a square loop design for the Capital Boulevard/Peace Street interchange, and a diamond design for the Capital Boulevard/Wade Avenue interchange.

**City of Raleigh 2030 Comprehensive Plan (November 2009).** Raleigh’s Comprehensive Plan is a policy document that provides the vision and associated strategies for the City to manage its growth in the next 20 years. A future greenway corridor is identified along Pigeon House Branch from Crabtree Creek to Wake Forest Road, although local planners have recently noted that the greenway in the project area will likely be constructed along West Street instead of Pigeon House Branch to avoid the floodplain. In the vicinity of Projects B-5121 and B-5317, the City is recommending a new collector street parallel with the Norfolk Southern rail line, which would serve as an extension/relocation of West Street between Fairview Road and Wake Forest Road. Capital Boulevard to Atlantic Avenue is identified for future regional rail, and Glenwood Avenue and Capital Boulevard are targeted multimodal corridors. Peace Street is identified as a bicycle route with bicycle lanes to be established through a road diet (currently unfunded).

**Peace Streetscape and Parking Plan (March 15, 2005).** This plan includes commercially zoned properties along Peace Street from West Street to St. Mary's Street, and extends south to North Street. The streetscape improvements outlined in the plan are intended to enhance the appearance of the corridor, improve pedestrian safety, and support economic development in the area. Pedestrian and bicycle accommodations were recommended on Peace Street combined with a road diet between Clark Street and Glenwood Avenue (both implemented several years ago). This plan has been fully funded, but funding for the remainder of the recommendations is currently being held in reserve for economic reasons.

**Glenwood South Streetscape and Parking Plan (January 2000).** This plan covers the Glenwood Avenue commercial area. The goal of this plan was to provide a coordinated streetscape concept, recommend parking improvements, and revise standards necessary to support a pedestrian-oriented urban development pattern. Although the City's intent at the time of this plan was to construct a transit station on the south side of Peace Street near Harrington Street, current conversations with City planners indicate this station likely will be located over Peace Street east of Capital Boulevard. This plan has been completed, and the City is now updating its Unified Development Ordinances.

**Downtown Overlay District (DOD).** The DOD is bound by West Street on the west, Wilmington Street on the east, and extends to the north along the CSX rail line to Halifax Street and to the south through the downtown. Within the study area, the DOD includes Seaboard Station and the Peace Street interchange except for the northwest quadrant. The DOD establishes exceptions to regulations such as minimum setback standards, maximum height standards, and parking requirements that vary between the numerous underlying zoning districts within the downtown area. It provides for high-density residential development and ground-level retail use regardless of the underlying zoning district.

### **C. Traffic Operations with Project**

**Table 5** lists the projected 2035 (Build) LOS and delay for the study intersections with construction of the project. The analysis included improved laneage and signal timing.

**Table 5 – Year 2035 Projected Intersection Levels of Service and Delay**

Location	LOS (Delay)	
	AM Peak Hour	PM Peak Hour
<b>Alternative P-Base</b>		
Peace Street at Capital Boulevard southbound ramps/Harrington Street Extension (signalized)	B (12.5)	B (10.8)
Peace Street at Capital Boulevard northbound ramps (signalized)	B (10.8)	B (15.4)
<b>Alternative P5</b>		
Peace Street at Capital Boulevard southbound ramps/Harrington Street Extension (signalized)	B (13.1)	A (9.6)
Peace Street at Capital Boulevard northbound ramps (signalized)	B (14.9)	C (24.6)
Peace Street at West Street (signalized)	A (9.3)	A (9.5)
Peace Street at Vaughn Court (unsignalized)	NB – F (172.4) SB – D (26.8)	NB – F (1562.3) SB – F (Err)*
Peace Street at Halifax Street/Salisbury Street/Wilmington Street (signalized)	C (21.8)	C (33.9)
West Street at Harrington Street (unsignalized)	WB – B (11.7)	WB – B (11.4)
Harrington Street at Johnson Street (unsignalized)	WB – E (42.9)	WB – B (13.8)
Harrington Street at Harrington Street Extension (unsignalized)	EB – B (10.6)	EB – B (10.3)
<b>Alternative W2c</b>		
Wade Avenue at Capital Boulevard northbound ramps (signalized)	D (40.6)	D (44.8)
Wade Avenue at West Street (unsignalized)	NB – C (22.9)	NB – C (18.0)

\* Synchro does not report LOS for unsignalized movements with a volume/capacity ratio greater than 3.0.

### III. ALTERNATIVES

#### A. No Build Alternative

Typically, the No Build alternative implies no action will be taken. In this situation, since a no-action alternative would create an unsafe situation for the interchanges, the No Build alternative is not acceptable. However, the No Build alternative serves as a basis for comparing impacts and benefits of the build alternatives.

#### B. Preliminary Build Alternatives

Between the beginning of the project and selection of alternatives to carry forward for detailed study, a total of ten alternatives were developed at the Peace Street interchange, and nine alternatives were developed at the Wade Avenue interchange. This section summarizes the alternatives considered, which are described in more detail in the *Alternatives Development Report* (September 2013).

The following conceptual options were presented to the public at the September 2011 public meeting:

**Peace Street interchange**

- **Alternative P1** – diamond
- **Alternative P2** – square loop
- **Alternative P3** – bowtie

**Wade Avenue interchange**

- **Alternative W1** – trumpet
- **Alternative W2** – diamond with West Street bridge
- **Alternative W3** – compressed diamond West Street bridge
- **Alternative W4** – compressed diamond with right-in/right-out at West Street

Functional designs of these (above) seven alternatives were developed for the purpose of estimating preliminary costs and impacts. Between November 2011 and July 2012, several alternatives were eliminated because they had higher impacts, or did not offer the same benefits as another alternative with similar impacts. Alternatives P2, W1, and W2 were modified to reduce impacts. Finally, “base” alternatives were added, which are designs similar to the existing interchanges (a half cloverleaf at Peace Street and a trumpet at Wade Avenue).

After several modifications of Alternatives P2, W1, and W2, the following alternatives were shown at the second public meeting in October 2012:

**Peace Street interchange**

- **Alternative P-Base** – half cloverleaf
- **Alternative P2d** – square loop

**Wade Avenue interchange**

- **Alternative W-Base** – trumpet
- **Alternative W1a** – trumpet
- **Alternative W2** – diamond with West Street bridge
- **Alternative W2b** – diamond

## **C. Detailed Study Alternatives**

Following the October 2012 public meeting comment period and a meeting with the State Historic Preservation Office in January 2013, Alternative P2d was eliminated because of impacts to the historic Roundhouse site. Alternative P5 was introduced as a new alternative that retains a square loop in the southwest quadrant and uses ramps in the east quadrants to avoid the Roundhouse. At Wade Avenue, Alternative W2 was eliminated because of the cost and impacts of constructing a West Street bridge over Wade Avenue. Alternative W2b was modified to combine the diamond and trumpet designs, which reduces impacts to properties on the west side of Capital Boulevard.

Preliminary designs were developed for the following detailed study alternatives:

### **Peace Street interchange**

- **Alternative P-Base** – half cloverleaf
- **Alternative P5** – square loop/ramps

### **Wade Avenue interchange**

- **Alternative W-Base** – trumpet
- **Alternative W2c** – diamond/trumpet

Impacts of the current alternatives are shown on **Tables 6 and 7**.

If the City of Raleigh provides funding for Project B-5121, Alternative P5 will likely be selected as the preferred alternative. Otherwise, Alternative P-Base will be selected.

If the City provides funding for Project B-5317, Alternative W2c will likely be selected as the preferred alternative. Otherwise, Alternative W-Base will be selected.

**Table 6 – Impacts of Detailed Study Alternatives – Peace Street Interchange**

Impact	Alternative	
	P-Base (Half Cloverleaf)	P5 (Square Loop/Ramps)
Business Relocations*	9	12
Impact to Business District	No adverse effect	No adverse effect because although businesses will be relocated, this alternative allows for redevelopment in SW quadrant
Effect on Development/ Land Use	No effect	Encourages redevelopment in SW quadrant because of potential driveway access from loops; City expects development in SW quadrant to be enhanced compared with alternatives that have a loop in the NW quadrant
Change in Vehicular Access	Will close Johnson Street at Capital Boulevard; will close some existing driveways on Capital Boulevard	Will allow for driveways from loops in SW quadrant; will close some existing driveways on Capital Boulevard
Change in Pedestrian Access	No change for pedestrians crossing ramps/loops; wider sidewalks on Peace Street	Improved access across square loop compared with half-cloverleaf ramps/loops; wider sidewalks on Peace Street and on square loop
Consistent with Local Plans	Not consistent with City of Raleigh’s <i>Capital Boulevard Corridor Study</i> , which recommends a square loop design. Consistent with LRTP and other local plans, which do not specify interchange type.	Consistent – partially matches design in local plan, allows City to retrofit interchange in the future
Change in Geometry	Slight increase in radius of ramp/loop in NW quadrant	Replaces southbound ramp/loop with square loop
Change in Traffic Operations	No change	Square loop is intended to function more slowly, like a street rather than an interchange ramp; adds traffic signal to northbound ramp movements
Impact to Parks	Decreases size of City’s planned park in NW quadrant	Square loop expected to have positive impact on use of City’s planned park
Historic Properties (Adverse Effect)	No Adverse Effect – Raleigh Cotton Mill (on the condition adequate access is provided) No Adverse Effect – Roundhouse**	No Adverse Effect – Raleigh Cotton Mill No Adverse Effect – Roundhouse**
Stream Impacts	Extend existing culverts for Pigeon House Branch by 20 linear feet	Extend existing culverts for Pigeon House Branch by 24 linear feet
FEMA Floodplains	1.6 acres affected; no FEMA coordination anticipated	2.0 acres affected; no FEMA coordination anticipated
Culvert Extension	1	1
Cost Estimate (in millions)		
Construction	\$10.8	\$12.0
Right of Way	\$10.8	\$17.7
Utility Relocation	\$3.8	\$8.3
Total Cost (Estimated)	\$25.4	\$38.0

\* No residential relocations are anticipated for any of the alternatives.

\*\* The Seaboard Air Line Turntable and Raleigh & Gaston Railroad HD and Roundhouse Site

Note: There were no impacts by any of the alternatives to forested areas, community facilities, wetlands, or federally protected species. There are no communities meeting the environmental justice criteria, and benefits and burdens resulting from the projects are anticipated to be equitably distributed throughout the community; therefore, there are no disproportionately high and adverse impacts to minority or low-income populations. The study area is in urbanized area as defined by US Census urbanized area maps, so a NRCS AD-1006 farmland forms for point projects are not required.

**Table 7 – Impacts of Detailed Study Alternatives – Wade Avenue Interchange**

Impact	Alternative	
	W-Base (Trumpet)	W2c (Diamond/Trumpet)
Business Relocations*	1	9
Impact to Business District	No adverse effect	No adverse effect
Effect on Development/ Land Use	No effect	Diamond ramps will improve access to businesses on east side of Capital Boulevard
Change in Vehicular Access	No change	Retains existing trumpet ramps but adds half-diamond ramps on the east side of Capital, providing access to properties on that side
Change in Pedestrian Access	No change	Improved access across diamond interchange compared with trumpet ramp
Consistent with Local Plans	Not consistent with City of Raleigh's <i>Capital Boulevard Corridor Study</i> , which recommends a diamond design. Consistent with LRTP and other local plans, which do not specify interchange type.	Consistent – partially matches design in local plan, allows City to retrofit interchange and extend West Street in the future
Change in Geometry	No change	Replaces flyover ramp with on/off ramps on east side
Change in Traffic Operations	No change	Convert northbound on/off ramps from free-flow movement to signal-controlled
Impact to Parks	No effect on existing or planned parks	No effect on existing or planned parks
Historic Properties (Adverse Effect)	No Effects	No Effects
Stream Impacts	No impact	Extend existing culverts for Pigeon House Branch by 34 linear feet
FEMA Floodplains	0.2 acres; no FEMA coordination anticipated	0.1 acres; FEMA coordination is anticipated
Culvert Extension	0	1
Cost Estimate (in millions)		
Construction	\$5.6	\$8.2
Right of Way	\$0.4	\$10.3
Utility Relocation	\$2.0	\$5.1
Total Cost (Estimated)	\$8.0	\$23.6

\* No residential relocations are anticipated for any of the alternatives.

Note: There were no impacts by any of the alternatives to forested areas, community facilities, wetlands, or federally protected species. There are no communities meeting the environmental justice criteria, and benefits and burdens resulting from the projects are anticipated to be equitably distributed throughout the community; therefore, there are no disproportionately high and adverse impacts to minority or low-income populations. The study area is in urbanized area as defined by US Census urbanized area maps, so a NRCS AD-1006 farmland forms for point projects are not required.

## IV. PROPOSED IMPROVEMENTS

The following section is related to the detailed study alternatives.

### A. Roadway Cross-Section and Alignment

Functional designs for the detailed study alternatives are shown on **Figures 2a** through **2d**. Proposed typical sections for the project are shown on **Figures 4**.

**Alternative P-Base.** This “half cloverleaf” alternative includes ramps and loops in the northeast and northwest quadrants. The proposed typical section on Capital Boulevard includes three 11-foot travel lanes in each direction with curb and gutter. A 10-foot planted median with 4-foot clear zones is proposed, for a total median width of 18 feet. On the bridge over Peace Street, Capital Boulevard will have four 11-foot travel lanes southbound and three 11-foot travel lanes northbound, with 4.5-foot paved shoulders on the inside lanes and 8-foot paved shoulders on the outside lanes. The Capital Boulevard bridge will have 15.5 feet of clearance over Peace Street.

Peace Street is proposed to include an inside 11-foot travel lane and an un-striped outside 16-foot travel lane in each direction with curb and gutter. A 4-foot concrete median is adjacent to two left-turn lanes that extend between the ramp termini.

The Capital Boulevard/Peace Street ramps are proposed to have one 12-foot travel lane with a 2-foot paved outside shoulder and curb and gutter. The Peace Street loops are proposed to have one 12-foot travel lane with a 6-foot paved outside shoulder and curb and gutter.

**Alternative P5.** This “square loop/ramps” alternative includes a square loop in the southwest quadrant and ramps in the northeast and southeast quadrants. The proposed typical section on Capital Boulevard includes three 11-foot travel lanes in each direction with curb and gutter. A 10-foot planted median with 4-foot clear zones is proposed, for a total median width of 18 feet. On the bridge over Peace Street, Capital Boulevard will have four 11-foot travel lanes southbound and three 11-foot travel lanes northbound to accommodate acceleration and deceleration lanes, with 4.5-foot paved shoulders on the inside lanes. The Capital Boulevard bridge will have 15.5 feet of clearance over Peace Street.

Peace Street is proposed to include an inside 11-foot travel lane and an un-striped outside 16-foot travel lane in each direction with curb and gutter. A 4-foot concrete median is adjacent to two left-turn lanes that extend between the ramp termini.

The Capital Boulevard/Peace Street “square loop” in the southwest quadrant is comprised of Johnson Street and Harrington Street, which will be extended to intersect with Peace Street. Johnson Street will have two 12-foot travel lanes and a center two-way left-turn lane. Harrington Street will have two 12-foot travel lanes with curb and gutter. The off- and on-ramps in the east quadrants include one 12-foot travel lane with additional turn and merge lanes and curb and gutter is on both sides.

**Alternative W-Base.** This “trumpet” alternative will replace the existing ramp and loop with a similar ramp and loop in approximately the same location. Capital Boulevard will not be affected as part of this alternative. Wade Avenue is proposed to have two 14-foot travel lanes with a 4-foot concrete monolithic island with curb and gutter. Eastbound includes a 3-foot paved shoulder outside, and westbound includes a 2-foot paved shoulder outside and a 4-foot paved shoulder inside. The Wade Avenue bridge will have 16.5 feet of clearance over Capital Boulevard.

**Alternative W2c.** This “diamond/trumpet” alternative will retain the existing ramps on the west side of Capital Boulevard, and introduce new diamond-style ramps on the east side of Capital Boulevard. The southbound lanes on Capital Boulevard will not be affected as part of this alternative, and the existing median barrier will be retained. The northbound lanes on Capital Boulevard are proposed to include three 11-foot travel lanes with curb and gutter.

Wade Avenue over Capital Boulevard is proposed to have two 12-foot travel lanes in each direction separated by a 4-foot concrete monolithic island, with curb and gutter. The Wade Avenue ramps will have two 12-foot travel lanes and curb and gutter. The Wade Avenue bridge will have 16.5 feet of clearance over Capital Boulevard.

## **B. Right of Way and Access Control**

Proposed right of way through the study area is variable. The current design extends right of way to the back of the berm along all streets.

Capital Boulevard will continue to have limited control of access, with interchanges and some driveways on Capital Boulevard and on the on/off ramps at both interchanges. There is no control of access along Peace Street or Wade Avenue within the project limits.

## **C. Speed Limit**

The posted speed limit on Capital Boulevard will remain 45 mph from north of Wade Avenue to north of Peace Street. However, the posted speed limit through the Capital Boulevard/Peace Street interchange will be reduced to 35 mph. The speed limits on Peace Street and Wade Avenue will remain 35 mph.

## **D. Design Speed**

The design speed on Capital Boulevard is 50 mph from north of Wade Avenue to north of Peace Street and 40 mph through the Capital Boulevard/Peace Street interchange and south to the end of the project.

## **E. Anticipated Design Exceptions**

Design exceptions would be necessary for all four detailed study alternatives (as explained below). For all detailed study alternatives, Capital Boulevard is proposed to have 11-foot lanes, which is narrower than the 12-foot design standard.

Additionally, current design standards require a 444-foot radius for ramps, 150-foot radius for a diamond interchange-style loops, and 533-foot radius for a trumpet interchange-style flyover ramp. Design exceptions at interchanges in an urban area are not uncommon.

**Alternative P-Base.** Design exceptions would be required for both loops and one ramp. The current design of the loop in the northwest quadrant has a 77-foot radius, and the loop in the northeast quadrant has a 67-foot radius. The ramp in the northeast quadrant has a 125-foot radius as it approaches a stop condition at Peace Street.

**Alternative P5.** The roads that make up the square loop in the southwest quadrant function as city streets rather than highway ramps or loops.

**Alternative W-Base.** Design exceptions would be required for two movements. The current design of the Wade Avenue flyover ramp has a 460-foot radius, and the loop in the southeast quadrant has a 90-foot radius.

**Alternative W2c.** Design exceptions would be required for two ramps. The current design of the ramp in the northwest quadrant has a 200-foot radius, and the ramp in the southwest quadrant has a 300-foot radius. Also for this alternative, a design exception would be required for the reverse curve on the service road, which has a 110-foot radius compared with a design standard of 154-foot radius.

## **F. Intersections/Interchanges**

The existing Capital Boulevard/Peace Street interchange is a half-clover, with ramps and loops in the northeast and northwest quadrants. The existing Capital Boulevard/Wade Avenue interchange is a trumpet, with a flyover ramp from Wade Avenue to the southeast quadrant, a loop in the southeast quadrant, and a ramp in the northwest quadrant.

**Alternative P-Base.** This alternative would retain a half-clover interchange design, but would slightly improve the turn radii in the two loops. As part of this design, several business driveways are proposed to be closed. Other driveways to the same parking lots will remain open, and no impacts to the businesses are anticipated. Driveways to properties that will be relocated also would be closed.

The existing intersection of Johnson Street with the frontage road in the southwest quadrant will be closed, and Johnson Street will become a cul-de-sac. The existing intersection of Peace Street with the Capital Boulevard southbound ramps will be shifted to the west and a traffic signal will be installed.

**Alternative P5.** This alternative would construct a square loop in the southwest quadrant and ramps in the east quadrants. As part of this design, several business driveways are proposed to be closed. Other driveways to the same parking lots will remain open, and no impacts to the businesses are anticipated. Driveways to properties that will be relocated also would be closed.

The existing intersection of Johnson Street with the frontage road will be closed, and Johnson Street will intersect with Capital Boulevard as part of the square loop. Harrington Street will be extended to intersect with Peace Street at a signalized tee-intersection. The driveway to the strip shopping center in the northeast quadrant will be retained, but will no longer be connected to the on-ramp. The new off- and on-ramp will intersect Peace Street with a traffic signal.

**Alternative W-Base.** This alternative would retain a trumpet interchange design, but would slightly improve the turn radii on the flyover ramp and loop. Driveways to properties that will be relocated would be closed.

**Alternative W2c.** This alternative would construct a diamond interchange, creating a new signalized intersection at Wade Avenue and the NCDOT Rail Division property on the east side of the interchange. The intersection of Capital Boulevard and Old Williamston Road

will be closed, and Old Williamston Road will be accessed via an existing intersection with the NCDOT Rail Division driveway. Driveways to properties that will be relocated would be closed.

## G. Service Roads

There are no service roads proposed as a part of this project.

## H. Railroad Crossings

No existing railroads cross this project. The CSX Railroad is parallel with Capital Boulevard on the west side, and has a bridge over Wade Avenue at the western terminus of the Capital Boulevard/Wade Avenue interchange design. The Norfolk Southern Railroad is parallel with Capital Boulevard on the east side, and has a bridge over Capital Boulevard approximately 0.4 mile south of Peace Street.

The Southeast High Speed Rail project proposes to cross Capital Boulevard between Wade Avenue and Peace Street.

## I. Structures

Bridge Nos. 213 and 227 would be replaced as part of all detailed study alternatives. The bridge lengths are listed in **Table 8**.

**Table 8 – Bridge Lengths**

Alternative	Bridge Length (ft)	Description
P-Base	127 each	Two parallel bridge structures
P5	127 each	Two parallel bridge structures
W-Base	360	Single-structure flyover ramp
W2c	276	Single-structure ramp between southbound ramp termini and northbound ramp termini

The following major (> 72 inch) culverts were evaluated for structural integrity:

**Alternative P-Base.** One 7-foot x 7-foot RCBC and one 14-foot x 7-foot RCBC under Peace Street, west of the Capital Boulevard interchange. It is proposed that these existing structures remain and the outlets be extended approximately 20 linear feet as a result of the Peace Street widening. This will match the existing structure and continue to provide approximately 140 square feet of opening. The channel width changes from 27 feet at the face of the culvert to approximately 15 feet approximately 36 feet downstream of the culvert. Through this distance, the concrete walls of the channel will most likely have to be modified or reconstructed to accommodate the increased length of the culvert.

**Alternative P5.** One 7-foot x 7-foot RCBC and one 14-foot x 7-foot RCBC under Peace Street, west of the Capital Boulevard interchange. It is proposed that these existing structures remain and the outlets be extended approximately 24 linear feet as a result of the Peace Street widening. This will match the existing structure and continue to provide

approximately 140 square feet of opening. The channel width changes from 27 feet at the face of the culvert to approximately 15 feet approximately 36 feet downstream of the culvert. Through this distance, the concrete walls of the channel will most likely have to be modified or reconstructed to accommodate the increased length of the culvert.

**Alternative W2c.** Two 14-foot x 12-foot RCBC under Capital Boulevard north of the Wade Avenue interchange. It is proposed that these structures remain and the outlet be extended approximately 34 linear feet as a result of the proposed northbound Capital Boulevard on-ramp. The culvert would continue to provide approximately 432 square feet of opening. However, both culverts have experienced scour issues and have some structural damage. During final design, consideration will be given to rehabilitating these culverts as part of this project.

There is a large aerial sewer line that is currently downstream of the existing culvert. This utility is expected to be expanded and relocated as part of a City of Raleigh project to be completed in 2016 and should not influence the design of the culvert extension. Since this culvert extension will occur in a FEMA regulated floodway and the adjacent floodplain contains insurable structures, FEMA approval process will be required. If this alternative is selected, this extension will require a Memorandum of Agreement (MOA) or a Conditional Letter of Map Revision (CLOMR) during the final design stage.

**Construction Methodology.** Stream bank stabilization is anticipated for the Capital Boulevard culvert extension east of the Wade Avenue bridge. Banks stabilization methods will be developed during final design. No bank stabilization will be needed for the Peace Street culvert extension due to the existing concrete walls adjacent to the stream. No dewatering is anticipated for the construction of the Capital Boulevard bridge. There is a potential need for dewatering around the Wade Avenue bridge piers during construction, and for both culvert extensions. Final dewatering locations and methodology will be determined during final design. No need for temporary access is anticipated at either bridge location. Foundation test borings will be performed as part of NCDOT's standard practices.

## **J. Bicycle and Pedestrian Facilities**

**Alternative P-Base.** Capital Boulevard is proposed to include 6-foot sidewalks separated from the travel lane by a 6.5-foot grass verge. On the bridge over Peace Street, Capital Boulevard will have 5.5-foot raised sidewalks adjacent to the outside lanes.

Peace Street is proposed to include an un-striped outside 16-foot travel lane in each direction to accommodate bicycles with 14-foot sidewalks on both sides.

The Capital Boulevard/Peace Street ramps and loops are proposed to have 5-foot sidewalks separated from the outside travel lane by a 5-foot grass verge.

**Alternative P5.** Capital Boulevard is proposed to include 6-foot sidewalks separated from the travel lane by a 6.5-foot grass verge. On the bridge over Peace Street, Capital Boulevard will have 5.5-foot raised sidewalks adjacent to the outside lanes.

Peace Street is proposed to include an un-striped outside 16-foot travel lane in each direction to accommodate bicycles with 14-foot sidewalks on both sides.

Johnson Street will have a 6-foot sidewalk on the south side and a 14-foot sidewalk on the north side. Harrington Street will have 14-foot sidewalks on both sides. The off- and on-ramps in the east quadrants include a 6-foot sidewalk on the east side separated from the travel lane by a grass verge.

**Alternative W-Base.** Capital Boulevard will not be affected as part of this alternative. Wade Avenue is proposed to have 6-foot sidewalks on both sides, which are separated from travel lanes by a 6.5-foot grass verge. On the bridge over Capital Boulevard and the loop, Wade Avenue will have 6-foot raised sidewalks on both sides.

**Alternative W2c.** The southbound lanes on Capital Boulevard will not be affected as part of this alternative, and the existing median barrier will be retained. Existing sidewalks on northbound Capital Boulevard will be removed through this section, replaced with sidewalks on the northbound off- and on-ramps.

Wade Avenue is proposed to have 6-foot sidewalks on both sides that are separated from travel lanes by a 6.5-foot grass verge. On the bridge over Capital Boulevard, Wade Avenue will have 5.5-foot raised sidewalks on both sides. The Wade Avenue ramps will have 5-foot sidewalks on the east side of the ramps.

## **K. Utilities**

Preliminary utility relocation information is based on the *Utilities Technical Memorandum* (May 2013). A utility survey and relocation design will be completed during final design.

The following utility relocations will likely be necessary:

### **Alternative P-Base.**

- Sanitary Sewer – Relocate lines along east and west sides of Capital Boulevard
- Stormwater Pipes and Structures – Relocate infrastructure along Capital Boulevard

### **Alternative P5.**

- Natural Gas – Relocate lines along Peace Street
- Telephone and Cable – Relocate lines on Peace Street
- Sanitary Sewer – Relocate lines along south side of Peace Street
- Relocate lines along east and west sides of Capital Boulevard
- Stormwater Pipes and Structures – Relocate infrastructure along Peace Street and Capital Boulevard

### **Alternative W-Base.**

- Natural Gas – Relocate lines along Wade Avenue
- Telephone and Cable – Relocate underground on Wade Avenue and above-ground fiber optic lines across Wade Avenue and along Capital Boulevard
- Power – Relocate power lines along Capital Boulevard and/or Wade Avenue
- Stormwater Pipes and Structures – Relocate along Capital Boulevard and/or Wade Avenue

### **Alternative W2c.**

- Natural Gas – Relocate lines along Wade Avenue
- Telephone and Cable – Relocate underground on Wade Avenue and above-ground fiber optic lines across Wade Avenue and along Capital Boulevard
- Power – Relocate power lines along Capital Boulevard and/or Wade Avenue
- Stormwater Pipes and Structures – Relocate along Capital Boulevard and/or Wade Avenue

## **L. Landscaping**

No new landscaping is currently proposed as part of this project. The City of Raleigh has requested additional landscaping in the medians, which will be addressed during final design.

## **M. Noise Barriers**

No noise barriers are recommended as part of the detailed study alternatives.

## **N. Work Zone, Traffic Control, and Construction Phasing**

Preliminary traffic control and construction phasing plans have been developed, and will be finalized during final design. The detailed study alternatives have been designed so that Capital Boulevard will remain open to traffic during construction. Detours will be used if individual ramps are closed at any point.

# **V. ENVIRONMENTAL EFFECTS OF PROPOSED ACTION**

## **A. Natural Resources**

Natural resources were catalogued in the *Natural Resources Technical Report* (July 2011) and are shown on **Figure 5**.

### **1. Biotic Resources**

#### **a) Terrestrial Communities**

Two terrestrial communities were identified in the study area: maintained/disturbed and mixed hardwood forest.

**Maintained/Disturbed.** The majority of the study area is comprised of urban areas including residential, commercial, and industrial properties. Maintained/disturbed communities include habitats that are impacted by human disturbances including regularly maintained roadside shoulders, highway medians, and utility rights-of-way. Common species within this community include low-growing grasses and herbs, including, but not limited to kudzu, broomsedge, Japanese honeysuckle, fescue, wild onion, and Bermuda grass.

**Mixed Hardwood Forest.** The mixed hardwood forest community differs from the maintained/disturbed community that makes up the majority of the project area due to the age class (25-50 years old) and contiguous nature of this community. This area is located in the northeastern quadrant of the study area near Wade Avenue. Common species that comprise the canopy in this community include loblolly pine, sycamore, and river birch. Herbaceous vegetation was observed to be very sparse to absent. Woody vine species include poison ivy and Japanese honeysuckle. Included in this community is a wetland area WB, which is categorized as a floodplain pool using the NC Wetland Assessment Method (NCWAM) classification system.

**b) Aquatic Communities**

Pigeon House Branch and Williamson Branch are both perennial streams that provide aquatic habitat within the study area.

**c) Summary of Anticipated Effects**

Terrestrial communities in the study area may be impacted by project construction as a result of clearing, grading, and paving of portions of the study area. All impacts to terrestrial communities will be to maintained/disturbed areas. No long-term impacts are anticipated to aquatic communities.

**2. Waters of the United States**

**a) Streams, Rivers, Impoundments**

Two jurisdictional streams were identified in the study area (listed in **Table 9**). The physical characteristics of these water resources are provided in **Table 10**.

**Table 9 – Water Resources in the Study Area**

Stream Name	Length (ft) in Study Area	Classification	NCDWQ Index Number	Best Usage Classification	Compensatory Mitigation Required
Pigeon House Branch	5,839	Perennial	27-33-18	C, NSW	Yes
Williamson Branch	40	Perennial	27-33-18-1	C, NSW	Yes

**Table 10 – Physical Characteristics of Water Resources in the Study Area**

Stream Name	Bank Height (ft)	Bankfull Width (ft)	Water Depth (in)	Channel Substrate	Velocity	Clarity
Pigeon House Branch	9-15	6-30	17	Rip rap, gravel, cobble, sand, bedrock, concrete	Slow	Turbid
Williamson Branch	2-4	30	3	Gravel, cobble, sand	Moderate	Clear

There are no designated anadromous fish waters or Primary Nursery Areas (PNA) present in the study area. There are no Outstanding Resource Waters (ORW), High Quality Waters (HQW), or water supply watersheds (WS-I or WS-II) within 1 mile of the project study area or within 1 mile downstream. The NCDWQ 2012 Final 303(d) list of impaired waters identifies Pigeon House Branch within the study area as an impaired water due to an excess of zinc as well as poor bioclassification of biological integrity.

There are no benthic monitoring stations within the project study area or within 1 mile of the project study area. Currently, this stream is “Not Rated” for aquatic life. No fish sampling stations are present within 1 mile of the study area.

**b) Wetlands**

One jurisdictional wetland was identified in the project study area. Wetland classification and quality rating data are presented in **Table 11**.

**Table 11 – Jurisdictional Characteristics of Wetlands in the Study Area**

Map ID	NCWAM Classification	Hydrologic Classification	NCDWQ Wetland Rating	Area (ac)
WB	Floodplain Pool	Riparian	25	0.007

**c) Riparian Buffers**

Streamside riparian zones within the study area are protected under provisions of the Neuse River Buffer Rules administered by NCDWQ. Both streams in the study area are subject to the buffer rule protection. No impacts are anticipated to streams or stream buffers, but final impacts will be determined during final design.

**d) Summary of Anticipated Effects**

There are no anticipated impacts to wetlands. Alternative P-Base will extend existing culverts for Pigeon House Branch by 20 linear feet. Alternative P5 will extend existing culverts for Pigeon House Branch by 24 linear feet. Alternative W2c will extend existing culverts for Pigeon House Branch by 34 linear feet.

**e) Avoidance, Minimization, and Mitigation**

**Avoidance and Minimization of Impacts.** Pigeon House Branch and Williamson Branch are subject to Neuse River Buffer Rules. Therefore, Design Standards for Sensitive Watersheds will be implemented during project construction. All detailed study alternatives avoid impacts to streams and wetlands, and NCDOT will continue to avoid or minimize impacts to the greatest extent practicable during final design.

**Compensatory Mitigation of Impacts.** The NCDOT will reevaluate during final design whether some minor encroachments may occur. If compensatory mitigation is required, NCDOT will investigate potential on-site stream and wetland mitigation opportunities. If on-site mitigation is not feasible, mitigation will be provided by North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP).

**3. Rare and Protected Species**

As of December 27, 2012, the United States Fish and Wildlife Service (USFWS) lists three federally protected species for Wake County (**Table 12**). A brief description of each species' habitat requirements follows, along with the Biological Conclusion rendered based on survey results in the study area. Habitat requirements for each species are based on the current best available information from referenced literature and/or USFWS.

**Table 12 – Federally Protected Species Listed for Wake County**

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	No	No Effect
<i>Alasmidonta heterodon</i>	Dwarf wedgemussel	E	No	No Effect
<i>Rhus michauxii</i>	Michaux's sumac	E	No	No Effect

Suitable habitat for the red-cockaded woodpecker is not present within the study area. Terrestrial communities within and in the vicinity of the study area are classified as maintained/disturbed or mixed hardwood forest (25-50 years old). No open, mature or old growth pine forest communities suitable for nesting or foraging occur within the study area or in the vicinity of the study area. In addition, a review of the NCNHP records (updated July 2013), indicates no known red-cockaded woodpecker occurrence within 1 mile of the study area.

A thorough description of the habitat assessment and survey results for the dwarf-wedgemussel is included in the appendix of the *Natural Resources Technical Report*, along with the rationale for the biological conclusion rendered. In addition, a review of the NCNHP records, (updated July 2013), indicates no known dwarf wedgemussel occurrences within 1 mile of the study area.

Suitable habitat for Michaux's sumac is not present within the study area. The mixed hardwood forested area located in the northeastern quadrant of the study area is too shady to accommodate this species. The remaining portions of the study area are primarily urban and regularly maintained or mowed. Although, this species will grow best in areas of occasional

disturbance, the study area is too frequently maintained to allow this species the chance to propagate. A review of the NCNHP records (updated July 2013), indicates no known Michaux’s sumac occurrence within 1 mile of the study area.

Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large, dominant trees are utilized for nesting sites, typically within 1 mile of open water. No water bodies large enough or sufficiently open to be considered potential feeding sources were identified, and there was no foraging habitat within the review area. Additionally, a review of the NCNHP database (updated July 2013) revealed no known occurrences of this species within 1 mile of the project study area. Due to the lack of habitat, known occurrences, and minimal impact anticipated for this project, it has been determined that this project will not affect this species.

#### 4. Soils

The Wake County Soil Survey identifies seven soil types within the study area. **Table 13** summarizes the characteristics of each soil series in the project study area.

**Table 13 – Soils in the Study Area**

Soil Series	Mapping Unit	Drainage Class	Hydric Status
Appling sandy loam	ApC2	Well-drained	Nonhydric
Cecil sandy loam, 2-6% slopes	CeB2	Well-drained	Nonhydric
Cecil sandy loam, 6-10% slopes	CeC2	Well-drained	Nonhydric
Cecil sandy loam, 10-15% slopes	CeD	Well-drained	Nonhydric
Cecil sandy loam, 15-45% slopes	CeF	Well-drained	Nonhydric
Chewacla soils	Ch	Somewhat poorly drained	Hydric*
Made land	Ma	NA	Nonhydric

\*Soils which are primarily non-hydric by may contain hydric inclusions.

## B. Cultural Resources

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic Preservation’s Regulations for Compliance with Section 106, codified as 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally-funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

### 1. Historic Architectural Resources

An architectural survey was performed in October 2011, and the Historic Architectural Analysis Report was completed in April 2012. There are five properties eligible or recommended eligible for listing on the National Register of Historic Places (NRHP) within the Area of Potential Effects (APE), shown on **Figure 6**. Effects on historic resources are summarized in **Table 14**.

**Table 14 – Historic Effects**

<b>Property and Status</b>	<b>Alternative</b>	<b>Effect Finding</b>	<b>Reasons</b>
Raleigh Cotton Mill (WA 3919)	Alt P-Base	No Adverse Effect	Moves Capital Blvd. away from property, adequate access to be maintained.
	Alt P5	No Adverse Effect	Moves Capital Blvd. away from property, access will be maintained by creating a new access point from Peace Street
Seaboard Air Line Turntable and Raleigh & Gaston Railroad (WA 7383)	Alt P-Base	No Adverse Effect	No construction within historic boundaries, but some temporary easement or new ROW within historic boundaries possible
	Alt P5	No Adverse Effect	No construction within historic boundaries, but some temporary easement or new ROW within historic boundaries possible
	Alt W-Base	No Effect	No construction within historic boundaries, but some temporary easement or new ROW within historic boundaries possible
	Alt W 2c	No Effect	No construction within historic boundaries, but some temporary easement or new ROW within historic boundaries possible
Noland Plumbing Company Building (WA 7126)	Alt W-Base	No Effect	No construction within historic boundaries, but some temporary easement or new ROW within historic boundaries possible
	Alt W 2c	No Effect	Maintains existing ROW

**2. Archaeological Resources**

A memo from SHPO (March 16, 2011, included in **Appendix A**) noted the presence of archaeological site 31WA1448 within the Area of Potential Effects (APE) for the proposed project. Containing a portion of the Raleigh & Gaston/Seaboard Air Line Railyard Complex, archaeological site 31WA1448 is considered potentially eligible for inclusion in the NRHP. For areas of the site affected by the bridge replacement project, SHPO recommended archaeological deep testing via backhoe to evaluate site significance and potential project effects as well as intensive historical and land use research of the APE.

According to a second memo from SHPO (March 18, 2011, included in **Appendix A**), archaeological site 31WA527, representing the remains of the Mordecai Mill in association with the Mordecai Plantation, is located within the northern portion of the proposed study area. SHPO noted that if the site were to be determined eligible for inclusion in the NRHP, then appropriate mitigation measures would need to be developed. Upon further review, it was determined that the location of archaeological site 31WA527 does not fall within the Area of Potential Effects (APE) for the proposed project, and will not be impacted; therefore, no further action is required regarding archaeological site 31WA527.

According to a memo to the Office of State Archaeology (OSA) from the NCDOT Archaeology Group (December 18, 2012, included in **Appendix A**), the Raleigh &

Gaston/Seaboard Air Line Railyard Complex (i.e. archaeological site 31WA1448) was determined to be eligible for the NRHP. The letter also recommended that if this site were to be impacted by the Preferred Alternative, then additional measures would be considered that may include development of a Memorandum of Agreement stipulating the efforts NCDOT will carry out to mitigate effects to the resource. In response (March 5, 2013, included in **Appendix A**), SHPO concurred with the determination of eligibility and the potential need for additional investigations if the site were to be impacted. Based on geospatial data presented by the NCDOT Archaeology Group, the designs of the alternatives at the Peace Street interchange were modified in order to eliminate any potential impacts to this site; therefore, no further action is required regarding archaeological site 31WA1448.

### **C. Section 4(f) Resources**

Section 4(f) of the US Department of Transportation (USDOT) Act of 1966, as amended, specifies that publicly owned land from a public park, recreation area, wildlife and waterfowl refuge, and all historic sites of national, state, and local significance may be used for federal projects only if there is no feasible and prudent alternative to the use of such land and the project includes all possible planning to minimize harm to 4(f) lands resulting from such use.

In the *Capital Boulevard Corridor Study Report*, the City of Raleigh identified a future open space, Devereux Meadows Park, to be constructed on the property currently used for the City's Solid Waste Services and Vehicle Fleet Services. The City envisions this area as a linear park including stream restoration and a greenway. According to City staff, the portion of the property within the proposed Capital Boulevard right of way will be designated as a transportation corridor rather than parkland, and therefore no use of park property is anticipated.

### **D. Section 6(f) Resources**

Section 6(f) of the Land and Water Conservation Fund Act of 1965 stipulates that property acquired or developed with the assistance of the Fund may not be converted to a use other than public recreation unless suitable replacement property is provided. No properties acquired or developed with the assistance of the Land and Water Conservation Fund exist in the project area.

### **E. Farmland**

The Farmland Protection Policy Act (FPPA) requires all federal agencies or their representatives to consider the impact of land acquisition and construction projects on prime and important farmland soils and to minimize the impact of Federal programs, or projects completed with the assistance of a Federal agency, have on the unnecessary and irreversible conversion of farmland (directly or indirectly) to non-agricultural uses. North Carolina Executive Order Number 96 requires all state agencies to consider the impact of land acquisition and construction projects on prime farmland soils and to ensure that actions of State agencies under the jurisdiction of the Governor will minimize the loss of prime agricultural and forest lands, as designated by the US Natural Resources Conservation

Service (NRCS). Land planned or zoned for urban development or identified as urbanized according to US Census maps is not subject to FPPA requirements.

Wake County has a Voluntary Agriculture District (VAD) ordinance and is working on a Farmland Protection Plan. However, there are no prime or important farmland soils within the study area, and no active farms within 1 mile. Also, since all of the land affected by the project is either currently developed or is zoned for residential or urban land use, this project is not subject to FPPA. No Farmland Conversion Impact Rating Forms (USDA Form AD-1006) are required for the project.

## F. Social Effects

Community features are shown on **Figure 7**.

### 1. Neighborhoods/Communities

Although several neighborhoods are on the edge of the study area, none of the alternatives are expected to directly impact any residences in those neighborhoods or affect the community cohesion and stability. Alternative W2c provides a new access point to commercial and state properties on the east side of Capital Boulevard. None of the Peace Street alternatives are expected to impact any nearby communities.

### 2. Relocation of Residences and Businesses

None of the alternatives are anticipated to impact residences.

Most property impacts are permanent, although some temporary construction easements along the corridor also are likely. Both interchanges will be built using staged construction schedules; traffic will remain open at all times, although some ramp movements may be closed temporarily during construction. Therefore, temporary changes in access are not expected to negatively affect business operations. Traffic control plans are described in more detail in **Section IV.N**.

The estimated number of business relocations for each alternative is in **Table 15**. The NCDOT relocation estimate is in **Appendix B**.

**Table 15 – Business Relocations**

Alternative	Total Business Relocations	Special Needs/Notes
<i>Peace Street Interchange</i>		
P-Base	9	Finch's (locally important restaurant)
P5	12	Finch's (locally important restaurant)
<i>Wade Avenue Interchange</i>		
W-Base	1	
W2c	9	

**Alternative P-Base.** This alternative will impact businesses in the northwest, southwest, and southeast quadrants of the Capital Boulevard/Peace Street interchange.

**Alternative P5.** This alternative will impact the majority of businesses in the southwest quadrant as well as Fairview Advertising in the southeast quadrant. In the southeast quadrant, Johnson Street will intersect with the northbound off-ramp to provide access to remaining properties.

**Alternative W-Base.** Several businesses in the southeast quadrant would be relocated by the new trumpet configuration.

**Alternatives W2c.** The new diamond interchange design would construct a new access point on the east side of Capital Boulevard near Old Williamson Road. This would provide direct access between those properties, Capital Boulevard, and Wade Avenue. The new ramps would require business relocations in the northeast and southeast quadrants.

NCDOT will offer relocation assistance to businesses that will be directly impacted by this project as part of the Uniform Relocation Assistance and Real Property Acquisition Policies Act (1970, as amended in 1987). A relocation report will be prepared for alternatives following preliminary design.

### **3. Environmental Justice**

“Environmental justice” refers to issues related to the prevention of discrimination against minority and low-income communities. According to the FHWA, there are three fundamental environmental justice principles:

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

The U.S. Department of Transportation Order to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 5680.1 – April 15, 1997) defines minority groups as being African-American, Hispanic, Asian-American, American Indian, and Alaskan Native. This same Order defines low-income as being persons whose median household income is at or below the Department of Health and Human Services (DHHS) poverty guidelines.

There are no communities identified within the study area that meet environmental justice criteria. Benefits and burdens resulting from the projects are anticipated to be equitably distributed throughout the community. Public involvement and outreach activities must ensure full and fair participation of all potentially affected communities in the transportation decision-making process.

### **4. Bicycle and Pedestrian Facilities**

There are no designated bike routes or bicycle facilities on Capital Boulevard, Peace Street, or Wade Avenue. Existing sidewalks on Capital Boulevard, Peace Street, the Capital

Boulevard/Peace Street ramps, and Wade Avenue will be retained or rebuilt. In addition, new sidewalks are proposed on the Capital Boulevard/Wade Avenue ramps, and grass verges are proposed between sidewalks and travel lanes in most locations.

## **5. Recreational Facilities**

None of the alternatives will affect existing recreational facilities.

## **6. Other Public Facilities and Services**

The nearest emergency response facilities, all approximately 1 mile from the projects, are the Whitaker Mill EMS station on Noble Road; fire stations on Fairview Road, Oberlin Road, and Dawson Street; and the Raleigh Police Department on Cabarrus Road. The Capital Boulevard corridor south of Wake Forest Road is part of the downtown fire response district.

The City of Raleigh Police Department, Wake County Sheriff's Department, and Wake County Emergency Medical Services (EMS) and Fire Department use Capital Boulevard as a primary patrol route and to respond to calls. All alternatives will leave Capital Boulevard, Wade Avenue, and Peace Street open to traffic during most of construction, which will help minimize short-term increases in response time during construction. According to EMS personnel, responders utilize GPS that automatically reroutes to avoid road closures. The Wake County EMS Chief of Operations was concerned about potential delays from queued traffic on the square loops at Peace Street, but overall did not have a preference between alternatives at Capital Boulevard/Peace Street. He supported the idea of connecting Fairview Road to West Street and extending West Street over Wade Avenue (no longer under consideration), but otherwise did not have a preference between alternatives at Capital Boulevard/Wade Avenue.

## **G. Economic Effects**

**Alternatives P-Base and W-Base.** The base alternatives will require business relocations, but will retain existing traffic and development patterns.

**Alternative P5.** The August 2012 *Capital Boulevard Corridor Study* notes that “[square loops] will have significant property impacts both during the construction phase and for right of way acquisition. The land that remains in the square loop option will consist of regularly shaped blocks suitable for mixed-use redevelopment.” According to the City, impacting businesses in these two quadrants will not have an overall effect on the greater downtown business district. Alternative P5 would allow for limited redevelopment in the southeast and southwest quadrants, with driveways permitted on the loop in the southwest quadrant and access to Johnson Street from the ramp in the southeast quadrant. This is a similar design to the two-loop concept discussed in the *Capital Boulevard Corridor Study*, although Alternative P5 has fewer property impacts than the two-loop concept.

**Alternatives W2c.** The new diamond interchange design would provide direct access to the properties on the east side of the interchange.

## **H. Land Use**

### **1. Existing Land Use and Zoning**

Zoning regulations within the study area are implemented by the City of Raleigh. The existing zoning classifies most of the study area as “I-2” (industrial), with a small section of “NB” (neighborhood business) at the Capital Boulevard/Peace Street interchange.

The City of Raleigh *2030 Comprehensive Plan* identifies the study area as part of the Downtown Regional Center, which is described as the area within Raleigh with the most intense growth and highest levels of transit, bicycle, and pedestrian access. The study area is currently comprised of primarily commercial and industrial uses along Capital Boulevard and West Street. Downtown Raleigh, which includes office, government, and commercial uses, is along the south edge of the study area; residential neighborhoods are on the north and west edges; and the CSX railroad track and rail/shipping uses (including NCDOT Rail Division offices and transfer facilities from rail to truck) form the east boundary.

Several overlay districts apply to areas within the study area. The Downtown Overlay District is intended to promote the development of intensive residential and nonresidential uses within the downtown area. The Neighborhood Conservation Overlay District is intended to preserve and enhance the general quality and appearance of older neighborhoods, for it is recognized that built environmental characteristics are a major part of the identity and positive image of the City. The Pedestrian Business Overlay District is intended to preserve and enhance the character of pedestrian-oriented retail districts.

### **2. Future Land Use**

The City of Raleigh proposes to change the existing industrial land uses to a mix of commercial, office, and residential along Capital Boulevard and West Street. Although the City’s current zoning does not yet reflect this change, the Future Land Use Map in the *2030 Comprehensive Plan* and the *Capital Boulevard Corridor Study* describe the City’s vision. The *2030 Comprehensive Plan* describes the two primary future land use categories: The Central Business District category is intended to enhance Downtown Raleigh as a vibrant mixed-use urban center. The Office Residential—Mixed-Use category is applied primarily to frontage lots along thoroughfares where low-density residential uses are no longer appropriate, as well as office parks and developments suitable for a more mixed-use development pattern.

### **3. Project Compatibility with Local Plans**

The City of Raleigh currently has most of the study area zoned as Industrial-2. However, the City’s *2030 Comprehensive Plan* and *Capital Boulevard Corridor Study* envision Capital Boulevard and West Street as a multiuse corridor with commercial, office, and some residential areas. One of the action items in the Comprehensive Plan was to amend the zoning ordinance to create a new “Downtown” zoning district, which likely would include the portion of Capital Boulevard within the study area.

The *Capital Boulevard Corridor Study* supports a square loop design for the Capital Boulevard/Peace Street interchange, and a diamond design for the Capital Boulevard/Wade Avenue interchange.

## **I. Indirect and Cumulative Effects**

Indirect and cumulative effects are described in more detail in the *Indirect and Cumulative Effects Report* (May 2013).

Indirect and cumulative effects were considered for the time period between now and 2035, which is the design year of the project. The horizon year of the most recent *Capital Area Metropolitan Planning Organization Long-Range Transportation Plan* is 2040 (updated in April 2013). The City of Raleigh *Comprehensive Plan* (2009) has a horizon year of 2030. The following subsections summarize indirect and cumulative project effects.

### **1. Indirect Effects**

Indirect community effects are characterized by those changes in land use related to the proposed project but not directly caused by the project. Construction of Project B-5121/B-5317 is expected to have minor indirect effects on land use decisions in the vicinity.

Under the “base” alternatives at both interchanges, there will be no change in travel patterns, access, exposure, or travel time. The other build alternatives, Alternative P5 and W2c, will increase access and exposure to new properties, but may slightly increase travel time for drivers using these interchanges. None of the alternatives are expected to create a new land use or transportation node. The design of Alternative W2c would allow the City to extend West Street over Wade Avenue in the future without reconstructing the Capital Boulevard/Wade Avenue interchange. The West Street extension project, which is proposed in the City’s *Capital Boulevard Corridor Study*, may affect residential and commercial development patterns along West Street.

Local planners expect most of the land within the vicinity to redevelop regardless of which alternative is selected (with the base alternatives having the same effect on development as the no build scenario). However, the pace of redevelopment will likely be quicker with the non-base alternatives, and the type of development may vary depending on alternative, especially at the Peace Street interchange.

### **2. Cumulative Effects**

Cumulative effects represent the total anticipated direct and indirect effects resulting from the project, in addition to those effects by other projects in the vicinity. No long-term cumulative effects are expected. Negligible short-term cumulative effects are anticipated on travel time during construction, while portions of the existing interchanges are closed and traffic is detoured.

Local planners expect that the “base” alternatives will have a negligible impact on the pace and type of development. Alternatives P5 and W2c are likely to increase the pace of development at the interchanges, and may result in minor cumulative impacts. Direct natural environmental impacts by NCDOT projects will be addressed by avoidance, minimization, or mitigation, consistent with programmatic agreements with the natural resource agencies during the Merger and Permitting processes. All developments will be required to follow local, state, and federal guidelines and permitting regulations.

## **J. Flood Hazard Evaluation**

The three major drainage crossings along the project (Pigeon House Branch under Capital Boulevard, Pigeon House Branch under Wade Avenue, and Pigeon House Branch under Peace Street) are located within a regulated FEMA study area.

Based on portions of the proposed roadway widening, realignment, culvert extensions, and proposed bridge occurring in a FEMA floodway, this project is likely to create an encroachment on the existing floodplain and floodway. Since both of the culvert extensions and bridge replacement are in a regulated FEMA floodway (FIRM Map Number 3720170400J, Panel Number 1704) a Memorandum of Agreement (MOA) or a Conditional Letter of Map Revision (CLOMR) will be required. Floodplain crossings will be designed to minimize the floodplain encroachments as much as possible. In NFIP flood hazard areas, the final hydraulic design should strive for a no-rise condition in the 100-year base flood elevation.

## **K. Traffic Noise Analysis**

### **1. Introduction**

This analysis is consistent with Title 23 Code of Federal Regulations Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise (Title 23 CFR 772) and the NCDOT *Traffic Noise Abatement Policy* (July 13, 2011). In accordance with these policies and procedures, Type I highway project must be analyzed for predicted traffic noise impacts. In general, Type I projects are proposed Federal or Federal-aid highway projects for construction of a highway or interchange on new location, improvements of an existing highway that substantially changes the horizontal or vertical alignment or increases the vehicle capacity, or projects that involve new construction or substantial alteration of transportation facilities such as weigh stations, rest stops, ride-share lots or toll plazas.

In accordance with the NCDOT Traffic Noise Analysis and Abatement Manual, the FHWA Traffic Noise Model® (TNM v.2.5) was used to predict existing and future design year 2035 hourly equivalent traffic noise levels,  $L_{eq(h)}$ , for the noise-sensitive receptor locations in the vicinity of the proposed Capital Boulevard bridge replacements. This traffic noise report represents the preliminary analysis of the predicted traffic noise impacts along the proposed bridge replacement projects.

Details of the analysis are in the *Traffic Noise Analysis* (October 2013), and results are summarized below.

### **2. Traffic Noise Impacts and Noise Contours**

The project area was divided into Noise Study Areas (NSA) in order to group similar land uses that are exposed to similar noise sources together. Noise Study Area A is located in the northeast quadrant of the Capital Boulevard and Peace Street interchange, and contains four noise-sensitive receptors. Noise Study Area B is located in the northwest quadrant of the Capital Boulevard and Wade Avenue interchange, and contains three noise-sensitive receptors. One of the receptors in NSA A is predicted to experience noise levels that approach or exceed the NAC, and none in NSA B are predicted to do so. None of the receptors in either NSA are predicted to experience a substantial noise increase.

Future build (2035) traffic is predicted to impact two noise-sensitive receptors. The impacted noise-sensitive receptors are predicted to experience noise levels that will approach or exceed the NAC. The number and types of predicted traffic noise impacts in each category are shown in **Table 16**. Impacts are delineated as either approaching or exceeding the FHWA NAC, by a substantial increase in Design Year 2035 build-condition traffic noise levels over existing noise levels, or by meeting both criteria.

**Table 16 – Traffic Noise Impact Summary**

Alternative	Impacted Receptors Approaching or Exceeding FHWA NAC		
	NAC B (Residential)	NAC C (Active Sport Areas, Cemeteries, etc.)	Total
P-Base	0	0	0
P5	1*	0	1
W-Base	0	1**	1
W2c	0	1**	1

Note: There were no impacted receptors in categories A (lands intended to be serene and quiet), D (auditoriums, libraries, places of worship, etc.), E (businesses, restaurants, hotels, etc.), or F (agriculture, manufacturing, emergency services, etc.).

\* Green space at a condominium complex

\*\* Entrance to a recording studio

### 3. Traffic Noise Abatement Measures

FHWA and NCDOT require that feasible and reasonable noise abatement measures be considered and evaluated for the benefit of all impacted build-condition traffic noise receptors. Feasibility and reasonableness are distinct and separate considerations. Feasibility is the consideration as to whether noise abatement measures can be implemented. Reasonableness is the consideration as to whether noise abatement measures should be implemented. Per NCDOT Policy, the following traffic noise abatement measures may be considered: highway alignment selection, traffic systems management, buffer zones, noise barriers (earth berms and noise walls), and noise insulation of Activity Category D land use facilities.

Consideration for noise abatement measures was given to all impacted receptors in the future build case. Noise abatement was determined not to be feasible due to site access constraints. Driveways of each property and other side streets were located such that a noise barrier would not be able to be constructed to adequately provide the required abatement.

## L. Air Quality Analysis

This section summarizes the results of the air quality analysis, which is discussed in detail in the *Air Quality Analysis* (April 2013).

### 1. Project Air Quality Effects

Air pollution originates from various sources. Emissions from industry and internal combustion engines are the most prevalent sources. The impact resulting from highway construction ranges from intensifying existing air pollution problems to improving the

ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility.

The Federal Clean Air Act of 1970 established the National Ambient Air Quality Standards (NAAQS). These standards were established to protect the public from known or anticipated effects of air pollutants. The most recent amendments to the NAAQS contain criteria for sulfur dioxide (SO<sub>2</sub>), particulate matter (PM), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), and lead (Pb).

The primary pollutants from motor vehicles are unburned hydrocarbons, nitrous oxides, carbon monoxide, and particulates. Hydrocarbons and nitrogen oxides can combine in a complex series of reactions catalyzed by sunlight to produce photochemical oxidants such as ozone and NO<sub>2</sub>. Because these reactions take place over a period of several hours, maximum concentrations of photochemical oxidants are often found far downwind of the precursor sources.

A project-level air quality analyses were prepared for this project. A copy of the unabridged version of the full technical report entitled *Air Quality Analysis (Microscale Carbon Monoxide and Mobile Source Air Toxics)*, dated September 30 2012 and *Revised Air Quality Analysis dated March 2013*, can be viewed at the Project Development & Environmental Analysis Unit, Century Center Building A, 1010 Birch Ridge Drive, Raleigh.

## **2. Attainment Status**

The project is located in Wake County, which is within the Raleigh-Durham maintenance area for carbon monoxide (CO) as defined by the EPA. The Raleigh-Durham area was redesignated for CO on September 18, 1995 and due to improved monitoring data was placed under a limited maintenance plan (conformity is required without a regional emissions analysis) on July 22, 2013. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Wake County. The Capital Area Metropolitan Planning Organization 2040 Long Range Transportation Plan (LRTP) and the 2012-2018 Transportation Improvement Program (TIP) conform to the intent of the SIP. The USDOT made a conformity determination on the LRTP on June 14, 2013 and the TIP on June 14, 2013. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There are no significant changes in the project's design concept or scope, as used in the conformity analyses.

## **3. Carbon Monoxide**

Because the project is located within the Raleigh-Durham maintenance area for carbon monoxide (CO), a microscale air quality analysis was performed to determine future CO concentrations resulting from the proposed highway improvements. "CAL3QHC - A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections" was used to predict the CO concentration near sensitive receptors. Carbon monoxide vehicle emission factors were calculated for the years 2017, 2022, and 2035 using the EPA publication "Mobile Source Emission Factors", and the MOBILE6 mobile source emissions computer model. Consultation with the North Carolina Department of

Environment & Natural Resources' Air Quality Section indicated that an ambient CO concentration of 2.9 ppm is suitable for calculations in Wake County. The analysis was performed between August 2012 and April 2013.

**Table 17 – Comparison of Model Result to Ambient Air Quality Standards for CO**

<b>Intersection of Peace Street at Capital Boulevard Northbound Ramps</b>				
<b>Measurement Period</b>	<b>NAAQS (ppm)</b>	<b>2017 Build Conditions (PM Peak)</b>	<b>2022 Build Conditions (PM Peak)</b>	<b>2035 Build Conditions (PM Peak)</b>
		<b>Rec 3 &amp; 4</b>	<b>Rec 4</b>	<b>Rec 3</b>
<b>1-hour (peak)</b>	35	4.5	4.5	4.9
<b>8-hour</b>	9	3.7	3.7	4.0

**Table 18 – Comparison of Model Result to Ambient Air Quality Standards for CO**

<b>Intersection of Wade Avenue at Capital Boulevard Southbound Ramps</b>				
<b>Measurement Period</b>	<b>NAAQS (ppm)</b>	<b>2017 Build Conditions (PM Peak)</b>	<b>2022 Build Conditions (PM Peak)</b>	<b>2035 Build Conditions (PM Peak)</b>
		<b>Rec 3 &amp; 4</b>	<b>Rec 4</b>	<b>Rec 3</b>
<b>1-hour (peak)</b>	35	4.5	4.4	4.8
<b>8-hour</b>	9	3.7	3.6	3.9

#### **4. Mobile Source Air Toxics (MSATs)**

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S.

Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. A 2007 EPA rule requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in our environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

The FHWA developed a tiered approach with three categories for analyzing MSAT in NEPA documents, depending on specific project circumstances. This project falls under Category 2 (“Projects with Low Potential MSAT Effects”) because it is intended to improve the operations of a highway, transit or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase emissions, and the Design Year traffic is not projected to meet or exceed the 140,000 to 150,000 AADT criterion.

**Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts**

**Analysis.** In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, <http://www.epa.gov/iris/>). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, <http://pubs.healtheffects.org/view.php?id=282>) or in the future as vehicle emissions substantially decrease (HEI, <http://pubs.healtheffects.org/view.php?id=306>).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupported assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (<http://pubs.healtheffects.org/view.php?id=282>). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (<http://www.epa.gov/risk/basicinformation.htm#g>) and the HEI (<http://pubs.healtheffects.org/getfile.php?u=395>) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There also is the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in 1 million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in 1 million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in 1 million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in 1 million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

## **5. Construction Air Quality Effects**

During construction of the proposed project, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise disposed of by the contractor. Any burning will be performed in accordance with applicable local laws and ordinances and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. Care will be taken to insure burning will be done at the greatest distance practical from dwellings and not when atmospheric conditions

are such as to create a hazard to the public. Burning will be performed under constant surveillance. Also during construction, measures will be taken to reduce the dust generated by construction when the control of dust is necessary for the protection and comfort of motorists or area residents.

## **M. Hazardous Materials**

Three hazardous material surveys have been conducted within the B-5121/B-5317 project study area. The first survey was performed by the NCDOT Geotechnical Engineering Unit in May 2009 for Project B-5121, and identified 12 potentially hazardous sites in the B-5121 (Peace Street) interchange area.

The second survey included a review of environmental regulatory records for federal and state databases within the B-5121/B-5317 study area and was provided by Environmental Data Research (EDR). The third survey was a review of environmental regulatory records and was provided by FirstSearch Technology Corporation.

Based on the surveys, the study area contains 28 potential leaking underground storage tank (LUST) sites, one potentially hazardous waste site, 22 underground storage tank (UST) sites, and ten Resource Conservation and Recovery Act (RCRA) generators. Several of the sites within the study area are on multiple lists.

A geotechnical report will be prepared for the full B-5121/B-5317 study area at a later phase in the project. Impacts to potential hazardous material sites will be determined at that time.

## **VI. COMMENTS AND COORDINATION**

A public involvement program is part of this project and has included the following efforts:

- Holding public meetings, which were advertised through direct mail and local newspapers
- Mailing newsletters to property owners in the project vicinity, which provided information on the status and decisions made through the project process
- Attending meetings with local officials
- Creating and updating the mailing list of community contacts to include workshop attendees and concerned citizens
- Responding consistently to citizens' requests for information

### **A. Public Meetings**

#### First Public Meeting

The first public meeting was held September 29, 2011, at the Progress Energy Center for the Performing Arts. On display were three conceptual designs at the Capital Boulevard/Peace Street interchange and four conceptual designs at the Capital Boulevard/Wade Avenue interchange. The meeting was held jointly with the City of Raleigh, which was displaying information about the City's Capital Boulevard Corridor Study. A short PowerPoint

Presentation about the bridge replacement projects was shown on a continuous loop, and a formal presentation was made by NCDOT and City staff. A total of 131 citizens signed in during the meeting.

Seventeen comment sheets or emails were received following the meeting. At Peace Street, there was a strong preference for Alternative P2 (square loops) over the other two alternatives. At Wade Avenue, preference was evenly divided for Alternatives W1 (trumpet), W2 (diamond), and W3 (compressed diamond with a grade separation at West Street). Several citizens requested pedestrian and bicycle access to be included in the project.

### Second Public Meeting

A second public meeting was held October 22, 2012, at the Progress Energy Center for the Performing Arts. All of the previous alternatives had been revised or replaced with new alternatives. These new alternatives were displayed at the meeting. Additional information about several ongoing City projects was available as well. No formal presentation was made. Seventy-two citizens signed in during the meeting.

Forty-three comment sheets or emails were received following the meeting. At Peace Street, 75% of commenters preferred Alternative P2d (square loops) over P-Base (half-clover). At Wade Avenue, support was relatively evenly divided for Alternatives W-Base (trumpet), W1a (trumpet with West Street bridge), and W2 (diamond with West Street bridge), with slightly less support for Alternative W2b (diamond).

### Third Public Meeting

A third public meeting was held November 19, 2013, at the Duke Energy Center for the Performing Arts (formerly the Progress Energy Center for the Performing Arts). The current alternatives were displayed, including Alternatives P-Base and P5 at Peace Street, and Alternatives W-Base and W2c at Wade Avenue.

Approximately 100 citizens attended the meeting, and 37 submitted comments. Of those who expressed a preferred alternative, approximately 83% supported Alternative P5 (26 out of 31 total) and 90% supported Alternative W2c (16 out of 20 total). Many citizens were in favor of improved bicycle facilities, and several were concerned about the change in access to businesses. Some of the impacted businesses opposed the alternatives that would relocate them and others did not oppose the proposed relocation.

## **B. Local Officials Meetings**

The first local officials meeting was held September 29, 2011, at the Progress Energy Center for the Performing Arts, prior to the first public meeting. The history and purpose and need of the project were presented. Topics discussed included potential environmental and design considerations, as well as potential design alternatives.

A second local officials meeting was held October 22, 2012, at the Progress Energy Center for the Performing Arts, prior to the second public meeting. Current alternative designs were presented and discussed. Local officials did not state support for specific alternatives.

The City of Raleigh will identify a preferred alternative after the public hearing. This decision will be documented in the final environmental document.

### **C. Public Hearing**

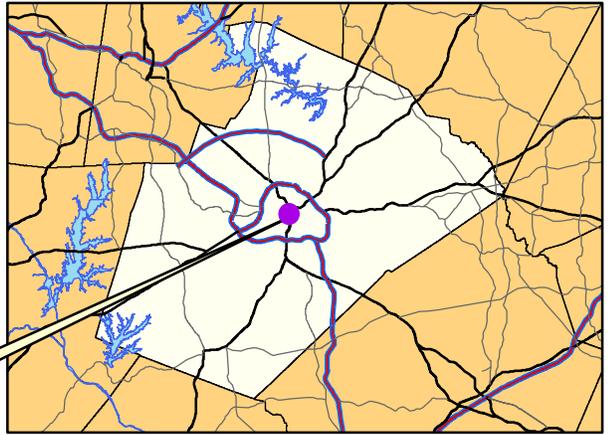
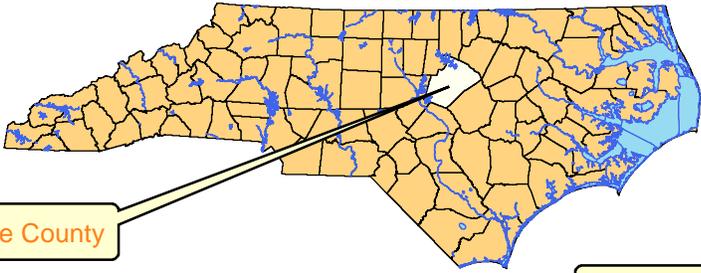
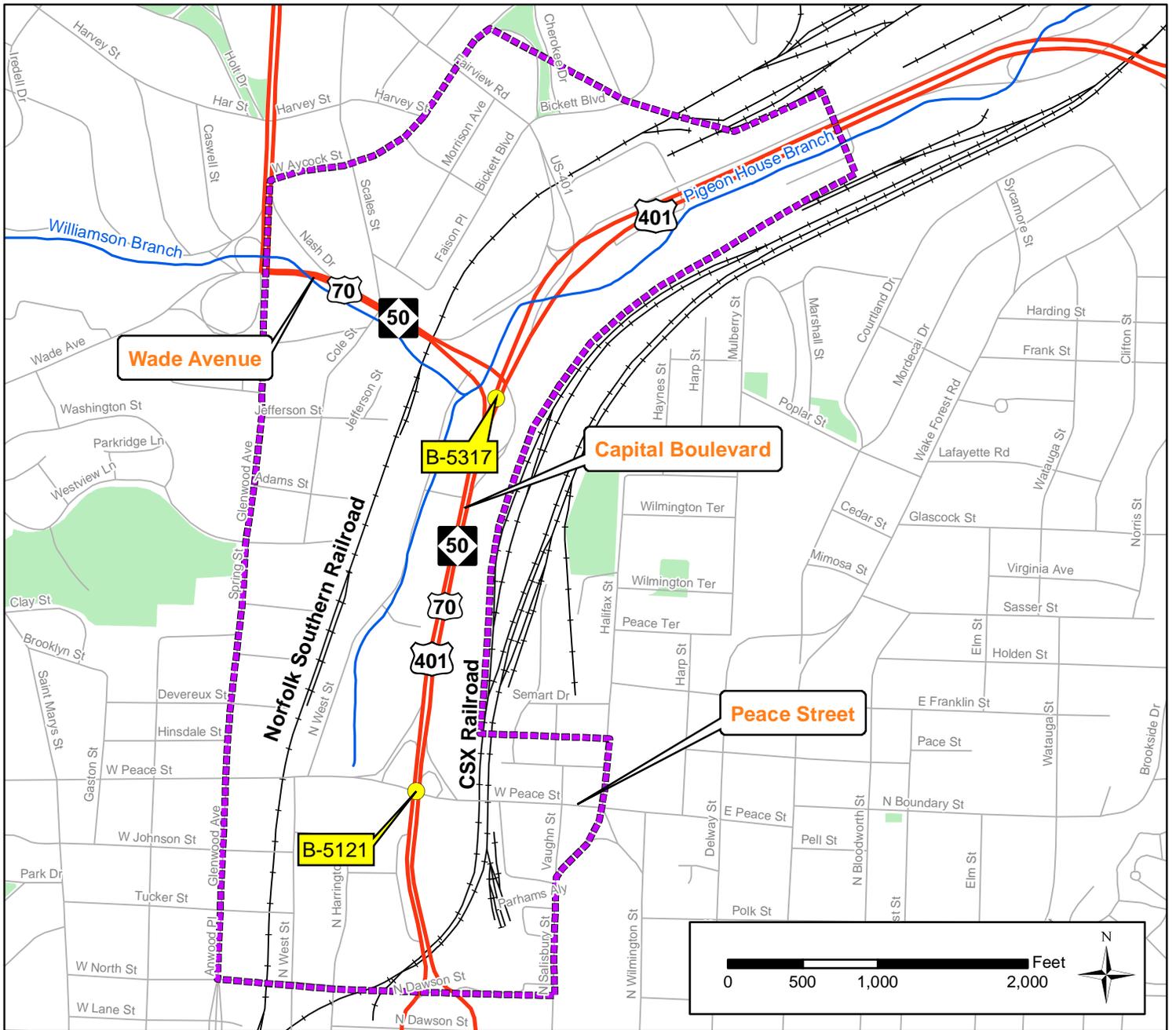
A Public Hearing will be held following the distribution of this Environmental Assessment.

### **D. Agency Coordination**

A start of study letter was mailed to agencies on February 18, 2011, inviting comments on Project B-5121/B-5317. Comments were received from the following agencies:

- U.S. Environmental Protection Agency
- Department of Environment and Natural Resources – Office of Conservation, Planning & Community Affairs
- North Carolina Wildlife Resources Commission
- Department of Environment and Natural Resources – Division of Water Quality
- North Carolina Department of Cultural Resources – State Historic Preservation Office

## FIGURES





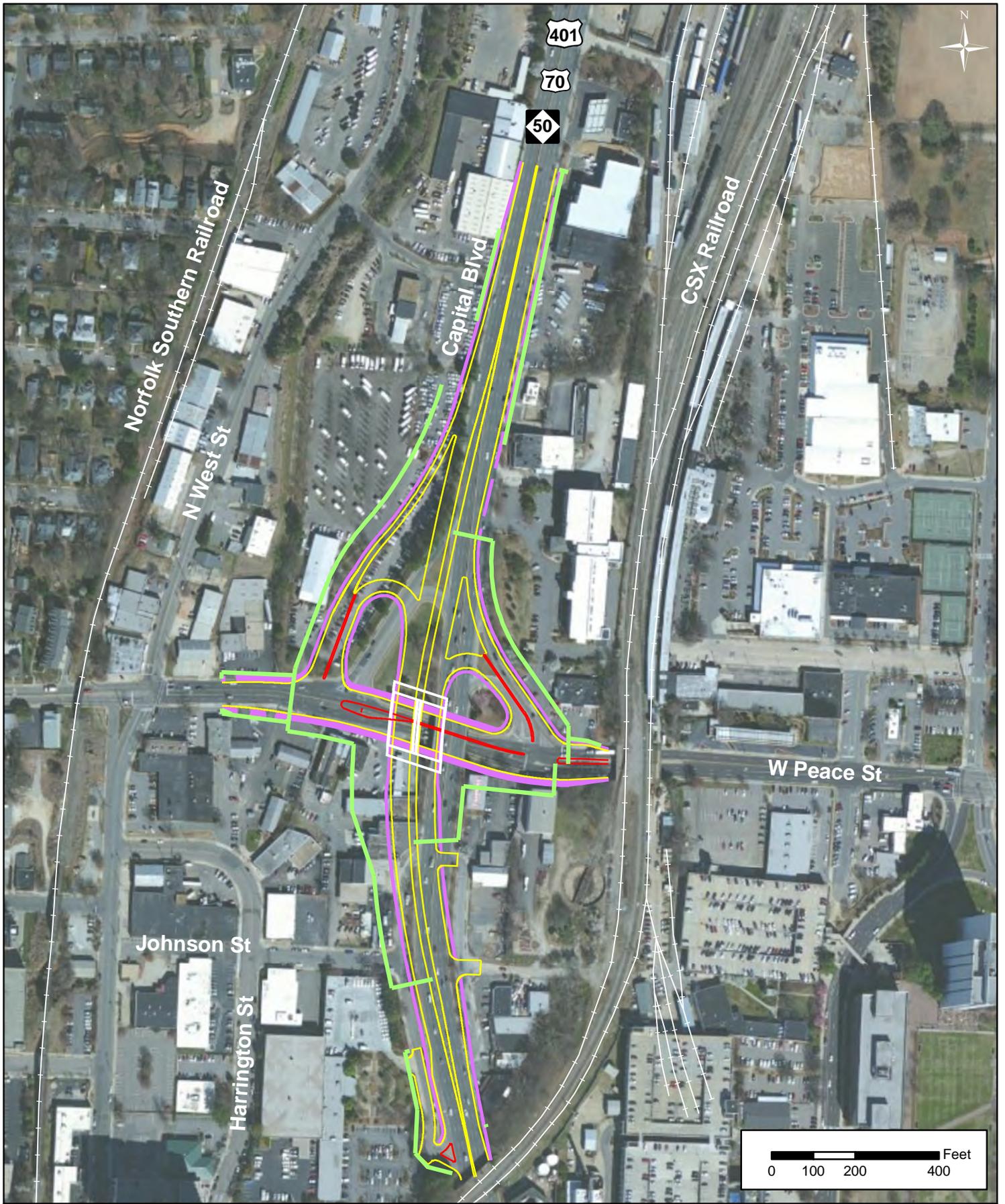
**NORTH CAROLINA  
DEPARTMENT  
OF  
TRANSPORTATION**

**Legend**

- Study Area
- Streams
- Interstates NCDOT
- US Highways
- Streets
- Proposed Bridges to be Replaced
- Railroads
- Wake County
- Public Open Areas

**Figure 1  
Vicinity Map**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County



**Legend**

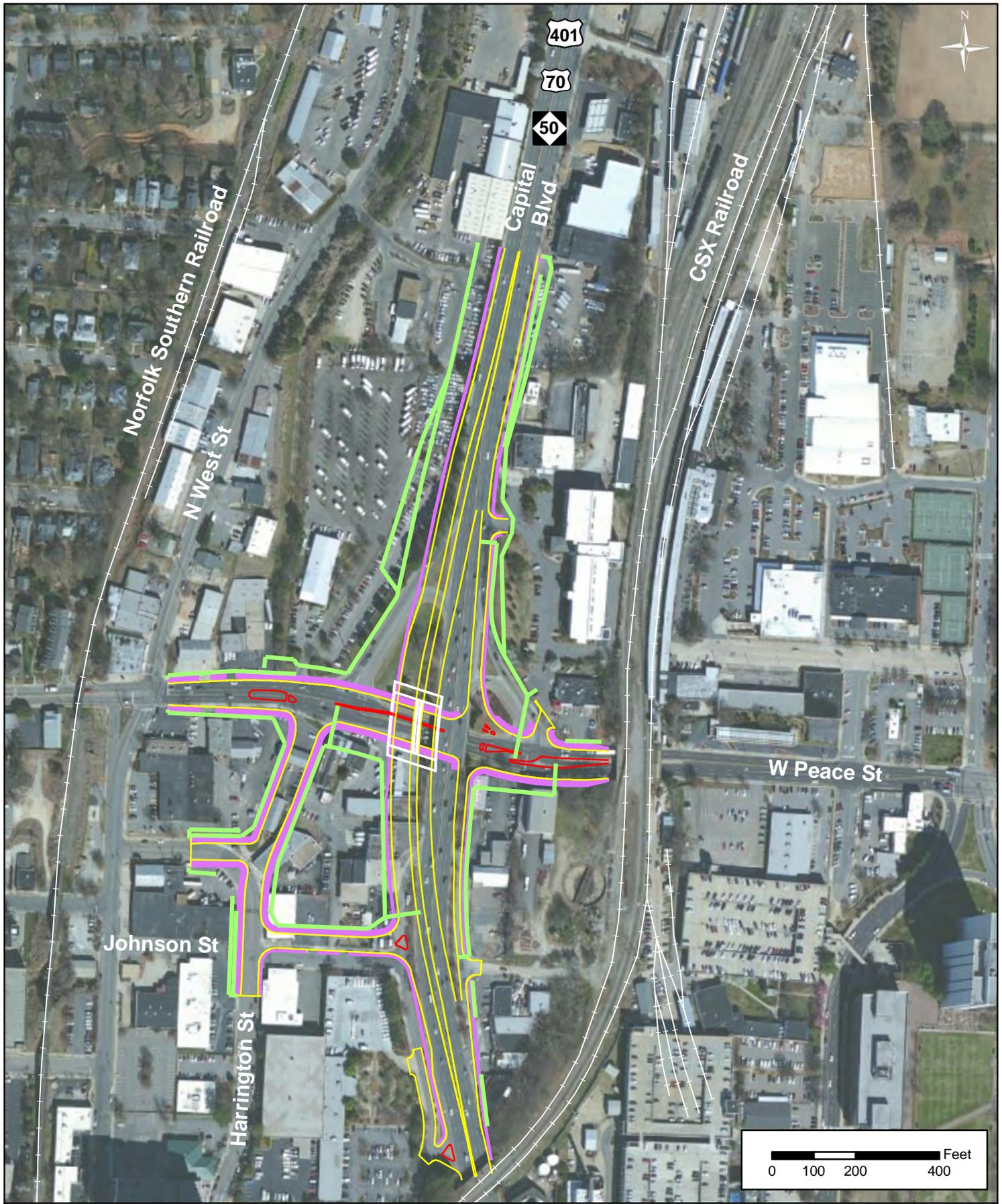
- Proposed Right of Way
- Proposed Roadway Bridge
- Proposed Edge of Travel
- Proposed Concrete Island
- Proposed Sidewalk



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DEPARTMENT  
OF  
TRANSPORTATION

**Figure 2a**  
**Alternative P-Base**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County

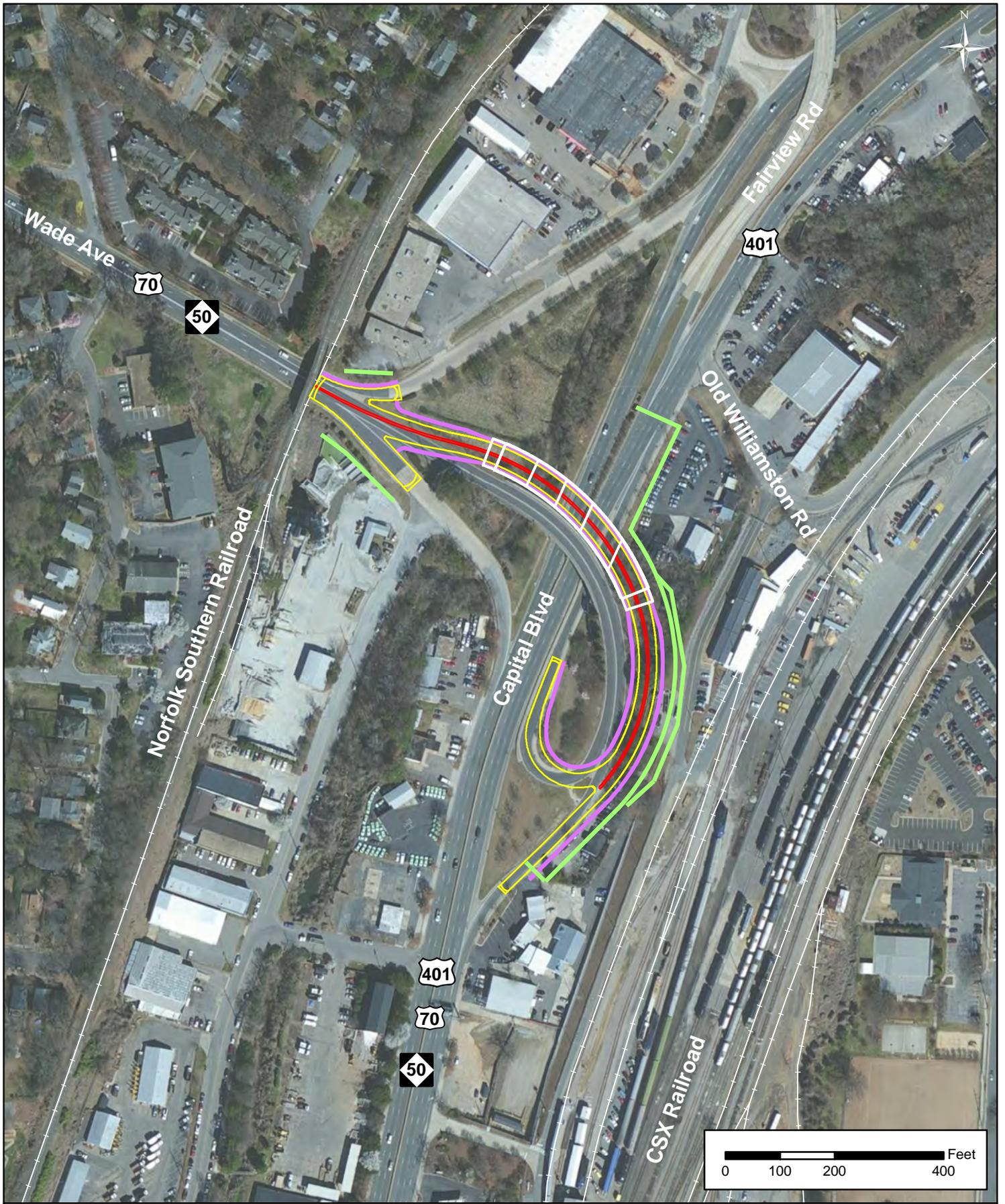


**Legend**

- Proposed Right of Way
- Proposed Roadway Bridge
- Proposed Edge of Travel
- Proposed Concrete Island
- Proposed Sidewalk

**Figure 2b**  
**Alternative P5**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County



**Legend**

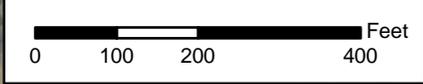
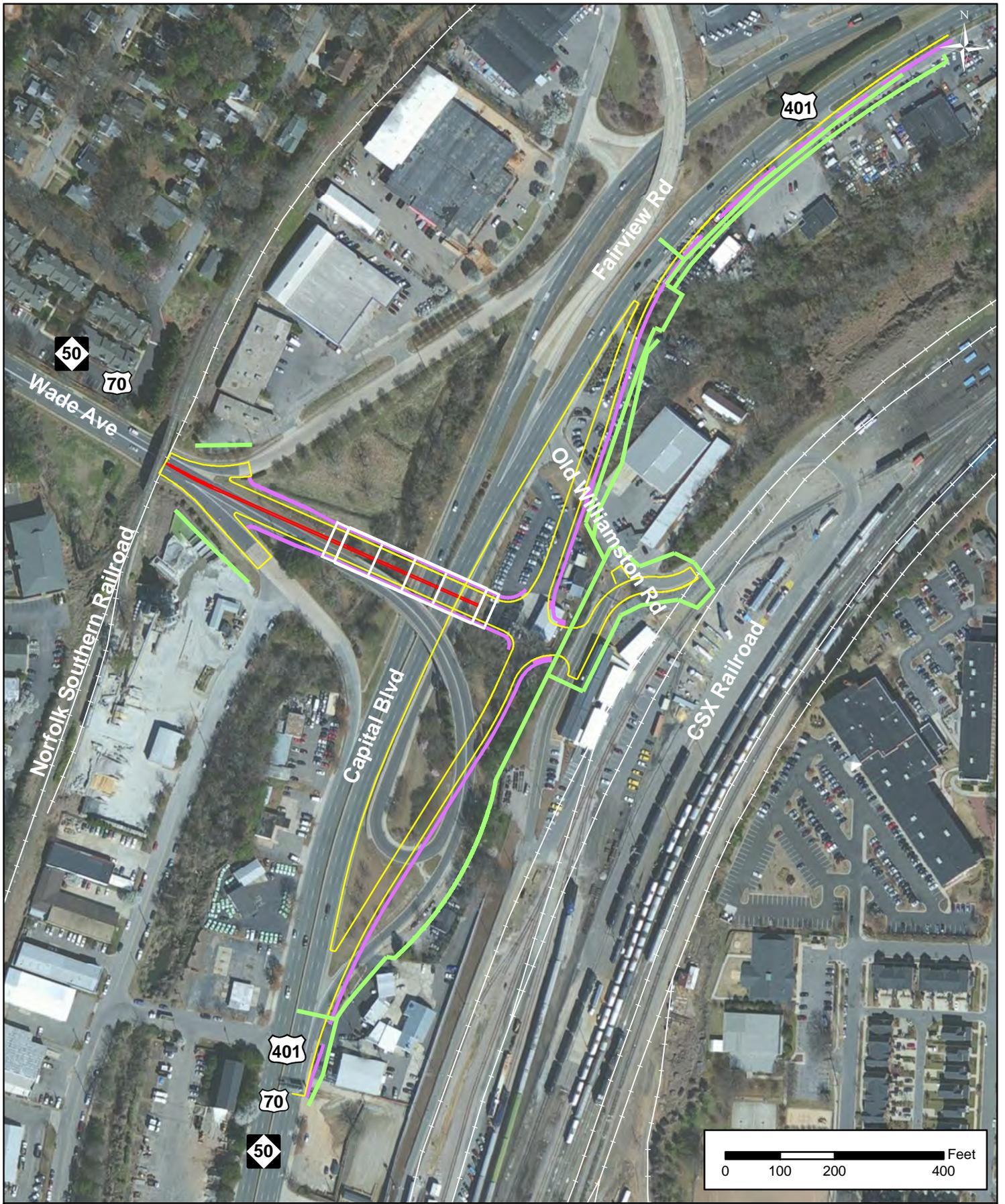
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- Proposed Concrete Island
- Proposed Sidewalk



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**Figure 2c  
Alternative W-Base**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County



**Legend**

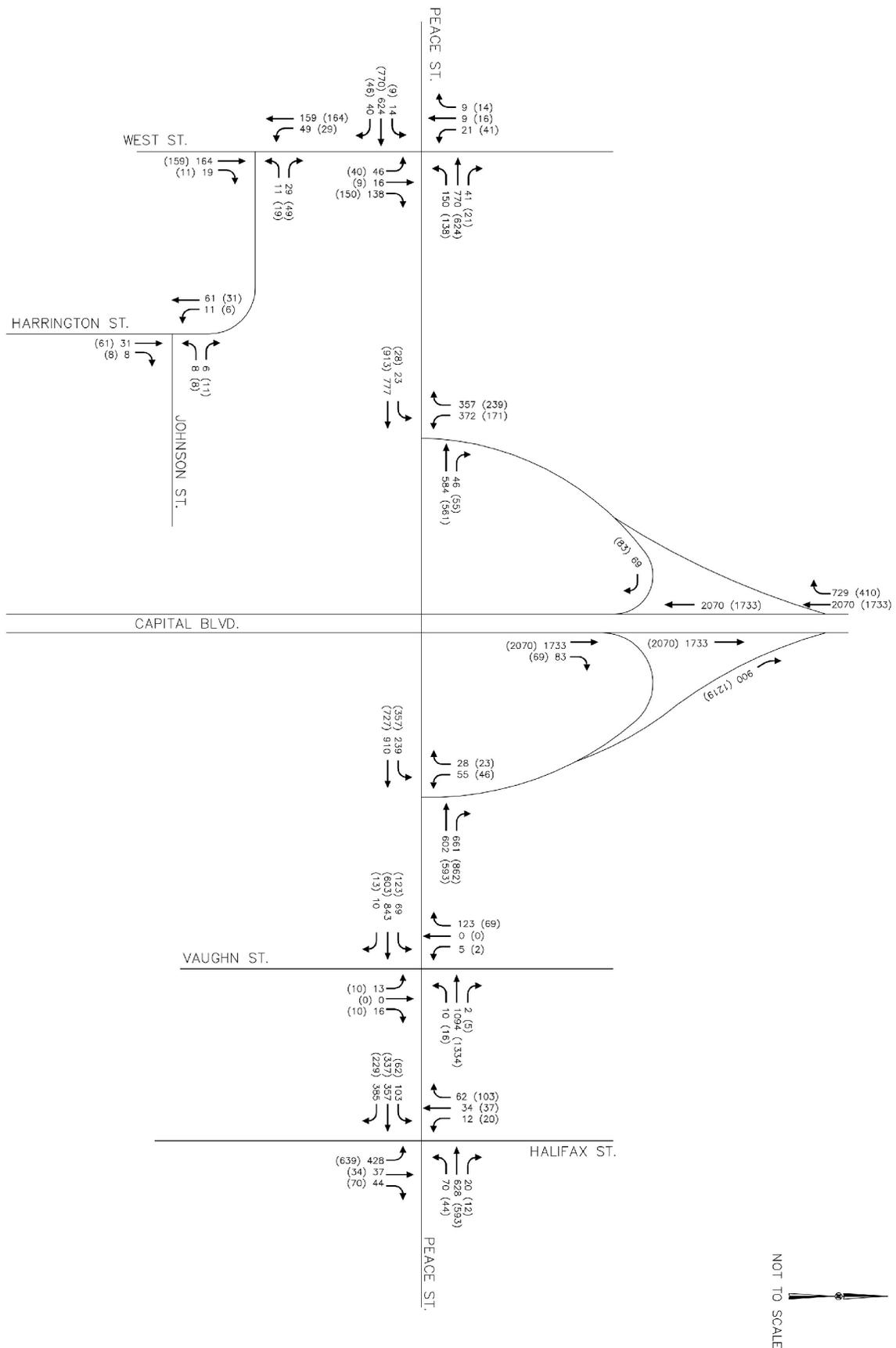
- Proposed Right of Way
- Proposed Roadway Bridge
- Proposed Edge of Travel
- Proposed Concrete Island
- Proposed Sidewalk



NORTH CAROLINA  
DEPARTMENT  
OF  
TRANSPORTATION

**Figure 2d  
Alternative W2c**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County



NORTH CAROLINA  
DEPARTMENT  
OF  
TRANSPORTATION

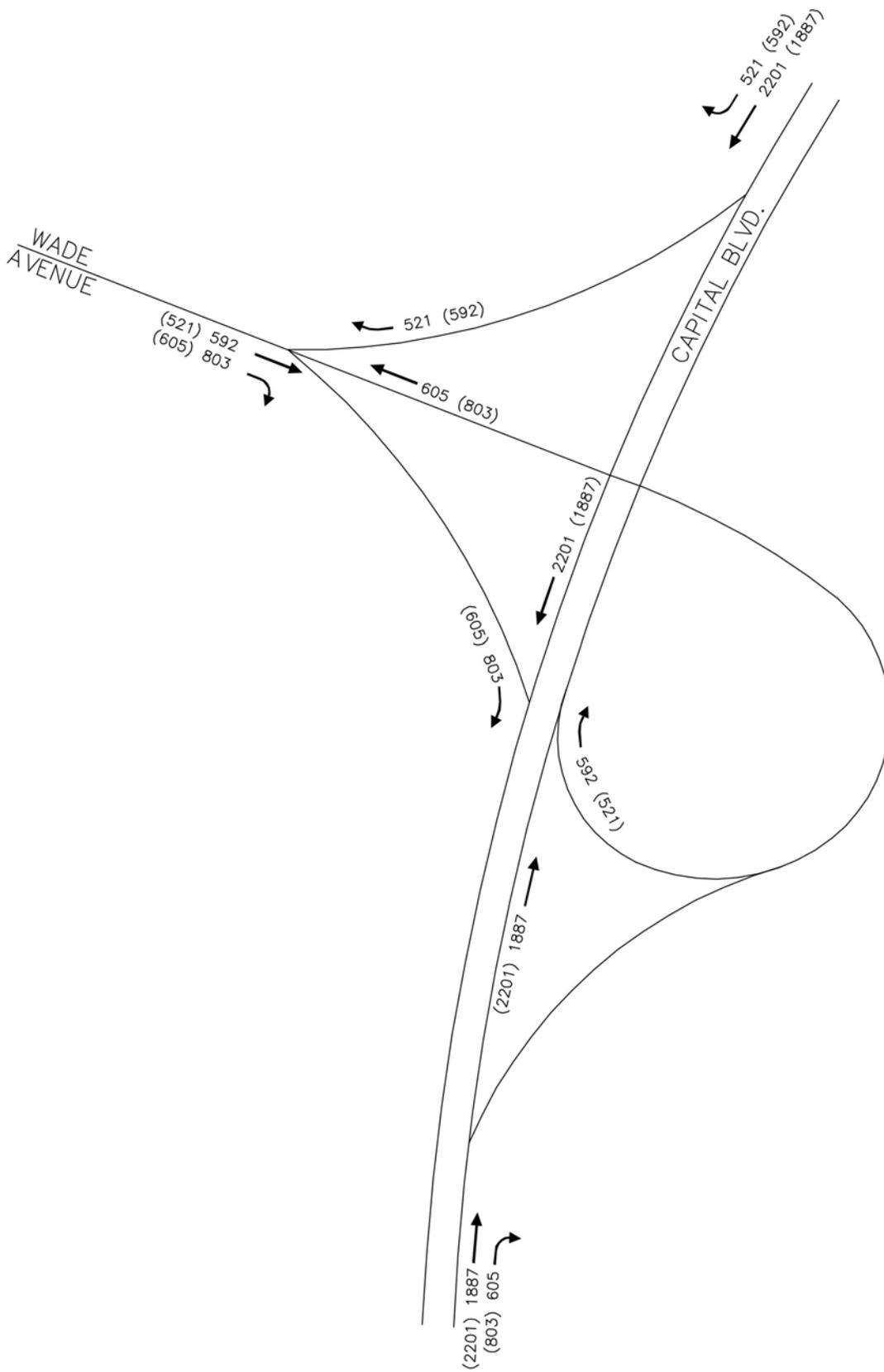
**Legend**  
XX AM Peak Hour  
(XX) PM Peak Hour

**Figure 3a**  
**Existing (2011) Average Daily Traffic Volumes**  
**Peace Street Interchange**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County



NOT TO SCALE

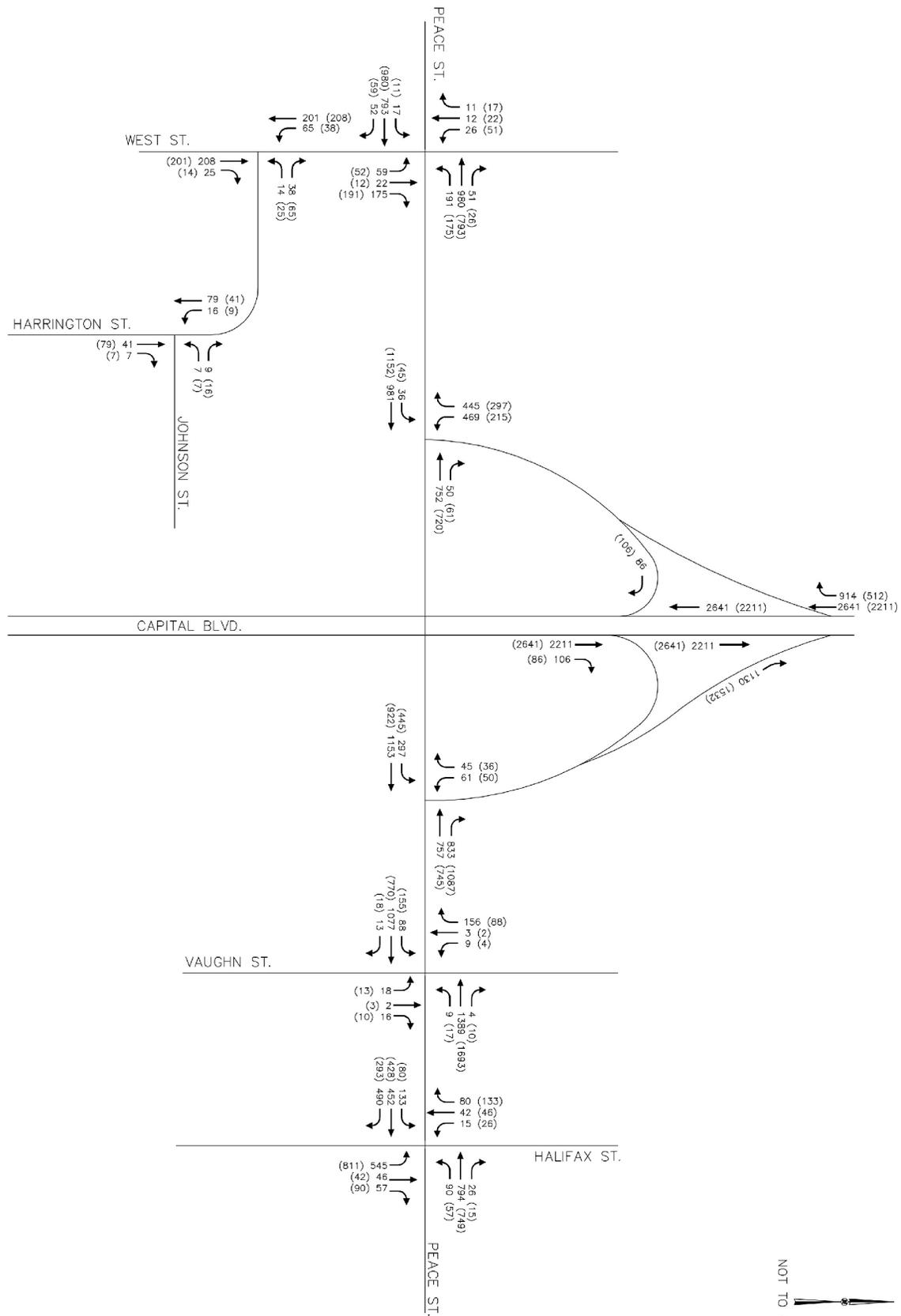


NORTH CAROLINA  
DEPARTMENT  
OF  
TRANSPORTATION

**Legend**  
XX AM Peak Hour  
(XX) PM Peak Hour

**Figure 3b**  
**Existing (2011) Average Daily Traffic Volumes**  
**Wade Avenue Interchange**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County



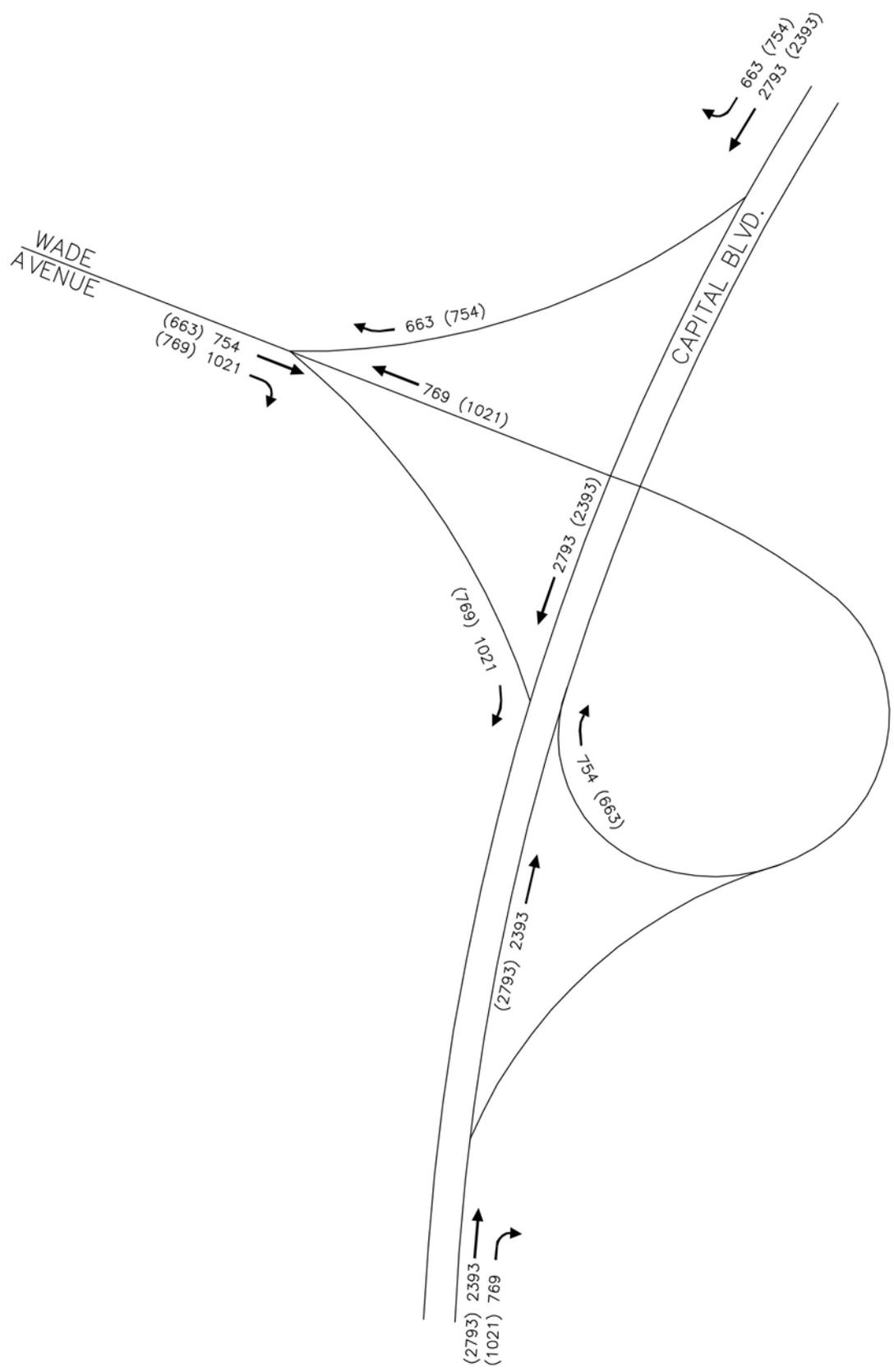
NORTH CAROLINA  
DEPARTMENT  
OF  
TRANSPORTATION

**Legend**

- XX AM Peak Hour
- (XX) PM Peak Hour

**Figure 3c**  
**Projected (2035) Average Daily Traffic Volumes**  
**Peace Street Interchange**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County



NORTH CAROLINA  
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OF  
TRANSPORTATION

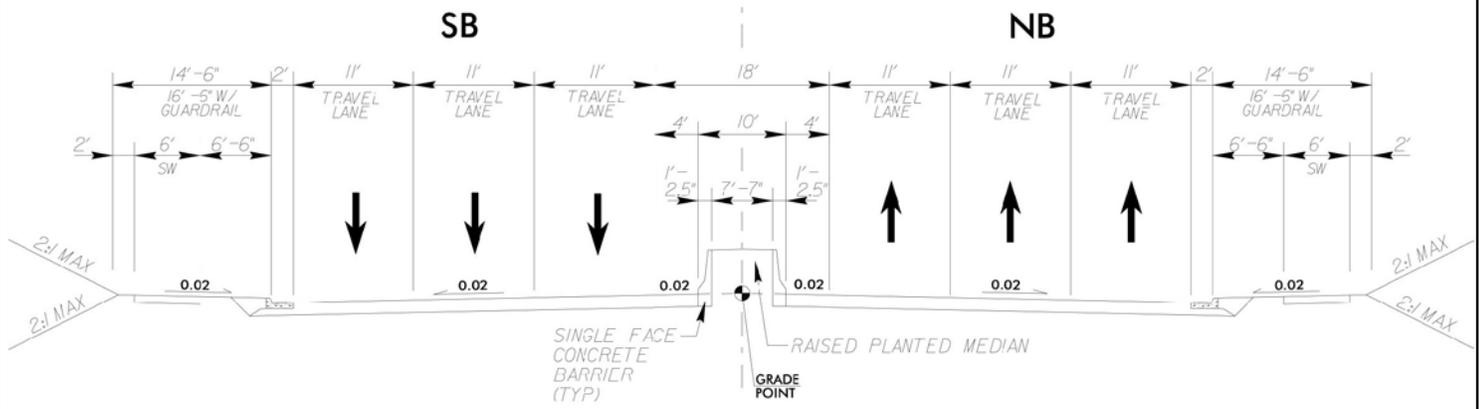
**Legend**

- XX AM Peak Hour
- (XX) PM Peak Hour

**Figure 3d**  
**Projected (2035) Average Daily Traffic Volumes**  
**Wade Avenue Interchange**

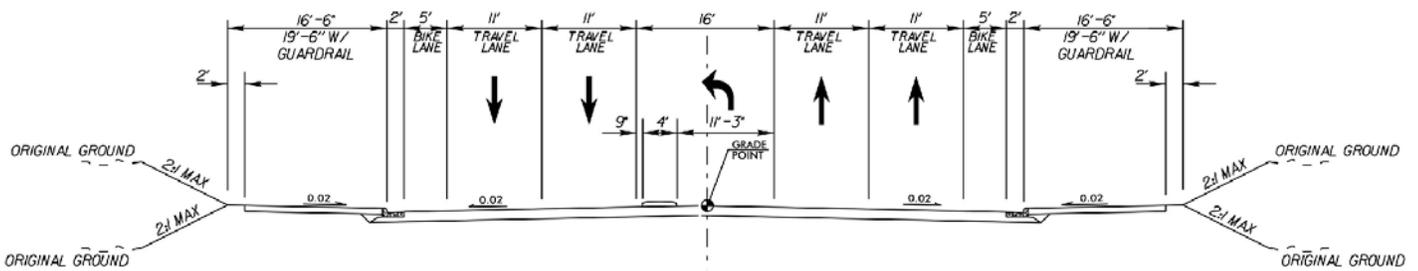
TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County

CL CAPITAL BLVD (US 70 /NC 50)



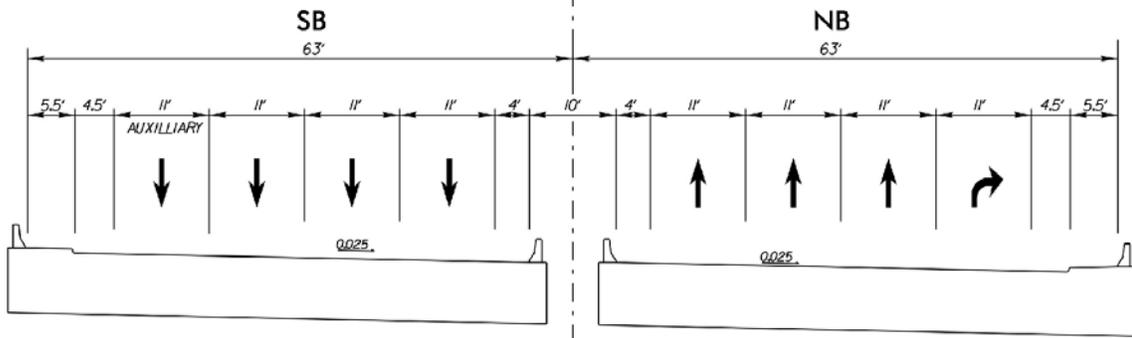
Roadway Typical Section 1

CL PEACE ST



Roadway Typical Section 2

CL CAPITAL BLVD (US 70/NC 50)



Bridge Typical Section 1

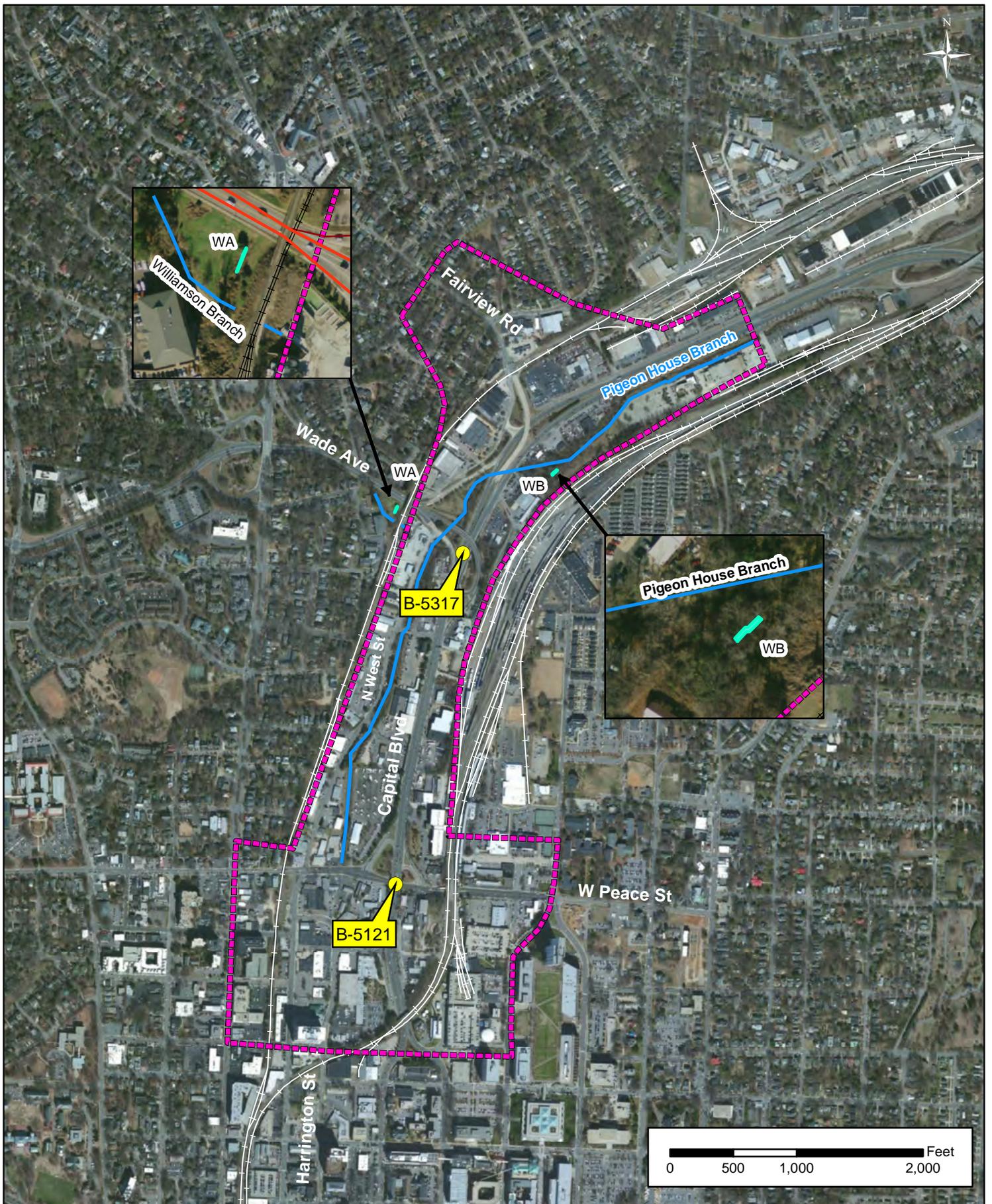


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TRANSPORTATION

**Figure 4a**  
**Typical Sections**  
**Peace Street Interchange**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County





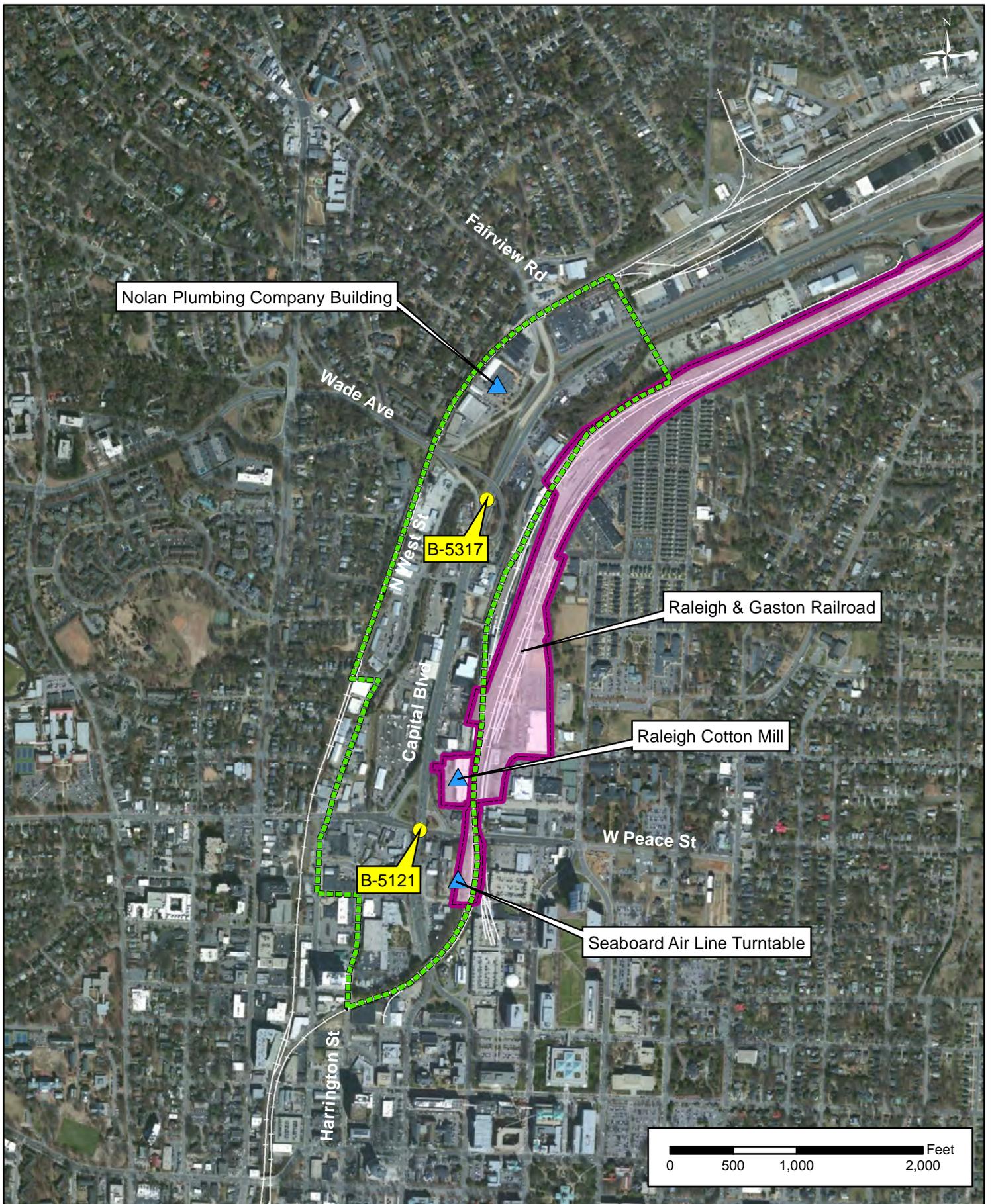
NORTH CAROLINA  
DEPARTMENT  
OF  
TRANSPORTATION

**Legend**

-  Environmental Study Area
-  Wetlands
-  Streams
-  Proposed Bridges to be Replaced

**Figure 5  
Environmental Features**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County



NORTH CAROLINA  
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TRANSPORTATION

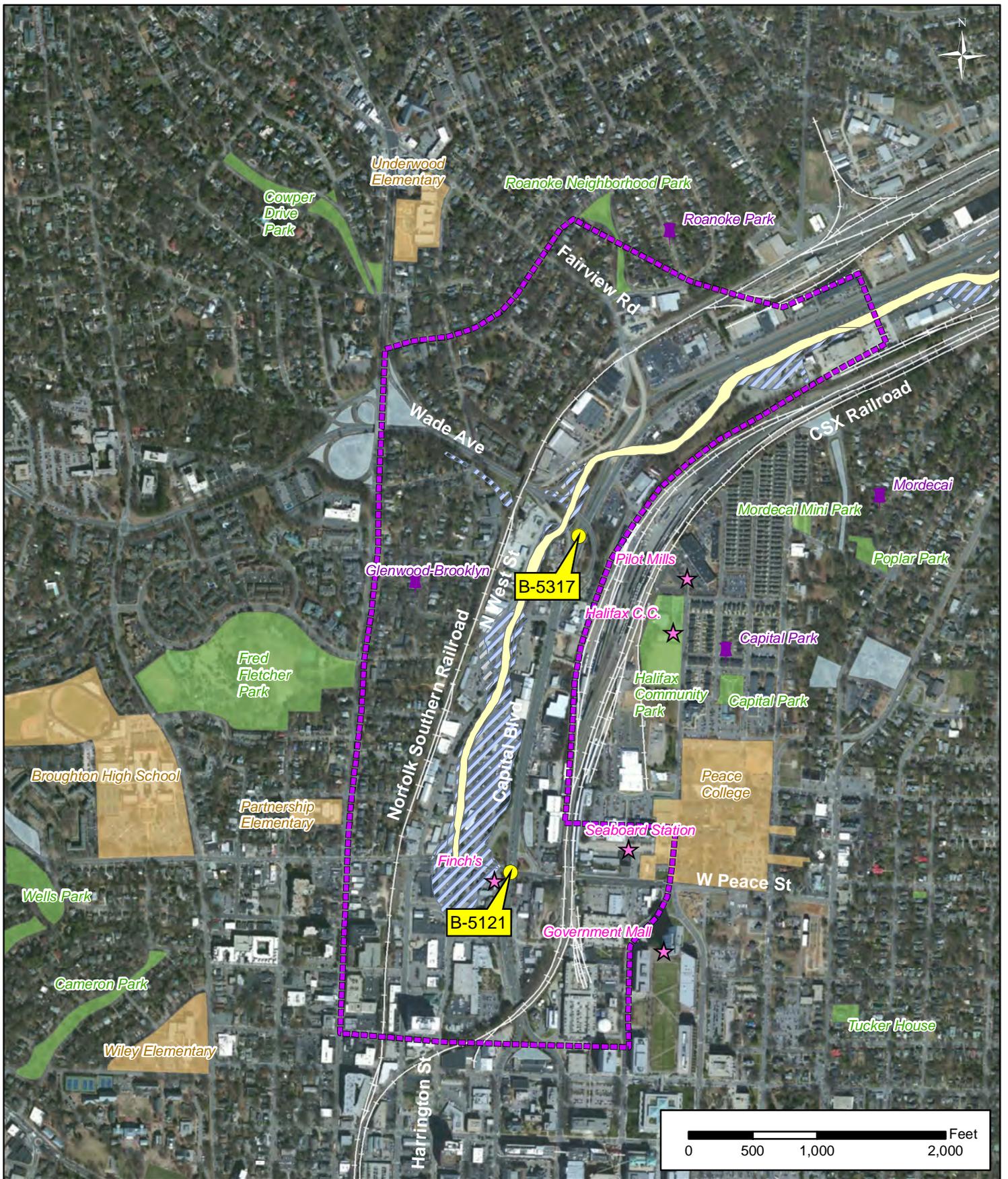
**Legend**

- Proposed Bridges to be Replaced
- Area of Potential Effects

- ▲ Historic Resources
- Historic Districts

**Figure 6  
Historic Resources**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County



**Legend**

- Proposed Bridges to be Replaced
- ★ Community Facility or Node
- Neighborhoods
- Study Area

- Floodway
- 100 Year Floodplain
- 500 Year Floodplain
- Park
- School
- Public Open Space

**Figure 7  
Community Features**

TIP Projects B-5121 & B-5317  
Capital Boulevard Bridge Replacements  
City of Raleigh, Wake County



NORTH CAROLINA  
DEPARTMENT  
OF  
TRANSPORTATION

## **APPENDICES**

**Appendix A – Agency Comments**

**Appendix B – NCDOT Relocation Estimate**

**Appendix C – Bridge Inspection Reports**

**APPENDIX A**  
**AGENCY COMMENTS**



North Carolina Department of Environment and Natural Resources  
Office of Conservation, Planning, & Community Affairs

Beverly Eaves Perdue, Governor

Linda Pearsall, Director

Dee Freeman, Secretary

March 1, 2011

**MEMORANDUM**

TO: Gregory Thorpe, NC DOT Project Development and Environmental Analysis Branch

FROM: <sup>HL</sup> Harry LeGrand, Natural Heritage Program

SUBJECT: Start of Study – Capital Boulevard Bridge Replacements at Peace Street and Wade Avenue; Raleigh, Wake County

REFERENCE: WBS No. 42263.1.1, TIP Project Nos. B-5121/B-5317

The Natural Heritage Program has no record of rare species, significant natural communities, significant natural heritage areas, or conservation/managed areas at the site nor within a mile of the project area. Although our maps do not show records of such natural heritage elements in the project area, it does not necessarily mean that they are not present. It may simply mean that the area has not been surveyed. The use of Natural Heritage Program data should not be substituted for actual field surveys, particularly if the project area contains suitable habitat for rare species, significant natural communities, or priority natural areas.

Please do not hesitate to contact me at 919-715-8697 if you have questions or need further information.



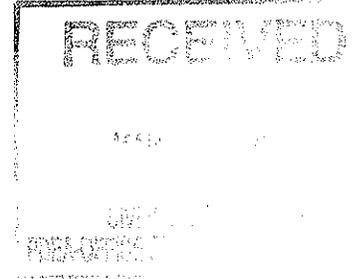
North Carolina Department of Environment and Natural Resources

Division of Water Quality  
Coleen H. Sullins  
Director

Beverly Eaves Perdue  
Governor

Dee Freeman  
Secretary

March 10, 2011



**MEMORANDUM**

**TO:** Gregory J. Thorpe, Ph.D., Director, NCDOT PDEA  
**FROM:** Rob Ridings, NCDWQ Transportation Permitting Unit *RR*  
**SUBJECT:** Scoping Review of NCDOT's Proposed Bridge Replacement Projects: B-5121 & B-5317 in Wake County.

Reference your correspondence dated received February 25, 2011 in which you requested comments for the referenced project. Preliminary analysis of the project reveals the potential for impacts to perennial streams and riparian buffers in the project area. Streams in the project area include:

Stream Name	River Basin & Subbasin	Stream Classifications	Stream Index Number	303(d) Listing?
Pigeon House Branch	NEU 02	C; NSW	27-33-18	Yes.
Williamson Branch	NEU 02	C; NSW	27-33-18-1	No.

Further investigations at a higher resolution should be undertaken to verify the presence of other streams and/or jurisdictional wetlands in the area. In the event that any jurisdictional areas are identified, the Division of Water Quality requests that NCDOT (or the consultant(s) that requested the comments) consider the following environmental issues for the proposed project:

**Project-Specific Comments**

1. Pigeon House Branch and Williamson Branch are class C, NSW waters of the state. Additionally, Pigeon House Branch is listed as 303(d) impaired waters of the State. NCDWQ is very concerned with sediment and erosion impacts that could result from this project. NCDWQ recommends that the most protective sediment and erosion control BMPs be implemented in accordance with *Design Standards in Sensitive Watersheds* to reduce the risk of nutrient runoff to these waters. NCDWQ requests that road design plans provide treatment of the storm water runoff through best management practices as detailed in the most recent version of NCDWQ *Stormwater Best Management Practices*.
2. This project is within the Neuse River Basin. Riparian buffer impacts shall be avoided and minimized to the greatest extent possible pursuant to 15A NCAC 2B.0233.

3. Any anticipated bank stabilization associated with culvert installations or extensions should be addressed in the Categorical Exclusion (CE) document and permit applications. It is understood that final designs are not determined at the time the CE is developed. However, the CE should discuss the potential for bank stabilization necessary due to culvert installation.
4. Any anticipated dewatering or access structures necessary for construction of bridges should be addressed in the CE and permit applications. It is understood that final designs are not determined at the time the CE is developed. However, the CE should discuss the potential for dewatering and access measures necessary due to bridge construction.

#### **General Comments Regarding Bridge Replacement Projects**

1. NCDWQ is very concerned with sediment and erosion impacts that could result from this project. NCDOT shall address these concerns by describing the potential impacts that may occur to the aquatic environments and any mitigating factors that would reduce the impacts.
2. If foundation test borings are necessary; it shall be noted in the document. Geotechnical work is approved under General 401 Certification Number 3687/Nationwide Permit No. 6 for Survey Activities.
3. If a bridge is being replaced with a hydraulic conveyance other than another bridge, NCDWQ believes the use of a Nationwide Permit may be required. Please contact the US Army Corp of Engineers to determine the required permit(s).
4. If the old bridge is removed, no discharge of bridge material into surface waters is allowed unless otherwise authorized by the US ACOE. Strict adherence to the Corps of Engineers guidelines for bridge demolition will be a condition of the 401 Water Quality Certification.
5. Whenever possible, NCDWQ prefers spanning structures. Spanning structures usually do not require work within the stream or grubbing of the streambanks and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges shall allow for human and wildlife passage beneath the structure. Fish passage and navigation by canoeists and boaters shall not be blocked. Bridge supports (bents) should not be placed in the stream when possible.
6. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to the most current version of NCDWQ's *Stormwater Best Management Practices*.
7. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.
8. If temporary access roads or detours are constructed, the site shall be graded to its preconstruction contours and elevations. Disturbed areas shall be seeded or mulched to stabilize the soil and appropriate native woody species shall be planted. When using temporary structures the area shall be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact allows the area to re-vegetate naturally and minimizes soil disturbance.
9. Sediment and erosion control measures sufficient to protect water resources must be implemented and maintained in accordance with the most recent version of North Carolina Sediment and Erosion Control Planning and Design Manual and the most recent version of NCS000250.

10. All work in or adjacent to stream waters shall be conducted in a dry work area unless otherwise approved by NCDWQ. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water.
11. Heavy equipment shall be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams. This equipment shall be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.
12. In most cases, the NCDWQ prefers the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour shall be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure shall be removed and the approach fills removed from the 100-year floodplain. Approach fills shall be removed and restored to the natural ground elevation. The area shall be stabilized with grass and planted with native tree species. Tall fescue shall not be used in riparian areas.

#### **General Comments if Replacing the Bridge with a Culvert**

1. Placement of culverts and other structures in waters, streams, and wetlands shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in disequilibrium of wetlands or streambeds or banks, adjacent to or upstream and down stream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWQ. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact the NCDWQ for guidance on how to proceed and to determine whether or not a permit modification will be required.
2. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation, floodplain benches and/or sills may be required where appropriate. Widening the stream channel shall be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.
3. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures shall be properly designed, sized and installed.

Thank you for requesting our input at this time. NCDOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Rob Ridings at 919-807-6403.

cc: Eric Alsmeyer, US Army Corps of Engineers, Raleigh Field Office  
Chris Murray, Division 5 Environmental Officer  
File Copy



North Carolina Department of Cultural Resources  
State Historic Preservation Office

Peter B. Sandbeck, Administrator

Beverly Eaves Perdue, Governor  
Linda A. Carlisle, Secretary  
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History  
Division of Historical Resources  
David Brook, Director

March 16, 2011

MEMORANDUM

TO: Greg Thorpe, Ph.D., Director  
Project Development and Environmental Analysis Branch  
NCDOT Division of Highways

FROM: Claudia Brown *PSE for Claudia Brown*

SUBJECT: Start of Study for Capital Boulevard Bridge Replacement at Peace Street, B-5121, Wake County, ER 08-2607

Thank you for your letter of February 18, 2011, concerning the above cited project.

Although our earlier comments are not included in your scoping information sheet, our memorandum of January 26, 2009, concerning this project noted that the area of potential effect (APE) for this project includes archaeological site 31WA1448, which is potentially eligible for inclusion in the National Register of Historic Places. This site contains a portion of the Raleigh and Gaston/Seaboard Air Line Railyard complex. Previous investigations in areas of the complex have found intact nineteenth century deposits located beneath fill material. The current study area, as depicted on the maps accompanying the scoping information sheet, is considerably larger and includes archaeological sites 31WA491 and 31WA527.

Site 31WA491 contains buried deposits related to the railyard as well as portions of the roundhouse. Portions of this site, which is eligible for inclusion in the National Register of Historic Places, were excavated prior to construction of parking deck number two, but undisturbed portions remain. Site 31WA527 is the deeply buried remains of Mordecai Mill. These remains are located in the northern portion of the study area and are unlikely to be affected by replacement of the Bridge 227 over Peace Street.

We recommend that the areas of 31WA1448 and 31WA491 to be affected by the proposed bridge replacement be subjected to archaeological deep testing via backhoe trenching to evaluate site significance and potential project effects. We also recommend intensive historical and land use research of the APE to determine what other buried archaeological remains are likely to be present.

Two copies of the resulting archaeological survey report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are submitted by the consulting archaeologist and well in advance of any construction activities.

A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at [www.archaeology.ncdcr.gov/ncarch/resource/consultants.htm](http://www.archaeology.ncdcr.gov/ncarch/resource/consultants.htm). The archaeologists listed, or any other experienced archaeologist, may be contacted to conduct the recommended survey.

We have conducted a search of our maps and files and located the following structures of historic or architectural importance within the joint study area for this project and the proposed bridge replacement at Capital Boulevard and Peace Street:

Site Number	Site Name	Status
WA0043	Seaboard Coast Line Railroad Company Building	Local Landmark National Register in 1971
WA2833	Pine State Creamery	National Register in 1997
WA3115	Seaboard Railway Station (Eugene C. Bagwell Station)	Study List in 1991 DOE in 1999 & 2005
WA3145	Roanoke Park Historic District	National Register in 2003
WA3919	Raleigh Cotton Mill	Study List in 1975 DOE in 1999 & 2005
WA4070	Hayes Barton Historic District	National Register in 2002
WA4189	Glenwood-Brooklyn Historic District	National Register in 2002
WA4547	Noland Plumbing Co.	Study List in 2006

The following additional structures are located adjacent to, but outside or, the proposed study area:

Site Number	Site Name	Status
WA3725	North Blount Street Historic District	Study List in 1977
WA3936	Blount Street Local Historic District	Local Landmark
WA4083	West Jones Street RR District	Study List in 1991 DOE in 1994

We recommend that a Department of Transportation architectural historian identify and evaluate any other structures over fifty (50) years of age within the project area, and report the findings to us.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/807-6579. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Matt Wilkerson, NCDOT  
Mary Pope Furr, NCDOT



North Carolina Department of Cultural Resources  
State Historic Preservation Office

Peter B. Sandbeck, Administrator

Beverly Eaves Perdue, Governor  
Linda A. Carlisle, Secretary  
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History  
Division of Historical Resources  
David Brook, Director

March 18, 2011

MEMORANDUM

TO: Greg Thorpe, Ph.D., Director  
Project Development and Environmental Analysis Branch  
NCDOT Division of Highways

FROM: Claudia Brown *PSE for Claudia Brown*

SUBJECT: Start of Study for Capital Boulevard Bridge Replacement at Wade Avenue, B-5317,  
Wake County, ER 11-0310

Thank you for your letter of February 18, 2011, concerning the above project. We have reviewed the scoping information sheet and accompanying maps and offer the following comments.

Archaeological site 31WA527 is located within the northern portion of the proposed study area. This deeply buried site is the remains of the Mordecai Mill, associated with the Mordecai Plantation. If this site is to be affected by the proposed bridge replacement, archaeological deep testing to determine site significance will be needed as soon as possible. If the site is determined to be eligible for inclusion in the National Register of Historic Places, appropriate mitigation measures will need to be developed and implemented in consultation with our office. In addition, we recommend intensive historic and land use research be conducted of the remainder of the area of potential effect (APE) to determine if other buried archaeological sites will be affected.

Potential effects to archaeological resources from replacement of the Peace Street bridge have been addressed in a separate memorandum.

Two copies of the resulting archaeological survey report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are submitted by the consulting archaeologist and well in advance of any construction activities.

A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at [www.archaeology.ncdcr.gov/ncarch/resource/consultants.htm](http://www.archaeology.ncdcr.gov/ncarch/resource/consultants.htm). The archaeologists listed, or any other experienced archaeologist, may be contacted to conduct the recommended survey.

We have conducted a search of our maps and files and located the following structures of historic or architectural importance within the joint study area for this project and the proposed bridge replacement at Capital Boulevard and Wade Avenue:

Site Number	Site Name	Status
WA0043	Seaboard Coast Line Railroad Company Building	Local Landmark National Register in 1971
WA2833	Pine State Creamery	National Register in 1997
WA3115	Seaboard Railway Station (Eugene C. Bagwell Station)	Study List in 1991 DOE in 1999 & 2005
WA3145	Roanoke Park Historic District	National Register in 2003
WA3919	Raleigh Cotton Mill	Study List in 1975 DOE in 1999 & 2005
WA4070	Hayes Barton Historic District	National Register in 2002
WA4189	Glenwood-Brooklyn Historic District	National Register in 2002
WA4547	Noland Plumbing Co.	Study List in 2006

The following additional structures are located adjacent to, but outside of, the proposed study area:

Site Number	Site Name	Status
WA3725	North Blount Street Historic District	Study List in 1977
WA3936	Blount Street Local Historic District	Local Landmark
WA4083	West Jones Street RR District	Study List in 1991 DOE in 1994

We recommend that a Department of Transportation architectural historian identify and evaluate any other structures over fifty (50) years of age within the project area, and report the findings to us.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/807-6579. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Matt Wilkerson, NCDOT  
Mary Pope Furr, NCDOT



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

December 18, 2012

Steve Claggett  
State Archaeologist  
Office of State Archaeology  
4619 Mail Service Center  
Raleigh, NC 27699-4619

Re: B-5121, Replacement of Bridge No. 227 on Capital Boulevard over Peace Street, Wake County, North Carolina (WBS 42263.1.1), Federal Aid No. BRNHS-0070(119), ER 08-2607.

Mr. Claggett,

Thank you for taking the time to meet with us on Tuesday, September 18, 2012, to discuss the eligibility of Site 31WA1448\*\*, the Raleigh & Gaston/Seaboard Air Line Railway Complex. After further discussions between the Office of State Archaeology (OSA) and NCDOT's Archaeology Group, we have determined that Site 31WA1448\*\* is to be recommended as eligible for the National Register of Historic Places (NRHP) per Criterion D based upon its potential to provide information pertaining to the development of Wake County and the City of Raleigh. In addition, Site 31WA1448\*\* should be considered a contributing element to the overall Raleigh & Gaston Railroad Historic District, whose boundary should be augmented in order to include Site 31WA1448\*\*. If it is determined that Site 31WA1448\*\* will be impacted by the Preferred Alternative chosen for the proposed project, then additional measures will be taken regarding 31WA1448\*\* that may include the development of a Memorandum of Agreement (MOA) stipulating the efforts NCDOT will carry out to mitigate effects to the resource.

Thank you for your assistance in this matter. Should you have any questions concerning this project, please contact me at (919) 707-6089 or Mr. Paul J. Mohler, NCDOT Archaeologist, at (919) 707-6080.

Regards,

Matt Wilkerson  
Archaeology Group Leader  
Human Environment Section

MTW/pjm

cc: Felix Davila, FHWA  
Vince Rhea, NCDOT PDEA  
Paul J. Mohler, NCDOT Archaeology  
Shelby Spillers, NCDOT Historic Architecture

MAILING ADDRESS:  
NC DEPARTMENT OF TRANSPORTATION  
PDEA - HUMAN ENVIRONMENT SECTION  
1598 MAIL SERVICE CENTER  
RALEIGH NC, 27699-1598

TELEPHONE: 919-707-6000  
FAX: 919-212-5785

WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

LOCATION:  
PDEA - HUMAN ENVIRONMENT SECTION  
CENTURY CENTER, BLDG. B  
1020 BIRCH RIDGE DRIVE  
RALEIGH NC, 27610



**North Carolina Department of Cultural Resources**  
**State Historic Preservation Office**

Ramona M. Bartos, Administrator

Pat McCrory, Governor  
Susan W. Kluttz, Secretary  
Kevin Cherry, Deputy Secretary

Office of Archives and History  
Division of Historical Resources  
David Brook, Director

March 5, 2013

MEMORANDUM

TO: Matt Wilkerson  
Office of Human Environment  
NCDOT Division of Highways

FROM: Ramona M. Bartos

*Re: for Ramona M. Bartos*

SUBJECT: Replace Bridge 227 on Capital Boulevard over Peace Street, B-5121, Wake County, ER 08-2607

Thank you for your letter of December 18, 2012, to Steve Claggett concerning the above project. We apologize for the delay in our response.

We concur with your determination that archaeological site 31WA1448\*\* is eligible for inclusion in the National Register of Historic Places under criterion D. If the site is to be affected by the Preferred Alternative for the project, additional investigations will be needed prior to project implementation. We look forward to working with you and your staff on the development of a Memorandum of Agreement delineating the appropriate mitigation measures for 31WA1448\*\*. Please forward information concerning the Preferred Alternative as soon as it is available.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above-referenced tracking number.

**CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS**

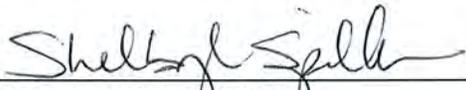
**Project Description: Replace Bridge Nos. 227&213 on US 70 over Peace St and Wade Ave in Raleigh.**

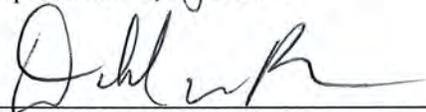
On January 8, 2013, representatives of the

- North Carolina Department of Transportation (NCDOT)
- Federal Highway Administration (FHWA)
- North Carolina State Historic Preservation Office (HPO)
- Other United States Army Corps of Engineers (USACE)

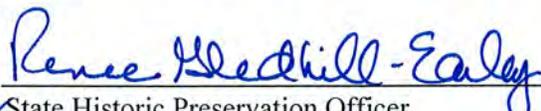
Reviewed the subject project and agreed on the effects findings listed within the table on the reverse of this signature page.

Signed:

  
\_\_\_\_\_  
Representative, NCDOT 2-5-13  
Date

  
\_\_\_\_\_  
FHWA, for the Division Administrator, or other Federal Agency 2-7-13  
Date

\_\_\_\_\_  
Representative, HPO Date

  
\_\_\_\_\_  
State Historic Preservation Officer 2-5-13  
Date

Federal Aid # BRNHS-00701(119) & BRNHS-0070(149)

TIP#: B-5121&B-5317

County: Wake

Property and Status	Alternative	Effect Finding	Reasons
Raleigh Cotton Mill (WA 3919) DOE, LL	P Base Alt	No Adverse Effect	Moves Capital Blvd. away from property; adequate access to be maintained.
	Alt P-2D	No Adverse Effect	Moves Capital Blvd. away from property; Access will be maintained by creating a new access point from Peace St.
Seaboard Air Line Turntable and Raleigh & Gaston Railroad HD and Roundhouse Site (WA 7383) DOE	P Base Alt	No Adverse Effect	No construction; easement or new ROW within historic boundaries.
	Alt P-2D	Adverse Effect	Major disturbance of Roundhouse Site with is a contributing resource eligible under criterion A and D.
	W Base Alt	No Effect	No construction; easement or new ROW within historic boundaries.
	Alt W 2B	No Effect	No construction; easement or new ROW within historic boundaries.
	Alt W 2C	No Effect	No construction; easement or new ROW within historic boundaries.
Noland Plumbing Company Building (WA 7126) DOE	W Base Alt	No Effect	No construction; easement or new ROW within historic boundaries.
	Alt W2	No Effect	Maintains existing ROW
	Alt W 2C	No Effect	Maintains existing ROW
	Alt W 2B	No Effect	No construction; easement or new ROW within historic boundaries.

Initialed: NCDOT SS FHWA USACE DB HPO Boye

FHWA intends to use SHPO's concurrence as a basis of a "de minimis" finding for the following properties, pursuant to Section 4(f):

Federal Aid # BRNHS-00701(119) & BRNHS-0070(149) TIP#: B-5121&B-5317 County: Wake

**CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS**

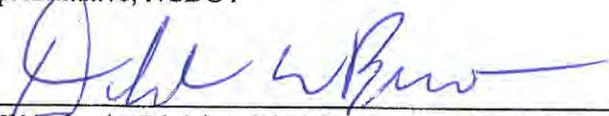
**Project Description: Replace Bridge Nos. 227&213 on US 70 over Peace St and Wade Ave in Raleigh.**

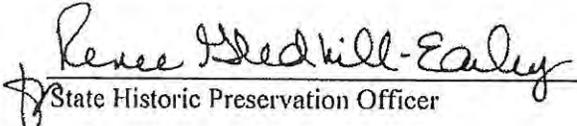
On December 17, 2013, representatives of the

- North Carolina Department of Transportation (NCDOT)
- Federal Highway Administration (FHWA)
- North Carolina State Historic Preservation Office (HPO)
- Other United States Army Corps of Engineers (USACE)

Reviewed the subject project and agreed on the effects findings listed within the table on the reverse of this signature page.\*

Signed:

_____ Representative, NCDOT	_____ Date
	12-20-13
_____ FHWA, for the Division Administrator, or other Federal Agency	_____ Date

_____ Representative, HPO	_____ Date
 State Historic Preservation Officer	12.20.13 Date

\*This is a second effects form which serves as an amendment to the effects form signed by all parties on February 5 and 7, 2013 and reflects the addition of an additional alternative known as Alt P5.

Federal Aid # BRNHS-00701(119) & BRNHS-0070(149)

TIP#: B-5121&B-5317

County: Wake

Property and Status	Alternative	Effect Finding	Reasons
Raleigh Cotton Mill (WA 3919) DOE, LL	Alt P5	No Adverse Effect	Moves Capital Blvd. away from property; Access will be maintained by creating a new access point from off ramp
Seaboard Air Line Turntable and Raleigh & Gaston Railroad HD and Roundhouse Site (WA 7383) DOE	Alt P5	No Adverse Effect	No construction; easement or new ROW within historic boundaries.

Initialed: NCDOT \_\_\_\_\_ ~~USACE~~ <sup>FHWA</sup> DB HPO RSE

FHWA intends to use SHPO's concurrence as a basis of a "de minimis" finding for the following properties, pursuant to Section 4(f):

From: [Militscher.Chris@epamail.epa.gov](mailto:Militscher.Chris@epamail.epa.gov) [<mailto:Militscher.Chris@epamail.epa.gov>]

Sent: Friday, March 18, 2011 1:31 PM

To: Rhea, Vincent J

Cc: [eric.c.alsmeyer@usace.army.mil](mailto:eric.c.alsmeyer@usace.army.mil); Ridings, Rob

Subject: Start of Study for B-5121 and B-5317, Wake Co.

Vince: EPA has reviewed the Start of Study information for the referenced bridge replacements projects located in the City of Raleigh at Peace Street and Wade Avenue along Capital Boulevard. EPA notes that Pigeon House Branch is listed on the 2010 NCDWQ 303(d) list for impaired waters of the U.S. Please include the most stringent stormwater control measures and other BMPs in the bridge replacement designs to minimize future impacts from construction activities and stormwater to this degraded stream.

EPA did not identify any other environmental concerns for these bridge replacement projects. Thank you.

Christopher A. Militscher, REM, CHMM  
USEPA Region 4 Raleigh Office  
919-856-4206

From: Wilson, Travis W. [mailto:[travis.wilson@ncwildlife.org](mailto:travis.wilson@ncwildlife.org)]  
Sent: Thursday, April 14, 2011 8:37 AM  
To: Rhea, Vincent J; Strong, Brian  
Cc: Hairr, Ron; Moore, Jeff; Gresham, Teresa  
Subject: RE: Scoping meeting for B-5121/B-5317

Vince, WRC does not have any specific concerns related to the replacement of these two structures.

Travis W. Wilson  
Eastern Region Highway Project Coordinator  
Habitat Conservation Program  
NC Wildlife Resources Commission  
1142 I-85 Service Rd.  
Creedmoor, NC 27522  
Phone: 919-528-9886 ext. 6  
Fax: 919-528-9839  
[Travis.Wilson@ncwildlife.org](mailto:Travis.Wilson@ncwildlife.org)

**APPENDIX B**  
**NCDOT RELOCATION ESTIMATE**

# REQUEST FOR R/W COST ESTIMATE

DATE RECEIVED: 11/26/13

DISTRIBUTED: 12/04/13

REVISION / **UPDATE**  
UPDATE : \_\_\_\_\_

I.D.NO./  
BREAK

DESCRIPTION

SCHEDULE

**B-5121 /** Replacement of bridges on Capital Blvd (US 70 / US 401 / NC R/W FY \_\_\_\_\_  
**B-5317** 50) At Peace St. and Wade Ave. (US 70 / NC 50) CONST FY \_\_\_\_\_ UNFUND  POST YRS

ACCESS: FULL C/A  PARTIAL C/A  NO CONTROL

WBS ELEMENT NUMBER: 42263.1.1 COUNTY: Wake

ENGINEER: Ahmad Al-Sharawneh DEPT.: PDEA DIV.: 5 APPRAISAL OFFICE.: 2

TYPE OF PLANS FURNISHED FOR ESTIMATE: Preliminary

DATE DUE: Before 12/26/13

PRIOR ESTIMATES OF LAND AND DAMAGES (WITH DATES):

**B-5121 08/29/12 L. Strickland: Base - 21 Parcels; \$9,710,370 L&D; \$9,940,370 Total**

**P2D - 32 Parcels; \$17,263,465 L&D; \$17,723,465 Total**

**B-5317 09/14/12 L. Strickland; Base - 4 Parcels; \$327,150 L&D; \$347,150 Total**

**W1A - 25 Parcels; \$11,777,100 L&D; \$12,102,100 Total**

**W2 - 27 Parcels; \$13,340,550 L&D; \$13,725,550 Total**

**W2B - 15 Parcels; \$10,206,825 L&D; \$10,506,825 Total**

BASED ON PAST PROJECT HISTORICAL DATA, THE LAND AND DAMAGE FIGURES HAVE BEEN ADJUSTED BY A FACTOR OF 50% TO INCLUDE CONDEMNATION AND ADMINISTRATIVE INCREASES THAT OCCUR DURING SETTLEMENT OF ALL PARCELS. THESE FIGURES PROJECT THE MOST ACCURATE ACQUISITION ESTIMATES **FOR 2 (TWO) YEARS** FROM THE DATE OF THIS ESTIMATE.

ESTIMATED BY: WBL TIME SPENT: 1 Day COMPLETED DATE: 12/27/2013 EXTENSION REQ.: \_\_\_\_\_

### ALTERNATES

	Peace St. Int. Alt P - Base	Peace St. Int. Alt P5	Wade Ave. Int. Alt W- Base	Wade Ave. Int. Alt W2C
ESTIMATED NO. OF PARCELS:	21	32	4	13
RESIDENTIAL RELOCATIONS:	0	0	0	0
BUSINESS RELOCATIONS:	9/\$225,000	12/\$300,000	1/\$25,000	9/\$225,000
GRAVES	0	0	0	0
LAND AND DAMAGE:	\$10,515,370	\$17,263,465	\$327,150	\$9,970,750
ACQUISITION:	\$105,000	\$160,000	\$20,000	\$65,000
<b>TOTAL ESTIMATED R/W COST:</b>	<b>\$10,845,370</b>	<b>\$17,723,465</b>	<b>\$372,150</b>	<b>\$10,260,750</b>

**\*\* TOTALS/VALUES \*\***

**PLEASE PROVIDE ONLY BASE NUMBERS. ALL TOTALING CALCULATIONS WILL BE COMPLETED BY THE ESTIMATE COORDINATOR, SARAH D. WHITE.**

THERE ARE NO FIGURES FOR UTILITY INVOLVEMENT ON THIS ESTIMATE AND NO PUE's.

**NOTES: Land and Damages includes a 50% increase factored in to cost.**

**APPENDIX C**  
**BRIDGE INSPECTION REPORTS**



NC DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 BRIDGE MANAGEMENT UNIT

ATTENTION

PM ISSUED BT 4 LT END OF CAP

# BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection - Contract

COUNTY WAKE BRIDGE NUMBER 910213 INSPECTION CYCLE 0 YRS  
 ROUTE US70 ACROSS US401 M.P. 0

LOCATION 0.3 MI.E. SR1793

SUPERSTRUCTURE REINFORCED CONCRETE DECK GIRDERS

SUBSTRUCTURE E.BTS&INT.BTS:2,3 & 5 RC CAP ON H-PILES;INT.BTS:RCP&B

SPANS 1@49';1@47';1@45';1@36';1@42';1@40'6

LONGITUDE 78° 38' 50.0" LATITUDE 34° 47' 42.0"

PRESENT CONDITION POOR INVENTORY RATING \_\_\_\_\_

INSPECTION DATE 11/07/2011 OPERATING RATING \_\_\_\_\_

PRESENT POSTING SV 23 TTST 27 PROPOSED POSTING \_\_\_\_\_

COMPUTER UPDATE \_\_\_\_\_ ANALYSIS DATE \_\_\_\_\_

POSTING LETTER DATE \_\_\_\_\_ SUFFICIENCY RATING \_\_\_\_\_

OTHER SIGNS PRESENT 2 DELINEATORS



LOOKING EAST

SIGN NOTICE ISSUED FOR	NUMBERED REQUIRED
<u>No</u> WEIGHT LIMIT	_____
<u>No</u> DELINEATORS	_____
<u>No</u> NARROW BRIDGE	_____
<u>No</u> ONE LANE BRIDGE	_____
<u>No</u> LOW CLEARANCE	_____

NATIONAL BRIDGE INVENTORY----- STRUCTURE INVENTORY AND APPRAISAL

Run Date: 12/20/2011

**IDENTIFICATION**

(1) STATE NAME -NORTH CAROLINA BRIDGE **910213**  
 (8) STRUCTURE NUMBER(FEDERAL) 000000001830213  
 (5) INVENTORY ROUTE (ON/UNDER) - ON 21000700  
 (2) STATE HIGHWAY DEPARTMENT DISTRICT 1  
 (3) COUNTY CODE 183 (4) PLACE CODE 55000  
 (6) FEATURE INTERSECTED - US401  
 (7) FACILITY CARRIED US70  
 (9) LOCATION 0.3 M.I.E. SR1793  
 (11)MILEPOINT 0  
 (16)LAT 34° 47' 42.0" (17)LONG 78° 38' 50.0"  
 (98)BORDER BRIDGE STATE CODE PCT SHARE  
 (99)BORDER BRIDGE STRUCTURE NO

SUFFICIENCY RATING = 34.1  
 STATUS = Structurally Deficient

**CLASSIFICATION** **CODE**

(112)NBIS BRIDGE SYSTEM - YES  
 (104)HIGHWAY SYSTEM Is not on NHS 0  
 (26) FUNCTIONAL CLASS - Other Principal Arterial 14  
 (100)STRAHNET HIGHWAY - Not a STRAHNET Route 0  
 (101)PARALLEL STRUCTURE - No Parallel Structure N  
 (102)DIRECTION OF TRAFFIC - 2-way Traffic 2  
 (103)TEMPORARY STRUCTURE -  
 (110)DESIGNATED NATIONAL NETWORK - Not on the National Network 0  
 (20) TOLL On Free Road 3  
 (31) MAINTAIN - State Highway Agency 01  
 (22) OWNER - State Highway Agency 01  
 (37) HISTORICAL SIGNIFICANCE - Not Eligible 5

**STRUCTURE TYPE AND MATERIAL**

(43) STRUCTURE TYPE MAIN: Concrete  
 TYPE - Tee Beam CODE 104  
 (44) STRUCTURE TYPE APPR :  
 TYPE - CODE 000  
 (45) NUMBER OF SPANS IN MAIN UNIT 6  
 (46) NUMBER OF APPROACH SPANS  
 (107)DECK STRUCTURE TYPE - 1 CODE  
 (108)WEARING SURFACE / PROTECTIVE SYSTEM :  
 (A) TYPE OF WEARING SURFACE - CODE  
 (B) TYPE OF MEMBRANE - CODE  
 (C) TYPE OF DECK PROTECTION - CODE

**CONDITION** **CODE**

(58) DECK 5  
 (59) SUPERSTRUCTURE 4  
 (60) SUBSTRUCTURE 4  
 (61) CHANNEL & CHANNEL PROTECTION 7  
 (62) CULVERTS N

**LOAD RATING AND POSTING** **CODE**

(31) DESIGN LOAD H 15 2  
 (63) OPERATING RATING METHOD - Load Factor  
 (64) OPERATING RATING - HS-17 130  
 (65) INVENTORY RATING METHOD - Load Factor  
 (66) INVENTORY RATING - HS-10 118  
 (70) BRIDGE POSTING - Posting Required 2  
 (41) STRUCTURE OPEN, POSTED ,OR CLOSED P  
 DESCRIPTION - Posted for Load

**AGE AND SERVICE**

(27) YEAR BUILT 1954  
 (106)YEAR RECONSTRUCTED  
 (42) TYPE OF SERVICE : ON - Highway - Pedestrian  
 UNDER - Highway - Waterway CODE 56  
 (28) LANES: ON STRUCTURE 2 UNDER STRUCTURE 6  
 (29) AVERAGE DAILY TRAFFIC 25000  
 (30) YEAR OF ADT 2003 (109) TRUCK ADT PCT 12%  
 (19) BYPASS OR DETOUR LENGTH 2 MI

**APPRAISAL** **CODE**

(67) STRUCTURAL EVALUATION 4  
 (68) DECK GEOMETRY 4  
 (69) UNDERCLEARANCES,VERTI & HORIZ 2  
 (71) WATERWAY ADEQUACY 8  
 (72) APPROACH ROADWAY ALIGNMENT 6  
 (36) TRAFFIC SAFETY FEATURES 0111  
 (113)SCOUR CRITICAL BRIDGES 8

**GEOMETRIC DATA**

(48) LENGTH OF MAXIMUM SPAN 49 FT  
 (49) STRUCTURE LENGTH 261 FT  
 (50)CURB OR SIDEWALK: LEFT 3 FT RIGHT 3 FT  
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 34.2 FT  
 (52) DECK WIDTH OUT TO OUT 42.3 FT  
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 33 FT  
 (33) BRIDGE MEDIAN - No Median CODE 2 FT  
 (34) SKEW 23° (35) STRUCTURE FLARED 0  
 (10) INVENTORY ROUTE MIN VERT CLEAR 999.9 FT  
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 34.2 FT  
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 999.9 FT  
 (54) MIN VERT UNDERCLEAR REF Not a Highway or Railroad 0 FT  
 (55) MIN LAT UNDERCLEAR RT REF Not a Highway or Railroad 000 FT  
 (56) MIN LAT UNDERCLEAR LT REF - 000 FT

**PROPOSED IMPROVEMENTS**

(75) TYPE OF WORK - CODE  
 (76) LENGTH OF STRUCTURE IMPROVEMENT  
 (94) BRIDGE IMPROVEMENT COST  
 (95) ROADWAY IMPROVEMENT COST  
 (96) TOTAL PROJECT COST  
 (97) YEAR OF IMPROVEMENT COST ESTIMATE  
 (114)FUTURE ADT 50000 (115) YEAR FUTURE ADT 2025

**INSPECTIONS**

(90) INSPECTION DATE 11/07/2011  
 (92) CRITICAL FEATURE INSPECTION : (93) CFI DATE  
 A) FRACTURE CRIT DETAIL - NO A)  
 B) UNDERWATER INSP - NO B)  
 C) OTHER SPECIAL INSP NO C)  
 SCOUR

**NAVIGATION DATA**

(38) NAVIGATION CONTROL - No Navigational Control CODE 0  
 (111)PIER PROTECTION - CODE  
 (39) NAVIGATION VERTICAL CLEARANCE 0  
 (116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR FT  
 (40) NAVIGATION HORIZONTAL CLEARANCE 0 FT

Structure No: 910213

County: WAKE

Run Date:

Span Number	Feature Intersected	Inventory Route	Minimum Maximum Vertical Clearance	Milepoint	Base Highway Network	LRS Inventory Route	Toll	Functional Classification	Nuner of Lanes	Average Daily Traffic	Year of Average Daily Traffic	Total Horizontal Clearance	See Note 1							Highway System of Route
													Reference Feature	Minimum Vertical Underclearance	Right Lateral Underclearance	Left Lateral Underclearance	Underclearance Appraisal Grade	STRAHNET Highway Designator	Direction of Traffic	
	6	5	10	11	12	13	20	26	28	29	30	47	54A	54	55	56	69	100	102	104
4	US 401 NBL	21004010	14.90		0			14	3	55000	2003	34.10	H	14.80	2	1	9	0	1	1
5	US 401 RAMP NBL	21004010	15.90		0			14	1	27500	2003	17.80	H	15.80	1	1	9	0	1	1
3	US 401 SBL	21004010	14.90		0			14	2	55000	2003	34.80	H	14.80	2	2	9	0	1	1

Note 1: Items 54, 55, and 56 are not reported FHWA under route data points but are collected for each under route to determine the minimum value for Underclearance Appraisal Item 69. The under route that generates the lowest Underclearance Appraisal value will be reported on the Facility Carried record.

**BRIDGE MANAGEMENT UNIT**

**DATA ON EXISTING STRUCTURE**

Run Date: 12/20/2011

COUNTY : WAKE                      DIVISION : 5              DISTRICT : 1              STRUCTURE NUMBER : 910213              LENGTH : 261 FEET

ROUTE CARRIED : US70                      FEATURE INTERSECTED : US401

LOCATED : 0.3 MI.E. SR1793                      BRIDGE NAME :                      CITY : RALEIGH

FUNC. CLASS : 14              SYST.ON : FA              SYST.UNDER : NFA              ADT & YR : 25000 2003              RAIL TYPE : LT 201 RT 201

BUILT : 1954              BY : SHC              PROJ : 4863              FED.AID PROJ : B-5317              DESIGN LOAD : H 15

REHAB :              BY :              PROJ :              ALIGNMENT : RT.              SKEW : 67              LANES : ON 2 UNDER 6

NAVIGATION : VC 0 FT              HC 0 FT              HT. CRN. TO BED : 30 FT              WATER DEPTH : 1 FT

SUPERSTRUCTURE : REINFORCED CONCRETE DECK GIRDERS

SUBSTRUCTURE : E.BTS&INT.BTS:2,3 & 5 RC CAP ON H-PILES;INT.BTS:RCP&B

SPANS : 1@49';1@47'6";1@45'6";1@36';1@42';1@40'6"

BEAMS OR GIRDERS : 6 LNS.1'6X2'4.5 REINF.CONC.DECK GIRDERS @ 7'6"CENTERS

FLOOR :                      ENCROACHMENT :                      DECK (OUT TO OUT) : 42.3 FT

CLEAR ROADWAY : 34.2 FT              BETWEEN RAILS : 40.3 FT              SIDEWALK OR CURB : LT 3 FT RT 3 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. : HS-10              OPE.RTG. : HS-17              CONTR.MEMBER : RCDG              POSTED : SV 23 TTST 27              DATE 07/09/2008

SYSTEM : Primary U.S. Route                      GREEN LINE ROUTE : N

**UNDER ROUTES AND CLEARANCES**

Span	Route Description	Vertical Clearances		Horizontal Clearances		
		MMVC	MVC	Total	Left	Right
4	US 401 NBL	14.90	14.80	34.10	1	2
5	US 401 RAMP NBL	15.90	15.80	17.80	1	1
3	US 401 SBL	14.90	14.80	34.80	2	2

Note: All measurements are in feet.

REMARKS :

# BRIDGE INSPECTION RECORD AND SUMMARY

INSPECTION TYPE Routine Inspection - Contract  
 BRIDGE NO. 910213 COUNTY WAKE ROUTE US70 OVER US401  
 STRUCTURE TYPE REINFORCED CONCRETE DECK GIRDERS  
 ROUTE ORIENTATION W - E SPANS 1@49';1@47'6";1@45'6";1@36';1@42';1@40'6"

EVALUATION CODES: CRITICAL (C, 0 - 3); POOR (P, 4); FAIR (F, 5, 6); GOOD (G, 7 - 9)

INSPECTION ITEM				ITEM 61			
DECK ITEMS			GRADES				
1. WEARING SURFACE			F	45. CHANNEL & CHANNEL PROT.	a. WATERWAY	G	
					b. ALIGNMENT	G	
2. DECK NO. OF EA TYPE SPN GRADE RATES SI & A ITEM 58			6		c. SCOUR	G	
			F		d. SLOPE PROT., RIP-RAP, DIKES, ETC.		
3. RAILING			F	50. APPROACH ROADWAY CONDITION			
				51. APPROACH SLABS			
				52. PAINT SYSTEM CODE			
				53. UTILITIES			
				54. RESPONSE TO LIVE LOAD			
				55. ESTIMATED REMAINING LIFE			
4. CURBS, WHEELGUARDS, PARAPETS, MEDIANS			F				
5. WALKWAYS (ON OR ATTACHED TO STRUCTURE)			F	60. REGULATORY SIGN NOTICE ISSUED			
				61. PROMPT-ACTION NOTICE ISSUED			
6. DECK EXP JTS. OR DEVICES. NO. OF EACH				62. PRESENTLY POSTED			
				63. TOT. FIELD INSP TIME (INCLUDE WRITE UP)(MAN HR)			
			5	F	64. TOTAL SNOOPER INSP. TIME (HRS)		
				65. TOTAL TRAFFIC CONTROL TIME (MAN HRS)			
7. DECK DEBRIS (INCLUDES EXCESS SAND/GRAVEL)			G				
				70. SI&A GENERAL CONDITION RATINGS			
SUPER STR. (FM. 1 (90)B TRUSS) ITEM 59				a. DECK	ITEM 58	5	
10. LONGITUDINAL BEAMS OR GIRDERS			P	b. SUPERSTRUCTURE	ITEM 59	4	
11. LONGITUDINAL JOIST OR STRINGERS				c. SUBSTRUCTURE	ITEM 60	4	
12. INT. DIAP'S, X-FRAMES, BRACING & CONN'S			F	d. CHANNEL & CHANNEL PROT.	ITEM 61	7	
13. END DIAP'S, CURTAIN WALLS, & CONN'S			P				
14. FLOOR BEAMS AND CONNECTIONS				71. SI&A FIELD APPRAISAL RATINGS			
15. BEARING ASSEMBLIES (INCLUDING MISALIGN)			P	a. WATERWAY ADAQUACY		7	
16. DRAINAGE SYSTEM (ON STRUCTURE)			F	b. APPR. RDWY. ALIGNMENT		7	
17. MOVABLE SPAN MACHINERY							
				72. FIELD SCOUR EVALUATION			
				G			
SUB STR. ITEMS. ITEM 60 (INCLUDE SCOUR)							
35. TIM SUB STR.				USE OF INSP. ACCESSIBILITY EQUIPMENT			
				SNOOPER (CODE S, 4, OR N)	HRS	NO	
				LADDER		NO	
36. CONC SUB STR.			P	BUCKET TRUCK		NO	
				BOAT		NO	
			P	OTHER		NO	
			F				
37. STEEL SUB STR.				SPECIAL INSPECTION REQUESTED FOR			
38. FOUNDATION PILES TYPE MATERIAL				NOTE			
39. SLOPE PROT., RIP-RAP (INCLUDE DRAINAGE)			F				
40. FENDER SYSTEMS				80. INSPECTED BY:	<i>Ro Williams</i>		
41. DRIFT			G	81. REVIEWED BY:			



NC DEPARTMENT OF TRANSPORTATION ATTENTION  
 DIVISION OF HIGHWAYS  
 BRIDGE MANAGEMENT UNIT

# BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection

COUNTY WAKE BRIDGE NUMBER 910227 INSPECTION CYCLE 2 YRS  
 ROUTE US70 ACROSS PEACE ST. M.P. 0  
 0.2 OF A MILE NORTH OF SR-1513  
 LOCATION 0.2 MI N SR 1513

SUPERSTRUCTURE RC DECK ON CONT I-BEAMS

SUBSTRUCTURE EBTS:RC CAP/H-PILES @8'6";IBTS:RCP&B/PILE FTGS.  
 1 @ 42'6" ; 1 @ 52' ; 1 @ 42'6" CONT.

SPANS 1@42'6";1@52';1@42'6" CONT.

LONGITUDE 78° 38' 34.51" LATITUDE 35° 47' 18.15"

INSPECTION DATE 10/23/2013 PRESENT CONDITION FAIR

PRESENT POSTING N NOT POSTED PROPOSED POSTING \_\_\_\_\_

OTHER SIGNS PRESENT \_\_\_\_\_



LOOKING NORTH

Fracture Critical	<u>No</u>
Temporary Shoring	<u>No</u>
Scour Critical	<u>No</u>
Scour POA	<u>No</u>

SIGN NOTICE ISSUED FOR	NUMBERED REQUIRED
<u>No</u> WEIGHT LIMIT	_____
<u>No</u> DELINEATORS	_____
<u>No</u> NARROW BRIDGE	_____
<u>No</u> ONE LANE BRIDGE	_____
<u>No</u> LOW CLEARANCE	_____

IDENTIFICATION				CLASSIFICATION			
(1) STATE NAME -NORTH CAROLINA	BRIDGE	910227		SUFFICIENCY RATING =			43.92
(8) STRUCTURE NUMBER(FEDERAL)		000000001830227		STATUS =	Structurally Deficient		
(5) INVENTORY ROUTE (ON/UNDER) - ON		21000700					
(2) STATE HIGHWAY DEPARTMENT DISTRICT		1					
(3) COUNTY CODE	183	(4) PLACE CODE	55000	(112)NBIS BRIDGE SYSTEM -			YES
(6) FEATURE INTERSECTED -	PEACE ST.			(104)HIGHWAY SYSTEM	Is not on NHS		0
(7) FACILITY CARRIED	US70			(26) FUNCTIONAL CLASS -	Arterial - Other		12
(9) LOCATION	0.2 MI N SR 1513			(100)STRAHNET HIGHWAY -	Not a STRAHNET Route		0
(11)MILEPOINT		0		(101)PARALLEL STRUCTURE -	No Parallel Structure		N
(16)LAT	35° 47' 18.15"	(17)LONG	78° 38' 34.51"	(102)DIRECTION OF TRAFFIC -	2-way Traffic		2
(98)BORDER BRIDGE STATE CODE		PCT SHARE		(103)TEMPORARY STRUCTURE -			
(99)BORDER BRIDGE STRUCTURE NO				(110)DESIGNATED NATIONAL NETWORK -	On the National Network		1
				(20) TOLL	On Free Road		3
				(31) MAINTAIN -	State Highway Agency		01
				(22) OWNER -	State Highway Agency		01
				(37) HISTORICAL SIGNIFICANCE -	Not Eligible		5
STRUCTURE TYPE AND MATERIAL				CONDITION			
(43) STRUCTURE TYPE MAIN:	Steel Continuous			(58) DECK			4
TYPE -	Stringer Multibeam or Girder	CODE	402	(59) SUPERSTRUCTURE			5
(44) STRUCTURE TYPE APPR :				(60) SUBSTRUCTURE			5
TYPE -		CODE	000	(61) CHANNEL & CHANNEL PROTECTION			N
(45) NUMBER OF SPANS IN MAIN UNIT			3	(62) CULVERTS			N
(46) NUMBER OF APPROACH SPANS							
(107)DECK STRUCTURE TYPE -	1	CODE		LOAD RATING AND POSTING			
(108)WEARING SURFACE / PROTECTIVE SYSTEM :				(31) DESIGN LOAD	H 15		2
(A) TYPE OF WEARING SURFACE -		CODE		(63) OPERATING RATING METHOD -	Load Factor		1
(B) TYPE OF MEMBRANE -		CODE		(64) OPERATING RATING -	HS-28		50
(C) TYPE OF DECK PROTECTION -		CODE		(65) INVENTORY RATING METHOD -	Load Factor		1
				(66) INVENTORY RATING -	HS-17		30
				(70) BRIDGE POSTING -	No Posting Required		5
				(41) STRUCTURE OPEN, POSTED ,OR CLOSED			A
				DESCRIPTION -	Open, No Restriction		
AGE AND SERVICE				APPRAISAL			
(27) YEAR BUILT			1948	(67) STRUCTURAL EVALUATION			5
(106)YEAR RECONSTRUCTED				(68) DECK GEOMETRY			2
(42) TYPE OF SERVICE : ON -	Highway - Pedestrian			(69) UNDERCLEARANCES,VERTI & HORIZ			3
UNDER - Highway		CODE	51	(71) WATERWAY ADEQUACY			N
(28) LANES: ON STRUCTURE	6 UNDER STRUCTURE		4	(72) APPROACH ROADWAY ALIGNMENT			8
(29) AVERAGE DAILY TRAFFIC			42000	(36) TRAFFIC SAFETY FEATURES			0000
(30) YEAR OF ADT	2011	(109) TRUCK ADT PCT	12%	(113)SCOUR CRITICAL BRIDGES			N
(19) BYPASS OR DETOUR LENGTH			3 MI	PROPOSED IMPROVEMENTS			
GEOMETRIC DATA				(75) TYPE OF WORK -			CODE
(48) LENGTH OF MAXIMUM SPAN			51 FT	(76) LENGTH OF STRUCTURE IMPROVEMENT			
(49) STRUCTURE LENGTH			137 FT	(94) BRIDGE IMPROVEMENT COST			
(50)CURB OR SIDEWALK: LEFT	5 FT RIGHT		5 FT	(95) ROADWAY IMPROVEMENT COST			
(51) BRIDGE ROADWAY WIDTH CURB TO CURB			68.25 FT	(96) TOTAL PROJECT COST			
(52) DECK WIDTH OUT TO OUT			81.25 FT	(97) YEAR OF IMPROVEMENT COST ESTIMATE			
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS)			66 FT	(114)FUTURE ADT	84000	(115) YEAR FUTURE ADT	2025
(33) BRIDGE MEDIAN -	No Median	CODE	2	INSPECTIONS			
(34) SKEW	12°	(35) STRUCTURE FLARED	0	(90) INSPECTION DATE			10/23/2013
(10) INVENTORY ROUTE MIN VERT CLEAR			999.9 FT	(92) CRITICAL FEATURE INSPECTION :			(93) CFI DATE
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR			33.125 FT	A) FRACTURE CRIT DETAIL -	NO		A)
(53) MIN VERT CLEAR OVER BRIDGE RDWY			999.9 FT	B) UNDERWATER INSP -	NO		B)
(54) MIN VERT UNDERCLEAR REF	Highway		14.2 FT	C) OTHER SPECIAL INSP	NO		C)
(55) MIN LAT UNDERCLEAR RT REF	Highway		2.5 FT	SCOUR			
(56) MIN LAT UNDERCLEAR LT REF -			0 FT	NAVIGATION DATA			
(38) NAVIGATION CONTROL -	Not Applicable	CODE	N	(99) NAVIGATION VERTICAL CLEARANCE			0
(111)PIER PROTECTION -		CODE		(116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR			FT
(39) NAVIGATION VERTICAL CLEARANCE			0	(40) NAVIGATION HORIZONTAL CLEARANCE			0 FT
(116)VERT - LIFT BRIDGE NAV MIN VERT CLEAR			FT				
(40) NAVIGATION HORIZONTAL CLEARANCE			0 FT				

Structure No: 910227

County: WAKE

Run Date:

Span Number	Feature Intersected	Inventory Route	Minimum Maximum Vertical Clearance	Milepoint	Base Highway Network	LRS Inventory Route	Toll	Functional Classification	Nuner of Lanes	Average Daily Traffic	Year of Average Daily Traffic	Total Horizontal Clearance	See Note 1							
													Reference Feature	Minimum Vertical Underclearance	Right Lateral Underclearance	Left Lateral Underclearance	Underclearance Appraisal Grade	STRAHNET Highway Designator	Direction of Traffic	Highway System of Route
	6	5	10	11	12	13	20	26	28	29	30	47	54A	54	55	56	69	100	102	104
2	PEACE ST	5000000	14.3		0			19	4	18000	2011	42.7	H	14.2	2.5		9	0	2	0

Note 1: Items 54, 55, and 56 are not reported FHWA under route data points but are collected for each under route to determine the minimum value for Underclearance Appraisal Item 69. The under route that generates the lowest Underclearance Appraisal value will be reported on the Facility Carried record.

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 11/14/2013

COUNTY : WAKE DIVISION : 5 DISTRICT : 1 STRUCTURE NUMBER : 910227 LENGTH : 137 FEET

ROUTE CARRIED : US70 FEATURE INTERSECTED : PEACE ST.

LOCATED : 0.2 MI N SR 1513 BRIDGE NAME : CITY : RALEIGH

FUNC. CLASS : 12 SYST.ON : FA SYST.UNDER : NFA ADT & YR : 42000 2011 RAIL TYPE : LT 311 RT 311

BUILT : 1948 BY : DOH PROJ : 4858 FED.AID PROJ : U-694(1) DESIGN LOAD : H 15

REHAB : BY : PROJ : ALIGNMENT : TAN. SKEW : 102 LANES : ON 6 UNDER 4

NAVIGATION : VC 0 FT HC 0 FT HT. CRN. TO BED : 0 FT WATER DEPTH : 0 FT

SUPERSTRUCTURE : RC DECK ON CONT I-BEAMS

SUBSTRUCTURE : EBTS:RC CAP/H-PILES @8'6";IBTS:RCP&B/PILE FTGS.

SPANS : 1@42'6";1@52';1@42'6" CONT.

BEAMS OR GIRDERS : 10 LINES VAR.CONT I-BEAMS @ 8'3 CTS.

FLOOR : 7 RC/5 AWS ENCROACHMENT : DECK (OUT TO OUT) : 81.25 FT

CLEAR ROADWAY : 68.25 FT BETWEEN RAILS : 78.25 FT SIDEWALK OR CURB : LT 5 FT RT 5 FT

VERT.CL.OVER : 999.9 FT

INV.RTG. : HS-17 OPE.RTG. : HS-28 CONTR.MEMBER : Cont I-Bms Int POSTED : SV TTST DATE 04/23/2009

SYSTEM : Primary U.S. Route GREEN LINE ROUTE : N

UNDER ROUTES AND CLEARANCES

Span	Route Description	Vertical Clearances		Horizontal Clearances		
		MMVC	MVC	Total	Left	Right
2	PEACE ST	14.30	14.20	42.70	0	2.50

Note: All measurements are in feet.

REMARKS :

# BRIDGE INSPECTION RECORD AND SUMMARY

INSPECTION TYPE Routine Inspection  
 BRIDGE NO. 910227 COUNTY WAKE ROUTE US70 OVER PEACE ST.  
 STRUCTURE TYPE RC DECK ON CONT I-BEAMS  
 ROUTE ORIENTATION S - N SPANS 1@42'6";1@52';1@42'6 CONT.

EVALUATION CODES: CRITICAL (C, 0 - 3); POOR (P, 4); FAIR (F, 5, 6); GOOD (G, 7 - 9)

INSPECTION ITEM				ITEM 61				
DECK ITEMS			GRADES					
1. WEARING SURFACE			F	45. CHANNEL & CHANNEL PROT.	a. WATERWAY			
2. DECK NO. OF EA TYPE SPN GRADE RATES SI & A ITEM 58			P		b. ALIGNMENT			
a. CONCRETE			3		c. SCOUR			
b. TIMBER					d. SLOPE PROT., RIP-RAP, DIKES, ETC.			
c. STEEL PLANK					50. APPROACH ROADWAY CONDITION			F
d. OPEN GRID				51. APPROACH SLABS				
3. RAILING			F	52. PAINT SYSTEM			V	F
a. CONCRETE				53. UTILITIES				
b. TIMBER				54. RESPONSE TO LIVE LOAD			G	
c. ALUMINUM				55. ESTIMATED REMAINING LIFE			4	
d. STEEL								
4. CURBS, WHEELGUARDS, PARAPETS, MEDIANS			F					
5. WALKWAYS (ON OR ATTACHED TO STRUCTURE)			F	60. REGULATORY SIGN NOTICE ISSUED			NO	
6. DECK EXP JTS. OR DEVICES. NO. OF EACH				61. PROMPT-ACTION NOTICE ISSUED			YES	
a. STEEL PL OR FINGER				62. PRESENTLY POSTED			NO	
b. MISC PREFAB				63. TOT. FIELD INSP TIME (INCLUDE WRITE UP)(MAN HR)			6	
c. COMPRESSION SEAL				64. TOTAL SNOOPER INSP. TIME (HRS)			0	
d. STANDARD JOINTS			2	F	65. TOTAL TRAFFIC CONTROL TIME (MAN HRS)			0
e. OPEN JOINTS								
7. DECK DEBRIS (INCLUDES EXCESS SAND/GRAVEL)			F					
				70. SI&A GENERAL CONDITION RATINGS				
SUPER STR. (FM. 1 (90)B TRUSS) ITEM 59				a. DECK		ITEM 58	4	
10. LONGITUDINAL BEAMS OR GIRDERS			P	b. SUPERSTRUCTURE		ITEM 59	5	
11. LONGITUDINAL JOIST OR STRINGERS				c. SUBSTRUCTURE		ITEM 60	5	
12. INT. DIAP'S, X-FRAMES, BRACING & CONN'S			F	d. CHANNEL & CHANNEL PROT.		ITEM 61		
13. END DIAP'S, CURTAIN WALLS, & CONN'S			F					
14. FLOOR BEAMS AND CONNECTIONS				71. SI&A FIELD APPRAISAL RATINGS				
15. BEARING ASSEMBLIES (INCLUDING MISALIGN)			F	a. WATERWAY ADAQUACY				
16. DRAINAGE SYSTEM (ON STRUCTURE)				b. APPR. RDWY. ALIGNMENT			8	
17. MOVABLE SPAN MACHINERY								
				72. FIELD SCOUR EVALUATION			N	
SUB STR. ITEMS. ITEM 60 (INCLUDE SCOUR)								
35. TIM SUB STR.				USE OF INSP. ACCESSIBILITY EQUIPMENT				
a. ABUT. & INT. BENT CAPS & RISERS				SNOOPER (CODE S, 4, OR N)		HRS	NO	
b. PILES, POST, SILLS, & BRACING				LADDER			NO	
c. BULKHEADS, WING'S, & TIE BACKS				BUCKET TRUCK			NO	
36. CONC SUB STR.				BOAT			NO	
a. ABUT. & INT. BENT CAPS			F	OTHER			NO	
b. ABUT. & BENT COL'S BREASTWALLS			F					
c. ABUT. & INT. BENT PILES								
d. BACKWALLS, WING'S, RETAIN. WALLS			P					
e. ABUT. & BENT FOOTINGS & SILLS								
37. STEEL SUB STR.				SPECIAL INSPECTION REQUESTED FOR				
a. ABUT. & INT. BENT CAPS & RISERS								
b. PILES, BRACING, AND BULKHEADS								
38. FOUNDATION PILES TYPE MATERIAL				NOTE				
39. SLOPE PROT., RIP-RAP (INCLUDE DRAINAGE)			G					
40. FENDER SYSTEMS				80. INSPECTED BY:		<i>Richard E. Lopez</i>		
41. DRIFT				81. REVIEWED BY:				