



Hillsborough Street/Blue Ridge Road Intersection Improvements



T.I.P. Project No. U-4437

**NC 54 (Hillsborough Street)
and SR 1664 (Blue Ridge Road)
near CSX Transportation System and North Carolina Railroad
and SR 3042 (Beryl Road) in Raleigh
Construct a grade separation**

Wake County, North Carolina


Federal Aid Number STP-0054(15)
WBS Element 35868.1.1
S.T.I.P Project Number U-4437

ADMINISTRATIVE ACTION CATEGORICAL EXCLUSION


Submitted pursuant to the National Environmental Policy Act 42 U.S.C. 4332(2)(c)
and 49 U.S.C. 303

U.S. Department of Transportation, Federal Highway Administration
N.C. Department of Transportation

9/26/12
Date

FOR 
Gregory J. Thorpe, Ph.D.
Branch Manager
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation

9/26/12
Date

FOR 
John F. Sullivan, III, P.E.
Division Administrator
Federal Highway Administration

**NC 54 (Hillsborough Street)
and SR 1664 (Blue Ridge Road)
near CSX Transportation System and North Carolina Railroad
and SR 3042 (Beryl Road) in Raleigh
Construct a Grade Separation**

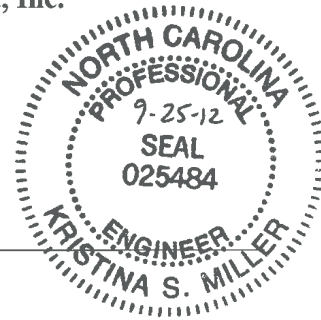
Federal Aid Number STP-0054(15)
WBS Element 35868.1.1
S.T.I.P Project Number U-4437
Raleigh, Wake County, North Carolina

Administrative Action
CATEGORICAL EXCLUSION

September 24, 2012

Document prepared by:
ARCADIS G&M of North Carolina, Inc.

In association with:
STV, Inc.



9-25-12
Date

Kristina S. Miller
Kristina S. Miller, P.E.
Environmental Planning Group Manager
ARCADIS G&M of North Carolina, Inc.

9-25-12
Date

Robin Pugh
Robin Pugh, A.I.C.P.
Lead NEPA Planner
ARCADIS G&M of North Carolina, Inc.

for the:
North Carolina Department of Transportation

9-26-12
Date

Leza Wright Mundt
Leza Wright Mundt
Project Planning Engineer
Project Development and Environmental Analysis Branch

Project Commitments

NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road) near CSX Transportation System and North Carolina Railroad and SR 3042 (Beryl Road) in Raleigh Construct a Grade Separation

Federal Aid Number STP-0054(15)
WBS Element 35868.1.1
S.T.I.P Project Number U-4437
Raleigh, Wake County, North Carolina

The following special project commitments have been developed through project development and design:

Work Zone Traffic Control Unit / Division 5

NCDOT will coordinate with emergency service providers, Wake County Public Schools, Triangle Transit, Capital Area Transit, and others as necessary during final design regarding access changes and detours. Coordination should continue through construction.

NCDOT will coordinate with the NC State Fair, PNC Arena, and the North Carolina State University (NCSU) Centennial Biomedical Campus regarding the project construction schedule. The schedule will be planned to minimize disruptions during the annual state fair.

A public information strategy will be developed to inform visitors of the best routes to entertainment venues in the project vicinity during construction.

Roadway Design Unit / Signals and Geometrics Section / Work Zone Traffic Control Unit / Division 5

NCDOT will coordinate with the City of Raleigh regarding constructing sidewalks along the south side of Beryl Road in which the City will pay a portion of the construction cost of the sidewalks.

NCDOT will construct sidewalks along both sides of Blue Ridge Road within the project limits. Sidewalks on the west side of Blue Ridge Road will be bifurcated from the vehicle travel lanes. Sidewalks will be 14-foot wide between Pylon Drive and Trinity Road and should be built according to preliminary plans. Sidewalks will be constructed on both sides of the connector road between Blue Ridge Road and Hillsborough Street. The sidewalk on the east side of the connector will be 8-10' in width to match the wide sidewalk to be constructed along Hillsborough Street by NCSU. NCDOT will coordinate with the City of Raleigh regarding construction of an ADA-compliant pedestrian access between Beryl Road and Blue Ridge Road.

Roadway Design Unit / Division 5 / Roadside Environmental Unit

NCDOT will coordinate with the J.C. Raulston Arboretum in providing directional signage to the arboretum from Blue Ridge Road.

NCDOT will provide landscaping along Blue Ridge Road and in the median (except under bridges) and on the slope between the connector road and Blue Ridge Road, where practicable.

NCDOT will coordinate with the City of Raleigh and other stakeholders as necessary if tree grates are to be incorporated in the sidewalks along Blue Ridge Road.

Roadway Design Unit / GeoEnvironmental Section

Two sites presently, or formerly, containing underground storage tanks (USTs) were identified in the project limits. Preliminary site assessments for soil and groundwater contamination will be performed prior to right-of-way acquisition.

Roadway Design Unit / Division 5

NCDOT will coordinate with NCSU during final design of the connector road to minimize encroachments on the leased parcels for future development of the NCSU Centennial Biomedical Campus (College of Veterinary Medicine).

Structures Management Unit

NCDOT will coordinate with the NC State Fairgrounds regarding the proposed ADA-compliant ramp that would provide handicap access from the sidewalk along Blue Ridge Road in proximity to the intersection with the connector road.

The wing wall in the southeast quadrant of the Beryl Road bridge will be constructed to accommodate an ADA-compliant sidewalk to be constructed to provide access between Blue Ridge Road and Beryl Road. The design of the sidewalk will be coordinated with the City of Raleigh as a cost-share item under the current pedestrian policy.

Division 5

The posted speed limit on Blue Ridge Road will be changed to 35 miles per hour between Pylon Drive and Trinity Road.

The Old Hickory Highway Marker will be removed and stored during construction, and will be re-erected at a comparable location in consultation with the NC State Historic Preservation Office.

The NC State Fairgrounds sign in the northwest quadrant of Blue Ridge Road and Hillsborough Street will be removed and stored during construction. Upon completion of project construction, the sign will be relocated to an appropriate location coordinated with the NC State Fairgrounds.

Division 5 / Rail Division

The NC State Fairgrounds railroad spur (“the circus track”) may be temporarily relocated during construction. This relocation will be coordinated with the NC State Fairgrounds, the North Carolina Railroad (NCRR) and Norfolk Southern, and its users, as appropriate.

Roadway Design Unit

The NCDOT will coordinate with the City of Raleigh regarding cost and installation of pedestrian scale lighting on Blue Ridge Road and Hillsborough Street.

Division 5 / Structures Management Unit / Project Development and Environmental Analysis

NCDOT, NC State Historic Preservation Office, Raleigh Public Arts Commission, Raleigh Urban Design Center, NC State Fairgrounds, and NCSU will work together on the plans for the retaining walls, bridges, and lighting to develop a unified design that incorporates public art in keeping with NCDOT's and the City Raleigh's public art policies. The scope and cost of the public art will be determined prior to construction in consultation with the NC State Historic Preservation Office, City of Raleigh, and other adjacent stakeholders.

Retaining walls will be finished to allow for installation of public art on their surfaces after construction. The appropriate surface treatment for art will be coordinated with the NC State Historic Preservation Office and the City of Raleigh.

Structures Management Unit / Project Development and Environmental Analysis

Bridges will be supported with vertical abutments. Retaining walls constructed on the west side of Blue Ridge Road will be designed to accommodate the bridge abutments.

NCDOT will coordinate with Triangle Transit to ensure the structure design accommodates future access through the retaining walls to the proposed light rail transit platform(s).

Contents

1	Purpose and Need for the Project	1
1.1	Introduction.....	1
1.2	Description of Proposed Action.....	1
1.3	Summary of Need for Proposed Action.....	1
1.4	Purpose of Proposed Action.....	3
1.5	Project Description.....	3
1.5.1	Project Setting and Study Area	3
1.5.2	Project Background.....	3
1.6	System Linkage.....	4
1.6.1	Description of Existing Facilities.....	4
1.6.2	Modal Interrelationships	6
1.6.3	Logical Termini.....	8
1.7	Socioeconomic Conditions	8
1.7.1	Population and Demographic Characteristics	9
1.7.2	Economic Conditions.....	11
1.7.3	Housing Characteristics	13
1.7.4	Community Characteristics.....	13
1.8	Transportation Planning.....	14
1.8.1	Raleigh Transportation Plan.....	14
1.8.2	Regional Transit Vision Plan	15
1.8.3	Capital Area Metropolitan Planning Organization 2035 Long Range Transportation Plan ...	16
1.8.4	North Carolina Railroad Company Commuter Rail Studies.....	16
1.8.5	NCDOT Transportation Improvement Program	17
1.8.6	Bicycle and Pedestrian Plans	17
1.9	Traffic Carrying Capacity	18
1.9.1	Existing Traffic Volumes (2004)	19
1.9.2	Existing Levels of Service (2004).....	19
1.9.3	Future Traffic Volumes (No Build)	20
1.9.4	Projected Levels of Service (No Build)	20
1.10	Safety	22

- 2 Alternatives..... 22
 - 2.1 Development of Preliminary Alternatives 22
 - 2.1.1 Roadway Design Criteria 23
 - 2.1.2 Capacity Analysis 23
 - 2.2 Preliminary Alternatives Considered but Eliminated 24
 - 2.2.1 Alternative Modes of Transportation 24
 - 2.2.2 No-Build Alternative..... 25
 - 2.2.3 Build Alternatives 25
 - 2.3 NCDOT Recommended Alternative..... 34
 - 2.3.1 Alternative 12 Lower Blue Ridge Road on existing location/Connector road..... 34
 - 2.3.2 Description of Proposed Improvements..... 35
 - 2.3.3 Preliminary Construction Cost Estimate..... 40
 - 2.3.4 Maintenance of Traffic During Construction..... 40
- 3 Affected Environment and Environmental Consequences 40
 - 3.1 Land Use 41
 - 3.1.1 Existing Land Use and Zoning..... 41
 - 3.1.2 Land Use Plans..... 42
 - 3.1.3 Land Use Impacts..... 44
 - 3.2 Cultural Resources 44
 - 3.2.1 Historic Architectural Resources 45
 - 3.2.2 Archaeological Resources..... 46
 - 3.2.3 Cultural Resources Impacts 46
 - 3.3 Section 4(f) Resources 47
 - 3.4 Visual Resources..... 48
 - 3.4.1 Landscape Character 48
 - 3.4.2 Sensitive Visual Resources 49
 - 3.4.3 Visual Impacts..... 49
 - 3.5 Farmland 49
 - 3.6 Section 6(f) Resources 50
 - 3.7 Socioeconomic Impacts 50
 - 3.7.1 Right-of-Way and Relocation Impacts..... 50

3.7.2	Economic Effects	50
3.7.3	Impacts to Neighborhoods/Communities.....	51
3.7.4	Impacts to Vehicular Mobility and Access	51
3.7.5	Impacts to Pedestrian and Bicycle Accommodations and Mobility.....	52
3.7.6	Impacts to Freight and Passenger Rail	53
3.7.7	Impacts to other Community Facilities	53
3.7.8	Impacts to Community Safety and Emergency Response	53
3.7.9	Environmental Justice	54
3.8	Flood Hazard Evaluation	54
3.9	Traffic Noise Analysis	54
3.9.1	Existing Noise Conditions	55
3.9.2	Traffic Noise Impacts.....	55
3.9.3	Potential Traffic Noise Abatement.....	56
3.9.4	Construction Noise.....	56
3.10	Air Quality	57
3.10.1	Existing Conditions.....	57
3.10.2	Model Results	58
3.10.3	Qualitative Mobile Source Air Toxics (MSATs) Impact Discussion	59
3.10.4	Transportation Conformity	60
3.10.5	Construction Air Quality.....	60
3.11	Hazardous Material.....	60
3.12	Topography, Geology and Soils.....	61
3.12.1	Topography and Geology.....	61
3.12.2	Soils.....	61
3.12.3	Topographic, Geologic, and Soil Impacts.....	63
3.13	Utilities.....	63
3.14	Biotic Resources	63
3.14.1	Terrestrial Communities	63
3.14.2	Aquatic Communities	64
3.14.3	Biotic Resource Impacts	64
3.15	Water Resources	64

3.15.1	Jurisdictional Waters.....	64
3.15.2	Anticipated Permit Requirements	65
3.16	Rare and Protected Species	65
3.17	Cumulative Effects.....	68
3.17.1	Impact-Causing Activities.....	68
3.17.2	Cumulative Effects Analysis.....	69
3.18	Summary of Anticipated Impacts	70
4	Comments and Coordination	72
4.1	Start of Study Notification	72
4.2	Agency Coordination and Public Involvement Summary	73
4.2.1	Citizens and Stakeholders Action Committee.....	73
4.2.2	Citizens Informational Workshops and Local Officials Meeting	74
4.2.3	Small Group Meetings	75
5	References	76

Tables

1	2000 – 2010 Population Growth
2	Race and Ethnicity (2010)
3	Median Income and Poverty Status (1999)
4	2000 - 2010 Housing Units
5	Level of Service and Volume to Capacity Summary
6	Design Criteria
7	Options Comprising Alternatives
8	2030 Level of Service and Volume to Capacity Summary for Alternative 12
9	Number of Impacted Receptors
10	Actual Ambient Air Quality Measurements
11	Predicted Maximum 1-Hour CO Concentrations (ppm)
12	Predicted Maximum 8-Hour CO Concentrations (ppm)
13	Soils Summary
14	Federally Protected Species Known from Wake County, North Carolina

Figures

- 1 Vicinity Map
- 2A Study Area – Features
- 2B Study Area – Community Services
- 3 Existing Project Intersection
- 4 Demographic Study Area
- 5A 2004 A.M. Peak Hour Balanced Count
- 5B 2004 Midday Peak Hour Balanced Count
- 5C 2004 P.M. Peak Hour Balanced Count
- 6A 2030 Projected A.M. Peak Hour Volumes
- 6B 2030 Projected P.M. Peak Hour Volumes
- 7A 2004 Peak Hour Level of Service
- 7B 2004 Peak Hour Movement Level of Service
- 8A 2030 Peak Hour Level of Service
- 8B 2030 Peak Hour Movement Level of Service
- 9 Alternative 12
- 10 Alternative 12 Visualizations
- 11A Typical Sections
- 11B Typical Sections
- 11C Typical Sections
- 12A Arena Plan – Sub-Areas
- 12B Arena Plan – Pedestrian Access
- 13 Historic Property Right-of-Way Impact

Appendices

- A Agency Comments
- B Historic Resources Coordination
- C Relocation Report
- D Public Involvement

1 Purpose and Need for the Project

1.1 Introduction

This report is a Categorical Exclusion (CE) for the proposed improvement of the intersection of NC 54 (Hillsborough Street) with SR 1664 (Blue Ridge Road) in Wake County, North Carolina.

This CE has been prepared by the North Carolina Department of Transportation (NCDOT) in coordination with the Federal Highway Administration (FHWA). It is intended to satisfy the requirements of both the National Environmental Policy Act (NEPA) and the North Carolina Environmental Policy Act. The document conforms to the Council on Environmental Quality (CEQ) guidelines, which implement the procedural provisions of NEPA, and the FHWA Guidance for Preparing and Processing Environmental and Section 4(f) Documents (Technical Advisory T6640.8A, 1987).

1.2 Description of Proposed Action

NCDOT proposes to improve the intersection of Hillsborough Street with Blue Ridge Road near CSX Transportation System and North Carolina Railroad and SR 3042 (Beryl Road) in Raleigh, Wake County, North Carolina. The 2012-2020 State Transportation Improvement Program (STIP) proposes to construct a grade separation. According to the STIP, right-of-way acquisition is scheduled in fiscal year (FY) 2015 and construction is scheduled to begin in FY 2018. The STIP has allocated \$3,460,000 for right-of-way acquisition, \$330,000 for utilities, and \$40,302,000 for construction, totaling \$44,092,000. (Including prior years cost for environmental studies, the total is \$45,050,000.) In the draft 2013-2023 STIP, right-of-way acquisition is scheduled in FY 2014 and construction is scheduled to begin in FY 2017.

1.3 Summary of Need for Proposed Action

The following conditions and guidelines demonstrate the need for the project:

- **Roadway Capacity Deficiencies**

The intersection of Hillsborough Street with Blue Ridge Road operates at LOS C, though specific movements operate at LOS F during peak hours.¹ (LOS is a qualitative measure used to describe the operating conditions of a roadway. LOS ranges from “A” representing the best operating conditions to “F” representing the worst conditions. LOS is detailed in Section 1.9.) The intersection has queues that exceed 300 feet and delay for several movements exceeds 60 seconds.

Weekend traffic in the area shows a similar trend in traffic volumes, due largely to numerous activities at the NC State Fairgrounds. During special events, such as the North Carolina State Fair and North

¹ These level of service values do not reflect delays due to the adjacent Blue Ridge Road at-grade rail crossing. When accounting for pre-emption, the level of service worsens. Existing level of service is based on 2004 traffic.

Carolina State University (NCSU) football games, the traffic volumes reach or exceed weekday peak-hour volumes.

With no improvements, the intersection of Hillsborough Street with Blue Ridge Road is projected to operate at a poor LOS F during a.m. and p.m. peak hours by 2030. The intersection would have queues that exceed 1,400 feet and the delay for several movements would exceed five minutes. The Transportation Element of the Raleigh Comprehensive Plan established a policy to maintain LOS E or better for overall intersection operations at all times, including peak travel times, unless maintaining this LOS would be infeasible and/or conflict with the achievement of other goals.

Traffic projections reflect development expected in the project area due to the transit station proposed by Triangle Transit near the project intersection. The transit station is expected to serve as a catalyst for development and redevelopment throughout the area. The City of Raleigh plans to encourage more intense development patterns to create a transit-oriented urban village surrounding this regional rail station.

- Proximity to At-Grade Railroad Crossing

Blue Ridge Road crosses the CSX Transportation and Norfolk Southern Railway tracks at grade. Both Hillsborough Street (to the north) and Beryl Road (to the south) run parallel to the railroad tracks and both intersect Blue Ridge Road adjacent to the at-grade crossing. The Hillsborough Street intersection with Blue Ridge Road is approximately 150 feet north of the Beryl Road intersection with Blue Ridge Road. The right-of-way for Hillsborough Street is adjacent to the railroad right-of-way owned by the North Carolina Railroad Company. Beryl Road, at this location, is within the 200 foot wide railroad right-of-way. The traffic signals for both intersections function adequately, with good railroad preemption phases in advance of the trains, in order to clear the tracks. However, large queues form on Blue Ridge Road and Hillsborough Street. These conditions are not reflected in the LOS values previously described. There are approximately 22 train movements through the study area daily.

- Hazard Elimination

The NCDOT Rail Division's Rail Grade Separation Guidelines include an exposure index to guide recommendations for grade separating highway-rail crossings. The exposure index is the product of the number of trains per day and the projected average daily highway traffic at the end of the design period. According to the guidelines, "separations should be constructed in urban areas when the exposure index is 30,000 or more." The exposure index at the Blue Ridge Road at-grade rail crossing is approximately 526,000. The exposure index will increase as freight and passenger rail service through the area is expanded.

- Pedestrian Deficiencies

The NC State Fairgrounds is the primary pedestrian traffic generator in the study area. The site generates large volumes of pedestrian traffic, especially along Hillsborough Street and at the project intersection.

Carter-Finley Stadium and the PNC Arena (formerly the RBC Center) also generate large volumes of pedestrian traffic in the area. Sidewalks and other infrastructure do not adequately support existing pedestrian traffic adjacent to the NC State Fairgrounds on Hillsborough Street or Blue Ridge Road.

1.4 Purpose of Proposed Action

The primary purposes of the proposed project are: 1) to reduce congestion at the intersection of Hillsborough Street with Blue Ridge Road by achieving level of service (LOS) E or better in the design year for overall intersection operation, and 2) to reduce train-related conflicts with vehicles and pedestrians in the study area. Another desirable outcome of the project is to address pedestrian deficiencies at and approaching the project intersection.

1.5 Project Description

1.5.1 Project Setting and Study Area

The proposed project is in western Raleigh in Wake County, North Carolina. (See Figure 1.) Wake County is primarily urban and is one of the fastest growing counties in the state.

The study area is bounded by Wade Avenue on the north, Interstate 440 (Raleigh Beltline) on the east, and Western Boulevard on the south. To the west, the study area is roughly bounded by the western boundary of the Westover community and Youth Center Drive. (See Figures 2A and 2B.) The study area for natural resources encompasses the project footprint and a 50 foot buffer and is also referred to as the project corridor. However, the Natural Resources Technical Report (February 2007), appended by reference, addressed the larger project study area.

The study area is primarily developed and includes a mixture of office, institutional, and industrial uses, as well as single-family and multi-family residential uses in its western and southern portions. North of Hillsborough Street, the study area is largely comprised of the approximately 180-acre NCSU College of Veterinary Medicine campus and the approximately 200-acre NC State Fairgrounds. The NC State Fair, held for ten days each October, had an average daily attendance of approximately 104,421 people in 2010. In all other months of the year, the NC State Fairgrounds are home to the largest flea market in the state. According to the NC State Fairgrounds website, the flea market attracts “tens of thousands” of shoppers each weekend, with the number increasing when other shows or events are held. Numerous special events are also held on the fairgrounds property throughout the year.

Additional information regarding land use and study area features is included in Section 3.

1.5.2 Project Background

The need for the proposed project was identified in 2001 during a planning study conducted by the City of Raleigh. The adopted study recommended that the feasibility of a Blue Ridge Road grade separation over

or under the rail corridor with connecting roads to Hillsborough Street be evaluated. The North Carolina Board of Transportation added the project to the STIP in 2002.

1.6 System Linkage

1.6.1 Description of Existing Facilities

A diagram of the project intersection is shown in Figure 3.

1.6.1.1 Hillsborough Street

Hillsborough Street is classified as a principal arterial in the Statewide Functional Classification System. The Raleigh Comprehensive Plan’s Arterials, Thoroughfares and Collector Street map shows Hillsborough Street as a major thoroughfare. Hillsborough Street is signed as NC 54 through the project intersection. Historically, Hillsborough Street was a major east-west route through Raleigh, serving as a major commercial spine connecting downtown to regional attractions such as NCSU, Meredith College, and the NC State Fairgrounds.

The Hillsborough Street right-of-way width varies and is approximately 120 feet east of the intersection with Blue Ridge Road and approximately 60 feet west of the intersection. The roadway section varies from a four-lane, median divided section at I-440 (east of the project intersection) to a five-lane section at the project intersection. At the project intersection, Hillsborough Street includes one westbound through lane, one westbound right turn lane, one westbound left-turn lane, two eastbound through lanes (one through lane includes a shared right turn movement), and one eastbound left-turn lane. West of the project intersection, Hillsborough Street is a three-lane shoulder section with a center turn lane. The existing profile of Hillsborough Street includes relatively flat grades. The posted speed limit in the study area is 35 miles per hour (mph). There is no control of access along Hillsborough Street in the study area.

The NC State Fairgrounds constructed a 10-foot sidewalk along a portion of the fairgrounds property on the north side of Hillsborough Street. There are no other sidewalks along Hillsborough Street in the study area; however, field observations and pedestrian studies indicate substantial pedestrian activity, especially related to activities at the NC State Fairgrounds.



Existing project intersection



Hillsborough Street – view west to project intersection

1.6.1.2 Blue Ridge Road

Blue Ridge Road is classified as a minor arterial in the Statewide Functional Classification System. The Raleigh Comprehensive Plan's Arterials, Thoroughfares and Collector Street map shows Blue Ridge Road as a major thoroughfare. The posted speed limit in the study area is 45 mph.

In the study area, the Blue Ridge Road right-of-way width varies from approximately 90 feet to 100 feet. Blue Ridge Road is primarily a five-lane section including a center turn lane. However, the roadway section varies at the project intersection where it includes two southbound through lanes, dual southbound left turn lanes, one southbound right turn lane, two northbound through lanes (one through lane includes a shared right turn movement), and one northbound left turn lane. South of Beryl Road, Blue Ridge Road includes two northbound through lanes (one through lane includes a shared right turn movement), one northbound left turn lane, and two southbound through lanes. South of Hillsborough Street, the roadway section includes curb and gutter and a sidewalk along the east side of the road. The existing profile of Blue Ridge Road includes grades of approximately three to four percent, although the roadway has relatively flat grades at the intersection with Hillsborough Street and the railroad crossing.



Blue Ridge Road – view north to project intersection

Blue Ridge Road crosses the CSX Transportation and Norfolk Southern Railway tracks at-grade between Hillsborough Street to the north and Beryl Road to the south. (See Figure 3.) In September 2011, Blue Ridge Road (south of Beryl Road) was repaved and restriped to include four-foot bicycle lanes in each direction.

Until 1992, when Blue Ridge Road was completed south of Hillsborough Street, the project intersection functioned as a three-legged intersection. Currently, Blue Ridge Road provides the only connection from Western Boulevard to Wade Avenue between I-440 and I-40, thereby providing a valuable link in the local road network. Just west of the study area, Edwards Mill Road (SR 1669) extends to Chapel Hill Road (NC 54). (Edwards Mill Road is proposed for extension to Western Boulevard; however, the project is not funded.)

1.6.1.3 Beryl Road

Beryl Road, classified as a collector street by the Raleigh Comprehensive Plan, parallels Hillsborough Street through the study area. The eastern terminus for Beryl Road is at Hillsborough Street east of the study area and the western terminus is at Powell Drive. For most of its length, Beryl Road is adjacent to the railroad tracks to the north and provides access to a number of properties to the south. Through the project intersection, Beryl Road is within the railroad right-of-way. Beryl Road is a two-lane section with

curb and gutter east of the intersection with Blue Ridge Road. The existing profile of Beryl Road includes relatively flat grades. West of Blue Ridge Road, only the portion of Beryl Road adjacent to the Gregory Poole Equipment Company has curb and gutter. There are several sections of sidewalk along Beryl Road east of Blue Ridge Road.

1.6.1.4 North Carolina Railroad Corridor

The North Carolina Railroad Company (NCRR) corridor, which dates to the 1850s, roughly parallels Hillsborough Street and Beryl Road through the study area. The NCRR owns and manages the 200-foot right-of-way, which includes one Norfolk Southern track, one CSX Transportation track, and one siding (circus/fair track). Norfolk Southern leases its track from NCRR, while CSX Transportation owns its track and controls the portion of the right-of-way on which the track is located. The circus/fair track is owned by the North Carolina Department of Agriculture and is used for activities on the NC State Fairgrounds and the PNC Arena. Norfolk Southern and CSX Transportation operate freight service through the area. In addition, Amtrak passenger trains travel through the study area daily and Triangle Transit² (formerly Triangle Transit Authority) plans to implement light rail service through the area. The rail corridor is designated by the USDOT as one of the national high-speed corridors. (Additional information about existing and future rail service is provided in Section 1.6.2. Details regarding plans for future light rail service are provided in Section 1.8.)

1.6.2 Modal Interrelationships

1.6.2.1 Railroads

Existing Passenger and Freight Service - Amtrak trains, operated in partnership with the State of North Carolina, provide daily service between Charlotte and Raleigh through the study area. A total of eight Amtrak trains travel through the project intersection daily.

Freight service through the area is operated by the Norfolk Southern and CSX Transportation. Approximately 22 trains, including passenger and freight trains, travel through the study area daily.

Southeast High Speed Rail Corridor - The rail corridor is designated by the USDOT as one of the national high-speed corridors. The Southeast High Speed Rail Corridor extends from Washington, D.C. through Richmond, Virginia; Raleigh, and Charlotte, North Carolina to Atlanta and Macon, Georgia. A corridor also extends from Raleigh through Columbia, South Carolina to Jacksonville, Florida. Most of the Southeast High Speed Rail project, an approximately 500-mile route, will utilize existing track and/or right-of-way. The project is currently in the environmental planning phase, with segments of the corridor in various stages of the planning process. A Tier I Environmental Impact Statement (EIS) was completed in June 2002 and a Record of Decision was issued in October 2002 for the segment from Washington, D.C. to Charlotte. A Tier II EIS is in progress for the segment from Richmond, Virginia to Raleigh.

² Triangle Transit operates regional bus and shuttle service and provides other commuter resources.

1.6.2.2 Airports

There are no airports in the study area. The Raleigh-Durham International Airport is approximately 7 miles west of the project intersection.

1.6.2.3 Public Transportation

City of Raleigh - The City of Raleigh provides public transit service, Capital Area Transit (CAT), within the city limits. CAT offers fixed-route and connector service, including connections to Triangle Transit regional routes. Currently, no fixed route CAT buses travel through the project intersection. However, several buses are routed near the project intersection. The Buck Jones Connector route terminates just south of the Kmart at the intersection of Blue Ridge Road and Western Boulevard, on the periphery of the study area. The Method route terminates at Method and Beryl roads, just east of the study area. CAT provides special-event transportation services from remote parking lots to the North Carolina State Fair.

Triangle Transit - Triangle Transit offers a regional bus service with connector shuttles, vanpool service and rideshare-matching service. One fixed route, connecting downtown Raleigh to RTP, travels through the project intersection. This route provides service to the NC State Fairgrounds park-and-ride lot at the intersection of Blue Ridge Road with Trinity Road and a park-and-ride lot on District Drive just north of the study area. In addition, two routes are along Western Boulevard at the southern boundary of the study area.

North Carolina State University - The Wolfline is NCSU's bus service, which operates when classes are in session. The Wolfline is open to the public, in addition to NCSU students, faculty and staff. The Vet School Route No. 6 serves both the NCSU College of Veterinary Medicine and the Carter-Finley park-and-ride lot on Trinity Road. The Westgrove Route No. 4 serves the park-and-ride lot on Westgrove Street (between Kmart and the Blue Ridge Cinemas). However, these routes do not pass through the project intersection.

1.6.2.4 Bicycle Routes, Sidewalks, and Pedestrian Movements

Beryl Road and Powell Drive are signed bicycle routes through the study area as part of a west Raleigh recreational loop (Route 4). A cross town route (Route 8) also follows Beryl Road, terminating at Blue Ridge Road. South of Hillsborough Street, Blue Ridge Road was recently restriped to include four-foot bicycle lanes in both directions. No other bicycle accommodations exist in the study area. The intersection of Hillsborough Street with Blue Ridge Road is one of the top nine locations of bicycle crashes in Raleigh, with three crashes reported from 2000 to 2006 (City of Raleigh 2009a).

A Pedestrian Study for the proposed project was completed in May 2010. The study documented existing pedestrian accommodations, summarized general observations of pedestrian activity, and provided information regarding pedestrian volumes in the study area. According to the Pedestrian Study, the study area lacks a cohesive sidewalk network and contains few additional pedestrian accommodations. There are more than 9 miles of public road network in the study area but less than two miles of sidewalk. There

is a 10-foot asphalt sidewalk along a portion of the NC State Fairgrounds Hillsborough Street frontage. There are no other sidewalks along Hillsborough Street or on Blue Ridge Road north of Hillsborough Street. Most of the sidewalks in the study area are associated with relatively recent development in the southern portion of the study area.

The NC State Fairgrounds is the primary pedestrian traffic generator in the study area, especially for ten days in the month of October when the North Carolina State Fair is held. On Friday, October 23, 2009, during the State Fair, more than 15,000 pedestrians passed through the project intersection. Pedestrian counts conducted in 2005 during other fairgrounds events revealed that most off-site pedestrian activity generated by the fairgrounds occurs along Hillsborough Street. Parking is allowed on the south side of Hillsborough Street in the railroad right-of-way. Pedestrians are more likely to cross Hillsborough Street mid-block between Hillsborough Street and Youth Center Drive. There are no sidewalks or other infrastructure to adequately support existing pedestrian traffic adjacent to the NC State Fairgrounds on Hillsborough Street or Blue Ridge Road. A fence was installed along the south side of the railroad tracks between Blue Ridge Road and Powell Drive to prevent pedestrians from crossing the railroad between these intersections.

Carter-Finley Stadium and the PNC Arena also generate large volumes of pedestrian traffic in the area during sporting events and other special events. However, in the absence of these special events, typical weekday pedestrian volumes in the area are low.

Additional information regarding pedestrian accommodations and circulation is included in the Pedestrian Study (May 2010), appended by reference.

1.6.3 Logical Termini

Federal Highway Administration regulations (23 CFR 771.111(f)) require that logical termini be established during the development of all highway improvement projects. The proposed action consists of improvements to the intersection of Hillsborough Street (NC 54) with Blue Ridge Road including the Blue Ridge Road at-grade railroad crossing and the adjacent intersection with Beryl Road. The project includes improvements needed to ensure that the intersections function; therefore, construction limits extend beyond the immediate intersection. Termini are logical in that they ensure that the proposed improvements would have independent utility. The proposed transportation project will be a usable and reasonable improvement even if no additional transportation improvements are made beyond the project limits. In addition, the project will not restrict the consideration of other transportation improvements in the foreseeable future.

1.7 Socioeconomic Conditions

The 2010 and 2000 U.S. Census were used, as available, to gather information on the demographics and economic characteristics of the study area. These data were supplemented with data from the North Carolina Employment Security Commission and North Carolina State Data Center, as appropriate. U.S. Census data were also obtained at the state, county, and city levels for comparison purposes and to more accurately define the characteristics of the study area.

Two Census block groups encompass the study area, as well as a larger area outside the study area boundary. These block groups are referred to as the Demographic Study Area. (Note: The two block groups comprising the Demographic Study Area were split with the 2010 census. 2000 Census Tract 524.01, Block Group 1 is the equivalent of 2010 Census Tract 524.01, Block Groups 1 and 2. 2000 Census Tract 524.02, Block Group 1 is the equivalent of Census Tract 524.07, Block Group 1 and a portion of Block Group 2. For an equivalent comparison, data for the portion of Block Group 2 that is outside the 2000 census geography was excluded from the block group total.) The Demographic Study Area is shown on Figure 4.

Additional socioeconomic information is included in the Community Impact Assessment for the proposed project, dated September 2011, and appended by reference.

1.7.1 Population and Demographic Characteristics

1.7.1.1 Population – Trends and Composition

Overall, the population of the Demographic Study Area increased approximately 15 percent from 2000 to 2010. The population increased by a similar rate of 16.4 percent in the previous decade (1990 to 2000). Most of this growth occurred outside the study area. From 2000 to 2010, several apartment complexes were constructed off Trinity Road. Growth within the study area occurred southwest of the Hillsborough Street intersection with Blue Ridge Road where several multi-family housing developments have been constructed since 2000.

In comparison, Raleigh and Wake County experienced substantial growth of approximately 46 percent and 43.5 percent, respectively, from 2000 to 2010. This residential growth made Wake County one of the fastest-growing counties in the state.

By examining 2010 Census data at the block level, it was determined that approximately 17.4 percent of the Demographic Study Area population (1,193 people) live in the study area. Approximately 80 percent of the study area population lives in the residential area between Beryl Road and Western Boulevard.

Population growth between 2000 and 2010 is shown on Table 1.

Table 1 2000 – 2010 Population Growth

Population	North Carolina	Wake County	Raleigh	Demographic Study Area	Census Tract 524.01, Block Group 1*	Census Tract 524.02, Block Group 1**
2000	8,049,313	627,846	276,579	5,988	2,666	3,322
2010	9,535,483	900,993	403,892	6,889	3,205	3,684
Increase	1,486,170	273,147	127,313	901	539	362
% Change	18.5%	43.5%	46.0%	15.0%	20.2%	10.9%

*2010 Census Tract 524.01 Block Groups 1 and 2

**2010 Census Tract 524.07 Block Group 1 and a portion of Block Group 2

Source: U.S. Census Bureau, 2000 Census Summary File 1, Table P1. Total Population; 2010 Census Summary File 1, Table P1: Total Population

1.7.1.2 Racial and Ethnic Makeup

Overall, the racial composition of the Demographic Study Area is similar to that of Wake County, Raleigh, and the state. This was not the case in 2000, when the Demographic Study Area population was comprised of a notably lower percentage of African Americans and a higher percentage of Asians compared to the county population. Another trend is an increase in the Hispanic population in the Demographic Study Area. However, the state, county, and city have experienced a similar trend.

Using 2010 Census data, a breakdown of the ethnicity and racial characteristics at the state, county, town, and census tract block group levels is shown in Table 2.

Table 2 Race and Ethnicity (2010)

	North Carolina	Wake County	Raleigh	Demographic Study Area *	Census Tract 524.01, Block Group 1	Census Tract 524.07, Block Group 1	Census Tract 524.07, Block Group 2**
Total:	9,535,483	900,993	403,892	5,928	2,244	2,068	1,616
White alone	6,528,950 68.5%	597,546 66.3%	232,377 57.5%	3,836 64.7%	1,483 66.1%	1,349 65.2%	1,004 62.1%
Black or African American alone	2,048,628 21.5%	186,510 20.7%	118,471 29.3%	1,265 21.3%	502 22.4%	409 19.8%	354 21.9%
American Indian and Alaska Native alone	122,110 1.3%	4,503 0.5%	1,963 0.5%	40 0.7%	11 0.5%	21 1.0%	8 0.5%
Asian alone	208,962 2.2%	48,553 5.4%	17,434 4.3%	338 5.7%	147 6.6%	131 6.3%	60 3.7%
Native Hawaiian and Other Pacific Islander alone	6,604 0.1%	387 0.0%	173 0.0%	4 0.1%	3 0.1%	0 0.0%	1 0.1%
Some other race alone	414,030 4.3%	40,928 4.5%	22,942 5.7%	276 4.7%	36 1.6%	92 4.4%	148 9.2%
Two or more races	206,199 2.2%	22,566 2.5%	10,532 2.6%	169 2.9%	62 2.8%	66 3.2%	41 2.5%
Hispanic or Latino	800,120 8.4%	87,922 9.8%	45,868 11.4%	439 7.4%	108 4.8%	179 8.7%	152 9.4%

* 2010 Census Tract 524.01 Block Group 2 was excluded; there is no population within the study area for Census Tract 524.01 Block Group 2

**Excludes the portion of this block group that was added in 2010

Source: U.S. Census Bureau, 2010 Census Summary File 1, Table P3: Race and Table P9: Hispanic or Latino

1.7.2 Economic Conditions

1.7.2.1 Major Employment Centers and Businesses

Wake County's diverse economic base is comprised of a wide range of industries. Retail trade, health care and social assistance, public administration, and educational services were the industries with the highest annual employment in 2010. The largest employment centers in Wake County include downtown Raleigh and the Research Triangle Park (located in Wake and Durham Counties). In Wake County, the State of North Carolina employs 24,739 people and the Wake County Public School System employs 16,755 people, according to Wake County Economic Development. IBM Corporation is the largest private employer with 10,800 employees. Other top employers in Wake County are NCSU (7,500 employees), WakeMed Health and Hospitals (7,100 employees), GlaxoSmithKline (6,000 employees), Rex Healthcare (4,400 employees), and SAS Institute, Inc. (4,149 employees).

Major employers in the study area are Gregory Poole Equipment Company, NCSU, and NCDOT. Employment centers are located in each quadrant of the project intersection. The Gregory Poole Equipment Company and the adjacent NCDOT Bridge Maintenance Yard comprise an employment center on the southwest quadrant of the Beryl Road intersection with Blue Ridge Road. East of Blue Ridge Road, the Pylon Industrial Park is also an employment center, with approximately 50 businesses. North of Hillsborough Street, the NCSU College of Veterinary Medicine and NC State Fairgrounds are centers for employment. While the NC State Fairgrounds does not employ large numbers of workers on a daily basis, many special events and the weekend flea market host a number of small businesses and vendors. The flea market is open every weekend, except during the State Fair, with more than 600 vendors.

Several businesses in the study area can only be accessed from Beryl Road. These include Capitol City Lumber, SecurCare Self Storage, and P.F.S. Sales Warehouse, all east of Blue Ridge Road. (See Figure 2A.) The J.C. Raulston Arboretum is also accessed from Beryl Road. Capitol City Lumber, with 15 employees, is a specialty business that does not rely heavily on drive-by traffic. Approximately ten percent of the business is through on-line sales (Nicholson, pers. comm., 2011).

West of Blue Ridge Road, the NCDOT Maintenance Yard, a vacant warehouse owned by the NC Farm Bureau, and the James A. Bailey Inc. construction facility are primarily accessed via Beryl Road. The Gregory Poole Equipment Company has access from Beryl Road and Blue Ridge Road. In addition to Blue Ridge Road, Beryl Road is accessible from Powell Drive at the western terminus and Pylon Drive, Method Road and Hillsborough Street at the eastern terminus.

1.7.2.2 Employment Growth by Industry (2000 – 2010)

Wake County experienced overall employment growth of 12.3 percent from 2000 to 2010. Health care and social assistance showed the most gain (53.0 percent), adding more than 15,000 employees during the 10-year period. Educational services added more than 12,000 employees and accommodation and food services added more than 8,000 employees. These industries experienced growth rates of 47.0 percent

and 31.7 percent, respectively. Although retail trade experienced a lower growth rate of 5.6 percent, the industry continues to be Wake County’s top employer with more than 49,000 people employed in the industry.

1.7.2.3 Income and Poverty Status

According to 2000 Census data, the median household income for the Demographic Study Area (\$39,104) is lower than Wake County (\$54,988) and Raleigh (\$46,612), but similar to the state (\$39,184). Within the Demographic Study Area, the median household income varies, with a lower median for the southern portion of the area. The median household income for the northern portion of the Demographic Study Area is comparable to the county and state. Similarly, median housing values in the southern portion of the Demographic Study Area are also lower than the other geographies, with the exception of the state overall. However, median housing values are provided only for owner-occupied units. This would not account for the high percentage of rental housing in the Demographic Study Area.

The percentage of the population below the poverty level in the Demographic Study Area (18.3 percent) is higher than the percentage for the county (7.8 percent), city (11.5 percent), and state (12.3 percent). In fact, this percentage for both Demographic Study Area block groups is higher than the county, city, and state. This identified low-income population meets Environmental Justice criteria. The student population in this area likely contributes to the higher percentage.

Median housing values for the Demographic Study Area are \$170,200 for the block group north of Hillsborough Street and \$139,900 for the block group south of Hillsborough Street. Median values for Wake County and Raleigh fall within this range.

Table 3 indicates median household income, median housing value, and populations below the poverty level.

Table 3 Median Income and Poverty Status (1999)

	North Carolina	Wake County	Raleigh	Demographic Study Area	Census Tract 524.01, Block Group 1	Census Tract 524.02, Block Group 1
Median Household Income	\$39,184	\$54,988	\$46,612	\$39,104	\$48,235	\$37,286
Median Housing Value	\$108,300	\$162,900	\$156,000	\$143,165	\$170,200	\$139,900
Population Below the Poverty Level (as a percentage of total population*)	958,667 (12.3%)	47,685 (7.8%)	29,807 (11.5%)	907 (18.3%)	242 (14.8%)	665 (20.0%)

*Population for whom the poverty status was determined

Source: U.S. Census Bureau, 2000 Census Summary File 3, Table P53: Median Income, Table H85: Median Value for all Owner-Occupied Housing Units, and Table P87: Poverty Status in 1999 by Age. The following 2000 Census Summary File 3 table were used to calculate the medians for the Demographic Study Area: P52: Household Income in 1999 and H84: Value for all Owner-Occupied Housing Units.

1.7.3 Housing Characteristics

From 2000 to 2010, approximately 422 new housing units were constructed in the Demographic Study Area, an increase of approximately 15.1 percent. North of Hillsborough Street, the new housing units were constructed primarily outside the study area. South of Hillsborough Street, housing construction during the 10-year period included several multi-family projects on Blue Ridge Road (Westgrove Apartments, Blue Ridge Apartments, and Autumn Woods) and Powell Drive (Powell Townes). (See Table 4.)

Table 4 2000 - 2010 Housing Units

	North Carolina	Wake County	Raleigh	Demographic Study Area	Census Tract 524.01, Block Group 1*	Census Tract 524.02, Block Group 1**
2000	3,523,944	258,953	120,699	2,798	1,004	1,794
2010	4,327,528	371,836	176,124	3,220	1,303	1,917
change	803,584	112,883	55,425	422	299	123
% change	22.8%	43.6%	45.9%	15.1%	29.8%	6.9%

*2010 Census Tract 524.01 Block Groups 1 and 2

**2010 Census Tract 524.07 Block Group 1 and a portion of Block Group 2

Source: U.S. Census Bureau, 2010 Census Summary File 1, Table H1: Housing Units and 2000 Census Summary File 1, Table H1: Housing Units

1.7.4 Community Characteristics

1.7.4.1 Neighborhoods/Communities

Several residential areas are within the study area. Westover includes approximately 150 single-family dwellings dating to the early- to mid-twentieth century. The boundaries of the Westover community are defined by Youth Center Drive, the NC State Fairgrounds, and Mt. Vernon School. Westover is somewhat isolated from other residential areas, as it is surrounded by publicly-owned properties and a commercial area along Hillsborough Street.

Another residential enclave within the study area includes homes primarily along Carolina Avenue, Pineland Circle and Gannett Street. This established residential area includes older single-family residences, as well as more recent construction. However, multi-family dwellings mostly comprise the recent construction. Primary access to this area is from Western Boulevard.

Multi-family residential development includes owner-occupied and renter-occupied dwellings located south of the Hillsborough Street, railroad, and Beryl Road corridor.

1.7.4.2 Community Facilities

Several community facilities are located in the study area, as shown on Figures 2A and 2B. These facilities include:

- Country Day Montessori School is located on a six-acre site on Gannett Street, just north of Western Boulevard. The school offers full or part-time enrollment for children ages six weeks through six years.
- The Westover United Methodist Church is on Powell Drive at the intersection with Carolina Avenue. According to Wake County tax records, the church building was constructed in 1951.
- The Oak Grove Community Cemetery is located at the eastern boundary of the study area, adjacent to I-440. The cemetery is associated with the Method community located east of I-440 (outside the study area).
- The Raleigh Police Department’s Southwest District office is located in the Pylon Industrial Park at the intersection of Pylon Drive and Hutton Street.
- The J. C. Raulston Arboretum at NCSU is located to the east of these commercial properties. The eight-acre arboretum includes a large and diverse collection of landscape plants. The arboretum has a staff of 14 and is open to the public. The arboretum director estimates annual visitor use at 50,000 (Bilderback 2011).
- State Highway Patrol Office – The facility at 1300 Blue Ridge Road houses a communications and logistics unit.
- City of Raleigh water tank – The elevated water tank sits on an approximately 0.49 acre lot on the east side of Blue Ridge Road, bordered on three sides by the NCSU College of Veterinary Medicine.

1.8 Transportation Planning

1.8.1 Raleigh Transportation Plan

The Transportation Element of Raleigh’s 2030 Comprehensive Plan “is meant to guide future development of the city’s corridors, roads, and highways for motorized and non-motorized transportation including public transit systems, bicycle, and pedestrian networks.” The Transportation Element includes numerous policies and action items with a focus on creating a well-maintained, multi-modal transportation network and linking transportation and land-use decisions, among others. Information presented in the plan that is most relevant to the proposed project and study area is discussed in this report.

One policy specifically applies to the project intersection and was incorporated as part of the project purpose. Policy T 2.10 states, “Maintain LOS E or better on all roadways and for overall intersection operation at all times, including peak travel times, unless maintaining this LOS would be infeasible and/or conflict with the achievement of other goals.”

The Transportation Element's Planned Transit Facilities map shows a rail transit station just west of Blue Ridge Road along the designated regional rail corridor. The plan emphasizes the link between transit and land use, and recommends that transit stations be integrated into walkable, transit-oriented developments.

Also in the study area, Hillsborough Street and Blue Ridge Road north of the railroad corridor are designated as multi-modal corridors. Transit and non-motorized modes are anticipated to provide a significant share of the total capacity of these streets. Bicycles should be accommodated and a high level of pedestrian facilities and amenities should be provided, according to the plan.

Additional policies with specific relevance to the proposed project include:

- Policy T 2.7: No street, alley, or other public right-of-way shall be abandoned without the highest level of scrutiny and concurrence among affected city departments and utility companies. (In addition, right-of-way abandonment is to be subject to five findings specified in the policy.) [Note: This policy would apply if at-grade rail crossing closures are considered.]
- Policy T 3.2: Ensure that all new roadway projects and major reconstruction projects provide appropriate and adequate right-of-way for safe and convenient movement for all users including bicyclists, pedestrians, transit riders, and motorists. Manage the use of rights-of-way to best serve future travel demand (e.g., Multi-modal Streets – incorporate wider sidewalks where appropriate).

1.8.2 Regional Transit Vision Plan

The Regional Transit Vision Plan: Recommendation's for North Carolina's Research Triangle Region is a report of the Special Transit Advisory Commission, a broad-based citizen group from across the Research Triangle Region. The Special Transit Advisory Commission was appointed by the area's two Metropolitan Planning Organizations (MPO), the Capital Area MPO (CAMPO) and the Durham-Chapel Hill-Carrboro MPO (DCHC MPO). The regional Transit Vision Plan was completed in 2008. The plan "recommends a high-quality, regional transit system to serve North Carolina's Research Triangle Region by promoting closer connections between our land use and transportation patterns and providing more travel choices for our growing population" (Special Transit Advisory Commission 2008). More specifically, the plan recommends investments in an enhanced region-wide bus network, circulators (initially anticipated to be buses), and rail (a combination of diesel multiple unit trains and light rail transit). Rail investments through the study area, connecting Durham to north Raleigh, would include diesel multiple unit rail cars operating within the existing railroad rights-of-way.

The plan recommends that Triangle Transit oversee design, construction and operation of the regional transit system, in close coordination with CAMPO and DCHC MPO.³ The planning horizon for the plan is 2035.

³ Prior efforts by Triangle Transit to implement a regional rail system were not successful because of increased construction costs and stricter federal guidelines for financing the project. The Special Transit Advisory Commission was created to generate a new region-wide transit vision and funding recommendations.

1.8.3 Capital Area Metropolitan Planning Organization 2035 Long Range Transportation Plan

The 2035 Long Range Transportation Plan was approved by the CAMPO board in May 2009 and by FHWA in June 2009. CAMPO developed the 2035 Long Range Transportation Plan to guide future investments in roads, transit services, bicycle and pedestrian facilities and related transportation activities and services. The plan lists a number of transportation investments, including STIP Project No. U-4437. While no other study area roadway projects are listed, several projects in the vicinity are listed. These include widening Trinity Road from Edwards Mill Road to Trenton Road and widening NC 54 (Chapel Hill Road) from Corporate Center Drive to Hillsborough Street.

Regarding transit, the plan is based largely on the recommendations of the Special Transit Advisory Commission presented in the Regional Transit Vision Plan. However, new light rail transit and commuter rail transit investments are included in the CAMPO plan. The proposal for light rail transit through the study area is a departure from previous recommendations for passenger rail service using only diesel mobile unit technology. Unlike the diesel mobile units, which could only be operated in the rail corridor, light rail transit can also operate outside the rail corridors. As noted in the plan, “the exact alignment (route) and timing of fixed guideway investments will be decided with more detailed studies.” For transportation modeling and financial planning purposes, the plan assumes light rail service will be implemented through the study area by 2025 and will operate within the existing railroad right-of-way. More detailed studies will determine any modifications to actual implementation phasing and routing. The plan acknowledges that “routing light rail transit service outside of the railroad rights-of-way that have been studied previously could result in a longer time needed to design and build the system.”

The plan also recommends enhanced bus transit services in the project vicinity. Types of improvements may include more frequent service, expanded service, and rail coordination.

CAMPO plans to prepare a mid-range transit plan to provide a vision of transit services that would be implemented over a 5- to 15-year period.

1.8.4 North Carolina Railroad Company Commuter Rail Studies

NCRR has completed several commuter rail studies in recent years. The Shared Corridor Commuter Rail Capacity Study was completed in October 2009 for a study corridor from Greensboro to Goldsboro. The purpose of this study was to determine if commuter and freight trains could share the tracks, and if so, to estimate the cost of the infrastructure required to accommodate the increased traffic. The study demonstrated that it is feasible to run commuter rail service within the approximately 140-mile study corridor. However, substantial capital infrastructure investments would be needed to ensure that the new service does not conflict with freight operations.

As a next step, NCRR completed the Commuter Rail Ridership and Market Study in May 2010 for the same study corridor. This study indicates a potential for strong future growth in commuter rail ridership with an estimated daily ridership of 11,150 passengers in 2022. Daily station boardings at a west Raleigh station are projected to be more than 1,000 passengers by 2022. The commuter rail segment with the

highest ridership potential would be between Durham and Wilson's Mills in Johnston County. This segment includes the project area. The study notes that "successful implementation will depend on a well-coordinated effort of all interested parties, including railroads, MPOs, transit operators, and others."

1.8.5 NCDOT Transportation Improvement Program

The proposed project is included in the 2012-2020 STIP and the Draft *Policy to Projects* document (which includes the draft 2013-2023 STIP), as Project No. U-4437. Other projects located in the study area vicinity include:

- B-4656: Remove bridge number 492 on SR 1011 (Hillsborough Street) over SR 1012 (Western Boulevard) and reconstruct intersections. Programmed for right-of-way and construction.
- U-2719: Widen I-440 (beltline) to multi-lanes from I-40 to north of SR 1728 (Wade Avenue). Programmed for right-of-way and construction.

1.8.6 Bicycle and Pedestrian Plans

1.8.6.1 City of Raleigh

Raleigh's policies for bicycles and pedestrians are documented in the 2030 Raleigh Comprehensive Plan. Policies and recommendations for bicycle transportation are further documented in the 2009 Bicycle Transportation Plan.

The 2030 Raleigh Comprehensive Plan notes that bicycles and pedestrians are an important component of the city's transportation system and includes a number of general policies regarding bicycle and pedestrian circulation, networks and infrastructure. Policies with specific relevance to the proposed project include:

- Policy T 5.5: Pedestrians and bicyclists shall be accommodated on roadway bridges, underpasses, and interchanges (except on roadways where they are prohibited by law). Bicycle lanes and wide sidewalks should be included on all new bridges and underpasses (requires NCDOT coordination on state-maintained roads).
- Policy T 5.13: Ensure that streets in areas with high levels of pedestrian activity (e.g., employment centers, residential areas, mixed-use areas, schools) support pedestrian travel by providing such elements as frequent and safe pedestrian crossings, large medians for pedestrian refuge, bicycle lanes, frontage roads with on-street parking, and/or grade separated crossings.

The Arena Area Plan, which encompasses the study area, includes the following specific policies for sidewalks in the Arena Area:

- Policy AP-A 25: All block faces throughout the Arena Plan area should have sidewalks. Exceptions may be made for areas south of the rail line that are not within easy walking distance to the rail stop.
- Policy AP-A 30: Extra wide sidewalks of 14- to 18-feet should be constructed on both sides of Trinity Road, on the east side of Youth Center Drive, and along Blue Ridge Road to accommodate the large crowds that will be walking in this area before and after major events.

Also in the 2030 Comprehensive Plan and the 2009 Raleigh Bicycle Transportation Plan, the Bicycle Facilities map proposes bicycle lanes on Hillsborough Street, Blue Ridge Road and Trinity Road. The 2009 Bicycle Facility Priority List ranks the proposed bicycle lanes as follows:

#25 Hillsborough Street, from I-440 to I-40

#51 Blue Ridge Road, from Western Boulevard to Lake Boone Trail

#139 Trinity Road, from I-40 to Blue Ridge Road

The Bicycle Facilities map also indicates a proposed greenway along Blue Ridge Road between Hillsborough Street and Trinity Road, with a proposed sidepath north of Trinity Road. A sidepath is also proposed along Trinity Road through the study area. (Note: A “sidepath” is a trail for bicyclists located alongside the roadway.)

1.8.6.2 CAMPO

The Bicycle and Pedestrian Facilities Plan is an integral part of CAMPO’s 2035 Long Range Transportation Plan. The Bicycle and Pedestrian Facilities Plan recommends “extensive integration of bicycle needs into the design and construction specification of new highways and other future or ongoing transportation projects.” The bicycle projects may include off-road shared-use bicycle paths, on-road bicycle lanes and wide shared roadways in urban areas, as well as paved four-foot shoulders on rural roads. While no specific projects (with bicycle and pedestrian improvements only) are listed in the project area, the plan acknowledges that roadway projects should incorporate bicycle and pedestrian accommodations in conjunction with capacity improvements.

According to the 2035 Long Range Transportation Plan, CAMPO relies on the “NCDOT Bridge Policy” to ensure that new bridges in the urban area include sidewalks or have sufficient bridge deck width to accommodate future sidewalks. In addition, CAMPO relies on the “NCDOT Planning and Designing Local Pedestrian Facilities” guide and local standards to identify appropriate facility type.

1.9 Traffic Carrying Capacity

Traffic surveys were conducted in December 2003 and January 2004 to determine traffic volumes through the study area. Peak hour (a.m., p.m., and midday) and 24-hour counts were performed. (See Figures 5A, 5B, and 5C.) These surveys were conducted while school was in session to reflect the highest average

rates. Traffic volumes have not changed substantially since that time. Traffic data were reduced to peak hour volumes, and a capacity analysis was completed to determine the impact of the region's growing transportation demand on the study area's existing transportation network. The Triangle Regional Model was used to project 2030 traffic. (See Figures 6A and 6B.) The a.m. and p.m. analyses were conducted for 2004 (the base year) and 2030 (the design year) based on the existing street configuration. The findings of these analyses are presented below.

Level of service (LOS) is a qualitative measure used to describe the operating conditions of a roadway. The Highway Capacity Manual (Transportation Research Board 2000) generally describes LOS in terms of factors such as speed, travel time, freedom to maneuver, traffic interruptions, driver comfort and convenience, and safety. Level of service is represented by a letter ranking from "A" to "F," with "A" representing free-flow conditions, and "F" representing traffic-breakdown conditions.

Operational capacity analyses, which determine the LOS of a facility, were conducted for existing Blue Ridge Road intersections (from Wade Avenue to Pylon Drive) and Hillsborough Street (from Chapel Hill Road to I-440), utilizing software and methodologies provided in the Highway Capacity Manual. Capacity is defined in the Highway Capacity Manual as "the maximum number of vehicles that can pass a given point during a specified period under prevailing roadway, traffic, and control conditions." In addition to LOS, this analysis provided volume to capacity ratios, queue lengths, and delays for each intersection.

1.9.1 Existing Traffic Volumes (2004)

Existing (2004) average daily traffic volumes on Hillsborough Street are approximately 20,760 vehicles per day (vpd) east of Blue Ridge Road and 18,440 vpd west of Blue Ridge Road. On Blue Ridge Road, existing (2004) average daily traffic volumes are 24,720 vpd north of Hillsborough Street and 17,720 vpd south of Hillsborough Street. Existing (2004) average daily traffic volumes on Beryl Road are approximately 2,350 vpd east of Blue Ridge Road and 2,150 vpd west of Blue Ridge Road.

1.9.2 Existing Levels of Service (2004)

LOS analyses were performed for 2004 traffic volumes in the a.m., p.m., and midday peak periods. (See Figures 7A and 7B.) The overall a.m. LOS for signalized intersections and unsignalized intersections are generally LOS C or better. However, an analysis of the movements for the intersection of Blue Ridge Road with Hillsborough Street shows that the eastbound left-turning and westbound through movements are at LOS E, and the westbound left-turning and northbound left-turning movements are at LOS D. In addition, queues for the eastbound left-turning and westbound through movements exceed 300 feet, which increases delay and driver frustration.

The midday and p.m. peak-traffic volumes, which are similar to each other, increased from the a.m. volumes. The midday and p.m. peak-period levels of service for signalized intersections are slightly worse than the a.m. peak period LOS for most of the intersections due to the increase in traffic volumes during the p.m. and midday periods. The intersection of Blue Ridge Road with Hillsborough Street

operates at LOS C overall.⁴ However, some legs of the intersection operate at LOS D or E, including the eastbound through, southbound left-turning, and southbound through movements. The eastbound left-turning movement operates at LOS F during the p.m. peak hour. As with the a.m. traffic analysis, the queue lengths for some of the analyzed movements are long. The queue for the westbound through movement exceeds 600 feet. The intersection of Blue Ridge Road and Beryl Road also experiences LOS D on southbound legs, which is a serious concern due to the location of the railroad between Hillsborough Street and Beryl Road.

Another factor to consider with the intersections of Blue Ridge Road with Hillsborough Street and Beryl Road is the railroad crossing between the two intersections. Beryl Road is approximately 150 feet south of Hillsborough Street, with the railroad tracks between these roads. (See Figure 3.) The traffic signals for both intersections function adequately, with good railroad preemption phases in advance of the trains for all vehicles to clear the tracks. However, large queues form on Blue Ridge Road and Hillsborough Street. These conditions are not reflected in the LOS values previously described. The crossing is protected by four quadrant gates, which drastically reduce the possibility of vehicles entering the tracks. However, vehicles can still be trapped inside the gates, especially if the vehicles have illegally entered on red. There are approximately 22 train movements through the study area daily.

Weekend traffic in the area shows a similar trend in traffic volumes, due largely to numerous activities at the NC State Fairgrounds. The traffic volume regularly reaches the same volume as weekday a.m. peak hours. Occasionally the volume will meet or exceed weekday p.m. peak-hour volume, during the North Carolina State Fair, NCSU football games, and events at the PNC Arena.

1.9.3 Future Traffic Volumes (No Build)

Projected (2030) average daily traffic volumes on Hillsborough Street are approximately 32,600 vpd east of Blue Ridge Road and 25,600 vpd west of Blue Ridge Road. On Blue Ridge Road, projected (2030) average daily traffic volumes are 35,500 vpd north of Hillsborough Street and 26,300 vpd south of Hillsborough Street. Projected (2030) average daily traffic volumes on Beryl Road are approximately 3,800 vpd east of Blue Ridge Road and 3,500 vpd west of Blue Ridge Road. These traffic projections are based on traffic demand without consideration for capacity restraints.

1.9.4 Projected Levels of Service (No Build)

Using the 2030 projected traffic volumes, the capacity of the project intersections were analyzed assuming no improvements (No Build). Level of service analyses were completed for conditions without trains using the track between Beryl Road and Hillsborough Street. (See Figures 8A and 8B.)

⁴ These level of service values do not reflect delays due to the adjacent Blue Ridge Road at-grade crossing. When accounting for preemption, the level of service worsens.

For the intersections analyzed, the projected a.m. peak period LOS would be E or F, with LOS F at the intersection of Blue Ridge Road with Hillsborough Street. Further analysis of this intersection reveals that eight of the possible twelve movements would operate a LOS F. The southbound right-turning movement would operate at LOS A and the southbound through and westbound right-turning movements would operate at LOS B. The northbound left-turning movement would operate at LOS E, while all other movements would operate at LOS F. An evaluation of the queue lengths for this intersection reveals that each leg would have at least one movement where the queue would exceed capacity values (storage bays and signal cycles). The adjacent intersection of Blue Ridge Road with Beryl Road would operate at LOS E. However, the capacity analysis did not take into account the proximity of the railroad and the intersection of Blue Ridge Road with Hillsborough Street. Southbound queues would form at the intersection of Blue Ridge Road with Hillsborough Street, rather than at the intersection of Blue Ridge Road with Beryl Road due to the railroad crossing.

The p.m. projected traffic volumes also would result in an overall LOS F at the intersection of Blue Ridge Road with Hillsborough Street, including seven movements operating at LOS F. The westbound right-turning movement would operate at LOS A, the southbound left-turning movement would operate at LOS B, and the eastbound through and eastbound right-turning movements would operate at LOS D. The northbound left-turning movement would operate at LOS E, while all other movements would operate at LOS F. Like the a.m. peak hour, each leg of the intersection would have at least one movement where the queue would exceed capacity values. The intersection of Blue Ridge Road with Trinity Road would operate at LOS F. Again, the analysis did not take into account the proximity of the railroad and the intersection of Blue Ridge Road with Hillsborough Street.

Planning is underway for new light rail transit and commuter rail transit through the study area. Freight traffic is also likely to increase during the planning period. The addition of trains to the existing passenger and freight trains crossing Blue Ridge Road daily will result in more frequent preemptions and will increase delays and lengthen queues. With no improvements, safety will be reduced as motor vehicles, freight trains, and commuter trains contend for the same space, especially during events at the NC State Fairgrounds, NCSU’s Carter-Finley Stadium, and the PNC Arena.

A summary of LOS and volume to capacity (v/c) ratio is included in Table 5.

Table 5 Level of Service and Volume to Capacity Summary

Intersection	LOS / Maximum v/c Ratio*			
	2004		2030 (No Build)	
	AM	PM	AM	PM
Blue Ridge Road at Hillsborough Street	C / 0.96	D / 0.99	F / 1.6	F / 1.76
Blue Ridge Road at Beryl Road	B / 0.38	B / 0.56	E / 0.83	E / 0.87

*volume to capacity ratio:

<0.85 Intersection is operating under capacity. Excessive delays are not experienced.

0.85-0.95 Intersection is operating near its capacity. Higher delays may be expected, but continuously increasing queues should not occur.

0.95-1.0 Unstable flow results in a wide range of delay. Intersection improvements will be required soon to avoid excessive delays.

>1.0 The demand exceeds the available capacity of the intersection. Excessive delays and queuing are anticipated.

(Source: <http://www.fhwa.dot.gov/publications/research/safety/04091/07.cfm#table37>)

1.10 Safety

Blue Ridge Road crosses the CSX Transportation and Norfolk Southern tracks at-grade, creating the potential for train-related conflicts with vehicles. Because of the high volume of pedestrian traffic in the area during special events, there is also a potential for train-related conflicts with pedestrians.

The NCDOT Rail Division uses an exposure index to guide recommendations for grade separating highway-rail crossings. As previously stated, the exposure index is the product of the number of trains per day and the projected average daily highway traffic at the end of the design period. The Rail Grade Separation Guidelines recommend that, "separations should be constructed in urban areas when the exposure index is 30,000 or more." The exposure index at the Blue Ridge Road at-grade rail crossing is approximately 526,000. This exposure index, which is based on the number of existing train movements through the study area, indicates a high potential for train-related conflicts with vehicles.

The potential for train-related conflicts with vehicles and pedestrians will increase as rail service through the area is expanded. Additional freight and passenger trains are planned, with the potential for additional track as well. As mentioned in Section 1.6.2, the rail corridor is designated the Southeast High-Speed Rail Corridor as part of an overall plan to expand passenger rail service from the northeast. Future train movements through the area will also include commuter rail and light rail transit. (See Sections 1.8.2, 1.8.3, and 1.8.4.)

2 Alternatives

2.1 Development of Preliminary Alternatives

During this environmental study, a number of alternatives were developed and evaluated. The development of initial preliminary alternatives considered existing conditions data, including historic resources; agency comments; and public involvement and comment, including the Citizens and Stakeholders Action Committee. Those alternatives that did not meet the purpose and need of the project, were considered impractical, and/or would likely result in substantial impacts were eliminated from further consideration.

A number of issues and constraints were identified early in the project planning process and were considered in the development and evaluation of preliminary alternatives. General project area constraints and issues include existing and future land use, community character and aesthetics, and the various modes of transportation that must be accommodated in the project area. Character and aesthetics are especially important in this area of Raleigh which attracts visitors from across the state and region. Historic buildings on the NC State Fairgrounds property play an important role in defining the area's character and are protected under Section 106 of the National Historic Preservation Act and Section 4(f) of the Department of Transportation Act of 1966 ("DOT Act").

Several alternatives were eliminated early in the planning process, while others were carried through preliminary design before being eliminated. Initially, alternative modes of transportation, one No Build

alternative, and nine build alternatives were considered. Based on comments received during the alternatives development phase, three additional build alternatives were developed and analyzed. The initial screening eliminated alternatives that were not considered reasonable or practical, due primarily to construction constraints and turning movement restrictions (i.e., Alternatives 3, 4 and 5). Capacity analysis was performed on the remaining alternatives to determine the future year (2030) LOS. Those alternatives that would not achieve the desired LOS were eventually eliminated (i.e., Alternatives 1, 2, 7, 8, and 10). After additional analysis of project impacts, which considered public and stakeholder comments, three additional alternatives were eliminated (i.e., Alternatives 6, 9, and 11). These alternatives are described in Section 2.2.3.

2.1.1 Roadway Design Criteria

The roadway design criteria utilized during the development of the preliminary alternatives is presented in Table 6. Design criteria for the proposed preliminary alternatives meet the NCDOT and American Association of State Highway and Transportation Officials (AASHTO) standards.

Table 6 Design Criteria

Criteria	Blue Ridge Road	Hillsborough Street	Beryl Road
Classification	Urban Arterial	Urban Arterial	Urban Local
Type of Terrain	Level	Level	Level
Design Speed	40 mph	40 mph	n/a
Posted Speed	35 mph*	35 mph	n/a
Proposed R/W Width	100 ft	TBD	n/a
Control of Access	No	No	n/a
Typical Section Type	4 Lane C & G	4 Lane C & G	n/a
Lane Width	11' - 12'	12'	n/a
Sidewalks	Yes	Yes	Yes
Bicycle Lanes	4'	No**	No
Median Width	n/a	n/a	n/a
Maximum Grade	7 %	7 %	n/a
Minimum Grade	0.3 %	0.3 %	n/a

* Propose reducing existing speed of 45 mph between Trinity Road and Pylon Drive
 **No bicycle lanes along Hillsborough Street; include 4' wide outside lanes on the proposed bridge

Notes:
 TBD = to be determined
 n/a = not applicable
 C & G = curb and gutter

2.1.2 Capacity Analysis

Capacity analyses were performed for build alternatives that were not eliminated in the initial screening. Results are provided in the technical report *Traffic Capacity Analysis – T.I.P. Project No. U-4437*, dated September 2007.

2.2 Preliminary Alternatives Considered but Eliminated

This section describes the alternatives that were eliminated and documents the reason(s) for elimination.

2.2.1 Alternative Modes of Transportation

2.2.1.1 *Transportation Systems Management Alternative*

Transportation Systems Management (TSM) improvements involve increasing the available capacity of the facility within the existing right-of-way with minimum capital expenditures and without reconstructing the existing facility. Items such as the addition of turn lanes, striping, signalization, and minor realignments are examples of TSM physical improvements. Traffic law enforcement, speed restrictions, access control and signal timing changes are examples of TSM operational improvements. TSM improvements would not address safety concerns resulting from proximity of the project intersection to the at-grade railroad crossing and would not adequately improve future LOS. Therefore, TSM was not considered a reasonable and feasible alternative and was eliminated from further consideration.

2.2.1.2 *Mass Transit Alternative*

The mass transit alternative considered forms of transportation other than the single-occupancy passenger vehicle. The City of Raleigh, Triangle Transit and NCSU already provide bus transit service in the area.

- The city of Raleigh provides public transit service, Capital Area Transit (CAT), within the city limits. CAT offers fixed-route and connector service, including connections to Triangle Transit regional routes. Several buses are routed near the project intersection.
- The Wolfline is NCSU's bus service, which operates when classes are in session. The Vet School Route No. 6 serves both the NCSU College of Veterinary Medicine and the Carter-Finley park-and-ride lot on Trinity Road. The Westgrove Route No. 4 serves the park-and-ride lot on Westgrove Street.
- Triangle Transit offers a regional bus line with connector shuttles, vanpool service, rideshare-matching service, in addition to the planned regional rail service. Three fixed routes, two of which connect downtown Raleigh to RTP, travel through the project intersection. These buses provide service to the State Fairgrounds park-and-ride lot located off Blue Ridge Road.

In addition, Triangle Transit is planning regional rail service through the area and a light rail transit station in proximity to the project intersection. While this service will provide a new regional transportation option, it will impact the efficiency of the project intersection due to the increased number of trains traveling through the at-grade intersection of Hillsborough Street with Blue Ridge Road.

The addition of sidewalks and bicycle lanes in the study area would enhance the proposed project, but would not fully meet the purpose and need of the project. In addition, the existing transit options already play a role in lessening congestion through the project intersection. The Mass Transit Alternative would not address the need to reduce congestion and train-related conflicts with vehicles and pedestrians at the intersection of Hillsborough Street with Blue Ridge Road, as described in the purpose and need for the project (Sections 1.3 and 1.4). The Mass Transit Alternative is not considered a reasonable and feasible alternative and was eliminated from further consideration.

2.2.2 No-Build Alternative

The No-Build Alternative would forgo any improvements to the intersection of Hillsborough Street with Blue Ridge Road with the exception of routine maintenance. Although the No-Build Alternative would avoid any adverse environmental impacts, adverse social impacts could result from increased accidents and delays.

Under the No-Build Alternative, the intersections of Blue Ridge Road with Trinity Road and with Hillsborough Street would operate at LOS F in both the a.m. and p.m. peak hours (2030). The intersection of Blue Ridge Road with Beryl Road would operate at a LOS E in both the a.m. and p.m. peak hours. Figure 8A shows the 2030 LOS at the intersections of Blue Ridge Road with Trinity Road, Hillsborough Street, and Beryl Road for the No-Build Alternative.

The No-Build Alternative would not address the need to reduce congestion and train-related conflicts with vehicles and pedestrians at the intersection of Hillsborough Street with Blue Ridge Road, as described in the purpose and need for the project (Sections 1.3 and 1.4). Also, the No-Build Alternative would not address pedestrian deficiencies at and approaching the project intersection. Therefore, the No-Build Alternative was eliminated from consideration. However, the No-Build Alternative provides a basis for comparing the adverse impacts and benefits of the build alternatives.

2.2.3 Build Alternatives

In developing the build alternatives, a number of options to improve the Hillsborough Street intersection with Blue Ridge Road and to eliminate the at-grade rail crossing were explored. For the Hillsborough Street intersection with Blue Ridge Road, options included improving the existing at-grade intersection or grade separating the intersection. In conjunction with a grade-separated intersection, several options were explored to maintain connectivity between Hillsborough Street and Blue Ridge Road:

- Connector road - The connection of Blue Ridge Road to Hillsborough Street would be by a two-way road in the northeast quadrant of the current intersection (NCSU Veterinary School property). The road would intersect Blue Ridge Road opposite the existing driveway into the NC State Fairgrounds (Gate 11). However, according to the master plan for the NC State Fairgrounds, Gate 11 would be closed to vehicular traffic in the design year. A signal is proposed at each end of the roadway.

- Roundabout - All the traffic on Hillsborough Street would travel through a two-lane roundabout northeast of the existing project intersection (NCSU Veterinary School property). The exit from Hillsborough Street to Blue Ridge Road would extend from this roundabout to Blue Ridge Road, intersecting opposite Trinity Road (State Highway Patrol property).
- Half single-point urban interchange - The connection of Blue Ridge Road to Hillsborough Street would be by a half single-point urban interchange on the north side of Hillsborough Street.

For the railroad crossing grade separation, options included:

- Lowering the railroad tracks, or
- Raising the railroad tracks; and/or
- Raising Blue Ridge Road, or
- Lowering Blue Ridge Road.

Preliminary build alternatives consisted of various combinations of these options, as well as different Blue Ridge Road alignments (new or existing location). The combinations of options that comprise each preliminary build alternative are illustrated in Table 7 and described in the following sections.

Table 7 Options Comprising Alternatives

Options		Alternatives											
		1	2	3	4	5	6	7	8	9	10	11	12
Hillsborough Street/ Blue Ridge Road Intersection	Improve the Hillsborough/Blue Ridge at-grade Intersection				X			X	X		X		
	Connector Road					X*	X					X	X
	Roundabout	X	X										
	(half) Single-Point Urban Interchange			X									
Railroad Crossing Grade Separation	Lower Railroad Tracks				X	X			X			X	
	Raise Railroad Tracks							X					
	Raise Blue Ridge Road	X	X	X		X	X		X		X	X	
	Lower Blue Ridge Road							X					X
Blue Ridge Road Alignment (horizontal)	Blue Ridge Road on Existing Location				X	X	X	X	X			X	X
	Blue Ridge Road on New Location	X	X	X							X		
	Close Blue Ridge Road									X			

*with turning movement restrictions

2.2.3.1 Alternative 1: Raise Blue Ridge Road on new location (tangent bridge) / Roundabout

This alternative would raise Blue Ridge Road over existing Hillsborough Street, railroad tracks, and Beryl Road on new location. All the traffic on Hillsborough Street would travel through a two-lane roundabout northeast of the existing project intersection. The connection between Blue Ridge Road and Beryl Road would be by existing Pylon Drive. The primary benefit of this concept is the elimination of existing at-grade intersections of Blue Ridge Road with Hillsborough Street and with Beryl Road and the elimination of the at-grade railroad crossing.

Capacity analysis was performed for this alternative. While the intersections of Blue Ridge Road with Pylon Drive and Pylon Drive with Beryl Road would operate at an acceptable LOS in both the a.m. and p.m. peak hours (LOS D or better), the intersection of Blue Ridge Road with Trinity Road would operate at a LOS F. The roundabout on Hillsborough Street would also operate at a LOS F in both the a.m. and p.m. peak hours. This LOS is due to the high through traffic volume on Hillsborough Street (which will circulate around the north side of the roundabout) and the high volume of traffic entering from this approach.

Primary impacts resulting from this alternative would be business relocations on the south side of Beryl Road; right-of-way impacts, especially to the NCSU College of Veterinary Medicine; and visual impacts due to the bridge spanning Hillsborough Street, the railroad tracks, and Beryl Road. This alternative would substantially impact the master plan for the NCSU College of Veterinary Medicine.

Primary reason for elimination: The roundabout on Hillsborough Street would not accommodate high through traffic volumes on Hillsborough Street; therefore, the alternative would not fully meet the project purpose and need.

2.2.3.2 Alternative 2: Raise Blue Ridge Road on new location (tangent bridge)/Roundabout

This alternative is similar to Alternative 1 except this alternative incorporates a tangent bridge design. The tangent bridge provides a tighter alignment to existing Blue Ridge Road compared to the curved bridge in Alternative 1. Traffic operations would be similar to Alternative 1.

Primary reason for elimination: The roundabout on Hillsborough Street would not accommodate high through traffic volumes on Hillsborough Street; therefore, the alternative would not fully meet the project purpose and need.

2.2.3.3 Alternative 3: Raise Blue Ridge Road on new location/Half single-point urban interchange

Alternative 3 would raise Blue Ridge Road on new location over Hillsborough Street, the railroad tracks, and Beryl Road. The connection of Blue Ridge Road to Hillsborough Street would be by a half single-point urban interchange on the north side of Hillsborough Street. Similar to Alternative 1 and 2, the connection between Blue Ridge Road and Beryl Road would be by existing Pylon Drive.

This alternative would eliminate several turning movements. Vehicles traveling northbound on Blue Ridge Road would not be able to turn onto Hillsborough Street and vehicles traveling on Hillsborough Street would not be able to turn southbound onto Blue Ridge Road. Capacity analysis was not performed for this alternative.

Primary reason for elimination: Due to turning movement restrictions, this alternative was not considered practical. This alternative would not fully meet the project purpose and need and was eliminated from further consideration in the initial phase of alternatives analysis.

2.2.3.4 Alternative 4: Lower the Railroad Tracks

Alternative 4 would eliminate the at-grade rail crossing by lowering the railroad tracks under Blue Ridge Road. The intersection of Hillsborough Street with Blue Ridge Road would remain at-grade. The I-440 bridge to the east and the railroad bridge over Hillsborough Street to the west would be the construction limits for lowering the railroad tracks. Given these constraints, lowering the railroad tracks to achieve an acceptable clearance under Blue Ridge Road would require grades in excess of allowable track grades. Capacity analysis was not performed for this alternative.

Primary reason for elimination: This alternative is not reasonable because of constraints to accommodating required railroad grades. Alternative 4 was eliminated from further consideration in the initial phase of alternatives analysis.

2.2.3.5 Alternative 5: Raise Blue Ridge Road on existing location/Lower the railroad tracks/Connector road

Alternative 5 is a combination of raising Blue Ridge Road and lowering the railroad tracks and Beryl Road. This alternative would bridge Blue Ridge Road on existing location over Hillsborough Street, the railroad tracks, and Beryl Road. The railroad tracks would be lowered approximately 13 feet. The connection of Blue Ridge Road to Hillsborough Street would be by a two-way road in the northeast quadrant of the current intersection. The road design with this alternative would prohibit left turns from the connector road onto Blue Ridge Road; therefore, vehicles traveling eastbound or westbound on Hillsborough Street would not be able to turn southbound on Blue Ridge Road. Capacity analysis was not performed for this alternative.

Primary reason for elimination: Considering traffic volumes, this alternative was not considered practical because of the turning movement restrictions. This alternative would not fully meet the project purpose and need and was eliminated from further consideration in the initial phase of alternatives analysis.

2.2.3.6 Alternative 6: Raise Blue Ridge on existing location/Connector road

Alternative 6 raises Blue Ridge Road on existing location over Hillsborough Street, the railroad tracks, and Beryl Road. The connection of Blue Ridge Road to Hillsborough Street would be by a two-way road

in the northeast quadrant of the current intersection. The connection between Blue Ridge Road and Beryl Road would be by existing Pylon Drive.

Similar to Alternative 1, the primary benefit of this alternative is the elimination of existing at-grade intersections of Blue Ridge Road with Hillsborough Street and with Beryl Road and the elimination of the at-grade railroad crossing. The major difference between these alternatives is the type of connection between Hillsborough Street and Blue Ridge Road.

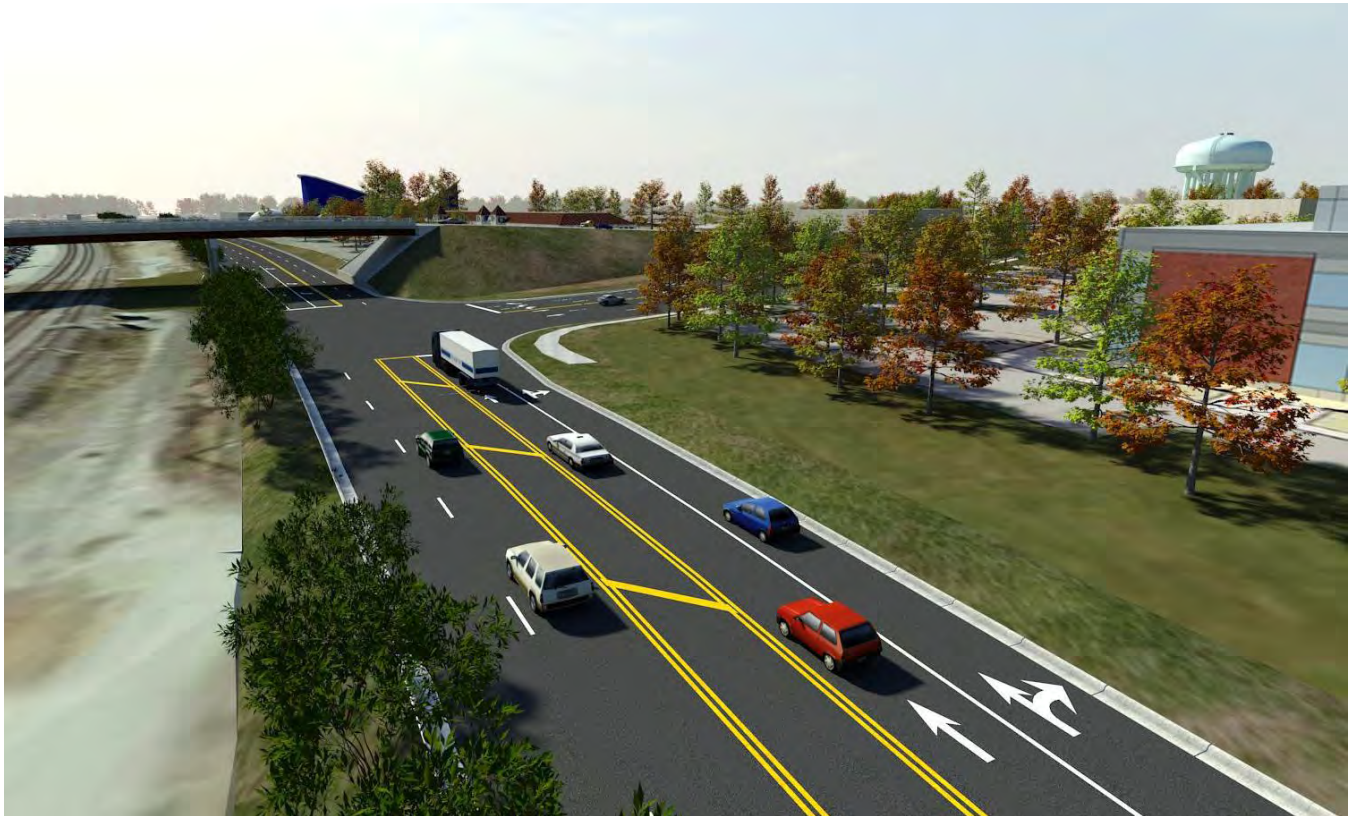
Capacity analysis was performed for this alternative. All intersections analyzed would operate at an acceptable LOS in both the a.m. and p.m. peak hours (LOS E or better).

The primary impact of this alternative would be visual impacts due to the bridge spanning Hillsborough Street, the railroad tracks, and Beryl Road. However, this alternative was considered practical and would meet the project purpose and need; therefore more detailed analysis and preliminary design were completed. This analysis included visualizations depicting views towards the project intersection, as well as animations depicting movement through the project intersection. These visual tools were presented to the Citizens and Stakeholders Action Committee. Of the alternatives carried through preliminary design, Alternative 6 would have the highest Blue Ridge Road bridge.

Based on the preliminary design, it was determined that Alternative 6 would also result in right-of-way impacts to a portion of the NC State Fairgrounds listed in the National Register of Historic Places. (See Section 3.2.1.) This right-of-way impact is in addition to the impact to the setting and views of the National Register-listed buildings on the fairgrounds property. The high bridge proposed with this alternative would also adversely impact the City of Raleigh's vision for more intense development in the area. (See Section 3.1.2.1.)

According to a resolution drafted by the Raleigh Passenger Rail Task Force and adopted by the Raleigh City Council, "the high bridge designed for Alternative 6 would be an obtrusive new feature in the area which would obscure important view sheds of the historic Fairgrounds and of the developing NCSU Centennial West campus and compromise the intersection's Transit-Oriented Development (TOD) economic development potential and pedestrian/bike access (similar in appearance and height to the I-440 bridge just east)" (Passenger Rail Task Force 2011). (See Appendix D.) In addition, there was a lack of support from the Citizens and Stakeholders Action Committee for Alternative 6 as compared to Alternative 12.

Primary reason for elimination: While this alternative would meet the project purpose and need, the introduction of a bridge structure in this area would have substantial impacts, including visual impacts on the setting and views of the historic buildings on the NC State Fairgrounds property, right-of-way impacts within a National Register boundary, and impacts to the city's vision for more intense development in the area. On July 24, 2012, representatives of the NCDOT, FHWA, and the State Historic Preservation Office (HPO) concurred that Alternative 6 would have an adverse effect on the NC State Fair Commercial and Education Buildings. (See Appendix B.) Because of these substantial impacts and lack of support from project stakeholders, Alternative 6 was eliminated from consideration.



Alternative 6 – view west towards the Blue Ridge Road bridge and the NC State Fairgrounds
Source: NCDOT



Alternative 6 – view south towards Hillsborough Street from the NC State Fairgrounds
Source: NCDOT

2.2.3.7 Alternative 7: Lower Blue Ridge Road on existing location/Raise railroad tracks/At-grade intersection

Alternative 7 is a combination of raising the railroad tracks and lowering Blue Ridge Road, resulting in the removal of the railroad crossing from between the intersections of Blue Ridge Road with Hillsborough Street and Blue Ridge Road with Beryl Road. Both intersections would remain at-grade and signalized. The primary benefit of this alternative is the elimination of the at-grade railroad crossing.

LOS analysis shows that this concept is similar to the No-Build Alternative. The intersection of Hillsborough Street with Blue Ridge Road would operate at a LOS F in both peak hours.

Primary reason for elimination: Alternative 7 would not improve traffic congestion at the Hillsborough Street intersection with Blue Ridge Road. This alternative would not meet the project purpose and need and was eliminated from further consideration.

2.2.3.8 Alternative 8: Raise Blue Ridge Road on existing location/Lower the railroad tracks/ At-grade intersection

This alternative is a combination of raising Blue Ridge Road and lowering the railroad tracks. This alternative also lowers Beryl Road and eliminates the intersection of Beryl Road with Blue Ridge Road by bridging Blue Ridge Road over Beryl Road. The intersection of Blue Ridge Road with Hillsborough Street would remain at-grade. The primary benefit of this alternative is the elimination of the at-grade railroad crossing.

LOS analysis results are similar to Alternative 7. The intersection of Hillsborough Street with Blue Ridge Road would operate at a LOS F in both peak hours.

Primary reason for elimination: Alternative 8 would not improve traffic congestion at the Hillsborough Street intersection with Blue Ridge Road. This alternative would not meet the project purpose and need and was eliminated from further consideration.

2.2.3.9 Alternative 9: Close the at-grade Blue Ridge Road railroad crossing

This alternative would close the existing at-grade Blue Ridge Road railroad crossing, resulting in T-intersections at Blue Ridge Road with Hillsborough Street and at Blue Ridge Road with Beryl Road. This alternative also includes improvements to Hillsborough Street from the intersection with Blue Ridge Road to the intersection with Youth Center Drive.

Capacity analysis was performed for this alternative. The analysis indicates that the intersection of Blue Ridge Road with Hillsborough Street would operate at a LOS D in the a.m. peak hour and at LOS F in the p.m. peak hour. With the exception of the intersection of Blue Ridge Road with Trinity Road, other intersections would achieve an acceptable LOS. With improvements, all intersections would achieve an acceptable LOS. However, traffic distribution for this alternative has ramifications beyond the project

intersection, as the traffic would reroute to I-440 and other alternate routes due to the resulting T-intersections.

The primary impacts resulting from this alternative would be loss of connectivity through the area and access impacts, especially to businesses in proximity to the project intersection.

Primary reason for elimination: This alternative would meet the project purpose and need; however, because of substantial impacts to connectivity through the area, Alternative 9 was eliminated from further consideration.

2.2.3.10 Alternative 10: Raise Blue Ridge Road on new location/At-grade intersection

This alternative proposes to raise Blue Ridge Road on new location over the railroad tracks. Hillsborough Street would be raised on existing location and the intersection of Blue Ridge Road with Hillsborough Street would be at-grade. Improvements would be made to the existing at-grade Hillsborough Street intersection with Blue Ridge Road. This alternative eliminates the intersection of Beryl Road with Blue Ridge Road by bridging Blue Ridge Road over Beryl Road.

This alternative is similar to Alternative 8 and LOS analysis results are similar. The primary differences are the alignment of Blue Ridge Road and the elevation of the railroad. With Alternative 10, Blue Ridge Road would be on new location, while Alternative 8 would retain the existing Blue Ridge Road alignment. Also, Alternative 10 would not lower the railroads as is proposed with Alternative 8.

Alternative 10 was developed in response to concerns regarding constructability with Alternative 8. Alternative 10 would simplify construction phasing because Blue Ridge Road would be on new alignment. However, for traffic operations, the alternatives are identical and this alternative does not adequately address traffic congestion at the Hillsborough Street intersection with Blue Ridge Road.

Primary reason for elimination: Alternative 10 would not improve traffic congestion at the Hillsborough Street intersection with Blue Ridge Road. This alternative would not meet the project purpose and need and was eliminated from further consideration.

2.2.3.11 Alternative 11: Raise Blue Ridge Road on existing location/Lower railroads/Connector road

Alternative 11 would raise Blue Ridge Road on existing location over Hillsborough Street, the railroad tracks, and Beryl Road. The connection of Blue Ridge Road to Hillsborough Street would be by a two-way road in the northeast quadrant of the current intersection. The road would intersect Blue Ridge Road opposite the driveway into the NC State Fairgrounds.

This alternative is similar to Alternative 6 and LOS analysis results are similar. The primary difference is that Alternative 11 lowers the railroad, which accommodates a lower Blue Ridge Road bridge. For traffic operations, the alternatives are identical. Similar to Alternative 6, the primary benefit of this alternative is the elimination of existing at-grade intersections of Blue Ridge Road with Hillsborough Street and with

Beryl Road and the elimination of the at-grade railroad crossing. While the lower bridge would reduce visual impacts, substantial cost and project phasing issues would be associated with the lowered railroad tracks. The project cost for Alternative 11 is estimated to be nearly double the cost of Alternative 6 and higher than other alternatives studies. However, this alternative would meet the project purpose and need; therefore more detailed analysis and preliminary design were completed.

Primary reason for elimination: While this alternative would meet the project purpose and need, lowering the railroad tracks would result in substantial visual impacts, project cost, and construction issues. On July 24, 2012, representatives of the NCDOT, FHWA, and the HPO concurred that Alternative 11 would have an adverse effect on the NC State Fair Commercial and Education Buildings. (See Appendix B.) Because of the project cost, as well as visual impacts and project phasing issues, this alternative was not considered practical and was eliminated.



Alternative 11 – view west towards the Blue Ridge Road bridge and the NC State Fairgrounds

2.3 NCDOT Recommended Alternative

2.3.1 Alternative 12 Lower Blue Ridge Road on existing location/Connector road

Alternative 12 would lower Blue Ridge Road on existing location under Hillsborough Street, the railroad tracks, and Beryl Road. These roadways and the railroad tracks would be bridged over Blue Ridge Road at a grade similar to the existing grade. The connection of Blue Ridge Road to Hillsborough Street would be by a two-way road in the northeast quadrant of the current intersection. The connection between Blue Ridge Road and Beryl Road would be by existing Pylon Drive. Alternative 12 is shown on Figure 9.

For traffic operations, Alternative 12 would function similar to Alternatives 6 and 11. All intersections analyzed would operate at an acceptable LOS in both the a.m. and p.m. peak hours (LOS E or better).

A summary of LOS and v/c ratio is included in Table 8.



Alternative 12

Table 8 2030 Level of Service and Volume to Capacity Summary for Alternative 12

Intersection	LOS / Maximum v/c Ratio	
	AM	PM
Blue Ridge Road at Pylon Drive	C / 1.00	C / 0.88
Beryl Road at Pylon Drive	D / 0.97	B / 0.72
Hillsborough Street at Connector Road	B / 0.81	C / 0.94
Blue Ridge Road at Connector Road	E / 1.24	B / 0.64
Blue Ridge Road at Trinity Road	D / 1.07	D / 1.05

Source: STV, Inc. 2011.

The primary benefit of this alternative is the elimination of existing at-grade intersections of Blue Ridge Road with Hillsborough Street and with Beryl Road and the elimination of the at-grade railroad crossing. By lowering Blue Ridge Road, this alternative would avoid the visual impacts associated with alternatives that would introduce a bridge structure in the viewshed. Similar to Alternative 6, visualizations depicting four views towards the project intersection, as well as animations depicting movement through the project intersection, were developed for Alternative 12. These visual tools were presented to the Citizens and Stakeholders Action Committee. Visualizations for Alternative 12 (four views) are shown in Figure 10.

Alternative 12 would meet the purpose of and need for the project by achieving LOS E or better in 2030 for operation of the intersections of Hillsborough Street with the connector road and Blue Ridge Road

with the connector road. Train-related conflicts with vehicles and pedestrians would be eliminated by grade separating the Blue Ridge Road crossing of the CSX Transportation and Norfolk Southern tracks.

The proposed project also includes accommodations to support the high volumes of pedestrian traffic in the area. These accommodations include 8- to 10-foot sidewalks along Hillsborough Street, 5- to 14-foot sidewalks along Blue Ridge Road, and 5- to 10-foot sidewalks along the proposed connector road. Bicycle lanes would be included along both sides of Blue Ridge Road.

The Citizens and Stakeholders Action Committee supported Alternative 12 and no support for other alternatives was expressed by the committee. In addition, support for Alternative 12 was expressed by various stakeholders, including the Raleigh Passenger Rail Task Force, the Raleigh City Council, and the general public. Alternative 12 is the recommended Preferred Alternative and is described further in Section 2.3.2.



Alternative 12 – view west towards lowered Blue Ridge Road and the NC State Fairgrounds
Source: NCDOT

2.3.2 Description of Proposed Improvements

Typical sections for Hillsborough Street, Blue Ridge Road, the proposed connector road, and Beryl Road are shown on Figures 11A, 11B, and 11C. All travel lanes are 12 feet wide unless otherwise noted.

2.3.2.1 Hillsborough Street

The construction limits for Hillsborough Street would extend from approximately 1,100 feet west of the existing Hillsborough Street intersection with Blue Ridge Road (near Dorton Arena), to approximately 900 feet east of the intersection.

Hillsborough Street would be a four-lane roadway through most of the project limits. East of the proposed connector road, the curb and gutter roadway section would be 60 feet wide with four travel lanes and a striped center median. West of the proposed connector road, the roadway section would be five lanes with a center turn lane. The Hillsborough Street intersection with the connector road would include an eastbound left-turn lane with storage of 400 feet. The roadway would taper to a four-lane section approximately 600 feet west of the intersection, then taper to a three-lane section (two travel lanes and a center turn lane) at the western project limits. For the most part, existing right-of-way widths would be maintained. Additional right-of-way would be needed to accommodate the proposed Hillsborough Street bridge. The speed limit would remain at 35 mph.

A 10-foot sidewalk would be constructed along the north side of Hillsborough Street west of the connector road. The NC State Fairgrounds constructed a temporary 10-foot asphalt sidewalk along a portion of Hillsborough Street (North Carolina State Fair Commercial and Education Buildings frontage); however, this sidewalk will be replaced when the Hillsborough Street/Blue Ridge Road intersection improvements are constructed. NCSU will construct an 8- to 10-foot sidewalk along the College of Veterinary Medicine campus' Hillsborough Street frontage prior to the construction of the proposed project.

The Hillsborough Street bridge would be approximately 90 feet long to span Blue Ridge Road. The bridge would be a five-lane section with a total width of approximately 77.5 feet, including 14-foot outside lanes and sidewalks extending along both sides of the bridge. The sidewalk on the north side of the bridge would be 10 feet wide and the sidewalk on the south side of the bridge would be 5.5 feet wide.

2.3.2.2 Blue Ridge Road

The construction limits for Blue Ridge Road would extend approximately 0.7 miles from just south of Pylon Drive to north of Trinity Road. The roadway would be lowered approximately 26 feet to obtain a clearance of 17 feet under the Hillsborough Street and Beryl Road bridges and a clearance of 23 feet under the railroad tracks. The lowered roadway would have a maximum grade of five percent.

Blue Ridge Road width would vary from a four-lane to six-lane divided curb-and-gutter section with 4-foot striped bicycle lanes in each direction. Inside through lanes would be 11 feet wide. At the intersection with Pylon Drive, Blue Ridge Road would be a five-lane section including two through lanes in each direction and an exclusive turn lane (northbound right and southbound left, approximately 250 feet and 530 feet, respectively). The roadway would taper to a four-lane median divided section under the Beryl Road, railroad, and Hillsborough Street bridges. The planted center median would vary from 4 feet under the bridges to 17 feet at the connector road intersection. North of the connector road through the

construction limits, Blue Ridge Road would be a six-lane section. At the intersection with the connector road, the roadway section would include dual southbound left turn lanes. At the intersection with Trinity Road, the roadway section would include dual northbound left turn lanes. North of the intersection with Trinity Road, the roadway section would include an exclusive southbound left turn lane and an exclusive southbound right turn lane.

Right-of way would vary from 100 feet to 120 feet. The proposed project includes plans to reduce the posted speed limit along Blue Ridge Road from 45 mph to 35 mph as indicated in the project design criteria. (See Table 6.)

A retaining wall is proposed along the west side of Blue Ridge Road from approximately 550 feet south of Beryl Road to approximately 750 feet north of Hillsborough Street, for a total length of approximately 1,575 feet. The height of the wall would vary from approximately five feet to 26 feet above the elevation of the roadway.

Five- to 14-foot sidewalks are proposed on both sides of Blue Ridge Road. On the east side of Blue Ridge Road a 14-foot sidewalk is proposed north of Pylon Drive. On the west side of the roadway, a 14-foot sidewalk is proposed along the retaining wall to Trinity Road. Along the retaining wall, the sidewalks would be constructed at a higher elevation than the roadway curb elevation and follow a similar profile to Blue Ridge Road. The maximum difference in the height of the roadway and the sidewalk would be approximately six feet.

Stairs would be integrated with the retaining wall just north of the Hillsborough Street Bridge to provide pedestrian access from the sidewalk to the NC State Fairgrounds. An ADA-compliant ramp would provide handicap access from the sidewalk in proximity to the Blue Ridge Road intersection with the connector road.



Alternative 12 – view west towards Blue Ridge Road and the retaining wall along the NC State Fairgrounds
Source: NCDOT



Alternative 12 – view south along Blue Ridge Road towards the Hillsborough Street bridge
Source: NCDOT

2.3.2.3 Connector Road

The connector road would extend approximately 600 feet between Blue Ridge Road and Hillsborough Street. Terminal intersections would be signalized. The proposed roadway would be a five-lane, curb and gutter section with an additional lane at the intersection with Hillsborough Street. Dual left-turn lanes would be provided at each end of the roadway. The right-of-way for the connector road would be approximately 65 feet (adjacent to the Blue Ridge Road right-of-way). The speed limit would be 35 mph. Control of access would extend along the east side of the roadway along the NCSU Veterinary School property. A ten-foot sidewalk would be located along the east side of the roadway and a five foot sidewalk would be located along the west side of the roadway. Pedestrian crosswalks would be marked at the roadway's intersections with Blue Ridge Road and Hillsborough Street.

2.3.2.4 Beryl Road

Improvements to Beryl Road would include a bridge over Blue Ridge Road and improvements to the roadway approach. The Beryl Road bridge would be approximately 90 feet long to span Blue Ridge Road. The bridge would be a two-lane section including two 20-foot travel lanes. The bridge section would also include 5.5-foot sidewalks on both sides, for a total width of approximately 54 feet. The curb and gutter roadway section would include two 18-foot travel lanes. The City of Raleigh requested that sidewalks be installed on the south side of Beryl Road in the project limits, with the city paying a portion of construction cost based on city policy. No sidewalks are proposed on the north side of Beryl Road. An ADA-compliant ramp is planned in the southeast quadrant of the Beryl Road bridge to allow pedestrian access between Beryl Road and Blue Ridge Road.

2.3.2.5 Trinity Road

The intersection of Trinity Road with Blue Ridge Road would be improved to add two lanes. These lanes would be eastbound right turn lanes with 400-foot storage and a 100-foot taper. This roadway widening along the south side would include curb and gutter.

2.3.2.6 Pylon Drive

Pylon Drive would be widened between the intersections with Blue Ridge Road and Uwharrie Court to add one turn lane. This section of Pylon Drive would be restriped to include one eastbound through lane, two westbound left turn lanes, and one eastbound right turn lane at Blue Ridge Road. Pylon Drive would also be restriped to add a 200 foot left-turn lane at the intersection with Beryl Road. The remainder of the roadway would include two through lanes. The Pylon Drive intersections with Blue Ridge Road and with Beryl Road would be signalized.

2.3.2.7 Railroad Bridge

The railroad tracks would be bridged over Blue Ridge Road. Similar to the roadway bridges, the railroad bridge would be approximately 90 feet long to span Blue Ridge Road. The width of the bridge, 50 feet,

would accommodate the existing tracks, as well as one future track to the south. (Note: The proposed bridge would not accommodate future tracks for light rail transit, but would not preclude future expansion of the bridge or construction of a separate bridge to the north.)

2.3.3 Preliminary Construction Cost Estimate

The total cost of Alternative 12 is estimated to be \$26,147,880. The estimated preliminary construction cost for Alternative 12 is \$19,000,000. Right-of-way acquisition cost is estimated to be \$5,680,000 and utility relocation and construction costs are estimated to be \$1,467,880.

2.3.4 Maintenance of Traffic During Construction

In accordance with the Work Zone Safety and Mobility Rule, a Transportation Management Plan (TMP) appropriate to the proposed project will be developed. The TMP will identify a set of coordinated transportation management strategies for use in managing the work zone impacts caused by the proposed project. Transportation management strategies for a work zone could include temporary traffic control measures, operational strategies such as signal retiming and traffic incident management, and public information and outreach.

Hillsborough Street and Beryl Road would be closed for a portion of the construction period. Options for detours are being explored and the duration needed for these detours is not known at this time. Street closures will be coordinated with the NC State Fairgrounds, NCSU (Carter-Finley Stadium), and others in the project area. Freight and passenger rail service will be maintained during construction.

3 Affected Environment and Environmental Consequences

The following sections describe the existing conditions of the study area and the potential impacts of Alternative 12 on the existing human, physical, and natural environment. Additional information is included in the following reports, appended by reference:

- Natural Resources Technical Report (NRTR), February 2007;
- Existing Conditions Report, July 2010;
- Indirect Land Use Screening Report, April 2011;
- Community Impact Assessment, October 2011;
- Traffic Noise Analysis, December 2011; and
- Air Quality Analysis Technical Report, April 2012.

Natural resources field investigations, documented in the NRTR, were conducted during March 2004 and August 2006. Additional field investigations were conducted in May 2011.

3.1 Land Use

3.1.1 Existing Land Use and Zoning

North of Hillsborough Street, the study area is largely comprised of the NC State Fairgrounds and the NCSU College of Veterinary Medicine. (See Figure 2A.) The NC State Fairgrounds were established on the current site in 1928. Facilities on the site include Dorton Arena, the Jim Graham Building, the Exposition Center, the Kerr Scott Building, and the Hunt Horse Complex. The NC State Fairgrounds also includes two properties listed in the National Register of Historic Places (NRHP), the North Carolina State Fair Commercial and Education Buildings and Dorton Arena. Both properties are in proximity to the project intersection. (See Section 3.2.1.)

The NCSU College of Veterinary Medicine opened in 1982 on the site of the former University Dairy Farm. The College of Veterinary Medicine is supported by a faculty of 155, with an enrollment of approximately 470 students, interns, and residents. As the only school of veterinary medicine in the state, the College of Veterinary Medicine also provides on-site continuing education and outreach programs for more than 4,000 clients annually. The 180-acre campus includes more than 20 buildings. Recent construction included the 110,000 square foot Randall B. Terry Jr. Companion Animal Veterinary Medical Center, which became fully operational in June 2011. William Moore Drive provides vehicular access to the site from Hillsborough Street and Blue Ridge Road. The Veterinary School anchors the 250-acre NCSU Centennial Biomedical Campus, which includes the adjacent University Club site.

North of the campus, the State Highway Patrol Office and a Ramada hotel are located on the east side of Blue Ridge Road. The NCDOT Division Maintenance Office and the Westchase Office Park are located on the west side of Blue Ridge Road.

West of the NC State Fairgrounds, several long-established businesses, such as Burke Brothers Hardware and Wayside Furniture, line Hillsborough Street. The Westover community, an established neighborhood with a small commercial district, is situated on the north side of Hillsborough Street, also west of the NC State Fairgrounds. (See Section 3.7.4.)

South of the railroad tracks and Beryl Road, there is a mix of properties in both public and private ownership. The Gregory Poole Equipment Company, a Caterpillar equipment dealer, marks the southwest quadrant of the project intersection. The business moved to this location in 1954 and encompasses several properties along Blue Ridge Road totaling approximately 17 acres. The NCDOT property commonly referred to as the "Bridge Maintenance Yard" occupies an adjacent approximately 45-acre parcel on the south side of Beryl Road. A mix of established single-family homes and more recent multi-family dwellings is in the southwestern portion of the study area (south of Beryl Road and west of Blue Ridge Road). Single-family homes are primarily located along Carolina Avenue, Pineland Circle and Gannett Street. Non-residential uses in this area include a private school and a church.

On the east side of Blue Ridge Road, a Quality Mart/Shell gas station, constructed in the early 1990s, marks the fourth quadrant of the project intersection. An adjacent warehouse is under the same

ownership as the gas station. On Blue Ridge Road, a parcel south of the gas station, owned by Gregory Poole Equipment Company, is used for equipment storage. To the east and south, Pylon Commercial Park includes a number of flexible-space commercial facilities along Pylon Drive and Hutton Street. Farther south on Blue Ridge Road, a multi-screen movie theater, an eleven-story apartment building, and a Kmart are also on the east side of the road.

Several other major facilities are in the project vicinity. NCSU's Carter-Finley Stadium, on Trinity Road west of the study area, has a capacity of approximately 55,500 people. On average, seven NCSU football games are played in the stadium each season. The PNC Arena, located northwest of Carter-Finley Stadium, opened in October 1999. The PNC Arena, with a capacity of up to 21,500 people, is home to the NCSU men's basketball team and the Carolina Hurricanes, a professional hockey team. Numerous other events, such as concerts and ice shows, draw large crowds to the facility. In 2010, there were more than 100 events scheduled at the facility.

Currently, development in the study area is occurring on the College of Veterinary Medicine portion of the NCSU Centennial Biomedical Campus. No development on private property is occurring or planned in the study area. The most recent private development included several multi-family housing projects on Blue Ridge Road. Residential development in the study area and vicinity will continue to be influenced by proximity to NCSU and direct roadway access to the region's employment centers.

All of the study area is subject to City of Raleigh zoning regulations. Most of the properties along Hillsborough Street and Beryl Road are zoned industrial. The NCSU College of Veterinary Medicine property is zoned office and institutional. Low-to-medium-density residential zoning is applied to the Westover community and much of the area south of Beryl Road and west of Blue Ridge Road. Neighborhood Business zoning accommodates the small-scale commercial uses in proximity to the intersection of Powell Drive with Western Boulevard, while Shopping Center zoning accommodates the larger scale commercial uses east of Blue Ridge Road near the intersection with Western Boulevard.

3.1.2 Land Use Plans

3.1.2.1 Raleigh 2030 Comprehensive Plan

The 2030 Comprehensive Plan, adopted by the Raleigh City Council in October 2009, is the city's long-range policy document to guide decisions about Raleigh's physical development. The Comprehensive Plan establishes a vision for the city and provides policy guidance and action items for implementation.

Future land use projected in the study area is primarily based on a proposal to locate a light rail transit station near the project intersection. This west Raleigh transit station is expected to serve as a catalyst for development and redevelopment throughout the area. The City of Raleigh plans to encourage more intense development patterns to create a transit-oriented urban village surrounding this transit station. According to the Comprehensive Plan, "complementary mixed-uses, including multi-family residential, offices, retail, civic and entertainment uses should be located within station areas."

The Comprehensive Plan's future land use map indicates a "community mixed use" area south of the rail corridor along portions of Beryl Road and Blue Ridge Road. This land use designation would include pedestrian-oriented retail uses, including ground floor retail space in multi-family housing developments. Medium density residential (14 to 28 units per acre) is recommended with higher densities of up to 70 units per acre around the proposed transit station.

The future land use map indicates a "neighborhood mixed use" area north of Trinity Road and at the existing Westover commercial area. This area would also include pedestrian-oriented retail. Although this area could include residential use, it is mainly intended as a commercial use area.

Raleigh's Comprehensive Plan also includes a detailed plan for the area surrounding the PNC Arena (the "Arena") which encompasses the study area. The Arena Plan takes into account the proposal to locate two transit stations in the plan area. (The other station would be located to the west of the study area near I-40). The Arena Plan further supports and encourages the more intense development desired in the area. The Arena Plan delineates a pedestrian-oriented development area that encompasses the project intersection. Included in this area is the NCDOT Bridge Maintenance Yard on Beryl Road. The Arena Plan notes that this is the only sizable parcel (approximately 45 acres) that could support intense, mixed-use, transit-oriented development within walking distance of the transit stop. Blue Ridge Road, Hillsborough Street, Trinity Road, Youth Center Drive, Westchase Boulevard, and Beryl Road east of Blue Ridge Road are designated as pedestrian corridors. (See Figure 12A, Arena Plan – Sub-Areas and Figure 12B, Arena Plan – Pedestrian Access.) Properties east of Blue Ridge Road and south of Hillsborough Street/Beryl Road, including the Quality Mart/Shell gas station, are not included in the pedestrian-oriented development area.

3.1.2.2 NC State Fairgrounds Master Plan

A State Fairgrounds long-range master plan was completed in 2009. The plan will enhance vehicular and pedestrian access and accommodate new facilities. The plan identifies approximately 48 projects to be completed over the next 20 to 30 years. These projects include new exposition space, pedestrian safety and traffic flow improvements, and additional on-site parking. The plan indicates sidewalks along Hillsborough Street and Blue Ridge Road, as well as the closure of the existing gate (vehicular access) on Blue Ridge Road (Gate 11). Main gates will be located on Hillsborough Street, Trinity Road, and Youth Center Drive. The specific time-frame for plan implementation will depend on the availability of funding.

3.1.2.3 NCSU College of Veterinary Medicine/Centennial Biomedical Campus Master Plan

Like the NCSU Centennial Campus, which is home to government and corporate partners, the Centennial Biomedical Campus is expected to develop with an emphasis on partnerships between academia, government, and industry. According to the campus master plan, an additional 1.6 million square feet of space would be constructed over the next 25 years. Approximately 32 building sites are available, including five parking decks. Most of these building sites are located on the southwest portion of the property, in proximity to the project intersection, and along Blue Ridge Road. The master plan

incorporates the proposed project by indicating a roadway to connect Hillsborough Street and Blue Ridge Road on the southwest corner of the property.

3.1.3 Land Use Impacts

3.1.3.1 Existing Land Use

The proposed project will have minor impacts on existing land use due to relocation. (See Section 3.7.1.)

3.1.3.2 Project Compatibility with Local Plans

The proposed project is consistent with Raleigh's 2030 Comprehensive Plan. Policy AP-A30 in the Arena Plan recommends extra wide sidewalks of 14- to 18-feet on both sides of Trinity Road and Blue Ridge Road. The project proposes 14-foot sidewalks on both sides of Blue Ridge Road and a 10-foot sidewalk on the north side of Hillsborough Street. Discussions are underway with the City of Raleigh and other stakeholders regarding the incorporation of tree grates and street trees along Blue Ridge Road.

The proposed project is also consistent with the NCSU Centennial Biomedical Campus Master Plan, and the NC State Fairgrounds Master Plan. However, the connector road may encroach upon a leased parcel for future development on the NCSU Centennial Biomedical Campus (College of Veterinary Medicine). Coordination is underway to avoid or minimize this encroachment.

The proposed project would not preclude plans for a transit station at the project intersection and would accommodate the transit-oriented development that is expected in proximity to the station.

3.1.3.3 Indirect Land Use Impacts

Factors shown to influence land use decisions include market conditions, land supply and demand, availability of water and sewer, and public policy. Where these factors are favorable to development, a transportation project has the potential to affect land use decisions. This potential is typically dependent on the project scope and change in accessibility attributed to the project.

The overall scope of the proposed project is limited, with the primary project benefit being reduced congestion and delay time at the intersection of Hillsborough Street with Blue Ridge Road. Although conditions are generally favorable for development, most of the land in the study area is publicly owned and development is not as dependent on market conditions. Redevelopment in the study area is largely dependent on the proposed construction of a transit station near the project intersection and is projected with or without the project. The potential for project-induced growth and land use change is negligible.

3.2 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 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 NRHP and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

3.2.1 Historic Architectural Resources

In a letter dated March 24, 2004 (see Appendix A), the State Historic Preservation Office (HPO) identified two properties of historic or architectural significance within the project area. These include the North Carolina State Fair Commercial and Education Buildings and Dorton Arena. Both of these properties are listed in the NRHP and are protected under Section 106 of the National Historic Preservation Act and Section 4(f) of the DOT Act.

A Phase I Historic Architectural Resources Survey, conducted in April 2004 by Circa, Inc., identified 30 properties within the area of potential effects that are at least 50 years of age. The area of potential effects extended beyond the study area and included properties removed from the project construction limits for Alternative 12. The area of potential effects included the railroad corridor from just west of the Hillsborough Street intersection with Chapel Hill Road to east of I-440 and the Blue Ridge Road corridor north of Hillsborough Street to Wade Avenue. Coordination with the HPO focused on the two NRHP-listed properties. These properties are on the NC State Fairgrounds in proximity to the project intersection.

The North Carolina State Fair Commercial and Education Buildings, constructed in 1928, are large rectangular exhibit halls. The stucco-covered buildings were listed in the NRHP in 1987 for their association with the promotion and celebration of North Carolina's agricultural tradition and as distinguished examples of the Mediterranean Revival style. The National Register boundary includes a 4.77-acre portion of the NC State Fairgrounds property, encompassing the buildings and parking areas between the buildings and Hillsborough Street. The North Carolina State Fair Commercial and Education Buildings are roughly 100 feet from the Blue Ridge Road edge of pavement.

J.S. Dorton Arena, constructed 1950-52, is an internationally famous prototype of a parabolic suspension structure. Dorton Arena was listed in the NRHP in 1973 for its significance in both architecture and engineering. Dorton Arena is further west on Hillsborough Street. The National Register boundary includes 1.25 acres, which is assumed to be limited to the building footprint (Circa, Inc. 2004).

A Phase II Historic Architectural Resources Survey was completed in 2007 by NCDOT. The following three properties were identified for further evaluation: Old Hickory Highway Marker, NCSU College of Veterinary Medicine Campus, and NC State Highway Patrol Complex storage building. Based on additional documentation, the HPO concurred that the Old Hickory Highway Marker is eligible for listing in the NRHP and that the State Highway Patrol Complex and the NCSU College of Veterinary Medicine Campus are not eligible for listing in the NRHP. The Old Hickory Highway Marker is located in existing right-of-way at the northeast quadrant of the Hillsborough Street intersection with Blue Ridge Road. The marker is one of a series of granite markers erected ca. 1930 along old NC Highway 10 by the War

Mothers of North Carolina to honor and commemorate the servicemen of the US Army's 30th Division during World War I. (See Appendix B.)

3.2.2 Archaeological Resources

No archaeological resources were identified in the study area. In a letter dated January 12, 2007, the HPO stated that “none of the alternates as currently proposed have the potential to affect archaeological resources eligible for inclusion in the National Register of Historic Places and we do not recommend any archaeological investigation in connection with this project.” Copies of the scoping response letters from the HPO are included in Appendix A.

3.2.3 Cultural Resources Impacts

3.2.3.1 *Historic Architectural Resources*

The proposed project would not impact Dorton Arena. However, permanent and temporary right-of-way and visual impacts to the North Carolina State Fair Commercial and Education Buildings are expected. Approximately 0.02 acre of the property within the historic boundary would be needed for right-of-way to accommodate the Hillsborough Street bridge over Blue Ridge Road. An additional approximately 0.3 acre of construction easement would be needed to build the project. (See Figure 13.) Visual impacts are described in Section 3.4.3. The proposed project would also impact the location of the Old Hickory Highway Marker between lowered Blue Ridge Road and the connector road.

On July 24, 2012, NCDOT, FHWA, and the HPO concurred that Alternative 12 for the Hillsborough Street/Blue Ridge Road intersection improvements project would have **no adverse effect** on the North Carolina State Fair Commercial and Education Buildings. This finding is based on a commitment that NCDOT, HPO, Raleigh Public Arts Commission, Raleigh Urban Design Center, NC State Fairgrounds, and NCSU will work together on the plans for the retaining walls, bridges, and lighting to develop a unified design that incorporates public art in keeping with NCDOT's and the City Raleigh's public art policies. At the July 24, 2012 meeting, it was also determined that the proposed project would have **no adverse effect** on the Old Hickory Highway Marker. This finding is based on a commitment that the marker will be removed and stored during construction, and will be re-erected at a comparable location in consultation with the HPO. In addition, NCDOT, FHWA, and the HPO concurred that Alternative 12 would have **no effect** on Dorton Arena. A copy of the concurrence form signed by NCDOT, FHWA and the HPO is included in Appendix B.

3.2.3.2 *Archaeological Resources*

No archaeological resources eligible for inclusion on the NRHP were identified within the archaeological area of potential effects. The HPO concurred that no further investigations are needed.

3.3 Section 4(f) Resources

Section 4(f) of the DOT Act, as amended, stipulates that the FHWA will not approve any program or project which requires the use of publicly owned park land, recreation area, wildlife or waterfowl refuge, or land of a significant historic site unless a) there is no feasible and prudent alternative to the use of such land and the project incorporates all possible planning to minimize harm resulting from such use, or b) a finding of “*de minimis*” impact is made.

The study area does not contain publicly owned parks, recreation areas, and wildlife or waterfowl refuges protected under Section 4(f) of the DOT Act, as amended. The NC State Fairgrounds is not protected under Section 4(f) of the DOT Act. According to the FHWA’s Section 4(f) Policy Paper, “Section 4(f) is not applicable to publicly owned fairgrounds that function primarily for commercial purposes (e.g., stock car races, annual fairs, etc.), rather than recreation.”

As previously mentioned, a greenway is proposed along Blue Ridge Road from Hillsborough Street to Trinity Road, and a sidepath is proposed along Blue Ridge Road north of Trinity Road and along Trinity Road. A determination of the applicability of the requirements of Section 4(f) considered the following:

- The proposed greenway is assumed to occupy the roadway right-of-way and is not limited to any specific location within that right-of-way.
- Proposed adjustments or changes to the existing roadway would not substantially impair the continuity of the proposed greenway.
- The proposed greenway is an integral part of the local transportation system and does not function primarily for recreational purposes.

Therefore, it was determined that Section 4(f) would not apply.

However, Section 4(f) does apply to the two historic properties on the fairgrounds site. Dorton Arena and the North Carolina State Fair Commercial and Education Buildings are listed in the NRHP, and therefore; are considered “significant historic sites” for purposes of Section 4(f). Dorton Arena would not be impacted by the proposed project. However, additional right-of-way would be required in proximity to the existing Hillsborough Street intersection with Blue Ridge Road, within the historic boundary for the North Carolina State Fair Commercial and Education Buildings. The proposed project would necessitate the conversion of approximately 0.02 acre of the historic property to a transportation use (for right-of-way). This conversion area is a grassy area between the Hillsborough Street edge of pavement and the existing parking lot and would not impact the parking lot or other improvements on the property. Section 4(f) also applies to the Old Hickory Highway Marker, which was determined eligible for listing in the NRHP.

In conjunction with Section 106 coordination, FHWA notified the State Historic Preservation Officer (SHPO) of its intent to use the HPO’s concurrence as the basis of a *de minimis* finding for the NC State

Fair Commercial and Education Buildings and the Old Hickory Highway Marker, pursuant to Section 4(f). In concurring with the Section 106 determination of “no adverse effect,” the SHPO also concurred with the *de minimis* finding for Section 4(f). (See Appendix B.) According to the FHWA’s Guidance for Determining *De Minimis* Impacts to Section 4(f) Resources, for historic sites, a *de minimis* impact means that FHWA has determined (in accordance with 36 CFR Part 800) that either no historic property is affected by the project or that the project will have “no adverse effect” on the historic property.

A *de minimis* impact determination also requires consideration of avoidance, minimization, mitigation or enhancement measures, but does not require analysis to determine if avoidance alternatives are feasible and prudent. In developing preliminary alternatives for the intersection improvement project, roadway alignments were shifted from the NRHP-listed property where possible. For those alternatives developed further, addressing the project purpose and need while avoiding the historic property was a priority. Of the alternatives that would meet the purpose and need, Alternative 12 presented the least impact to the NC State Fair Commercial and Education Buildings. Alternative 12 would also minimize visual impacts, as compared to alternatives that would raise Blue Ridge Road (via as a bridge over Hillsborough Street) and obstruct views to the historic buildings. None of the alternatives that would meet the project purpose and need would avoid impacts to the Old Hickory Highway Marker. However, the marker will be removed, stored, and re-erected at a comparable location, in consultation with the HPO,

For historic properties, a separate public review process is not required for the determination of a *de minimis* impact. The information supporting the *de minimis* impact finding is included in this CE and is available for public comment. FHWA has made a finding of *de minimis* impact by the signing of this document.

3.4 Visual Resources

3.4.1 Landscape Character

Overall, the character of the study area is varied. The area has a mix of older and more recent development, including both residential and commercial development. The scale of development in the area also varies, ranging from large structures such as Westgrove Towers and Blue Ridge Cinemas to the small-scale residential and commercial structures in the Westover community. Roadways in the study area also contribute to the varied character of the area. The more recently constructed five-lane, curb and gutter section of Blue Ridge Road (south of the project intersection) is in contrast to the three-lane section of Hillsborough Street without curb and gutter and with adjacent gravel parking lots (west of the project intersection).

The character of the project intersection is largely defined by the open, rolling pastureland of the NCSU College of Veterinary Medicine and the historic buildings at the NC State Fairgrounds. The project intersection is also marked by overhead electrical lines and numerous signs, including the NC State Fairgrounds’ illuminated sign. The character of the Veterinary School campus, especially as viewed from the project intersection and Blue Ridge Road, is in transition with the construction of a number of new facilities planned on the western portion of the property. The master plan for the campus directs most

new construction to this portion of the site along Blue Ridge Road. This more intense pattern of development will result in a more urban character along Blue Ridge Road. However, buildings would be set back from Hillsborough Street.

3.4.2 Sensitive Visual Resources

Several resources are considered visually sensitive because of their historic value. The two historic buildings on the fairgrounds property play a major role in defining the character of the area and are prominent in the viewshed along Hillsborough Street, especially from the east. The North Carolina State Fair Commercial and Education Buildings have marked the project intersection since the fair moved to this location in 1928. The building's distinct red tile roof, towers, and other unique features set the building apart from other structures in the area and in Raleigh. Dorton Arena, with its distinctive curving roofline, is another unique image in proximity to the project intersection. These images not only define the project intersection, but are important aspects of the image of the city as a whole.

3.4.3 Visual Impacts

Given the number of regional and statewide attractions in the area, community character and aesthetics are important in the study area. The proposed project would alter the appearance of the project area by introducing a grade-separated intersection and lowering Blue Ridge Road. The lowered roadway would require a retaining wall along a portion of the NC State Fairgrounds' Blue Ridge Road frontage. Proposed roadway and railroad bridges would be at approximately the existing roadway elevation. Unlike other alternatives considered but eliminated, Alternative 12 will not obstruct important views of the historic buildings at the project intersection. (See Figure 10.) Upon review of several alternatives being considered, Raleigh's Passenger Rail Task Force noted that Alternative 12 would preserve the historic viewsheds of the NC State Fairgrounds and of the NCSU College of Veterinary Medicine campus (Passenger Rail Task Force 2011).

Based on the commitment under Section 106 of the National Historic Preservation Act, project stakeholders will work together to develop a unified design for the retaining walls, bridges, and lighting. (See Section 3.2.3.1.)

Temporary visual impacts are expected during construction.

3.5 Farmland

The Farmland Protection Policy Act (FPPA) of 1981 requires all federal agencies or their representatives to consider the impact on prime and important farmland of all construction and land acquisition projects. The purpose of the FPPA is "to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to uses." According to the Act, "farmland" does not include land already in or committed to urban development. Therefore, the project site does not meet the Act's definition of farmland and the Farmland Protection Policy Act does not apply.

3.6 Section 6(f) Resources

Section 6(f) of the Land and Water Conservation Fund Act of 1965 (LWCF) protects grant-assisted areas from conversions to uses other than the original intended purpose. It requires replacement of any land improved with LWCF monies that is converted to non-recreational purposes.

There are no properties in the study area that were acquired or developed with financial assistance of Section 6(f) of the Land and Water Conservation Fund Act. Therefore, no use of Section 6(f) resources would be attributed to the construction of the proposed project.

3.7 Socioeconomic Impacts

3.7.1 Right-of-Way and Relocation Impacts

The Quality Mart/Shell gas station on the southeast quadrant of the Blue Ridge Road intersection with Beryl Road will be displaced. Although a number of alternatives were explored, none of the alternatives would be able to avoid impacts to this property. Impacts to this property were unavoidable primarily because of the efforts to avoid impacts to the historic property on the west side of Blue Ridge Road (NC State Fair Commercial and Education Buildings). According to the relocation report, this relocation would involve two businesses on one property: the Shell gas station (property owner) and the convenience store (tenant). No other relocations are expected. (See Appendix C.)

Right-of-way would be acquired from eleven properties. Approximately 4.3 acres of permanent right-of-way and approximately 4.9 acres of temporary construction easement would be needed for the proposed project.

3.7.2 Economic Effects

There would be no substantial impact to the overall economic and business resources in the study area. The project improvements would reduce congestion and eliminate potential conflicts with rail traffic, enhancing accessibility to employment centers in the area. However, several businesses would be directly impacted by the proposed project. Based upon the preliminary designs for the project, the Quality Mart/Shell gas station would be relocated, as noted in Section 3.7.1. Access to the adjacent P.F.S. Sales Warehouse and other businesses on Beryl Road would also be affected. (See Section 3.7.4.) Access to the Gregory Poole Equipment Company's storage yard on the east side of Blue Ridge Road would be impacted by the grade change of the roadway. During construction, the areas used for Gregory Poole Equipment Company employee parking would also be impacted. Company representatives indicated that the loss of the storage yard is a concern and part of the Gregory Poole operations would likely have to move to another location if the storage yard is reduced. Company representatives stated that the company would likely relocate if the area redevelops for transit oriented development as proposed. Right-of-way acquisition is not expected to notably impact other businesses.

3.7.3 Impacts to Neighborhoods/Communities

There are no communities or neighborhoods adjacent to the proposed project. The proposed project is not expected to impact the overall physical make-up of the communities or neighborhoods in the study area or vicinity. The project will not form a barrier between existing communities.

3.7.4 Impacts to Vehicular Mobility and Access

Overall, the proposed project is expected to enhance mobility and access, while resulting in localized access impacts. The proposed project will result in improved travel times for traffic using Hillsborough Street and Blue Ridge Road due to a reduction in delays at the project intersection.

The proposed project would change circulation patterns in the area by eliminating the intersection of Blue Ridge Road with Beryl Road. Access from Blue Ridge Road to Beryl Road, and vice versa, would be via Pylon Drive. The length of this impact would depend on the direction of travel (i.e., northbound or southbound on Blue Ridge Road) and the destination on Beryl Road. To access properties on Beryl Road west of Blue Ridge Road, the new travel pattern using Pylon Drive would add approximately 0.4 miles if traveling northbound on Blue Ridge Road and approximately 0.8 miles if traveling southbound on Blue Ridge Road. The length of this impact to properties east of Blue Ridge Road would depend on the specific destination on Beryl Road. As an example, to access the P.F.S. Sales Warehouse from Blue Ridge Road, the project would add approximately 0.28 miles (Blue Ridge Road northbound) and approximately 0.64 miles (Blue Ridge Road southbound) to the trip. To access the J.C. Raulston Arboretum from Blue Ridge Road, the project would add approximately 0.07 miles (Blue Ridge Road northbound) and approximately 0.24 miles (Blue Ridge Road southbound) to the trip. The benefit, especially for southbound Blue Ridge Road traffic, is the elimination of potential train conflicts and delays at the intersection with Beryl Road. The J.C. Raulston Arboretum's website currently advises visitors to avoid that intersection, by stating "Beryl Road, Blue Ridge Road, and Hillsborough Street all form one large intersection with railroad tracks in the center. We recommend that Arboretum visitors avoid this alternate route since this large intersection is difficult to navigate." The arboretum director stated that he usually avoids the southbound left-turn from Blue Ridge Road to Beryl Road by using Pylon Drive as an alternate route (Bilderback, pers. comm. 2011). The owner of Capitol City Lumber stated that he is more concerned with access during construction than after construction of the proposed project (Nicholson, pers. comm. 2011). In addition to access from Blue Ridge Road via Pylon Drive, these Beryl Road businesses would continue to be accessible from Powell Drive to the west and Method Road and Hillsborough Street to the east.

Because of changes in grade, the Gregory Poole Equipment Company property on the east side of Blue Ridge Road would not be accessible from the lowered roadway. Access to the Gregory Poole Equipment Company property on the west side of Blue Ridge Road would shift south to align with Pylon Drive. This intersection of Blue Ridge Road with Pylon Drive would be signalized.

While off-site detours would be utilized for some of the construction duration, the local road network would accommodate detours without adding substantial travel time.

3.7.5 Impacts to Pedestrian and Bicycle Accommodations and Mobility

The project will notably enhance pedestrian mobility in the project area. Although pedestrian volumes in the study area are high, existing conditions are not conducive to pedestrian mobility and safety. The area lacks a cohesive sidewalk network and contains few additional pedestrian accommodations. Despite the fact that some roads such as Blue Ridge Road and Trinity Road have sidewalks on one side, a lack of convenient and safe pedestrian crossings coupled with high volumes of vehicular traffic make crossing the roads at non-designated locations a high risk endeavor.

Within the project limits, sidewalks are proposed on both sides of Blue Ridge Road and the connector road. Sidewalks will also be constructed along the north side of Hillsborough Street, including both sides of the bridge. (NCSU will construct a sidewalk along the College of Veterinary Medicine's Hillsborough Street frontage.) Preliminary plans also show sidewalks on the Beryl Road bridge. The City of Raleigh requested that sidewalks be constructed on the south side of Beryl Road with the city paying a portion of the construction cost.

Stairs are proposed in the northwest quadrant of the Hillsborough Street bridge over Blue Ridge Road to allow pedestrians on Blue Ridge Road to access Hillsborough Street and the fairgrounds. The NC State Fair Gate 11 on Blue Ridge Road would become a handicapped entrance, eliminating vehicular access. ADA-compliant pedestrian access (ramp) in this location is proposed. The fairgrounds staff noted that the master plan indicates a focus on an improved Gate 1 (Hillsborough Street) for pedestrian access.

Pedestrian crosswalks are proposed at the Blue Ridge Road intersections with Trinity Road and the connector road, as well as at the Hillsborough Street intersection with the connector road. In addition, a ramp will be constructed in the southeast quadrant of the Beryl Road bridge over Blue Ridge Road to allow pedestrian access between Beryl Road and Blue Ridge Road.

Sidewalks along Blue Ridge Road under the bridges and along a portion of the fairgrounds property will be constructed at a higher elevation than the roadway (less clearance for pedestrians is needed under the bridges). This tiered cross-section would require less excavation and help separate pedestrian and vehicular traffic. This would also discourage pedestrians from crossing Blue Ridge Road under the bridges.

The proposed project would not permanently impact the west Raleigh recreational bicycle loop (Route 4), which follows Beryl Road through the study area to Powell Drive. However, the continuity of the route would be impacted during the construction of the Beryl Road bridge. The proposed project would not affect the cross town route (Route 8) which also follows Beryl Road, but it would alter the route's connection to the NC State Fairgrounds. The route terminates at Blue Ridge Road, but the route is described as connecting "west Raleigh and the State Fairgrounds to the southeast by passing through Downtown." As previously mentioned, a ramp in the southeast quadrant of the Beryl Road bridge will provide access between Beryl Road and Blue Ridge Road. This connection would also be temporarily impacted during construction.

South of Hillsborough Street, Blue Ridge Road was recently restriped to include four-foot bicycle lanes in both directions. Bicycle lanes are included in the proposed project on Blue Ridge Road through the construction limits.

The proposed project is in compliance with United States Code, Title 23, Section 109(m) which prohibits the approval of a highway project that “will result in the severance of an existing major route or have significant adverse impact on the safety for nonmotorized transportation traffic and light motorcycles, unless such project or regulatory action provides for a reasonable alternate route or such a route exists.” Based on coordination with the City of Raleigh, the proposed project would not conflict with either of the designated bike routes that serve the area (recreational loop 4 and cross-town route 8) (Lamb, pers. comm. 2012).

3.7.6 Impacts to Freight and Passenger Rail

The proposed project will accommodate NCRP plans to add a freight track in the future. In addition, the proposed project will not preclude plans to construct a transit station in proximity to the project intersection and to provide light rail service on new tracks through the project area.

3.7.7 Impacts to other Community Facilities

The proposed project would not affect other community facilities in the study area such as the Westover United Methodist Church or the Oak Grove Community Cemetery.

3.7.8 Impacts to Community Safety and Emergency Response

The proposed project would create areas of isolation along Blue Ridge Road under bridges. However, the issue of crime associated with Alternative 12 was not raised during any of the numerous meetings with stakeholders. However, with alternatives that included raising Blue Ridge Road over the railroad tracks, this issue was raised by a city council member. Lighting will be considered during future phases of design.

Overall, the proposed project would enhance mobility for emergency vehicles traveling through the area, especially with the elimination of delays caused by rail traffic. Community response and emergency response providers in the study area include the Raleigh Police Department’s Southwest District office and a State Highway Patrol Office. Nearby providers include a Wake County Emergency Medical Services (EMS) unit just north of the study area and a Raleigh fire station just south of the study area. A Raleigh Police Department representative felt that the proposed project would enhance officer’s ability to respond to emergency calls (Nieman, pers. comm. 2011). The elimination of the Blue Ridge Road intersection with Beryl Road was not a concern to the community safety and emergency response personnel interviewed.

The Wake County EMS Assistant Chief of Operations indicated that Trinity Road, Youth Center Drive, and Powell Drive would provide adequate detour routes in the area (Olson, pers. comm. 2011). The city

and county emergency management information systems and dispatch office would work together during the construction period to determine the fastest routes to the emergency scene (Gibbons, pers. comm. 2011).

3.7.9 Environmental Justice

3.7.9.1 Environmental Justice Regulations

Title VI of the Civil Rights Act of 1964, protects individuals from discrimination on the grounds of race, age, color, religion, disability, sex, and national origin. Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” provides that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations. Executive Order 12898 requires that Environmental Justice principles be incorporated into all transportation studies, programs, policies and activities. The three environmental principles are: 1) to ensure the full and fair participation of all potentially affected communities in the transportation decision-making process. 2) to avoid, minimize or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority or low income populations. 3) to fully evaluate the benefits and burdens of transportation programs, policies, and activities, upon low-income and minority populations.

3.7.9.2 Affected Population

Although population meeting Environmental Justice criteria have been identified within the Demographic Study Area for this project, these populations are not adjacent to or in proximity to the construction limits for the project. Therefore, impacts to these Environmental Justice populations are not expected.

3.8 Flood Hazard Evaluation

Wake County participates in the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA). The study area is found on Wake County Flood Hazard Boundary Map Panels 37183C0317 E, 37183C0319 E, 37183C0336 E, and 37183C0338 E. These maps indicate no special flood hazard areas inundated by the 100-year flood within the study area.

3.9 Traffic Noise Analysis

A preliminary noise analysis was conducted in accordance with FHWA Noise Abatement Criteria (NAC) set forth in Title 23 CFR Part 772, and the NCDOT Traffic Noise Abatement Policy, effective July 13, 2001. This analysis is documented in the Traffic Noise Analysis Report (December 2011), appended by reference. A summary of the report findings is presented in this section.

3.9.1 Existing Noise Conditions

Ambient noise is comprised of existing noise sources from both natural and manmade events. It includes commercial operations, grass mowing, and natural events such as the sounds of wind, thunderstorms, and wildlife. It is noise that is considered to be currently existing and typically present in a particular area.

Existing traffic noise exposure is relatively unvarying in the vicinity of the proposed project. Hillsborough Street and Blue Ridge Road traffic is the dominant noise source for receptors adjacent to these roadways and in proximity to the existing intersection. At increased distances from the roadway, the influence of existing road traffic noise decreases. However, due to the prevalent volumes, speed and intersection controls, existing road traffic may be the dominant noise source for several hundred feet beyond the existing right-of-way limits. The existing CSX and Norfolk Southern rail lines that parallel Hillsborough Street can at times be the dominant noise source for study area receivers, but it is not frequent enough to be included as a part of the ambient noise. Consequently, the project noise analysis addresses noise impacts due only to vehicular traffic. The measured ambient 15 minute Leq noise level, ranged from 54 to 65 dB(A).

3.9.2 Traffic Noise Impacts

Traffic noise impacts occur when the predicted traffic noise levels either approach or exceed the FHWA noise abatement criteria, or substantially exceed the existing noise levels. The number and types of predicted traffic noise impacts for the project are shown in Table 9. The calculated existing and future noise levels and noise level increases are provided in Appendix B of the Traffic Noise Analysis.

Table 9 Number of Impacted Receptors

Alternative Description	Approximate # Of Impacted Receptors Approaching Or Exceeding FHWA NAC ²					Substantial Noise Level Increase ³	Impacts Due To Both Criteria ⁴	Total Impacts Per 23 CFR 772 ⁵
	A	B	C	D	E			
Existing	0	0	0	0	0	0	0	0
No Build	0	0	2	0	0	0	0	2
Build ¹	0	0	1	0	0	0	0	1

1. This table presents the number of build-condition traffic noise impacts as predicted for the build-condition alternative and no-build alternative presently under consideration. Refer to Appendix B of the Traffic Noise Analysis for a detailed analysis of traffic noise impacts at each noise sensitive receptor location.

2. Predicted traffic noise level impact due to approaching or exceeding NAC.

3. Predicted “substantial increase” traffic noise level impact.

4. Predicted traffic noise level impact due to exceeding NAC and “substantial increase” in build-condition noise levels.

5. The total number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion.

In the analysis year 2030, No Build exterior traffic noise levels are expected to impact two locations within the study area: the State Highway Patrol Office and a Gregory Poole Equipment Company employee picnic area. These locations will experience noise levels above the NAC. In the analysis year 2030, Build exterior traffic noise levels are expected to impact only one location within the study area. The State Highway Patrol Office will experience noise levels above the NAC.

3.9.3 Potential Traffic Noise Abatement

FHWA and NCDOT require that feasible and reasonable measures be considered to abate traffic noise at all predicted traffic noise impacts. Measures considered include highway alignment selection, traffic systems management, buffer zones, proper use of land controls, noise walls, and earth berms. None of these measures could be implemented in a manner that would reduce or eliminate noise impacts resulting from the proposed project. Consequently, no traffic noise abatement is recommended and no noise abatement measures are proposed for incorporation into the project plans.

3.9.4 Construction Noise

The predominant construction activities associated with this project are expected to be earth removal, hauling, grading, bridge erection, and paving. Temporary and localized construction noise impacts will likely occur as a result of these activities. During daytime hours, the predicted effects of these impacts will be temporary speech interference for passers-by and those individuals living or working near the project. During evening and nighttime hours, steady-state construction noise emissions such as from paving operations will be audible, and may cause impacts to activities such as sleep. Sporadic evening and nighttime construction equipment noise emissions such as from backup alarms, lift gate closures (“slamming” of dump truck gates), etc., will be perceived as distinctly louder than the equivalent acoustic environment, and will likely cause severe impacts to the general peace and usage of noise-sensitive areas, particularly residences and hotels.

Relatively loud construction noise activities such as usage of pile-drivers and impact-hammers (jack hammer, hoe-ram) will create sporadic, temporary, and significant construction noise impacts in the near vicinity of those activities.

Generally, low-cost and easy-to-implement construction noise control measures should be incorporated into the project plans and specifications (e.g., work-hour limits, equipment exhaust muffler requirements, portable sound enclosures, haul-road locations, elimination of “tail gate banging,” ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication/rapport).

While discrete construction noise level prediction is difficult for a particular receiver or group of receivers, it can be assessed in a general capacity with respect to distance from known or likely project activities. For this project, earth removal, grading, hauling, and paving is anticipated to occur in the near vicinity of noise-sensitive receptors. Although construction noise impact mitigation should not place an undue burden upon the financial cost of the project or the project construction schedule, pursuant to the requirements of 23 CFR 772.19, it is the recommendation of the Traffic Noise Analysis that:

- For receptors at the NC State Fairgrounds, closest to the project site, construction activities should be coordinated and scheduled in conjunction with functions at the fairgrounds and Dorton Arena.

- If meeting the project schedule requires that earth removal, grading, hauling and/or paving must occur during work/institutional peak hours, the Contractor shall notify NCDOT as soon as possible. In such instance(s), all reasonable attempts shall be made to notify and to make appropriate arrangements for the mitigation of the predicted construction noise impacts upon the affected property owners and/or residents.
- If construction noise activities must occur during context-sensitive hours in the vicinity of noise-sensitive areas, discrete construction noise abatement measures including, but not limited to portable noise barriers and/or other equipment-quieting devices shall be considered.

3.10 Air Quality

A summary of air quality issues in the study area is presented in this section. Details of the complete air quality analysis can be found in the Air Quality Technical Memorandum for STIP Project No. U-4437 (ARCADIS April 2012), appended by reference.

3.10.1 Existing Conditions

The North Carolina Department of Environment and Natural Resources (NCDENR) maintains air quality monitors that measure actual ambient air concentrations of the criteria pollutants⁵ throughout the state. Based on the location of the project with respect to available monitors, the air quality data reported for Wake and Cumberland Counties were selected as most representative of the study area. Table 10 lists the actual monitored values recorded for 2008 through 2010 in Wake County as reported on the NCDENR Division of Air Quality's (NCDAQ) website, except for PM10 which was measured in Cumberland County, and the 3-hour SO₂ value which is taken from the NCDAQ's *2007 Ambient Air Quality Report*, published May 2011. It was necessary to refer to the Cumberland County monitor for PM10 because the actual monitoring data for Wake County is not available in the statistical form of the standard.

Based on the available monitoring data, the project area is located in an area classified as currently being in "attainment" of the standards for all criteria pollutants.

⁵ Criteria pollutants are compounds that have been shown to cause degradation to the quality of ambient air. These compounds are commonly referred to as the "criteria" air pollutants because the criteria used to measure air quality in a given area are their concentrations in ambient air.

Table 10 Actual Ambient Air Quality Measurements

Pollutant	Measured Concentration	Units	Averaging Time	NAAQS*
Carbon Monoxide (CO)	1.6 ⁽¹⁾	ppm	8-hour	9
	2.0 ⁽¹⁾	ppm	1-hour	35
Nitrogen Dioxide (NO ₂)	NA	ppm	Annual Arithmetic Mean	100
Ozone (O ₃)	0.073 ppm	ppm	8-hour	0.075
Particulate Matter (PM ₁₀)	31 ⁽²⁾	µg/m ³	24-hour	150
Particulate Matter (PM _{2.5})	10.2	µg/m ³	Annual Arithmetic Mean	15
	22 ⁽³⁾	µg/m ³	24-hour	35
Sulfur Dioxide (SO ₂)	14 ⁽⁴⁾	ppb	1-hour	75
	0.013	ppm	3-hour	0.5
Lead (Pb)	NA	µg/m ³	3-month rolling	0.15

* National Ambient Air Quality Standards

µg/m³ micrograms per cubic meter

ppm parts per million

ppb parts per billion

NA Not Available in Wake County

(1) 2nd Maximum value (2010)

(2) 3-year average of the 98th percentile (2007-2009)

(3) 3-year average of the 98th percentile (2008-2010)

(4) 3-year average of the 99th percentile (2008-2010)

Currently, Wake County is classified as a maintenance area for carbon monoxide (CO). This classification refers to areas that had previously exceeded the National Ambient Air Quality Standards (NAAQS) but had since shown reductions in concentrations to levels below the standard such that they are now maintaining concentrations at the reduced levels. NCDENR guidance indicates that the average 1-hour background concentration of CO that should be used for modeling in Wake County is 2.9 ppm. This value is conservative, evidenced by the comparison to the actual recorded concentrations shown in Table 10.

3.10.2 Model Results

Tables 11 and 12 show the maximum CO concentrations predicted by the U.S. Environmental Protection Agency’s (USEPA) CAL3QHC dispersion model over the one- and eight-hour averaging periods, respectively. A background concentration of 2.9 ppm is included. A copy of the CAL3QHC model output files are included in the Air Quality Technical Memorandum, Appendix E.

For each scenario, the model indicates that the maximum concentrations are expected to be well below the NAAQS for both time averaging periods. This slight increase in CO concentration with time can be explained by the projected increase in traffic volume between 2015 and 2035. Although MOBILE6.2

accounts for improved vehicle engine performance in the future such that emissions per vehicle mile declines with time, these reductions are evidently offset by the magnitude of the expected increase in traffic volume.

Table 11 Predicted Maximum 1-Hour CO Concentrations (ppm)

Location	2010	2015		2020		2030		2035	
	Baseline	Build	No Build	Build	No Build	Build	No Build	Build	No Build
Hillsborough Street and Blue Ridge Road	5.4	4.7	5.2	4.6	5.1	4.7	7.9	4.9	5.5
NAAQS	35	35	35	35	35	35	35	35	35

Table 12 Predicted* Maximum 8-Hour CO Concentrations (ppm)

Location	2010	2015		2020		2030		2035	
	Baseline	Build	No Build	Build	No Build	Build	No Build	Build	No Build
Hillsborough Street and Blue Ridge Road	4.3	3.7	4.1	3.6	4.0	3.7	6.2	3.9	4.3
NAAQS	9	9	9	9	9	9	9	9	9

* A persistence factor of 0.79 is used to convert one-hour results to eight-hour results.

Since the maximum 1-hour and 8-hour CO concentrations for each scenario are shown to be below the NAAQS, the proposed project is not expected to contribute to a violation of the NAAQS.

3.10.3 Qualitative Mobile Source Air Toxics (MSATs) Impact Discussion

The purposes of this project are to reduce congestion at the intersection of Hillsborough Street with Blue Ridge Road and to reduce train-related conflicts with vehicles and pedestrians by constructing a grade separation at the project intersection. This project has been determined to generate minimal air quality impacts for Clean Air Act Amendments (CAAA) criteria pollutants and has not been linked with any special Mobile Source Air Toxics (MSAT) concerns. As such, this project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the No-Build Alternative.

Moreover, USEPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with USEPA's MOBILE6.2 model forecasts a combined reduction of 72 percent in the total annual emission rate for the priority MSAT from 1999 to 2050 while vehicle-miles of travel are projected to increase by 145 percent. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

3.10.4 Transportation Conformity

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) which establishes regulations and emission control measures for improving air quality in the State. Transportation conformity is required for federally funded or approved transportation projects in areas that have been designated by the USEPA as “nonattainment” for not meeting the NAAQS. Conformity to the SIP means that transportation activities will not cause new violations of the NAAQS, worsen existing violations, or delay timely attainment or achievement of interim emissions reductions or other milestones associated with the relevant standard.

The project is located in Wake County, which is within the Raleigh-Durham-Chapel Hill nonattainment area for ozone (O₃) as defined by the USEPA. This area was designated nonattainment for O₃ under the eight-hour ozone standard effective June 15, 2004. However, due to improved monitoring data, this area was redesignated as maintenance for O₃ under the eight-hour standard on December 26, 2007. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the SIP. The current SIP does not contain any transportation control measures for Wake County.

The proposed project is exempt from transportation conformity per 40 CFR 93.126.

3.10.5 Construction Air Quality

Construction activities may cause minor short-term air quality impacts in the form of dust from earthwork and unpaved roads. These impacts will be minimized by adherence to all State and local regulations. Construction equipment and associated work practices and procedures will have to meet the NCDOT Standard Specifications and NCDAQ emission standards that govern activities such as open burning (15A NCAC 2D .1900).

3.11 Hazardous Material

Hazardous materials sites may include, but are not limited to, underground storage tank (UST) sites, hazardous waste sites (dump sites), regulated landfills, and unregulated dump sites. In August 2010 the NCDOT performed a field reconnaissance within the project limits to identify hazardous material sites. In addition, a file search of appropriate environmental agencies’ databases was performed to assist in evaluating sites identified during this study.

Based on the field reconnaissance and records search, two sites were identified that may contain petroleum USTs. No hazardous waste sites, landfills or other geoenvironmental concerns were identified within the project limits. The UST sites are listed below.

- Quality Mart/Shell gas station, 4709 Beryl Road: The tank bed is located approximately 75 feet east of the Blue Ridge Road centerline. According to the UST Section registry there are three tanks currently in use.

- Gregory Poole Equipment Company, 4807 Beryl Road: The former tank bed is located approximately 90 feet west of the Blue Ridge Road median and 400 feet south of the intersection of Blue Ridge Road with Beryl Road. According to the UST Section registry, eight tanks were removed from 1989 to 1992. The former tank bed is covered with a concrete slab and used to park customer equipment. Two USTs were abandoned in place.

These sites are anticipated to present low geoenvironmental impacts to the project. The Quality Mart/Shell gas station would be displaced by the proposed project.

3.12 Topography, Geology and Soils

3.12.1 Topography and Geology

Wake County is in the Piedmont Physiographic Province of North Carolina. It lies at the edge of the Piedmont and incorporates the complex geology of relatively old, greatly distorted rocks (at one time very deep within the earth's crust) with that of relatively young Coastal Plain sediment (deposited by rivers and the sea). The rocks, structures, and landforms span a history of some 600 million years (Parker 1995). Wake County is composed of three different groups of rocks of contrasting type, structure, and age:

- Old metamorphic rocks consisting mostly of gneisses, shists, and phyllites with mafic and granitic intrusions (Late Precambrian and Paleozoic Ages);
- Stratified sedimentary rocks underlying a strip less than 10 miles wide and separated from the older rocks by a fracture filled with diabase (Triassic Age); and,
- Coastal Plain sediments (Cretaceous and Cenozoic Age). Soils and weathered rock extend downward 10 to 60 feet in most places. Outcrops of hard bedrock are rare and mostly confined to streambeds and excavations (Parker, 1995).

The topography of Wake County ranges from steep hills, primarily in the west, to flatlands in the south and east. Gently rolling topography defines the study area. Elevations in the study area range from approximately 370 feet above mean sea level (msl) at the northeastern and southeastern corners of the study area to approximately 500 feet above msl along the portion of Blue Ridge Road north of the project intersection, as depicted on the Raleigh West, North Carolina, USGS topographic quadrangle map.

3.12.2 Soils

The process of soil development depends on both biotic and abiotic influences. These influences include past geologic activities, the nature of parent materials, environmental and human influences, plant and animal activity, duration of development, climate, and topographic position. The Wake County soil

survey indicates that one soil association is present within the project corridor⁶, the Cecil association (Cawthorn 1970). Soil associations generally consist of one or more major soils and some minor soils or miscellaneous areas. These associations provide a broad perspective of the soils and landscapes in a particular area. They establish a basis for comparing the potential of large areas for general kinds of land use.

According to the soil survey published by the Wake County Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service (SCS), the soil types found within the project corridor include Cecil clay loam, Cecil sandy loam, Colfax sandy loam, and made land (Cawthorn 1970). Descriptions of the soils within the project corridor are included in Table 13.

Table 13 Soils Summary

Map Unit	Soil Series	Slope	Drainage	General Characteristics
CeB2, CeC2	Cecil sandy loam	2-10%	Well-Drained	Infiltration is fair to good, surface runoff is medium to very rapid, and the hazard of erosion is moderate. These upland soils are on broad, smooth interstream divides, on short to long side slopes, and on narrow side slopes bordering drainage ways.
CIC3	Cecil clay loam, severely eroded	6-10%	Well-Drained	Infiltration is poor, surface runoff is rapid to very rapid, and the hazard of further erosion is severe. These upland soils are on smooth interstream divides and on narrow side slopes.
Cn*	Colfax sandy loam	0-6%	Somewhat Poorly Drained	Infiltration is good, and surface runoff is medium to slow. The soils are at the heads of drainage ways, on foot slopes, and in slight depressions.
Ma	Made land			The areas in this mapping unit have been altered by man to the extent that the profile of the original soils cannot be recognized. The areas in this mapping unit vary greatly, and no generalizations are included in the soil survey regarding the soils present.

* Occurs on Hydric Soils list, Gregory, 2001.
Source: Cawthorn 1970.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (Cowardin et al. 1979). The NRCS has split hydric soil mapping units into two categories, Hydric A and Hydric B. Hydric A soil mapping units are defined as areas that contain all hydric soils or have hydric

⁶ The study area for natural resources encompasses the project footprint and a 50 foot buffer and is also referred to as the project corridor. However, the Natural Resources Technical Report (February 2007), appended by reference, addressed the larger project study area.

soils as a major component. Hydric B soil mapping units are defined as areas that are known to contain inclusions of hydric soils. According to the Wake County NRCS, one Hydric B soil occurs within the project corridor. The Hydric B soil is Colfax sandy loam (Gregory 2001). However, it should be noted that the entire study area has been developed since the publication of the soil survey. The area mapped as Colfax sandy loam, in the study area, currently supports a building and associated parking lot.

3.12.3 Topographic, Geologic, and Soil Impacts

As a result of earthwork, attributed primarily to lowering Blue Ridge Road, and various other construction activities, the project would result in localized alterations of study area topography, geology, and soils. The project would not impact hydric soils. Based on available information, it is not known if blasting of bedrock would be required during construction. Additionally, as construction materials are added to and removed from the project site, soils may be replaced, redistributed, and/or compacted. The subtraction of material would lower the elevation of some areas along Blue Ridge Road. Alterations would generally be confined to the construction site, and the project is expected to have a negligible overall impact to the region's topography, geology, and soils.

3.13 Utilities

Given the urbanized nature of the study area, public utilities are available throughout much of the study area. Based on field inspection, water and sewer, natural gas, electric, telephone and fiber optic utilities are present. Overhead power lines traverse the project intersection and are located throughout much of the study area. Underground power lines are in areas of more recent development such as the Pylon Industrial Park. An overhead power transmission line is located along the north side of Trinity Road and crosses to the east side of Blue Ridge Road just north of the Trinity Road intersection with Blue Ridge Road. A City of Raleigh elevated water tank is located on the east side of Blue Ridge Road just south of the Trinity Road intersection with Blue Ridge Road.

NCDOT will coordinate with all public utility providers located within the project area to ensure that the utilities are incorporated into the final design of the project. Utilities may be attached to proposed bridge structures as needed. Any necessary relocation of public utilities would be coordinated with the appropriate utility provider and completed without long-term interruptions in service.

3.14 Biotic Resources

3.14.1 Terrestrial Communities

One terrestrial plant community, consisting of maintained/disturbed lands, can be found in the study area. This maintained/disturbed lands community is characterized by human influences and artificial surfaces related to residential development, roadways, maintained yards, pasture land, and other areas that are manipulated. Vegetation associated with this community is kept in a low state of succession by regular mowing or maintenance. This community is present throughout the study area.

The roadway rights-of-way are dominated by fescue (*Festuca* spp.). The remaining developed areas are not dominated by any one species due to the wide spacing of planted shade trees and maintained conditions. The shade trees include loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*), southern red oak (*Quercus falcata*), eastern red cedar (*Juniperus virginiana*), sycamore (*Platanus occidentalis*), and sweet gum (*Liquidambar styraciflua*). Planted shrubs include Chinese privet (*Ligustrum sinense*), flowering dogwood (*Cornus florida*), and crepe myrtle (*Lagerstroemia* sp.). Fescue dominates the groundcover. Small bushy patches or hedgerows can be found at few locations, generally associated with fences located along property boundaries. Ruderal species such as blackberry (*Rubus* spp.), muscadine grape (*Vitis rotundifolia*), trumpet creeper (*Campsis radicans*), goldenrod (*Solidago* spp.) and tree-of-heaven (*Ailanthus altissima*) are common in these hedgerows.

As noted, developed areas contain large expanses of frequently cut grass, few and widely spaced trees, paved surfaces, and small bushy patches or hedgerows. These areas are likely to support abundant domestic predators and introduced species that reduce habitat suitability for many native species. Species observed during field visits are indicated by an asterisk (*). Reptile and amphibian species are limited to a few small, secretive species. The reptiles are likely to include the rough earth snake (*Virginia striatula*), northern brown snake (*Storeria dekayi*), and ground skink (*Scincella lateralis*). Amphibians are not likely to be represented due to the lack of aquatic habitats in the immediate vicinity. Bird species found in the study area include the introduced house sparrow (*Passer domesticus*)*, northern mockingbird (*Mimus polyglottos*)*, Carolina chickadee (*Poecile carolinensis*)*, American robin (*Turdus migratorius*)*, American crow (*Corvus brachyrhynchos*)*, northern cardinal (*Cardinalis cardinalis*)*, and blue jay (*Cyanocitta cristata*)*. House mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), woodchuck (*Marmota monax*)*, and big brown bat (*Eptesicus fuscus*) are mammals likely to be found in the study area.

3.14.2 Aquatic Communities

There are no aquatic communities in the project corridor.

3.14.3 Biotic Resource Impacts

The proposed project would impact maintained/disturbed communities. No other terrestrial communities would be disturbed. The project would not impact aquatic communities.

3.15 Water Resources

3.15.1 Jurisdictional Waters

The study area is drained by tributaries of the Neuse River Basin. The study area is within the North Carolina Division of Water Quality (NCDWQ) Subbasin 03-04-02 and the United States Geological Survey (USGS) Hydrologic Unit 03020201. No jurisdictional waters, streams or wetlands, exist in the project corridor.

The NCDWQ classifies the surface waters of the state based on their intended best uses. The closest named creeks most likely to drain the study area include House Creek and Bushy Creek. These two creeks are classified as Class C Nutrient Sensitive Waters (NSW).

No Outstanding Resource Waters (ORW), High Quality Waters (HQW), or Water Supply Waters (WS-I or WS-II) occur within 1.0 mile of the study area. Also no streams within 1.0 mile of the study area are listed on the North Carolina 2010 Final 303(d) list of impaired waters. There are no benthic or fish sampling sites within 1.0 mile of the study area.

3.15.2 Anticipated Permit Requirements

Section 404 of the Clean Water Act requires authorization from the Secretary of the Army, acting through the USACE, for the discharge of dredged or fill material into all “Waters of the United States,” including wetlands. A USACE permit is required whether the work is permanent or temporary.

No “Waters of the United States” are located in the project corridor; therefore, no USACE permit is needed for implementation of this project. The corresponding Section 401 Water Quality Certification from the NCDWQ also will not be needed.

Since no streams are located in the project corridor, there are no corresponding riparian buffers. No authorization for impacts to riparian buffers will be necessary for implementation of this project.

3.16 Rare and Protected Species

Some populations of fauna and flora have declined, or are in the process of declining due to either natural forces or their inability to coexist with humans. Section 7 of the Endangered Species Act of 1973, as amended (ESA)], requires that any action likely to adversely affect a species classified as federally protected be subject to review by the U.S. Fish and Wildlife Service (USFWS). Other species may receive additional protection under state laws. As of September 22, 2010 the USFWS identified three endangered (E) species as potentially occurring in Wake County. An additional species, the bald eagle, is protected under the provisions of the Bald and Golden Eagle Protection Act (Eagle Act). Table 14 lists the species protected under both Acts. Discussion of the species and their respective habitats follow.

Table 14 Federally Protected Species Known from Wake County, North Carolina

Scientific Name	Common Name	Federal Status
Vertebrates		
<i>Picoides borealis</i>	Red-cockaded woodpecker	E
<i>Haliaeetus leucocephalus</i>	Bald eagle	BGPA
Invertebrates		
<i>Alasmidonta heterodon</i>	Dwarf wedgemussel	E
Vascular Plants		
<i>Rhus michauxii</i>	Michaux's sumac	E

Notes: T – Threatened; E – Endangered; SC – Special Concern
 BGPA- Bald and Golden Eagle Protection Act

Red-cockaded woodpecker (*Picoides borealis*)

Federal Status: ENDANGERED

The red-cockaded woodpecker (RCW) is 7.1 to 7.9 inches long with a wingspan of 13.8 to 15 inches. It is identified by plumage that is entirely black and white except for small red streaks on the sides of the nape of the male. The back of the RCW is black with white horizontal stripes, and it has a large white cheek patch surrounded by a black cap, nape, and throat. The woodpecker's diet is mainly insects, including ants, beetles, wood-boring insects, caterpillars, and corn ear worms, when available.

The RCW is found in open pine forests in the southeastern United States. The RCW is unique among woodpeckers because it nests exclusively in living pine trees. The bird uses open, old growth stands of southern pines, particularly longleaf pine (*Pinus palustris*), for foraging and nesting habitat. Slash, pond, or loblolly pines (*P. elliottii*, *P. serotina*, and *P. taeda*) will also be utilized if longleaf pine is not available. The forested stand ideally contains at least 50 percent pine and lacks a thick understory. The birds excavate nests in pines greater than 60 years old and that generally are contiguous with pine stands at least 30 years of age. The foraging range of the RCW may extend 500 acres and must be contiguous with suitable nesting sites. In good, well-stocked pine habitat, sufficient foraging substrate can be provided on 80 to 125 acres.

Biological Conclusion: No Effect

Habitat for the RCW is not found within the project corridor. The pine communities that are present do not possess the acreage necessary to be considered suitable habitat for this species. A review of North Carolina Natural Heritage Program (NCNHP) records in June 2010 did not reveal any known populations within 1.0 mile of the study area.

Dwarf wedgemussel (*Alasmidonta heterodon*)

Federal Status: ENDANGERED

The dwarf wedgemussel is a relatively small (from 0.9 to 1.8 inches in length) mussel with a subrhomboidal to subtrapezoidal shell. The exterior shell color is greenish-brown with green rays. The interior nacre is bluish to silvery white. The species is unique in the reversed arrangement of its lateral teeth, with two teeth on the right valve and one on the left. The dwarf wedgemussel had a historic range from New Brunswick, Canada, south to the Neuse River in North Carolina. Currently, its range is greatly reduced in the northern portion of the range and fragmented throughout the southern portion. The mussel inhabits large rivers to small streams within its range. The preferred substrate has clay banks stabilized with the root systems of trees. Other bed substrates include coarse sands, mixed sand, gravel and cobble, and very soft silts. The most important feature of their preferred habitat appears to be excellent to good water quality.

Biological Conclusion: No Effect

Streams, which could be habitat for the dwarf wedgemussel, are not found in the project corridor. A review of NCNHP records in June 2010 did not reveal any known populations within 1.0 mile of the study area.

Michaux's sumac (*Rhus michauxii*)

Federal Status: ENDANGERED

Michaux's sumac is a densely pubescent, dioecious, rhizomatous shrub. It has a low stature, usually growing to less than two feet high. The leaves are compound with seven to 13 serrately edged, hairy leaflets on a hairy rachis. Male or female flowers are found in dense terminal panicles typical of the genus. Flowers bloom in June and seed heads are visible from August to September. Due to habitat fragmentation, colonies of this dioecious plant, when they occur, often are only one large clone representing a single sex. Unfortunately, this quality is a serious limitation to the reproduction and repopulation of this species. Michaux's sumac grows in dry, open woodlands and forest edges in scattered locations from Virginia to Georgia. In the Piedmont region, it is usually associated with clayey soils derived from mafic rock, such as Carolina slates or gabbro.

Biological Conclusion: No Effect

Habitat for Michaux's sumac, consisting of shrubby edges, is found in the project corridor. A walking survey of available habitat within the project corridor was conducted on August 4, 2006 and again on May 19, 2011. No specimens of Michaux's sumac were found. A review of NCNHP records in June 2010 did not reveal any known populations within 1.0 mile of the study area.

Bald and Golden Eagle Protection Act

Habitat for the bald eagle (*Haliaeetus leucocephalus*) 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 1.0 mile of open water. Eagle nests are found in proximity to water (usually within 0.5 mile) with a clear flight path to the water and in the largest living tree in an area, with an open view of the surrounding land. Human disturbance can cause nest abandonment.

Habitat for the bald eagle is not found within the project corridor or within 1.0 mile of the project corridor. No bodies of water large enough to be considered appropriate habitat are present. In addition, a review of NCNHP records in June 2010 did not reveal any known populations within 1.0 mile of the study area. Because the proposed project will not have any effect on the bald eagle or its habitat, no “eagle take permit” will be required.

3.17 Cumulative Effects

A number of past actions and trends in the study area vicinity were considered to determine the potential, when added to impacts expected with the proposed project, to have cumulative impacts on the study area resources. These past, present, and future actions include land development and transportation projects.

3.17.1 Impact-Causing Activities

The study area is a largely developed area with limited vacant land. Development of the area, both public and private, spans the twentieth century. The area includes large publicly-owned facilities including the NC State Fairgrounds and the NCSU College of Veterinary Medicine/NCSU Centennial Biomedical Campus. The NC State Fairgrounds were established on the current site in 1928 and the historic exhibition buildings (Commercial and Education Buildings) were constructed the same year. Today, the building largely appears as it did in 1928; however, site improvements included paving the parking area between the building and Hillsborough Street and erecting a large illuminated sign at the project intersection in the 1990s. To the west, historic Dorton Arena was constructed in the early 1950s. The NCSU College of Veterinary Medicine opened in 1982 on the site of the University Dairy Farm. Initial buildings were set back from the project intersection; however, recent development on the site is in proximity to the project intersection based on the campus master plan.

Several nearby facilities enhanced the area as a regional destination. Carter-Finley Stadium was constructed in 1966 and a major expansion was completed in 2006. The adjacent PNC Arena opened in October 1999.

Private development in the study area includes long-established businesses, especially along Hillsborough Street west of the project intersection; the Gregory Poole Equipment Company established in 1951; and flexible-space commercial facilities constructed in the 1980s and early 1990s in the Pylon Drive area. The most recent development in the study area includes several multi-family residential developments in the southern portion of the area.

Blue Ridge Road was extended from Western Boulevard across the railroad corridor to Hillsborough Street in the early 1990s. The new roadway bisected the Gregory Poole Equipment Company property, creating a small triangular-shaped property east of Blue Ridge Road. The extension of Blue Ridge Road also increased access to and visibility of properties south of Beryl Road. The property at the southeast quadrant of the new Blue Ridge Road intersection with Beryl Road especially benefitted, and a Quality Mart/ Shell gas station was constructed on this property.

In addition to the proposed project, other planned transportation projects in the area include several projects listed in the 2012-2020 STIP. To the west of the study area, STIP Project No. B-4656 proposes to remove the Hillsborough Street bridge over Western Boulevard and reconstruct the intersections. The City of Raleigh is completing a planning study in conjunction with this transportation project. Along the eastern study area boundary, STIP Project No. U-2719 proposes to widen I-440. Both of these projects are programmed for right-of-way and construction.

Just east of the study area, Beryl Road crosses the railroad at-grade near the Beryl Road intersection with Hillsborough Street (eastern terminus of Beryl Road). This at-grade crossing is one of four public crossings in west Raleigh to be considered for closure. (The closure of the Beryl Road at-grade crossing is still under consideration and a decision has not been made to close, to keep open, or to develop alternatives for connectivity. Therefore, the Beryl Road at-grade crossing closure is not considered “reasonably foreseeable” and is not addressed in the analysis of cumulative effects for the proposed project.)

Triangle Transit plans to construct a transit station in proximity to the project intersection. Although a specific site for the transit station has not been selected, a location in the vicinity of Blue Ridge Road and the fairgrounds main entrance was endorsed by the Raleigh City Council. The proposed transit station is likely to accelerate redevelopment of the area. More intense development in this area is consistent with locally adopted plans. The Raleigh 2030 Comprehensive Plan specifies more intense mixed-use development in proximity to the planned light rail transit station. This development could occur with or without the proposed project. Water and sewer service is provided by the City of Raleigh and there is adequate capacity to serve future development in the study area. Currently, the only notable construction in the area is occurring on the NCSU Centennial Biomedical Campus.

In addition, the City of Raleigh is in the initial phase of a study for the Blue Ridge Road corridor from Western Boulevard to Edwards Mill Road, encompassing the project intersection. The study will examine transportation conditions and emphasize multimodal transportation, as well as make recommendations for roadway and accessibility improvements. The city expects the study to be implemented through zoning amendments, comprehensive plan amendments, and transportation related design improvements. The study is expected to be complete by late 2012.

3.17.2 Cumulative Effects Analysis

Cumulatively, the proposed project and other planned roadway and transit projects in the study area should enhance accessibility and transportation mobility options in the area. Of these projects, the

proposed transit station is more likely to accelerate redevelopment of the area; however, more intense development in this area is consistent with locally adopted plans. This development could occur with or without the proposed project. The contribution of the proposed project to cumulative impacts on human and/or natural features resulting from current and planned development would be negligible. Potential indirect and cumulative effects to downstream water quality should be negligible.

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.

3.18 Summary of Anticipated Impacts

Overall, the proposed project would result in minimal impacts to resources in the area. The primary impact would be the visual impact attributed to lowering Blue Ridge Road. Although views would remain intact, a large retaining wall would be required along a portion of Blue Ridge Road and the change in topography would alter the character of the existing landscape. Anticipated impacts are summarized below.

Land Use - The proposed project will have minor impacts on existing land use due to relocation. The potential for project-induced growth and land use change is negligible.

Compatibility with Local Plans - The proposed project is generally consistent with Raleigh's 2030 Comprehensive Plan. The proposed project is also consistent with the NCSU Centennial Biomedical Campus Master Plan, and the NC State Fairgrounds Master Plan. The connector road may encroach on a leased parcel (future development) on the NCSU Centennial Biomedical Campus (College of Veterinary Medicine). Coordination is underway to avoid or minimize this encroachment.

The proposed project would not preclude plans for a transit station at the project intersection and would accommodate the transit-oriented development that is expected in proximity to the station.

Historic Architectural Resources - On July 24, 2012, NCDOT, in consultation with the HPO and FHWA, determined that Alternative 12 for the Hillsborough Street/Blue Ridge Road intersection improvements project would have **no adverse effect** (with commitments) on the North Carolina State Fair Commercial and Education Buildings and **no adverse effect** (with commitments) on the Old Hickory Highway Marker. In addition, NCDOT, FHWA, and the HPO concurred that Alternative 12 would have **no effect** on Dorton Arena.

Section 4(f) – Approximately 0.02 acre of the historic NC State Fair Commercial and Education Buildings site would be acquired for permanent right-of-way and the location of the Old Hickory Highway Marker would be impacted by project construction. The FHWA has made a finding of *de minimis* impact by the signing of this document.

Visual Resources - The proposed project would alter the appearance of the project area by introducing a grade-separated intersection and lowering Blue Ridge Road. In combination with the development occurring and planned on the NCSU College of Veterinary Medicine campus, the proposed project would contribute to a more urbanized character of the area surrounding the project intersection.

Relocation - The Quality Mart/Shell gas station on the southeast quadrant of the Blue Ridge Road intersection with Beryl Road will be displaced. According to the relocation report, this relocation would involve two businesses on one property: the Shell gas station (property owner) and the convenience store (tenant).

Right-of-way – Right-of-way would be acquired from eleven properties. Approximately 4.3 acres of permanent right-of-way and approximately 4.9 acres of temporary construction easement would be needed for the proposed project.

Businesses - There would be no substantial impact to the overall economic and business resources in the study area. The project improvements would reduce congestion and eliminate potential conflicts with rail traffic, enhancing accessibility to employment centers in the area. In addition to the relocation, the Gregory Poole Equipment Company's storage yard on the east side of Blue Ridge Road would be impacted by the change in grade of the roadway. During construction, the areas used for Gregory Poole Equipment Company employee parking would also be impacted.

Access - Overall, the proposed project is expected to enhance regional mobility and access, while resulting in localized access impacts. The proposed project will result in improved travel times for traffic using Hillsborough Street and Blue Ridge Road due to a reduction in delays at the project intersection. The proposed project would change circulation patterns in the area by eliminating the intersection of Blue Ridge Road with Beryl Road. Access to the Gregory Poole Equipment Company's storage yard on the east side of Blue Ridge Road would be impacted by the grade change of Blue Ridge Road. The property would not be accessible from the lowered roadway.

Community Safety and Emergency Response - Overall, the proposed project would enhance mobility for emergency vehicles traveling through the area, especially with the elimination of delays caused by rail traffic.

Hazardous Materials - There are USTs on the Quality Mart/Shell gas station property, which would be displaced by the proposed project.

Topography, Geology, Soils - As a result of earthwork, attributed primarily to lowering Blue Ridge Road, and various other construction activities, the project would result in localized alterations of study area topography, geology, and soils.

4 Comments and Coordination

4.1 Start of Study Notification

In December 2003, NCDOT distributed start of study letters to federal, state, and local agencies and officials likely to have an interest in the project. The letter described the preliminary study area, project history, and existing conditions (e.g., land use, and cultural resources). The start of study letter provided agencies with the opportunity to comment on the proposed improvements and the study area.

The mailing list for the start of study letter included the following federal, state, and local agencies:

Advisory Council on Historic Preservation

Federal Emergency Management Agency

Federal Railroad Administration

National Marine Fisheries Service

*U.S. Army Corps of Engineers, Wilmington District

*U.S. Department of Agriculture – Natural Resources Conservation Service

U.S. Department of Commerce – Ecology and Environmental Conservation Office

U.S. Department of Health and Human Services – Region IV

U.S. Department of Housing and Urban Development

*U.S. Department of Interior – Bureau of Indian Affairs

U.S. Department of Interior – Bureau of Outdoor Recreation

*U.S. Department of Interior – Fish and Wildlife Service

U.S. Department of Interior – National Park Service

U.S. Department of Interior – Office of Environmental Policy and Compliance

U.S. Forest Service

U.S. Environmental Protection Agency

U. S. Geological Survey

*N.C. Department of Administration – State Clearinghouse

*N.C. Department of Agriculture and Consumer Services – North Carolina State Fair

*N.C. Department of Cultural Resources – State Historic Preservation Office

*N.C. Department of Environment and Natural Resources

N.C. Department of Environment and Natural Resources – Division of Marine Fisheries

* N.C. Department of Environment and Natural Resources – Division of Water Quality

*N.C. Department of Public Instruction

*N.C. Wildlife Resources Commission

*North Carolina State University – Department of Transportation

City of Raleigh

*Triangle Transit (formerly Triangle Transit Authority)

*Wake County Public School System

Written comments were received from agencies noted with an asterisk (*). Copies of the comments received are included in Appendix A.

4.2 Agency Coordination and Public Involvement Summary

Public involvement was an essential component of the project planning process. Public involvement for the proposed project included five meetings and on-going coordination with a stakeholders committee (Citizens and Stakeholders Action Committee), two Citizens Informational Workshops, a Local Officials Meeting, and a number of small group meetings. Activities are summarized below.

4.2.1 Citizens and Stakeholders Action Committee

The Citizens and Stakeholders Action Committee (CSAC), comprised of key stakeholders, was established to provide input and direction throughout the project development and environmental assessment phase of the project. Participants included representatives of NCSU, NC State Fairgrounds, Gregory Poole Equipment Company, Raleigh Historic Districts Commission, Norfolk Southern Corporation, North Carolina Railroad, CAMPO, City of Raleigh Transportation Services, and Triangle Transit, among others. The CSAC met at key project milestones. The project team (NCDOT and consultants) held the following meetings with the CSAC.

- Meeting 1 (February 2004): Presented the project to the CSAC and discussed traffic issues and project constraints. Received general project comments from the CSAC.
- Meeting 2 (January 2005): Presented and discussed six preliminary concepts. The CSAC provided input in preparation for a public workshop held in March 2005.
- Meeting 3 (November 2007): Continued review of project alternatives. Several alternatives were eliminated and several were added.
- Meeting 4 (August 2009): Presented preliminary designs for several alternatives (6, 7, 8, and 10).
- Meeting 5 (February 25, 2011): Presented preliminary designs for additional alternatives (11 and 12). At this meeting, those in attendance supported Alternative 12 as the alternative to be carried forward in the Categorical Exclusion. No opposition to Alternative 12 or support for other alternatives was expressed.

Meeting summaries are included in Appendix D.

4.2.2 Citizens Informational Workshops and Local Officials Meeting

Meeting Notification - A newsletter was developed to notify study area property owners and residents, as well as other interested citizens, about the upcoming workshops. The newsletter was distributed to approximately 325 people on the mailing list in February 2005. The mailing list was updated in 2011. The second newsletter was distributed to approximately 450 people. In addition to the newsletters, meeting notification occurred through local newspapers.

The first newsletter introduced the project, outlined the environmental review process, provided contact information, and announced the March 10, 2005 Citizens Informational Workshop. The second newsletter provided more detailed information about Alternative 12.

Citizens Informational Workshop 1 - A Citizens Informational Workshop was held on March 10, 2005. The purpose of the meeting was to introduce the project to the public and get comments on five project concepts. The following five project concepts were presented utilizing display mapping and a project handout:

- Raise Blue Ridge Road over Hillsborough Street, the railroads, and Beryl Drive on new location;
- Raise Blue Ridge Road over Hillsborough Street, the railroads, and Beryl Drive on existing location;
- A combination of raising the railroads and lowering Blue Ridge Road;
- A combination of raising Blue Ridge Road and lowering the railroads; and
- Close the existing at-grade Blue Ridge Road/railroad crossing.

There was no consensus among attendees concerning a preferred concept. Specific comments stressed the need to include bicycle and pedestrian accommodations.

Citizens Informational Workshop 2 - The second Citizens Informational Workshop was held on Thursday, May 12, 2011. The purpose of the meeting was to present Alternative 12 to the public and to solicit comments. In addition to display mapping and a project handout, the study team developed visualizations and animations depicting Alternative 12. The animations were continuously projected throughout the duration of the workshop.

Most attendees expressed support for Alternative 12. However, owners of the Quality Mart/Shell gas station (Blue Ridge Road intersection with Beryl Road) and the adjacent P.F.S. Sales Warehouse expressed opposition and concern regarding proposed impacts to these properties. The property owner also expressed frustration at not being included in project stakeholders meetings.

Local Officials Meeting - A Local Officials Meeting was held on Thursday, May 12, 2011, prior to the Citizens Informational Workshop. Representatives of NCSU, NC State Fairgrounds, the City of Raleigh

(including the City Council), and Capitol Area Metropolitan Planning Organization attended. The project team (NCDOT and consultants) presented Alternative 12. No opposition to the alternative was expressed. Discussion and questions focused primarily on pedestrian access and circulation and the future transit station.

Meeting summaries are included in Appendix D.

4.2.3 Small Group Meetings

The project team has also met with interested stakeholders upon request, including the following:

- CAMPO Bicycle and Pedestrian Stakeholders Committee (May 2005)
- NCSU (August 2009 and November 2010)
- NC State Fairgrounds (August 2009, August 2010, and June 2011)
- Gregory Poole Equipment Company (September 2009 and October 2011)
- CAMPO and City of Raleigh Transportation (October 2009)
- Blue Ridge Road Corridor Group (January 2010)
- City of Raleigh Urban Design staff (May 2010)
- City of Raleigh Transportation Services staff (September 2010)
- Railroad agencies: Norfolk Southern Corporation, CSX Transportation, and NCRR (August 2010)
- Raleigh Passenger Rail Task Force (December 2010)*
- Burke Brothers Hardware (February 2011)
- NCRR (February 2011)
- Section 106 coordination meetings (May 2011, July 2011, and November 2011)
- Quality Mart/Shell Gas Station and P.F.S. Sales Warehouse (June 2011)
- Triangle Transit (August 2011)
- Triangle Transit and City of Raleigh (January 2012)
- Raleigh Arts Commission (January 2012)
- Westover neighborhood representative (February 2012)
- West Citizens Advisory Council (CAC) (March 2012)

*The Passenger Rail Task Force was appointed by the Raleigh City Council to provide direction regarding several railroad-related issues. Among these, the task force was directed to recommend a preferred option for the proposed project. The Passenger Rail Task Force adopted a resolution supporting Alternative 12. (See Appendix D.)

5 References

- Amtrak. 2010. <http://www.bytrain.org/passenger/citystops/raleigh.html>. Accessed May 2010.
- ARCADIS. 2012. Air Quality Analysis Technical Memorandum, Intersection Improvements at Hillsborough Street and Blue Ridge Road. North Carolina Department of Transportation. April.
- ARCADIS. 2011a. Community Impact Assessment, Intersection Improvements at Hillsborough Street and Blue Ridge Road. North Carolina Department of Transportation. November.
- ARCADIS. 2011b. Indirect Land Use Screening, Intersection Improvements at Hillsborough Street and Blue Ridge Road. North Carolina Department of Transportation. April.
- ARCADIS. 2011c. Traffic Noise Technical, Intersection Improvements at Hillsborough Street and Blue Ridge Road. North Carolina Department of Transportation. December.
- ARCADIS. 2010a. Pedestrian Study. Intersection Improvements at Hillsborough Street (NC 54) and Blue Ridge Road (SR 1664). North Carolina Department of Transportation. May.
- ARCADIS. 2010b. Summary of Existing Conditions. Intersection Improvements at Hillsborough Street (NC 54) and Blue Ridge Road (SR 1664). North Carolina Department of Transportation. July.
- ARCADIS. 2007a. Natural Resources Technical Report, Intersection Improvements at Hillsborough Street (NC 54) and Blue Ridge Road (SR 1664). North Carolina Department of Transportation. February.
- ARCADIS. 2007b. Traffic Capacity Analysis, Intersection Improvements at Hillsborough Street and Blue Ridge Road. North Carolina Department of Transportation. January.
- Bilderback, Ted. 2011. Director, J.C. Raulston Arboretum. Personal communication [email] to R.Pugh, ARCADIS. September 22.
- Capital Area Metropolitan Planning Organization. 2010. <http://www.campo-nc.us>. Accessed May 2010.
- Circa, Inc. 2004. Phase I Historic Architectural Resources Survey Report and Preliminary Inventory List. North Carolina Department of Transportation. April.
- City of Raleigh. 2010a. <http://www.raleigh-nc.org>. Accessed May 2010.
- City of Raleigh. 2009a. Bicycle Transportation Plan. Located at: http://www.raleighbpac.org/RaleighBikePlan_lowrez.pdf. Accessed August 23, 2011. p.2-10.

- City of Raleigh. 2009b. The 2030 Comprehensive Plan for the City of Raleigh, Volume I: Comprehensive Plan. November 1. Located at:
[http://www.raleighnc.gov/publications/Planning/Comprehensive_Plan/2030_Comp_Plan_Final_Versi
on-Low_Res.pdf](http://www.raleighnc.gov/publications/Planning/Comprehensive_Plan/2030_Comp_Plan_Final_Version-Low_Res.pdf). Accessed April 2010.
- Country Day Montessori School of Raleigh. <http://www.countrydaymontessorischool.com/default.html>.
Accessed June 2010.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitat of the United States. U.S. Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C.
- Federal Highway Administration (FHWA). Signalized Intersections: Informational Guide.
<http://www.fhwa.dot.gov/publications/research/safety/04091/07.cfm#table37>. Accessed June 27, 2012.
- FHWA. 1989. Section 4(f) Policy Paper. June 7.
- Gibbons, Chris. 2011. Captain B-Shift, Engine 8, Raleigh Fire Department. Personal communication to C. Bukowy, ARCADIS. August 3.
- Gregory, J.D. 2001. Hydric Soils and Growing Season: Wetland Delineation Data for North Carolina. Department of Forestry, NC State University, Raleigh, NC.
- HNTB. 2008. North Carolina Railroad Company Shared Corridor Commuter Rail Capacity Study. Located at: <http://www.ncrr.com/capacity-study.html>. October.
- J.C. Raulston Arboretum. <http://www.ncsu.edu/jcraulstonarboretum/index.php> Accessed September 2011.
- Lamb, Eric J., P.E. 2012. City of Raleigh Office of Transportation Planning. Personal communication to L. Mundt, NCDOT. September 11.
- Nicholson, Ed. 2011. Capitol City Lumber. Personal communication to R. Pugh, ARCADIS. September 19.
- Nieman, Captain. 2011. City of Raleigh Police Department, Southwest District Office. Personal communication to C. Bukowy, ARCADIS. August 3.
- North Carolina Department of Commerce. 2010. Wake County Profile.
<https://edis.commerce.state.nc.us/docs/countyProfile/NC/37183.pdf>. Accessed May 2010 and August 2011.

- North Carolina Department of Environment and Natural Resources (DENR). Division of Land Resources. <http://www.dlr.enr.state.nc.us/pages/permittedmines.html>. Accessed June 2010.
- North Carolina Division of Water Quality (NCDWQ). 2009. Neuse River Basinwide Water Quality Plan. <http://h2o.enr.state.nc.us/basinwide/Neuse/2008/documents/Chapter2.pdf>. Accessed June 2010.
- NCDWQ. 2008. North Carolina Integrated Report Categories 4 and 5 (Impaired Waters List). <http://portal.ncdenr.org/web/wq/ps/mtu/assessment>. Accessed June 2010.
- NCDWQ. 2006. Neuse River Basinwide Assessment Report. <http://www.esb.enr.state.nc.us/Basinwide/Neuse06BasinReportFinal.pdf>. Accessed June 2010.
- North Carolina Department of Transportation (NCDOT). <http://www.ncdot.org>. Accessed May 2010 and July 2011.
- NCDOT. Urban Functional Classification Maps. <http://www.ncdot.gov/doh/preconstruct/tpb/FCS/UrbanMaps.html>. Accessed April 2010.
- NCDOT Rail Division. <http://www.bytrain.org>. Accessed May 2010 and December 2011.
- North Carolina Employment Security Commission. <http://www.ncesc.com>. Accessed July 2011.
- North Carolina Natural Heritage Program. <http://www.ncnhp.org/Pages/heritagedata.html>. Accessed June 2010.
- North Carolina Railroad Company. <http://www.ncrr.com>. Accessed May 2010.
- North Carolina State Fair. <http://www.ncstatefair.org>. Accessed June 2011.
- North Carolina State University (NCSU). <http://www.ncsu.edu>. Accessed May 2010 and June 2011.
- NCSU College of Veterinary Medicine. <http://www.cvm.ncsu.edu>. Accessed June 2011.
- NCSU. Facilities Division. http://www.ncsu.edu/facilities/physical_master_plan/update/index.htm. Accessed June 2010.
- Olson, Jonathan. 2011. Assistant Chief of Operations, Wake County Emergency Medical Services. Personal communication to C. Bukowy, ARCADIS. August 3.
- Parker, J.M., III. Geology and Mineral Resources of Wake County. North Carolina Department of Environment, Health, and Natural Resources, Division of Land Resources. 123 pp.

Passenger Rail Task Force. 2011. Resolution to the Raleigh City Council. January 18.

Raleigh Flea Market. <http://www.raleighfleamarket.net>. Accessed May 2010.

RBC Center. <http://www.rbccenter.com>. Accessed June 2011.

STV, Inc. 2011. Traffic Capacity Analysis Second Addendum, Intersection Improvements at Hillsborough Street (NC 54) and Blue Ridge Road (SR 1664). North Carolina Department of Transportation. October.

Special Transit Advisory Commission. 2008. Regional Transit Vision Plan: Recommendations for North Carolina's Research Triangle Region. <http://www.transitblueprint.org/stac.shtml>. Accessed May 2010.

Southeast High Speed Rail Corridor. <http://www.sehsr.org>. Accessed May 2010 and August 2011.

Steere Davies Gleave. 2010. NCRRC Commuter Rail Ridership and Market Study. Located at: <http://www.ncrr.com/commuter-rail-ridership.html>. May.

Triangle Transit. 2010a. <http://triangletransit.org>. Accessed May 2010.

Triangle Transit. 2010b. <http://triangletransit.org/bus/maps-and-schedules>. Accessed May 2010.

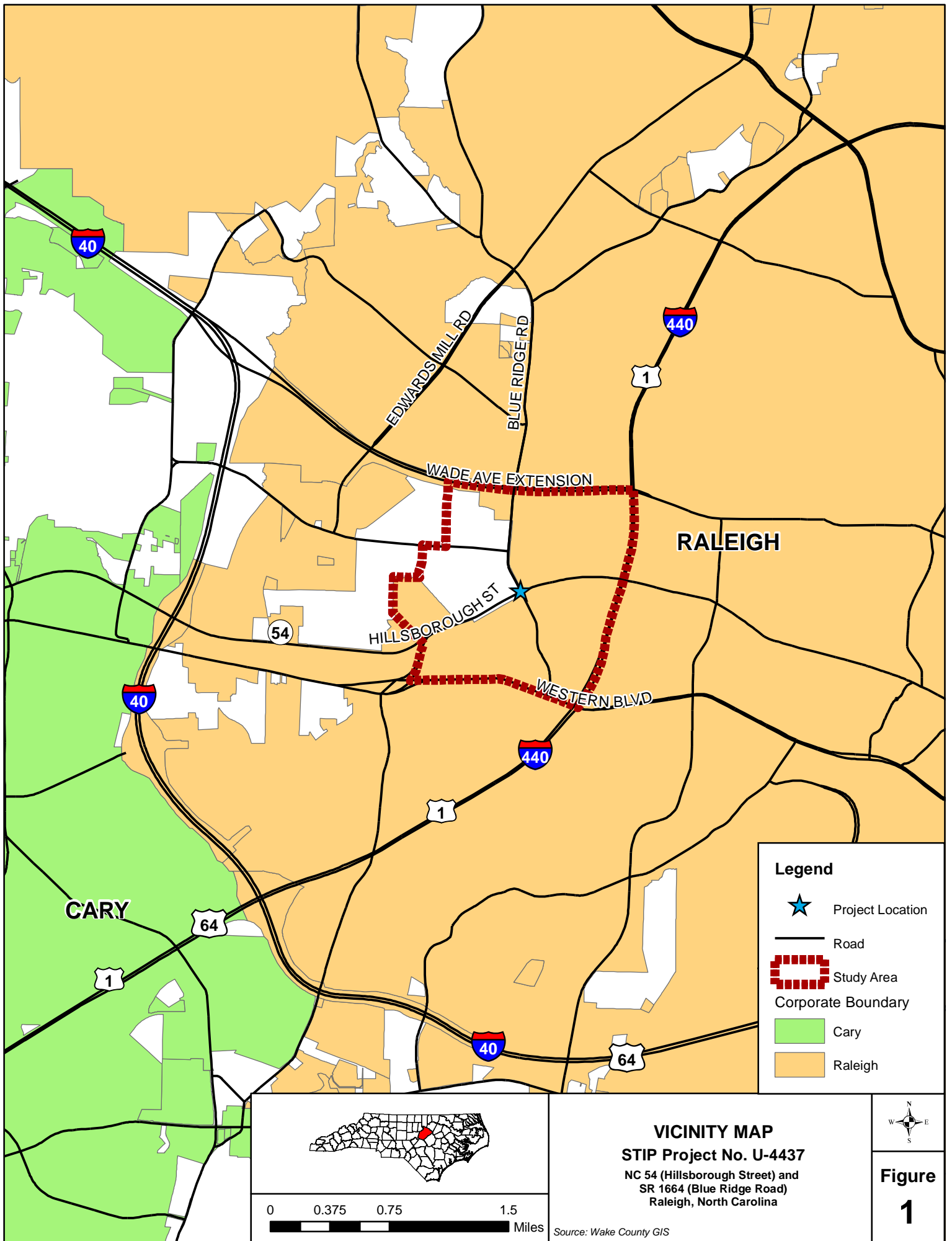
U.S. Census Data. 1990 and 2000. <http://factfinder.census.gov>. Accessed May 2010 and June 2011.

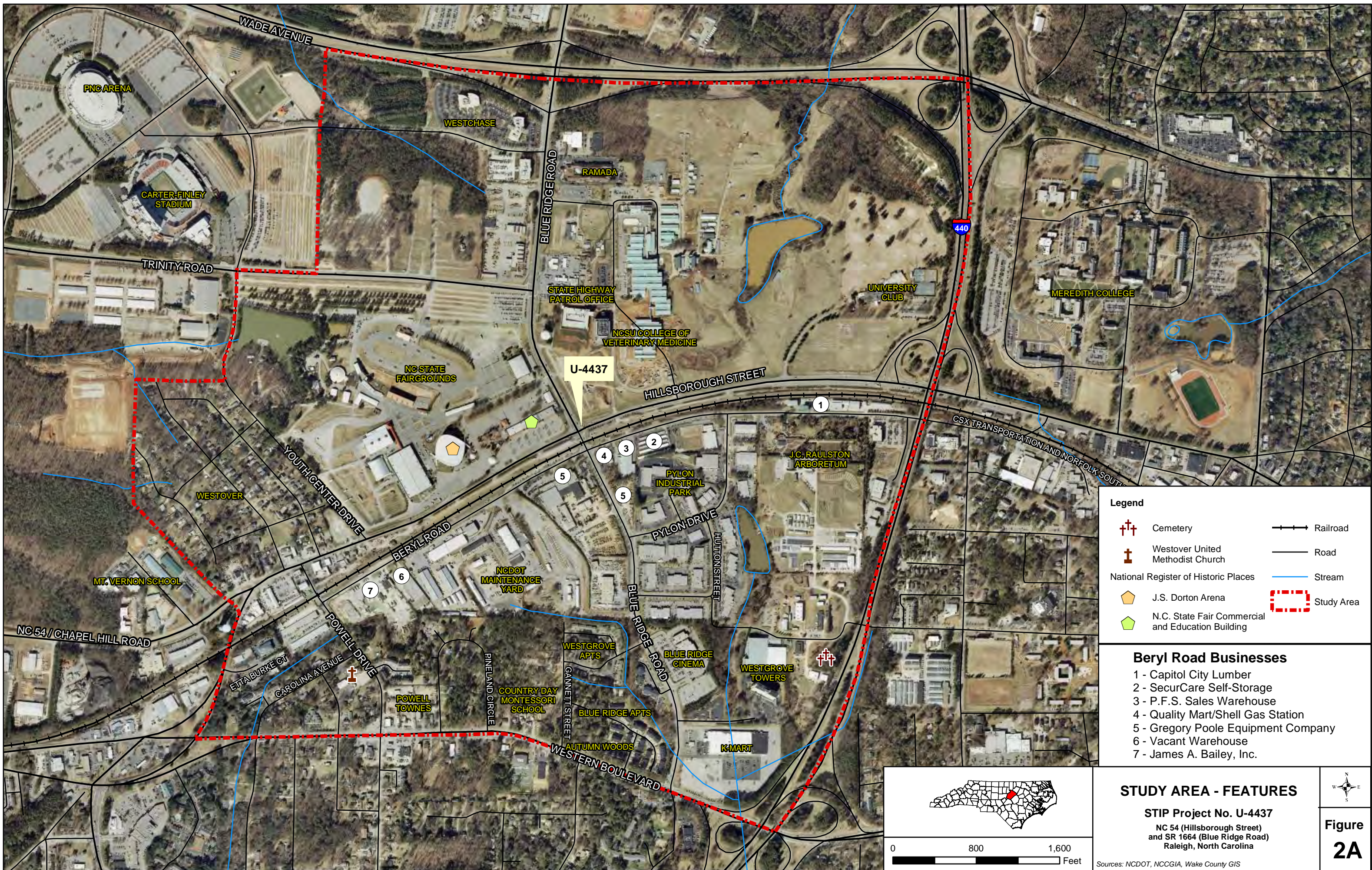
U.S. Census Data. 2010. <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>. Accessed July 2011.

U.S. Fish and Wildlife Service. <http://www.fws.gov/nc-es/es/countyfr.html>. Accessed June 2010.

Wake County Economic Development. 2011. [website] <http://www.raleigh-wake.org/page/major-employers>. Accessed July 2011.

Figures

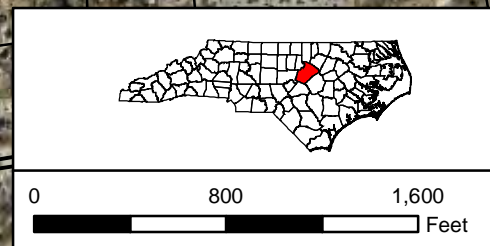




Legend

	Cemetery		Railroad
	Westover United Methodist Church		Road
	National Register of Historic Places		Stream
	J.S. Dorton Arena		Study Area
	N.C. State Fair Commercial and Education Building		

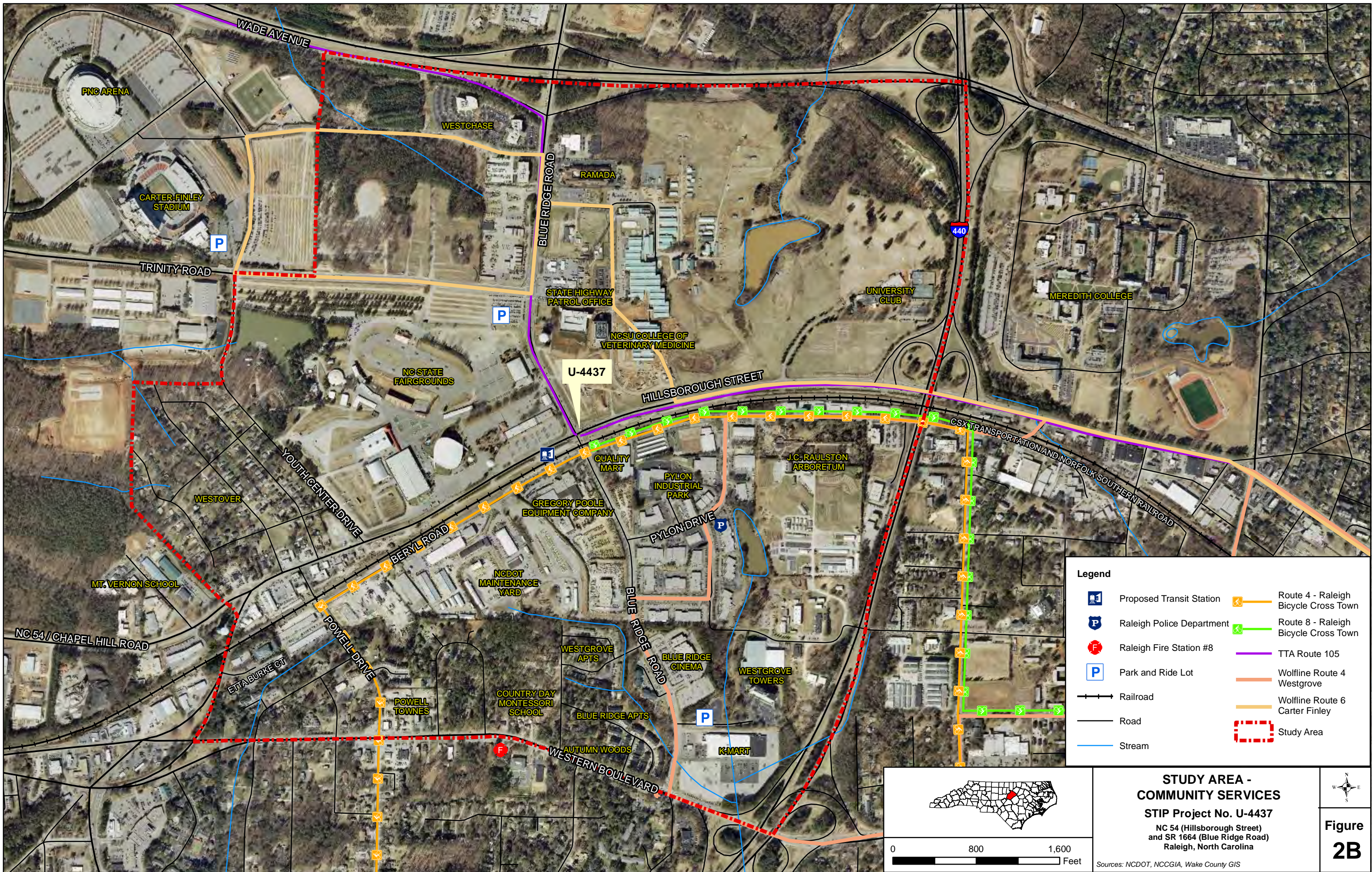
- Beryl Road Businesses**
- 1 - Capitol City Lumber
 - 2 - SecurCare Self-Storage
 - 3 - P.F.S. Sales Warehouse
 - 4 - Quality Mart/Shell Gas Station
 - 5 - Gregory Poole Equipment Company
 - 6 - Vacant Warehouse
 - 7 - James A. Bailey, Inc.



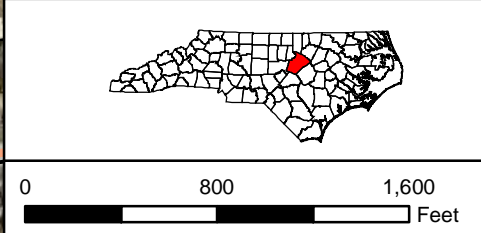
STUDY AREA - FEATURES

STIP Project No. U-4437
 NC 54 (Hillsborough Street)
 and SR 1664 (Blue Ridge Road)
 Raleigh, North Carolina

Sources: NCDOT, NCCGIA, Wake County GIS



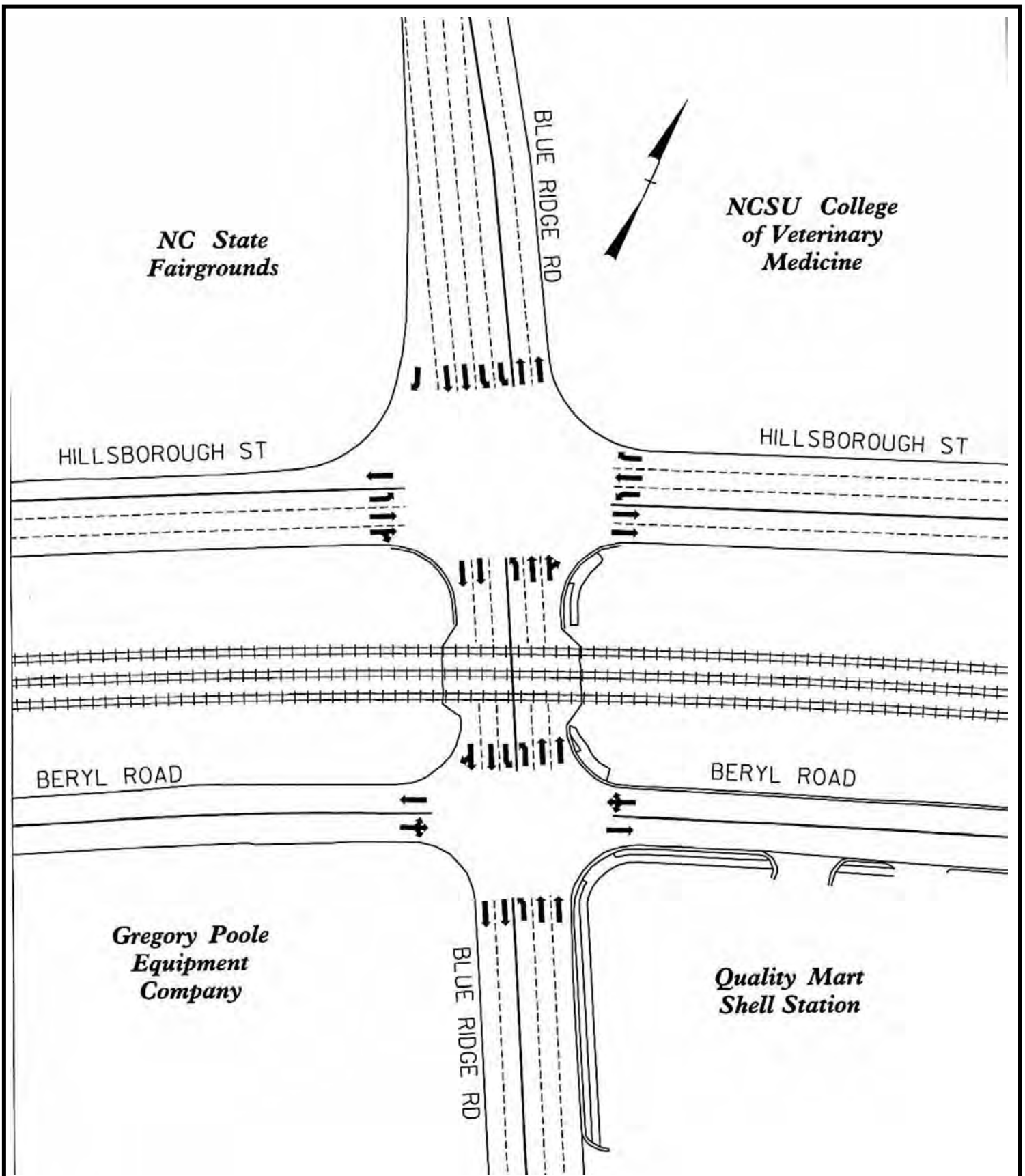
Legend			
	Proposed Transit Station		Route 4 - Raleigh Bicycle Cross Town
	Raleigh Police Department		Route 8 - Raleigh Bicycle Cross Town
	Raleigh Fire Station #8		TTA Route 105
	Park and Ride Lot		Wolfline Route 4 Westgrove
	Railroad		Wolfline Route 6 Carter Finley
	Road		Study Area
	Stream		



STUDY AREA - COMMUNITY SERVICES
STIP Project No. U-4437
 NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
 Raleigh, North Carolina

Sources: NCDOT, NCCGIA, Wake County GIS

Figure 2B



Prepared For:



Note:

Map is not drawn to Scale

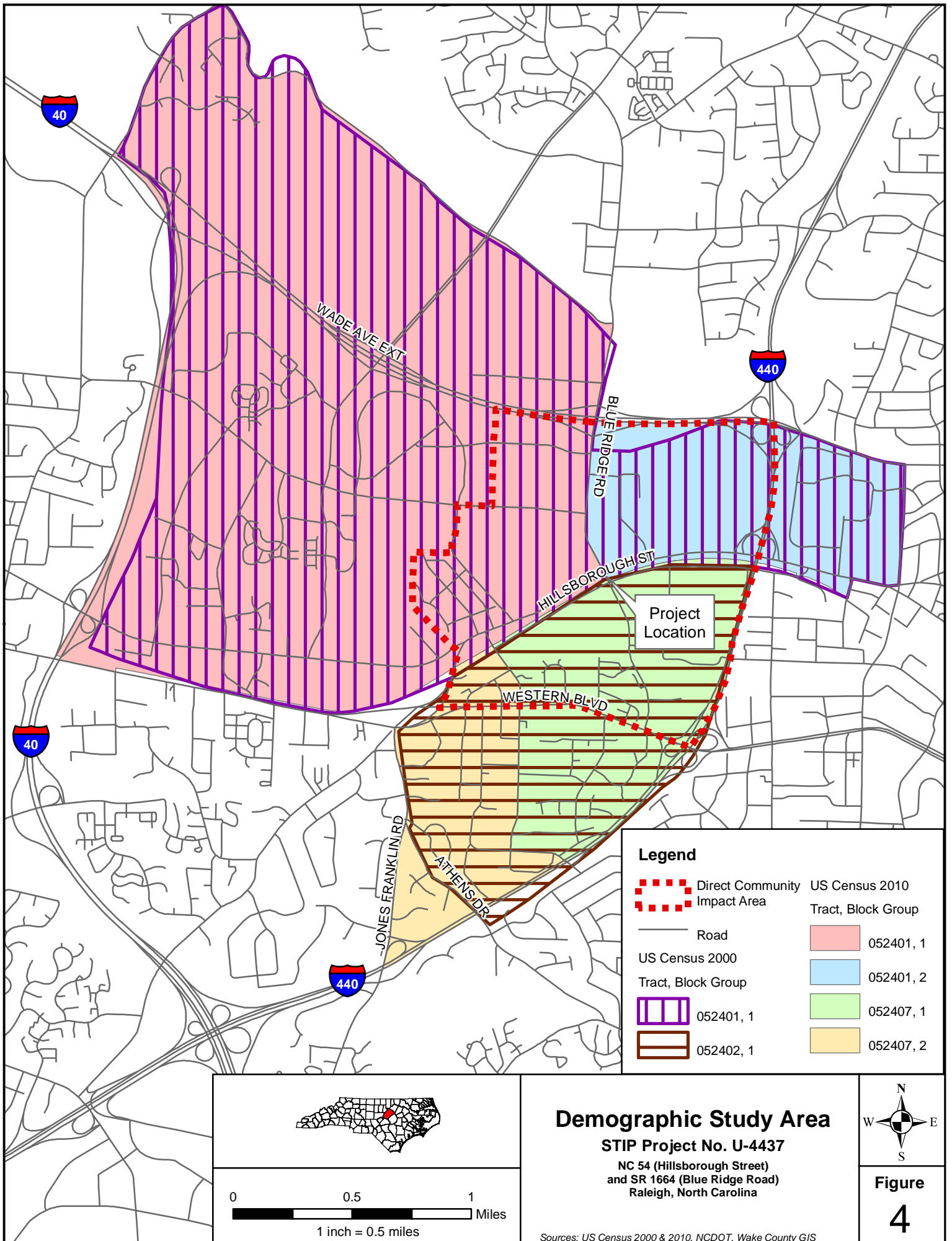
EXISTING PROJECT INTERSECTION

STIP Project No. U-4437

NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

Figure

3



Legend

- Direct Community Impact Area
- Road
- US Census 2000 Tract, Block Group 052401, 1
- US Census 2000 Tract, Block Group 052402, 1
- US Census 2010 Tract, Block Group 052401, 1
- US Census 2010 Tract, Block Group 052401, 2
- US Census 2010 Tract, Block Group 052407, 1
- US Census 2010 Tract, Block Group 052407, 2

Demographic Study Area

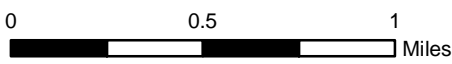
STIP Project No. U-4437

NC 54 (Hillsborough Street)
and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

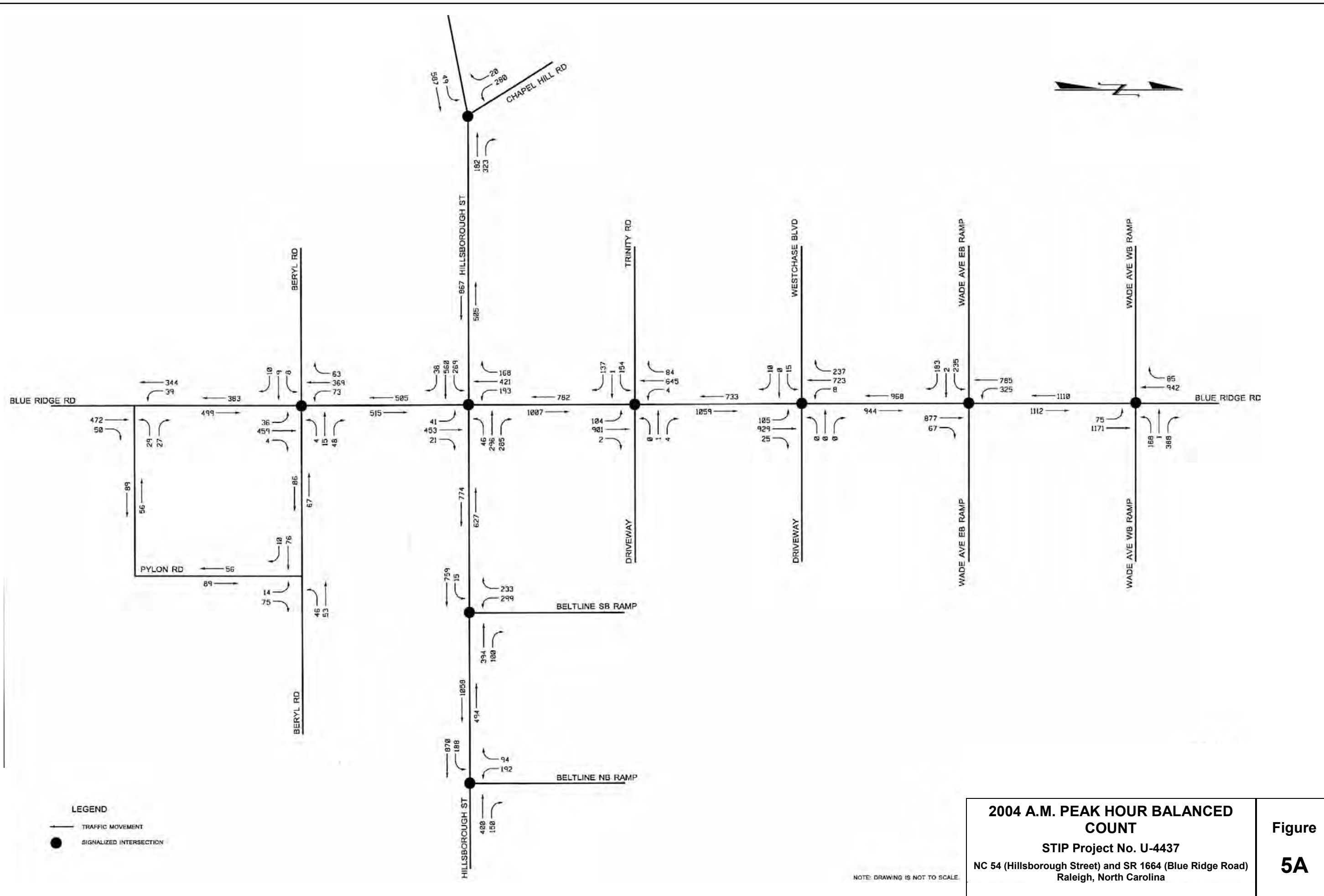


Figure

4

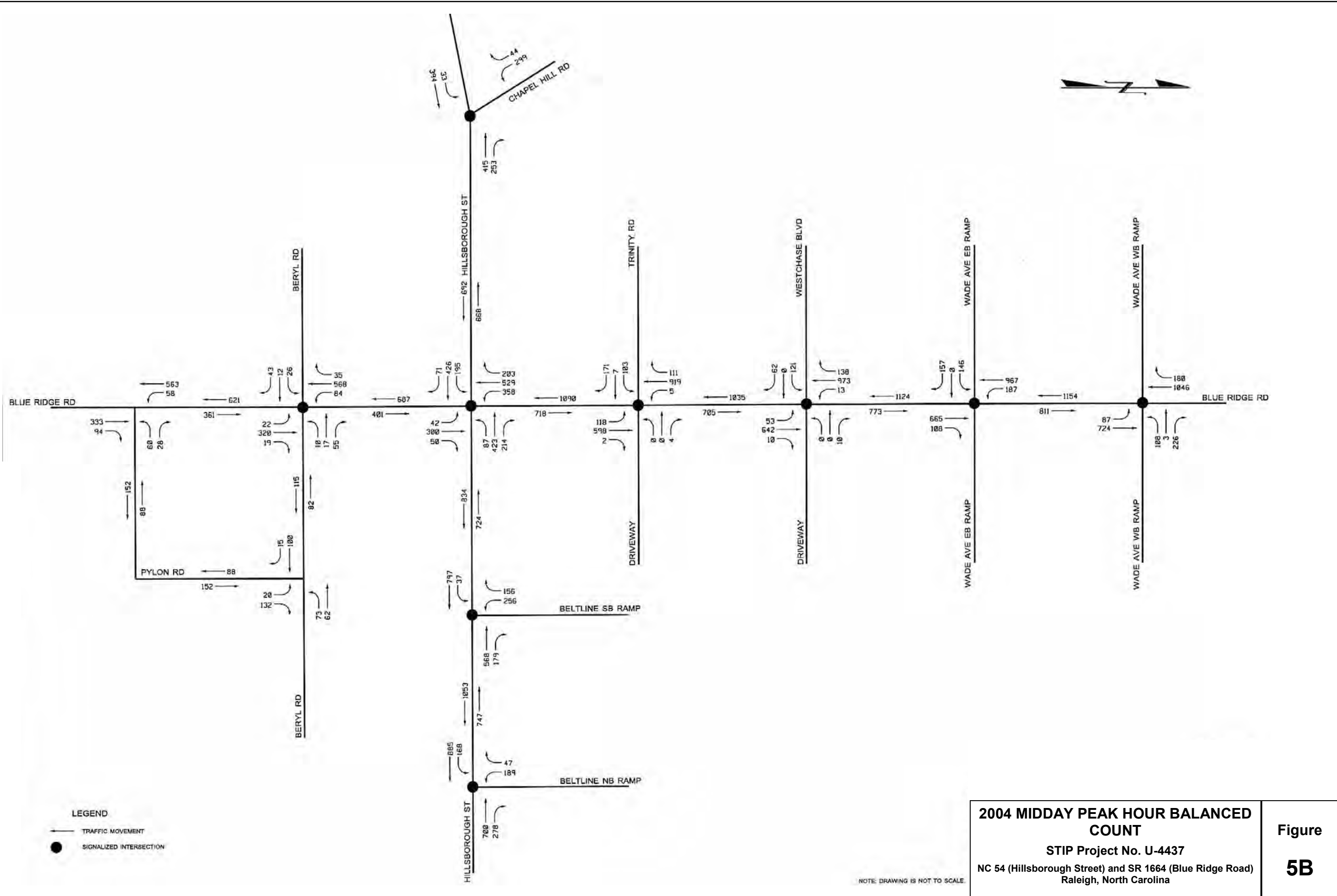


Sources: US Census 2000 & 2010, NCDOT, Wake County GIS



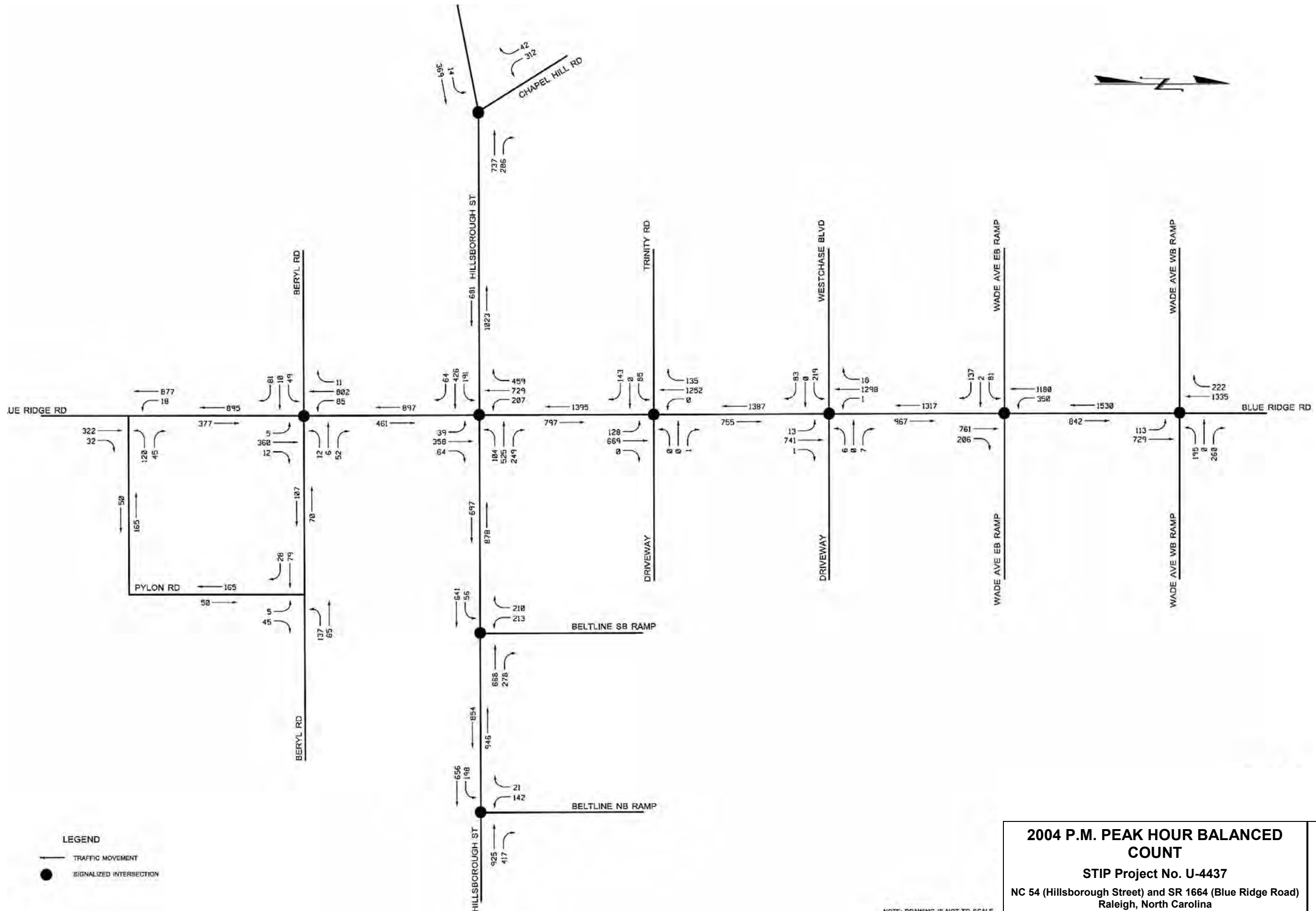
2004 A.M. PEAK HOUR BALANCED COUNT
STIP Project No. U-4437
NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

Figure
5A



2004 MIDDAY PEAK HOUR BALANCED COUNT
STIP Project No. U-4437
NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

Figure
5B



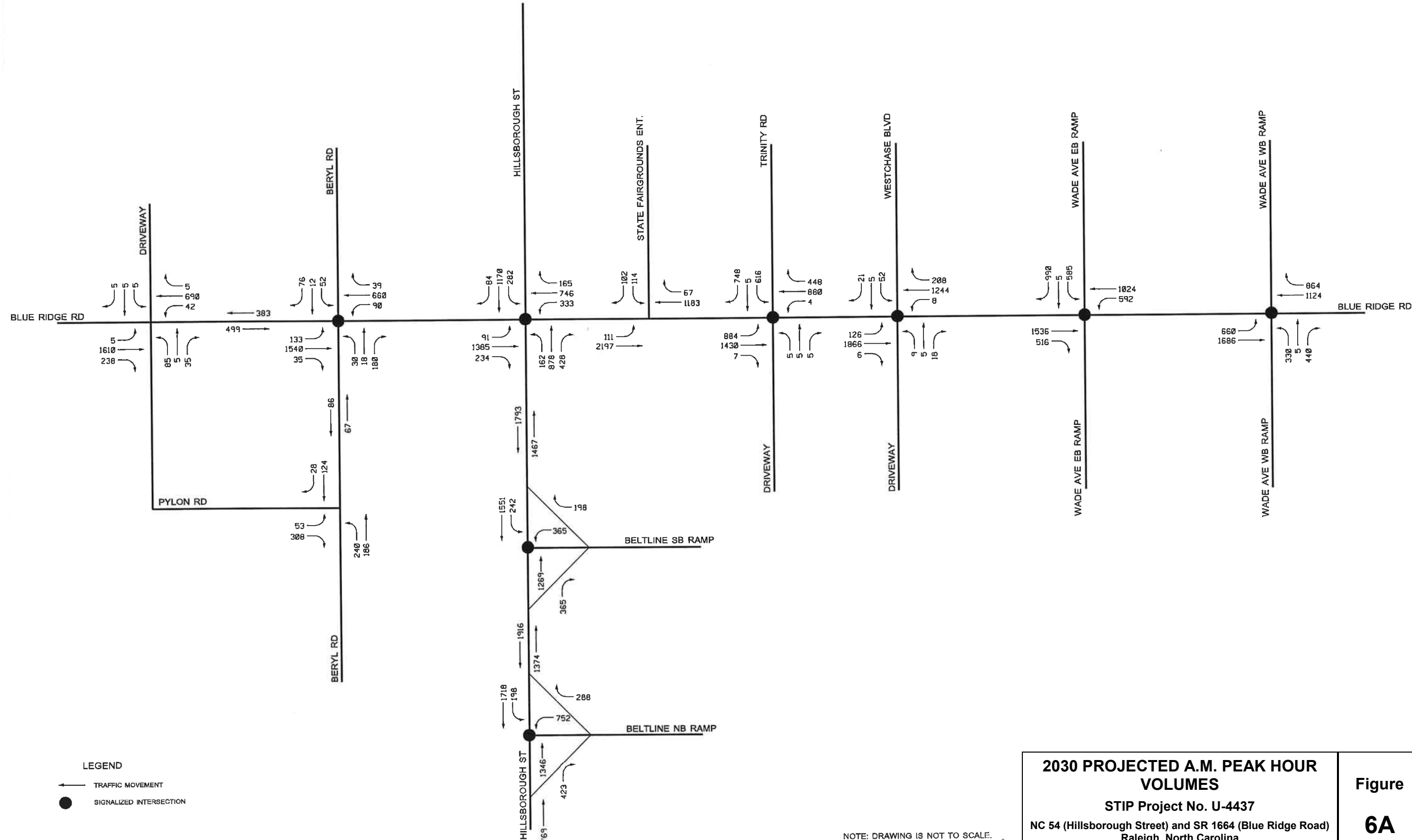
2004 P.M. PEAK HOUR BALANCED COUNT

STIP Project No. U-4437

NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

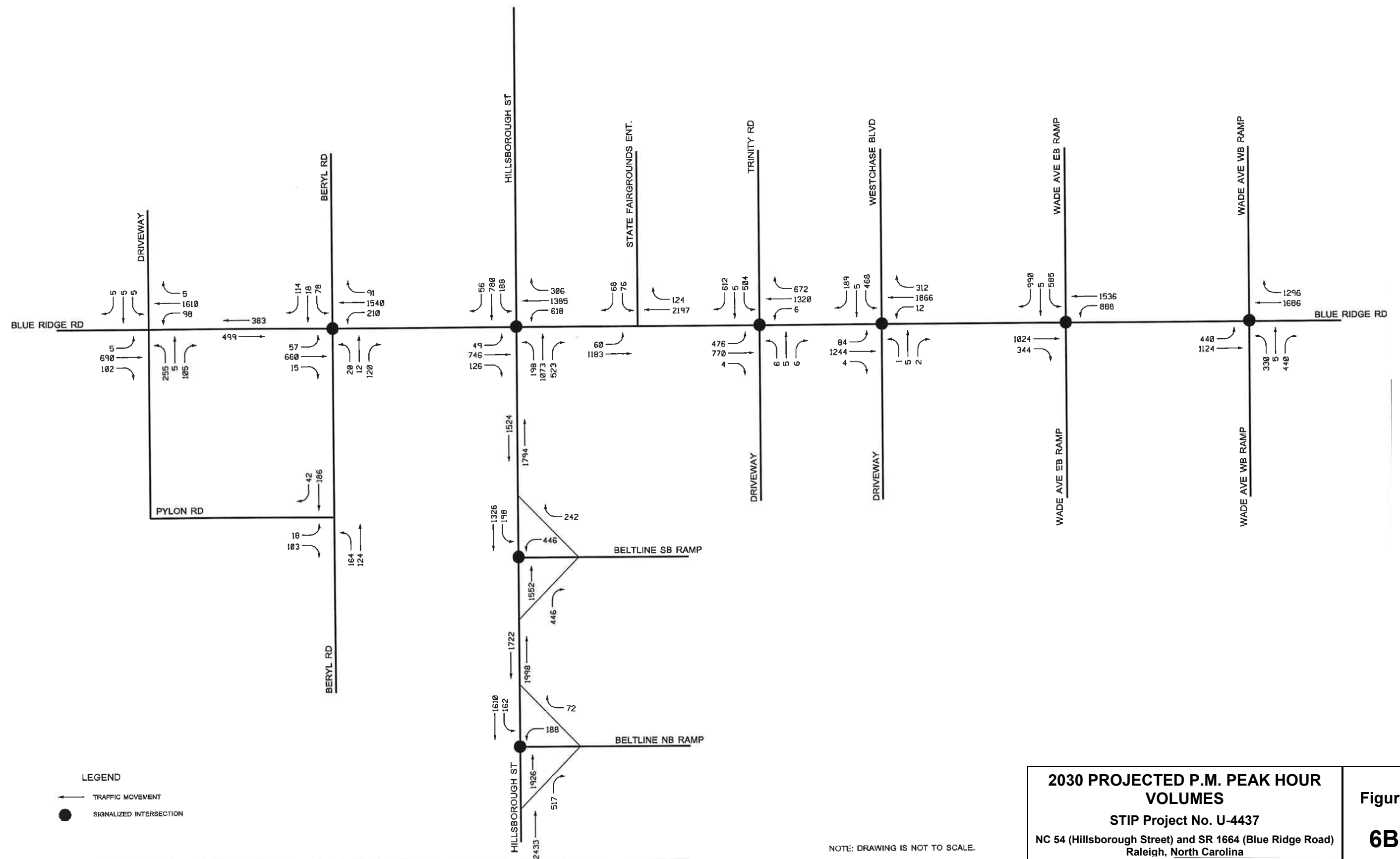
Figure

5C



2030 PROJECTED A.M. PEAK HOUR VOLUMES
STIP Project No. U-4437
NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

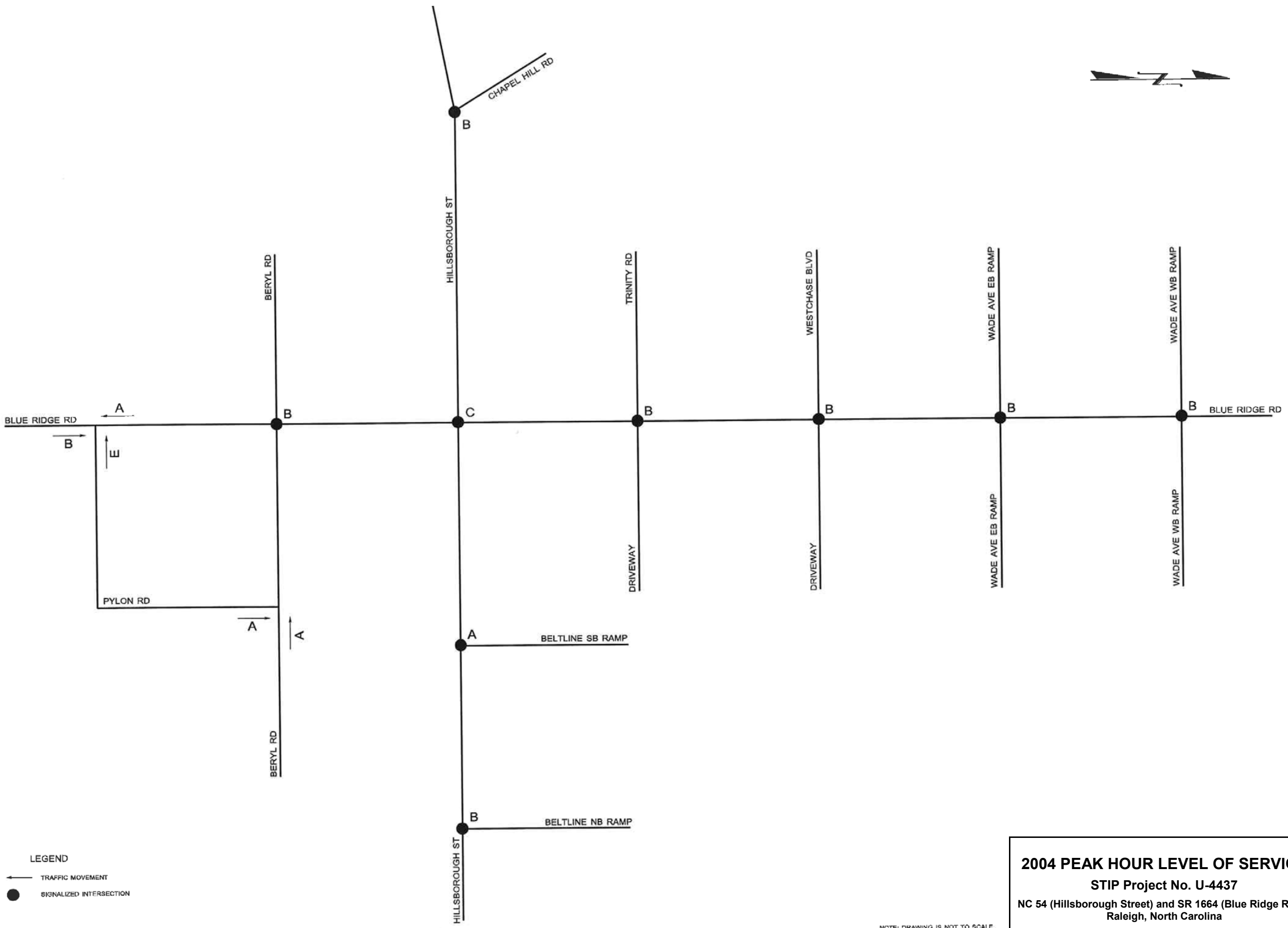
Figure
6A



NOTE: DRAWING IS NOT TO SCALE.

2030 PROJECTED P.M. PEAK HOUR VOLUMES
STIP Project No. U-4437
NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

Figure
6B

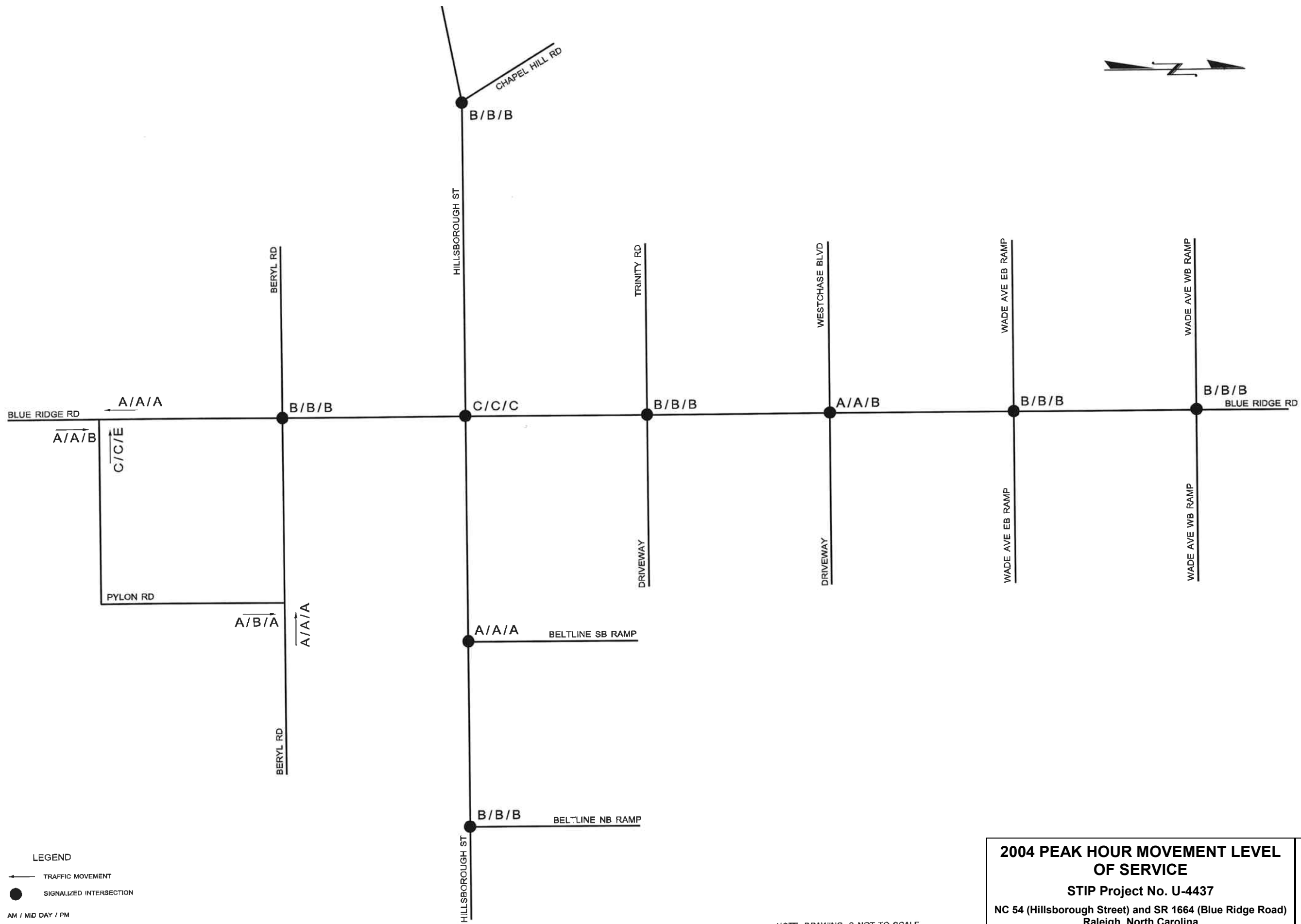


LEGEND
 ← TRAFFIC MOVEMENT
 ● SIGNALIZED INTERSECTION

NOTE: DRAWING IS NOT TO SCALE.

2004 PEAK HOUR LEVEL OF SERVICE
 STIP Project No. U-4437
 NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
 Raleigh, North Carolina

Figure
7A

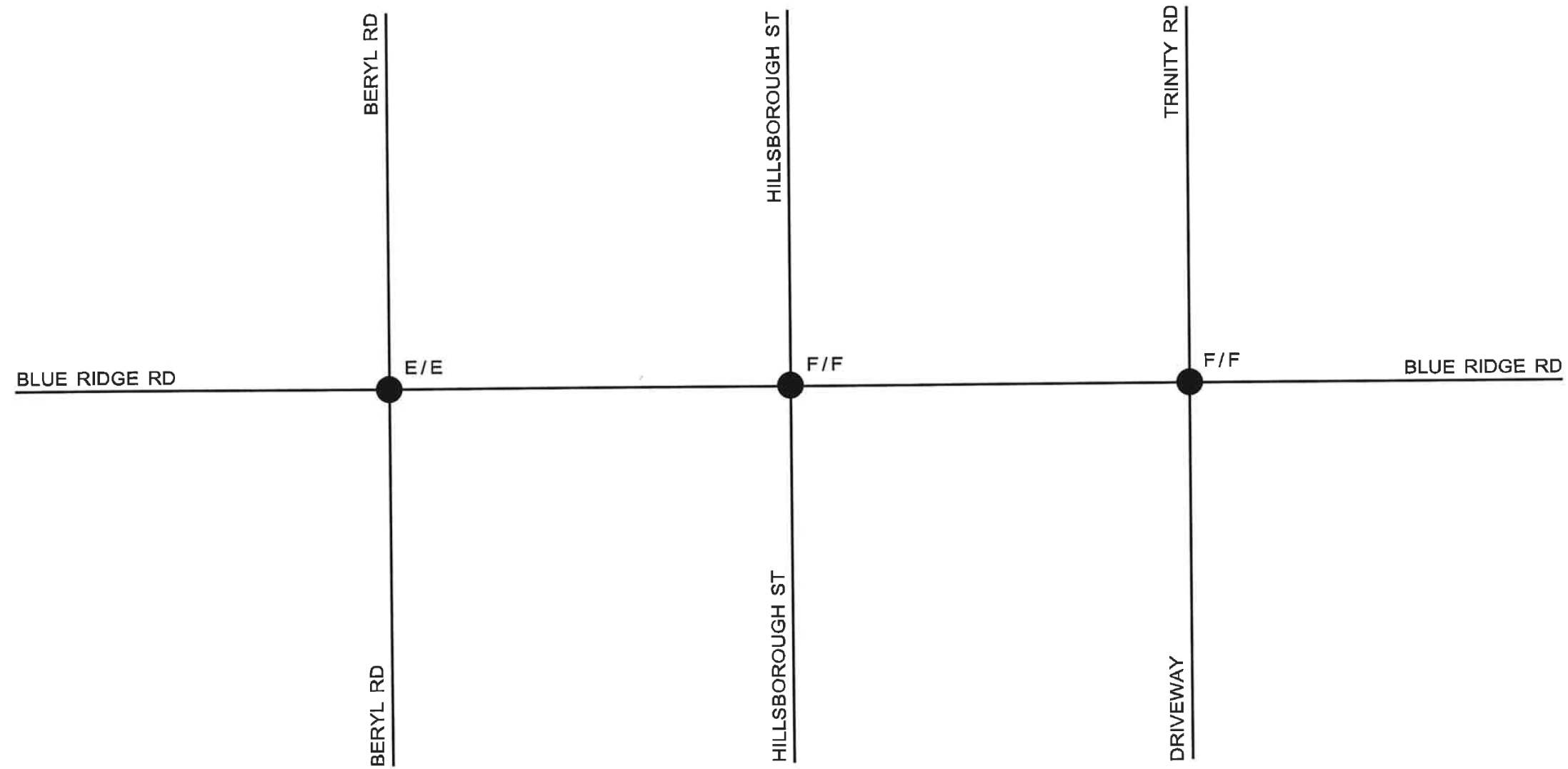


LEGEND
 ← TRAFFIC MOVEMENT
 ● SIGNALIZED INTERSECTION
 AM / MID DAY / PM

NOTE: DRAWING IS NOT TO SCALE.

2004 PEAK HOUR MOVEMENT LEVEL OF SERVICE
 STIP Project No. U-4437
 NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
 Raleigh, North Carolina

Figure
7B

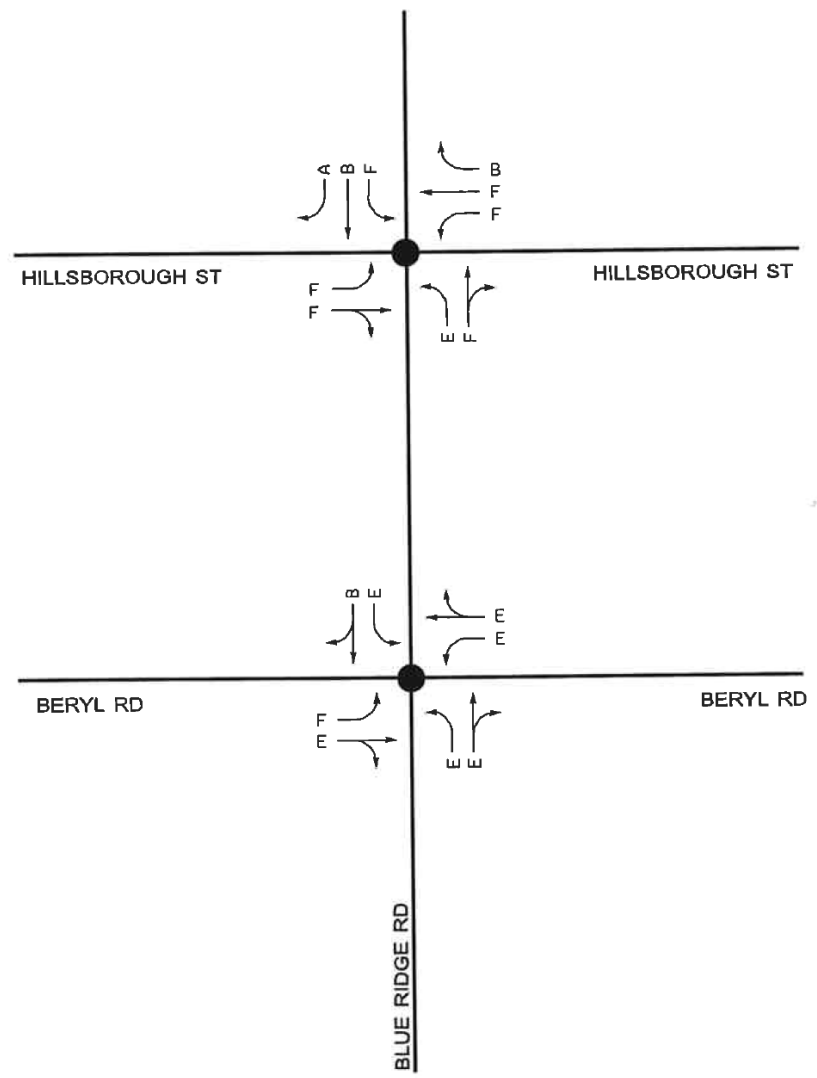


- LEGEND
- ← TRAFFIC MOVEMENT
 - SIGNALIZED INTERSECTION
 - E / E AM/PM PEAK HOUR LEVEL OF SERVICE

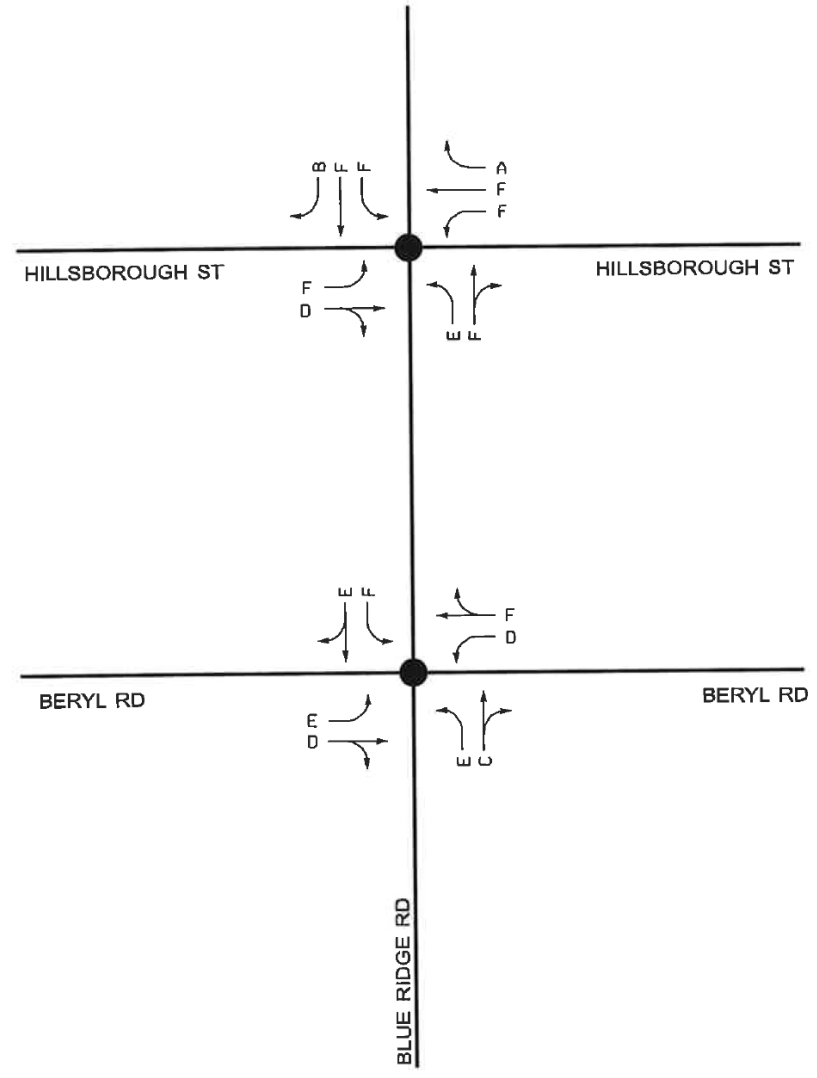
NOTE: DRAWING IS NOT TO SCALE

2030 PEAK HOUR LEVEL OF SERVICE
STIP Project No. U-4437
NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

Figure
8A



AM



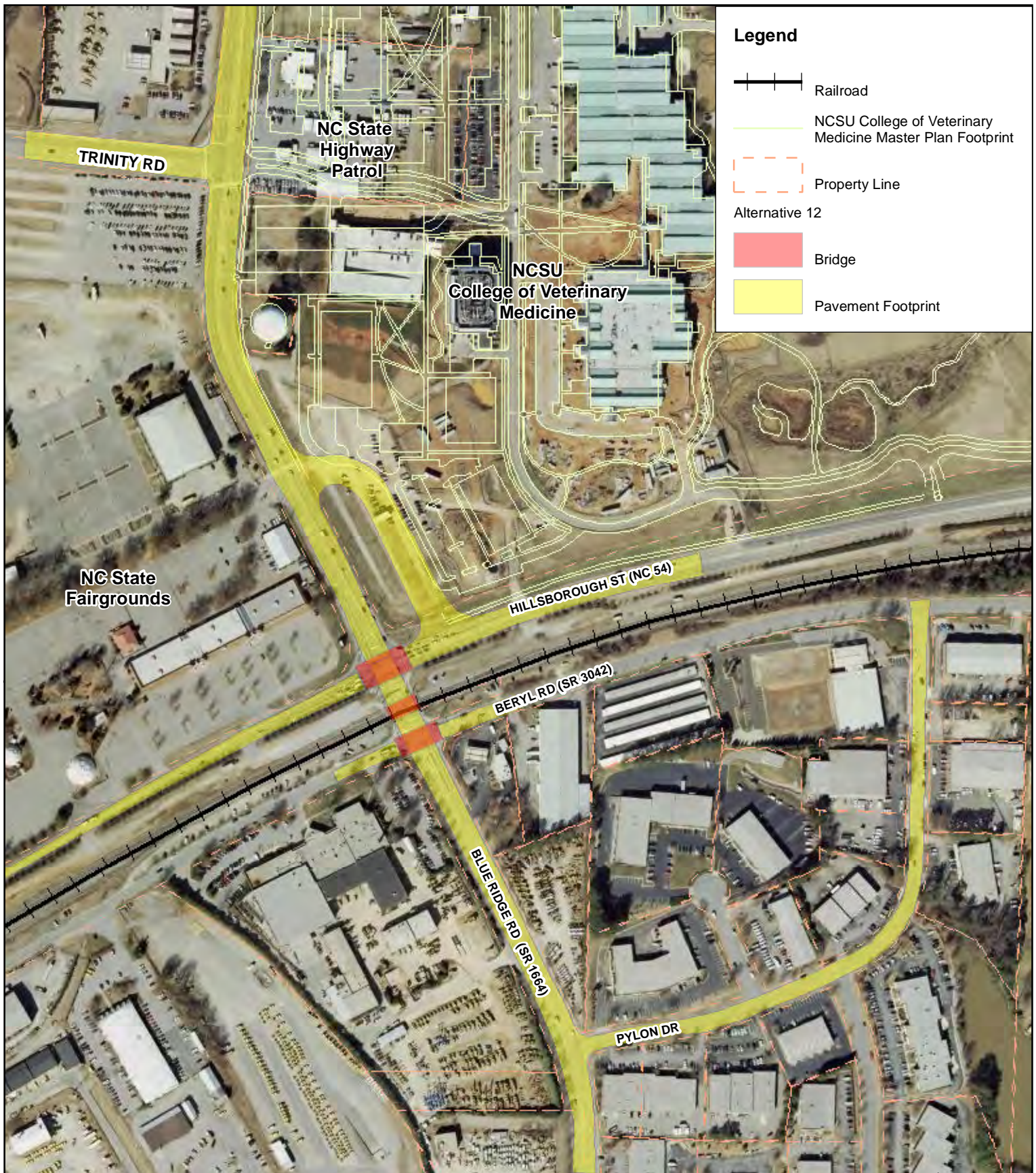
PM

- LEGEND**
- ← TRAFFIC MOVEMENT
 - SIGNALIZED INTERSECTION
 - E/E AM/PM PEAK HOUR LEVEL OF SERVICE






NOTE: DRAWING IS NOT TO SCALE.

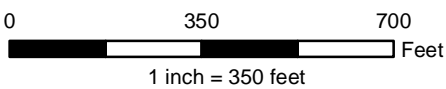
2030 PEAK HOUR MOVEMENT LEVEL OF SERVICE
STIP Project No. U-4437
NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

Figure 8B



Legend

-  Railroad
-  NCSU College of Veterinary Medicine Master Plan Footprint
-  Property Line
- Alternative 12**
-  Bridge
-  Pavement Footprint



Alternative 12
STIP Project No. U-4437
 NC 54 (Hillsborough Street)
 and SR 1664 (Blue Ridge Road)
 Raleigh, North Carolina



Figure
9

Sources: NCDOT, Wake County GIS, NCSU Dept of Veterinary Medicine

View East



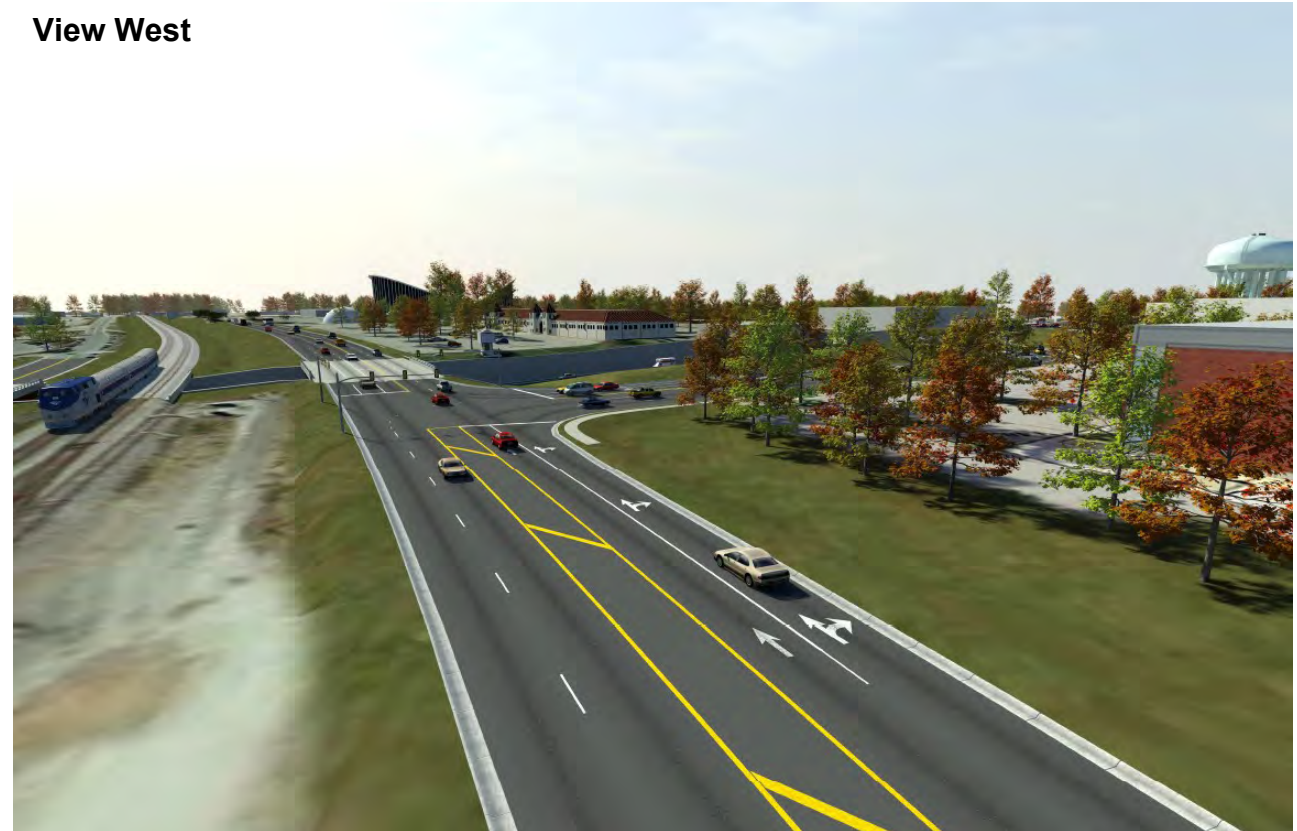
View South



View North



View West

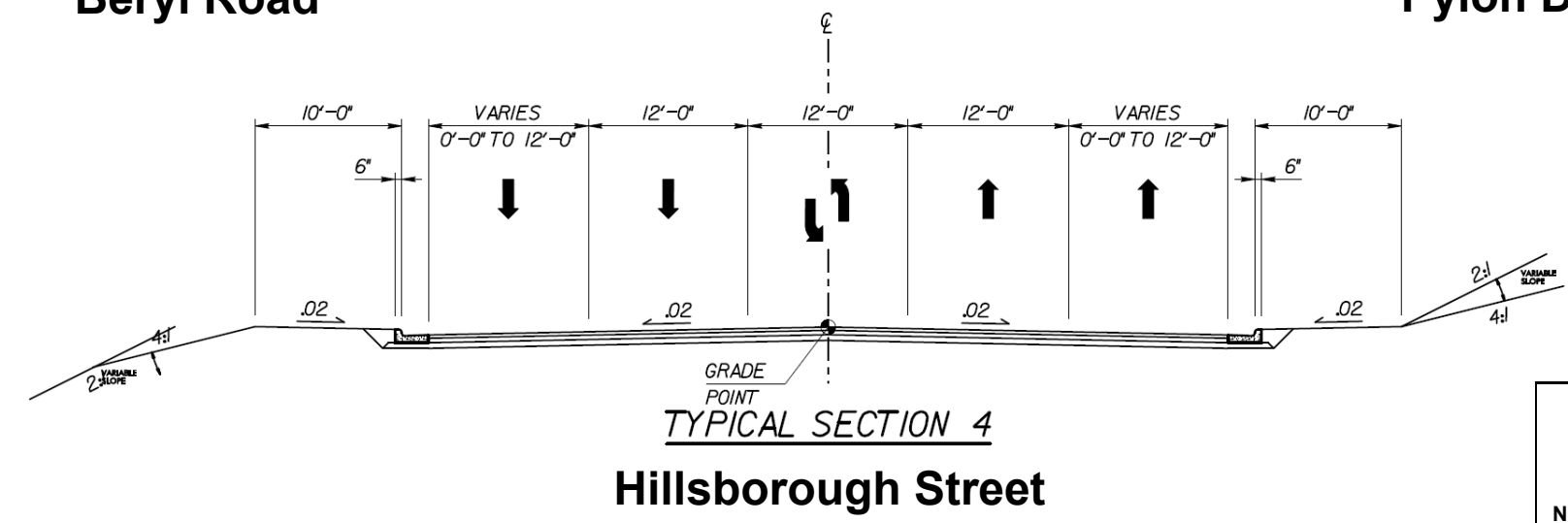
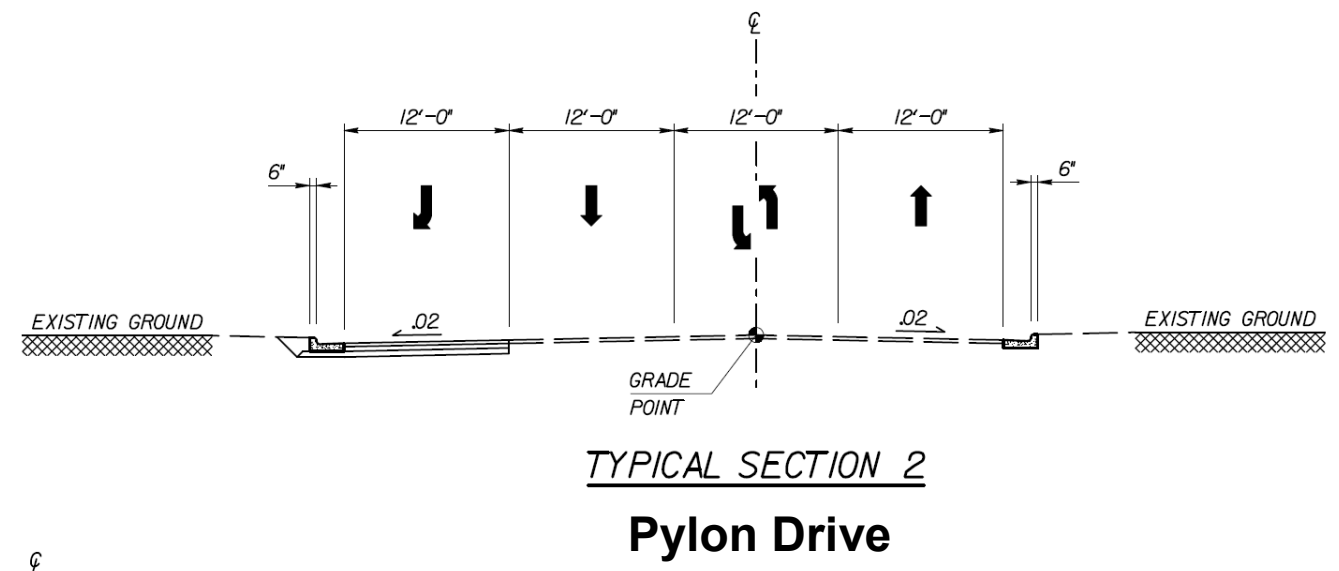
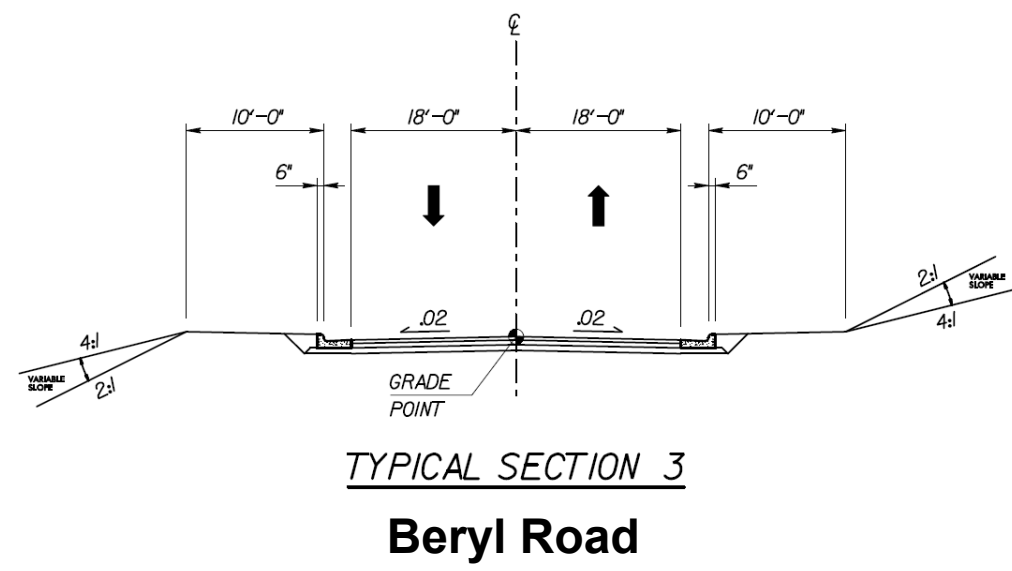
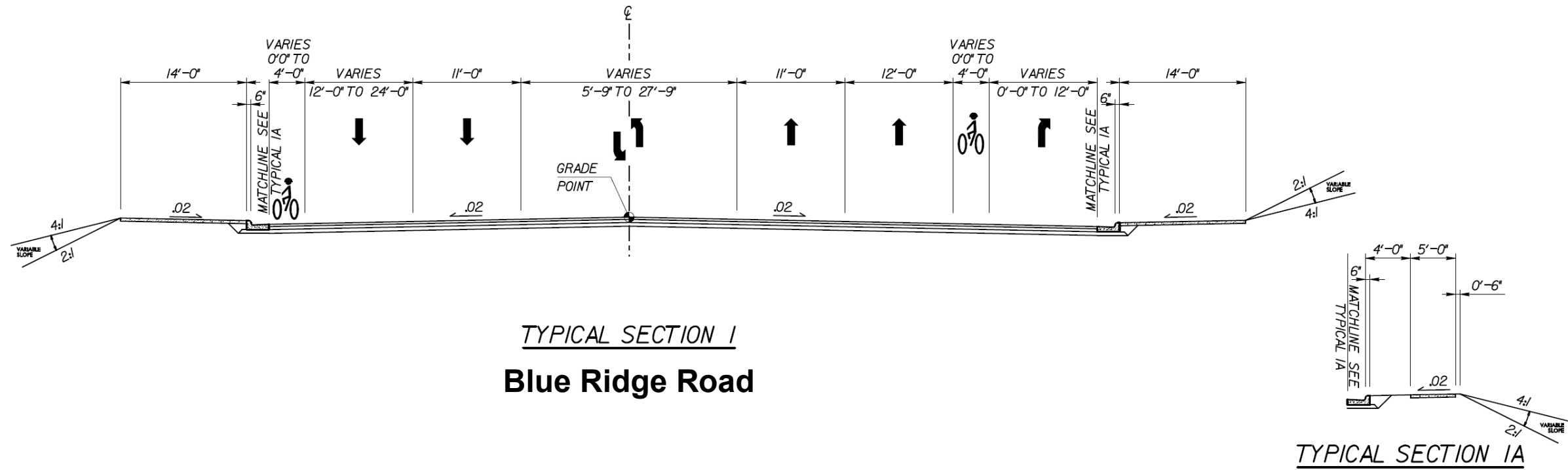


ALTERNATIVE 12 VISUALIZATIONS
STIP Project No. U-4437
NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

Source: NCDOT, May 2011

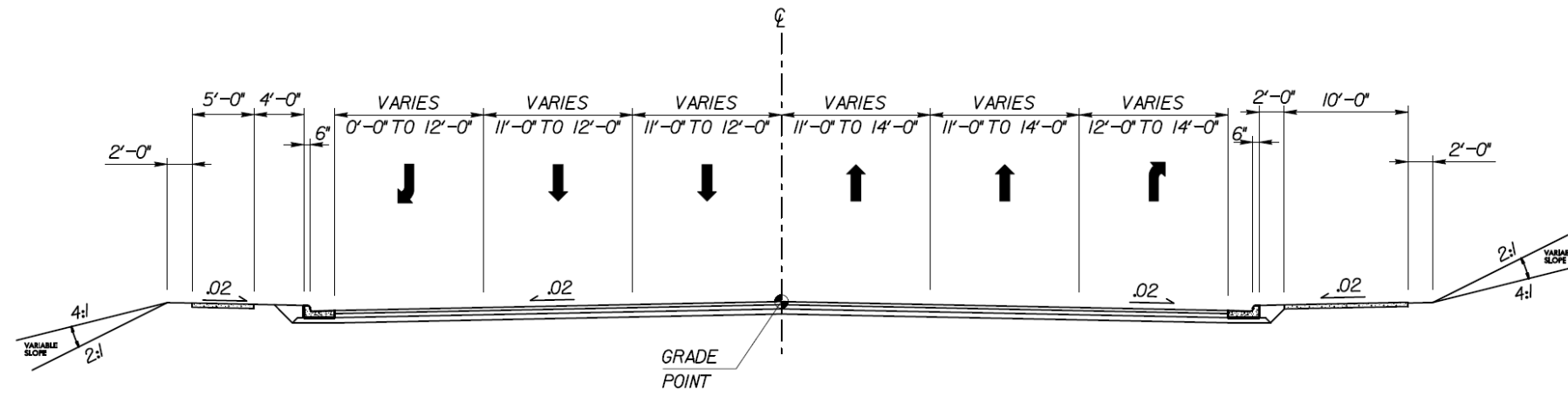
Figure

10

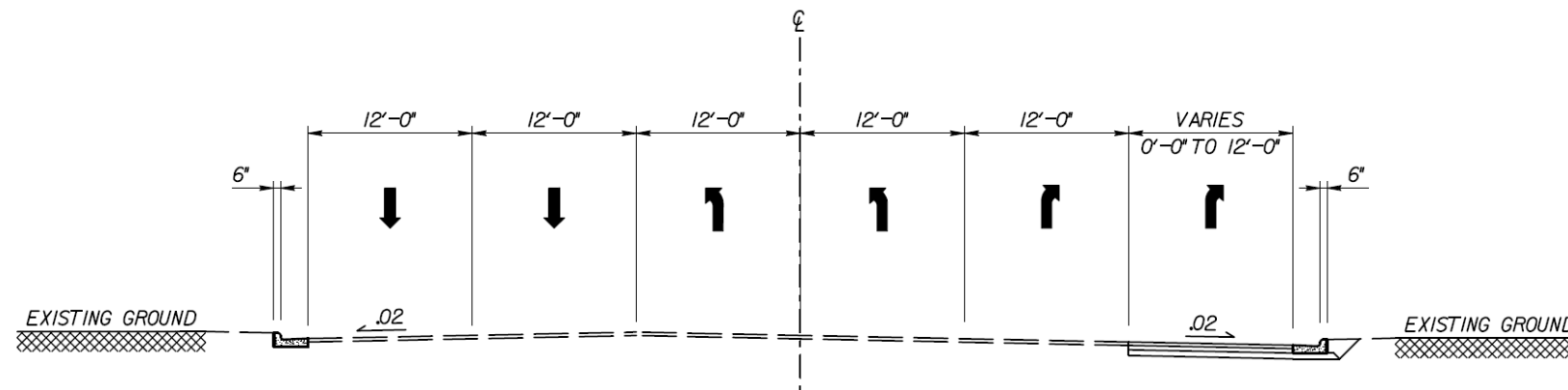


TYPICAL SECTIONS
STIP Project No. U-4437
NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina
Source: STV

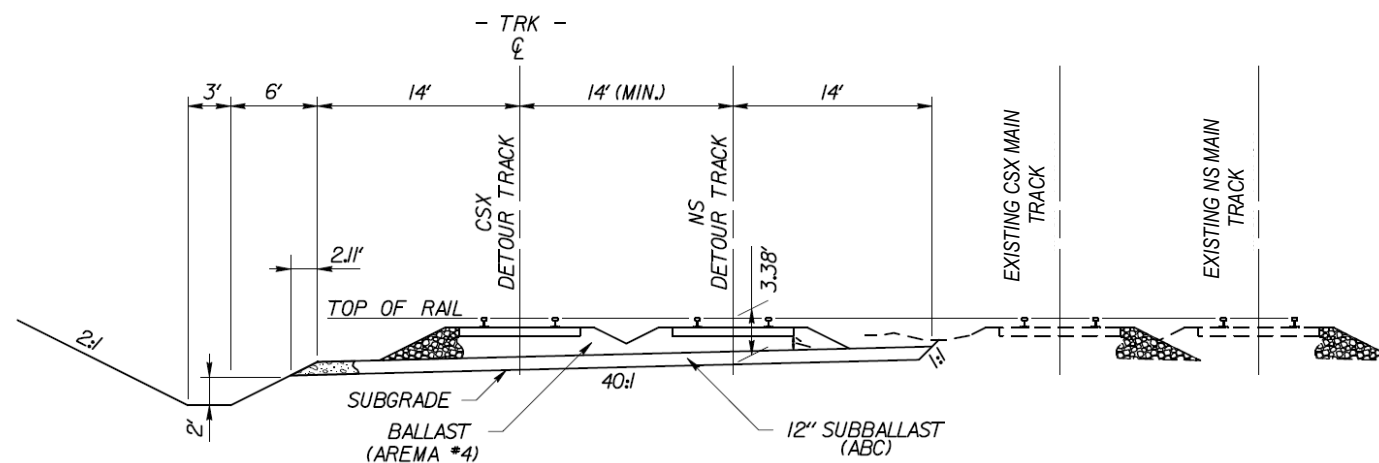
Figure
11A



TYPICAL SECTION 5
Connector Road



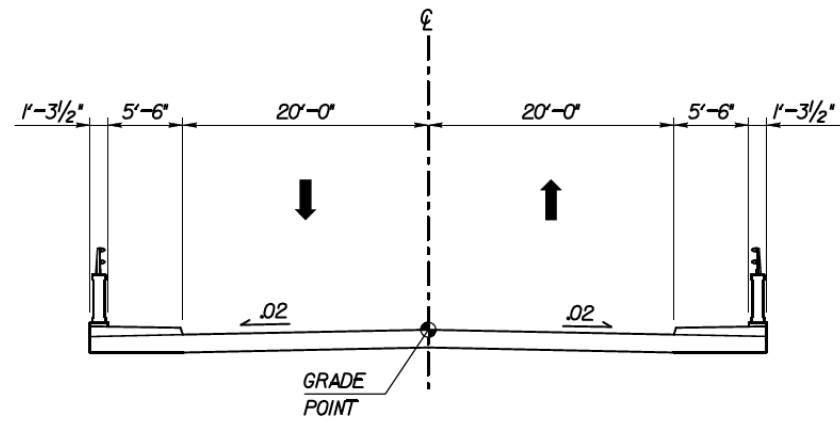
TYPICAL SECTION 6
Trinity Road



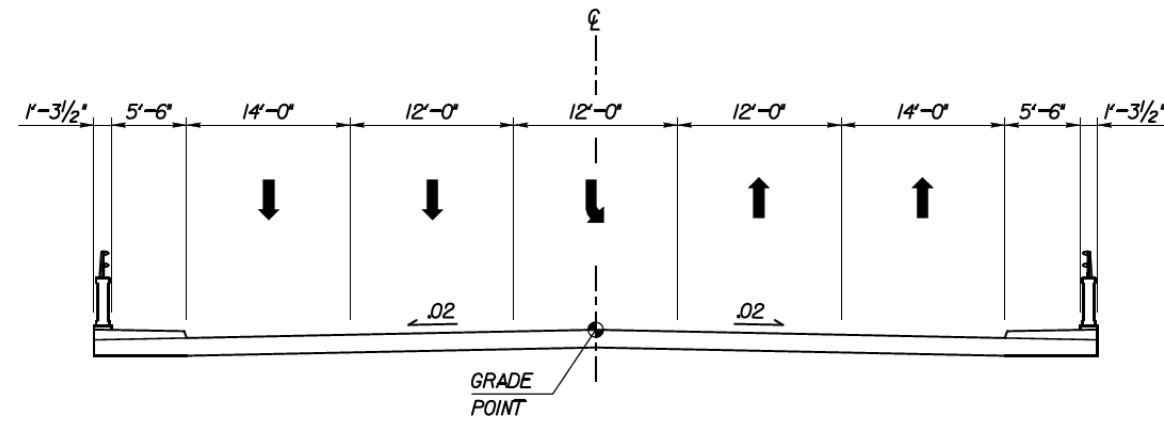
TYPICAL ROADBED SECTION 7
Railroad Corridor

TYPICAL SECTIONS
STIP Project No. U-4437
NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina
Source: STV

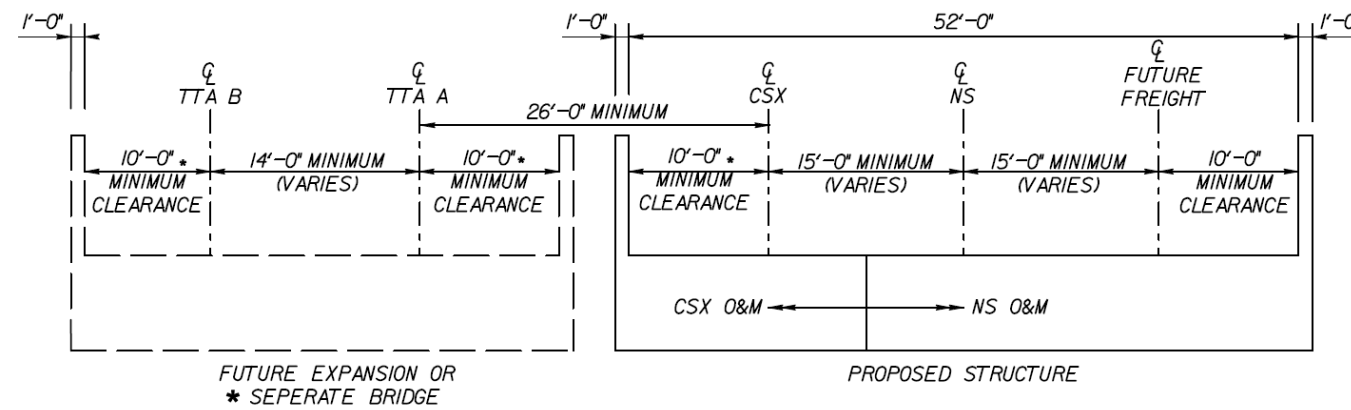
Figure
11B



TYPICAL SECTION 8
Beryl Road Bridge

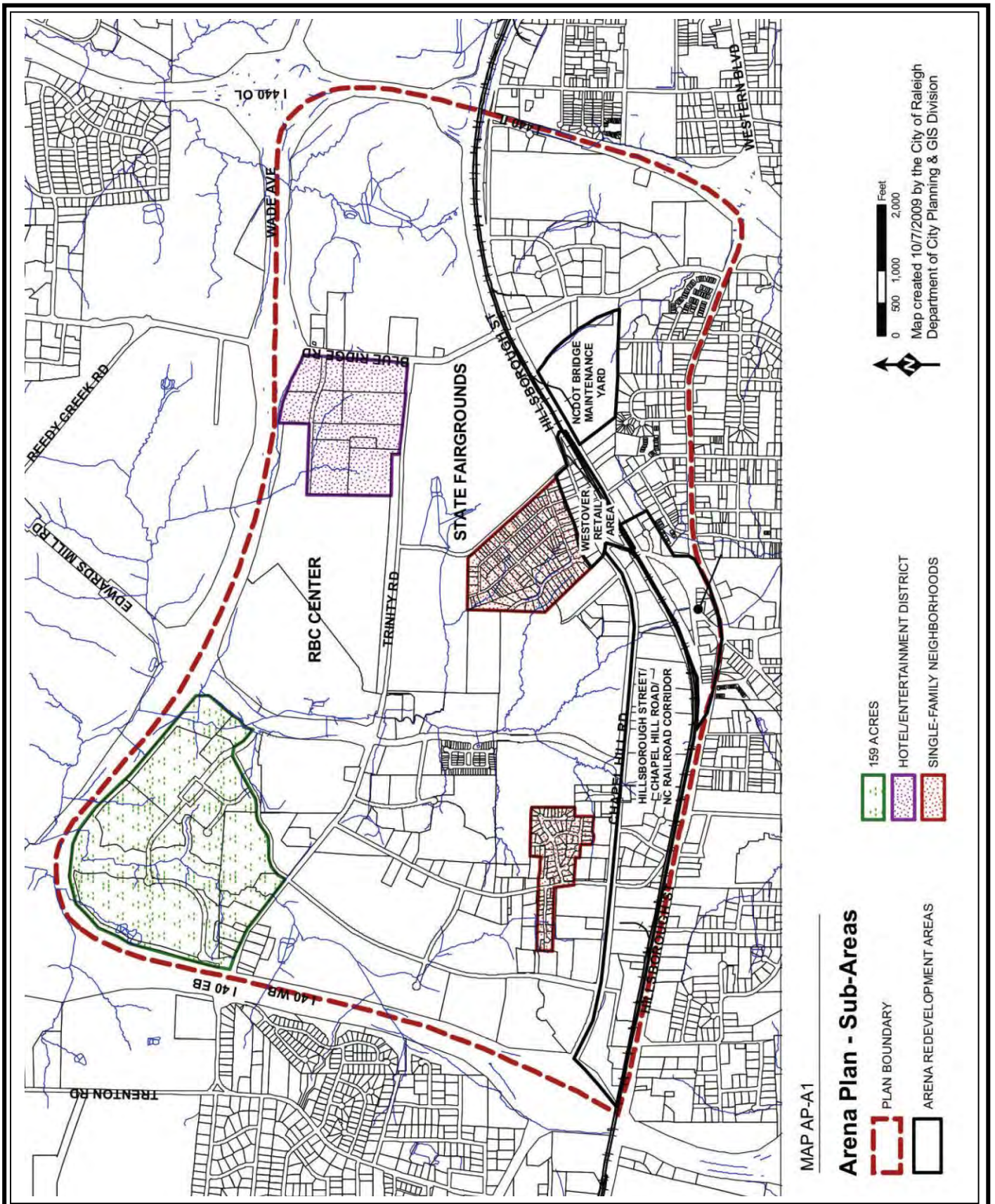


TYPICAL SECTION 9
Hillsborough Street Bridge



TYPICAL SECTION 10
Railroad Bridge

<p>TYPICAL SECTIONS STIP Project No. U-4437 NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road) Raleigh, North Carolina</p>	<p>Figure 11C</p>
<p>Source: STV</p>	



Prepared For:



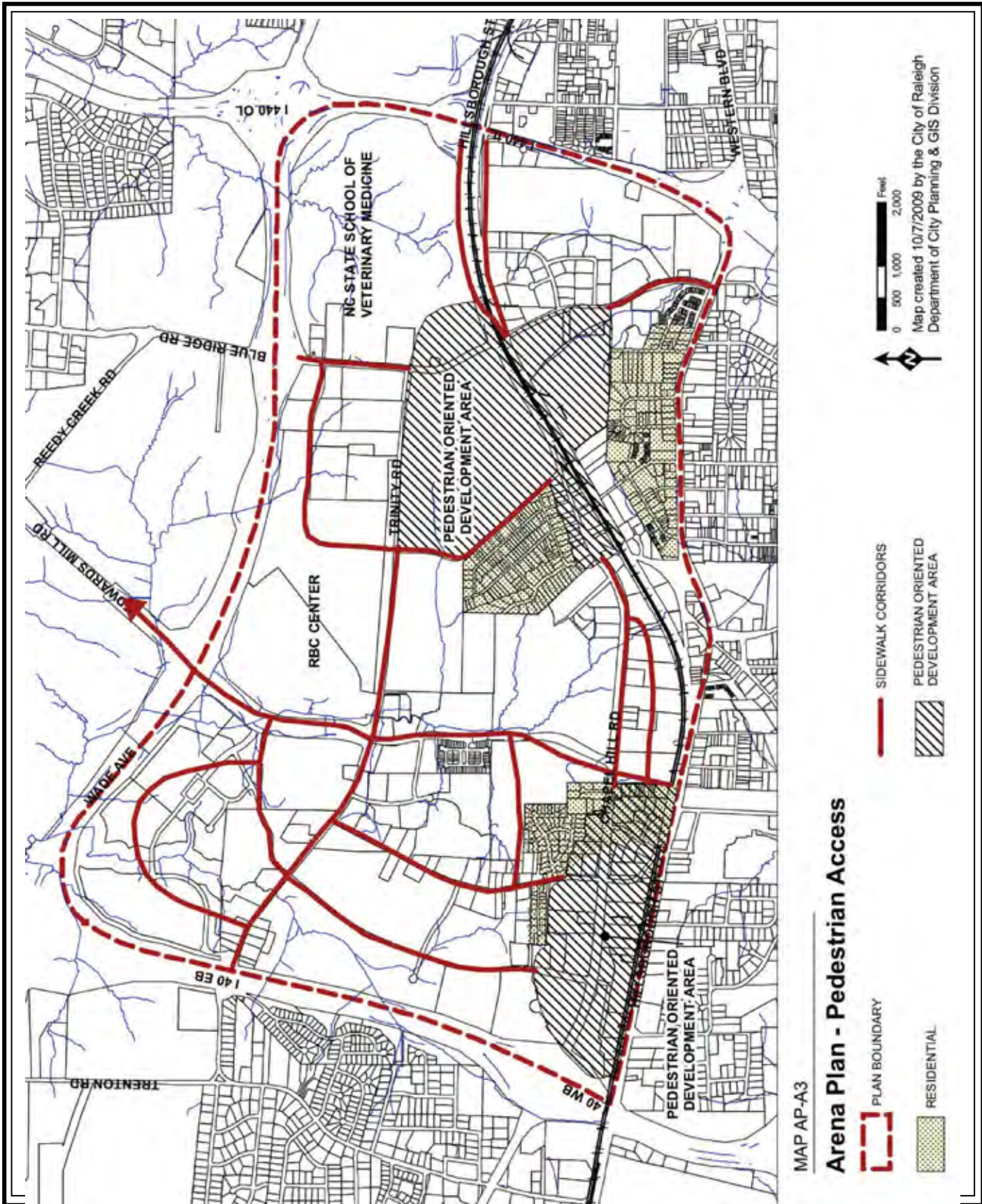
Source:
Raleigh
Comprehensive
Plan 11/2009

ARENA PLAN – Sub-Areas
STIP Project No. U-4437

NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

Figure

12A



MAP AP-A3

Arena Plan - Pedestrian Access

-  PLAN BOUNDARY
-  SIDEWALK CORRIDORS
-  PEDESTRIAN ORIENTED DEVELOPMENT AREA
-  RESIDENTIAL

0 500 1,000 2,000 Feet



Map created 10/7/2009 by the City of Raleigh
Department of City Planning & GIS Division

Prepared For:



Source:
Raleigh
Comprehensive
Plan 11/2009

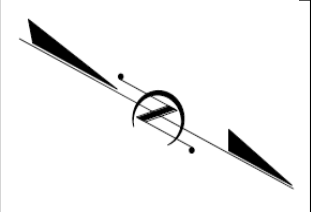
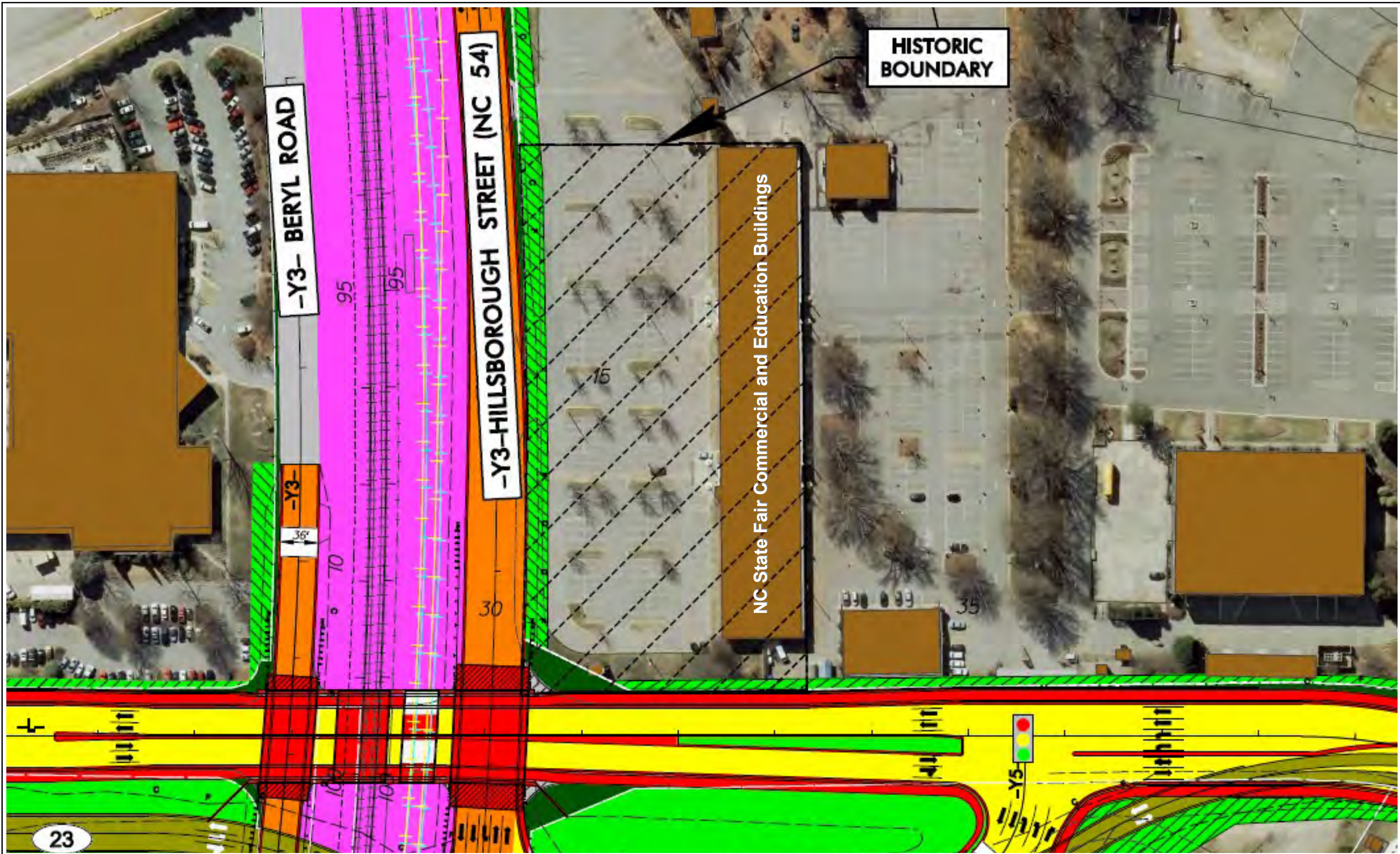
ARENA PLAN – Pedestrian Access

STIP Project No. U-4437

NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
Raleigh, North Carolina

Figure

12B



LEGEND	
	Proposed Traffic Signal
	Historic Property Boundary
	Buildings
	Existing Right of Way
	Proposed Right of Way
	Proposed Easements
	Existing Roadway
	Existing Roadway to be Resurfaced
	Proposed Roadway
	Temporary Roadway (subject to change)
	Proposed Structures
	Railroad Right of Way

HISTORIC PROPERTY RIGHT OF WAY IMPACT
 STIP Project No. U-4437
 NC 54 (Hillsborough Street) and SR 1664 (Blue Ridge Road)
 Raleigh, North Carolina
 Source: STV

Figure
13

Appendix A

Agency Comments

Appendix B

Historic Resources Coordination

Appendix C

Relocation Report

Appendix D

Public Involvement

