NC 68 HAZARD ELIMINATION IMPROVEMENTS

From South of SR 2111 (East Harrell Road) to
North of SR 4831 (Bartonshire Drive)
Guilford County, North Carolina

WBS ELEMENT – 41877.1.1
FEDERAL AID PROJECT NO.: STP-0068(10)
TIP PROJECT NO. W-5114

ADMINISTRATIVE ACTION
CATEGORICAL EXCLUSION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
N.C. DEPARTMENT OF TRANSPORTATION
submitted pursuant to the National Environmental Policy Act 42 USC 4332(2)(c)

APPROVED:

11/2/12
Date

FOR Gregory J. Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Unit

11/5/12
Date

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

NC 68 HAZARD ELIMINATION IMPROVEMENTS

FROM SOUTH OF SR 2111 (EAST HARRELL ROAD) TO
NORTH OF SR 4831 (BARTONSHIRE DRIVE)
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OCTOBER 2012

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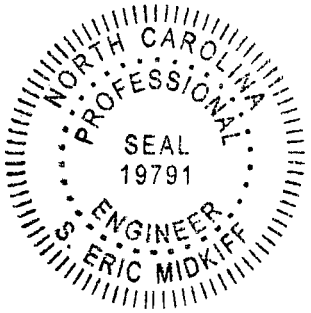

PROJECT COMMITMENTS

NC 68 HAZARD ELIMINATION IMPROVEMENTS
FROM SOUTH OF SR 2111 (EAST HARRELL ROAD) TO NORTH OF
SR 4831 (BARTONSHIRE DRIVE)
GUILFORD COUNTY, NORTH CAROLINA
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Highway Division 7 Construction

- During construction, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise disposed of by the Contractor. Any burning done, will be done in accordance with applicable local laws and ordinances, and in accordance with the applicable regulations of the North Carolina SIP for air quality, in compliance with 15 NCAC 2D.0520. Care will be taken to insure burning will be done at the greatest distance practical from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Burning will be performed under constant surveillance. Also during construction, measures will be taken to reduce the dust generated by construction, when the control of dust is necessary for the protection and comfort of motorists or area residents.

- If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream or river water.

- Sediment and erosion control measures, sufficient to protect water resources, must be implemented and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual* and the most recent version of NCS000250.

- Borrow/waste areas shall avoid wetlands to the maximum extent practical.

- Should construction activities encounter archaeological remains, or the suspicion of cultural deposits, the NCDOT Archaeology Group should be contacted as soon as possible for consultation.

Project Development and Environmental Analysis Unit, Roadway Design Unit, Highway Division 7 Construction

- The Haw River is subject to the Jordan Lake riparian buffer regulations; therefore *NCDOT Design Standards in Sensitive Watersheds* will be required for any project design, construction and maintenance performed within these riparian buffer zones

- Roadway design plans must provide treatment of storm water runoff through best management practices, as detailed in the most recent version of the *NCDWQ Stormwater Best Management Practices.*

CATEGORICAL EXCLUSION

Prepared by the Project Development and Environmental Analysis Unit,
of the North Carolina Department of Transportation,
in Consultation with the Federal Highway Administration

SUMMARY

1. Type of Action

This is a Federal Highway Administration (FHWA) Administrative Action, Categorical Exclusion (CE).

2. Description of Action

The North Carolina Department of Transportation (NCDOT) proposes to improve NC 68 from south of SR 2111 (East Harrell Road) to north of SR 4831 (Bartonshire Drive), north of the Town of Oak Ridge in Guilford County. Figure 1 shows the location and the limits of the project. The purpose of this project is to improve vehicular safety and traffic operations along NC 68, within the project limits. The project is approximately 0.5 mile in length and is a two-lane, two-way facility that crosses the Haw River, between SR 2111 (East Harrell Road) and SR 2029 (West Harrell Road).

The proposed improvements to NC 68 are federally funded. Project Number W-5114 is included in the NCDOT 2012-2020 Transportation Improvement Program (TIP). Right-of-way acquisition and construction are scheduled in federal fiscal years 2013 and 2014, respectively. The current total estimated cost of the project is $3,032,328, consisting of $482,328 for right-of-way acquisition and $2,550,000 for construction.

3. Alternatives Considered

The alternatives studied for the proposed action include the No-Build Alternative and Build Alternatives 1A and 1B.

The No-Build Alternative offers no improvements to the project area, and does not improve vehicular safety along this section of NC 68. Since the No-Build Alternative does not address the purpose and need of the proposed action, it is not recommended.

Build Alternative 1A proposed relocating the intersection of SR 2111 (East Harrell Road), approximately 450 feet south of its existing location, along NC 68, and relocating the intersection of SR 2029 (West Harrell Road), approximately 800 feet north of its existing location along NC 68, aligning it opposite the intersection of SR 4831 (Bartonshire Drive) with NC 68. A southbound left-turn lane was also proposed for the relocated East Harrell Road intersection. The replacement of an existing, northbound right-turn lane and construction of a proposed, southbound left-turn lane were designed for the existing SR 4831 (Bartonshire Drive) intersection with NC 68. No traffic signal was warranted for the proposed intersection design of existing SR 4831 (Bartonshire Drive) and relocated SR 2029 (West Harrell Road) with NC 68. The length of these proposed hazard elimination improvements along NC 68 were approximately 0.5 mile.

Build Alternative 1B (*Recommended*) proposed relocating the intersection of SR 2011 (East Harrell Road), approximately 450 feet south of its existing location, along NC 68, and closing the intersection of SR 2026 (West Harrell Road) with NC 68. A southbound, left-turn lane was also proposed for the relocated SR 2111 (East Harrell Road) intersection with NC 68. The replacement of an existing, northbound right-turn lane and construction of a proposed, southbound left-turn lane were designed for the existing SR 4831 (Bartonshire Drive) intersection with NC 68. The length of these proposed, hazard elimination improvements along NC 68 were approximately 0.5 mile.

4. Coordination

NCDOT Project Development staff consulted with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), the US Fish and Wildlife Service (USFWS), the North Carolina Wildlife Resources Commission (NCWRC), the North Carolina Department of Environment and Natural Resources - Division of Water Quality (NCDWQ), the Greensboro Urban Area Metropolitan Planning Organization (GUAMPO) and both the Town of Oak Ridge and the Town of Stokesdale municipal staff, during the planning, development and public involvement phases of this project. The USACE staff also verified project stream and wetland delineation on-site with NCDOT staff, prior to the final reporting of these findings. Per the NCDOT Cultural Resources staff, no survey by the North Carolina Historic Preservation Office (HPO) was required for this project. Resource agency comments and correspondence is included in Appendix 1.

5. Summary of Beneficial and Adverse Environmental Impacts

Table 1 contains a summary of the quantifiable impacts associated with the proposed hazard elimination improvements along NC 68, at the Haw River crossing. The impacts associated with the proposed project are described in detail in Section V of this document.

6. Actions Required by Other Agencies

Constructing the proposed action will not result in impacts to jurisdictional surface waters. No other action is required by other agencies.

7. Additional Information

Additional information concerning the assessment can be obtained by contacting the following persons:

John F. Sullivan III, P. E., Division Administrator
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina, 27601
Telephone: (919) 747-7000

Gregory J. Thorpe, Ph.D., Environmental Management Director
North Carolina Department of Transportation
Project Development and Environmental Analysis Unit
1548 Mail Service Center, Raleigh, North Carolina, 27699-1548
Telephone: (919)-707-6000

W-5114 Summary of Impacts

Category	Units	Proposed Action
Project Length	Miles	0.5
Residential Relocations	Total	0
	Minority	0
Business Relocations	Total	0
	Minority	0
Total Relocations	Total	0
Non-Profit Relocations	Total	0
Hazardous Material Sites	Each	0
Terrestrial Community Impacts	Number / Total Acres	4 / 7.02
Wetlands	Number / Total Acres	2 / 0.022
Stream Impacts	No. / Total Linear feet	0 / 0.00
Buffer Impacts	Number / Square feet	1 / 21,780
Protected Species	Species	0
Noise (0 – 6 dBA)	Impacted Properties (Residence / Business)	0
Architectural Resources	Eligible Properties	0
Archaeological Resources	Eligible Properties	0
Air Quality - Carbon Monoxide Concentration	NAAQS Standard *	In Compliance
Construction Cost	Dollars	$ 2,550,000
Right of Way Cost	Dollars	$ 482,328
Total Cost	Dollars	$ 3,032,328

* National Ambient Air Quality Standards - Maximum CO permitted per hour average = 35 parts per million (ppm)

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GUILFORD COUNTY, NORTH CAROLINA
WBS ELEMENT – 41877.1.1
FEDERAL AID PROJECT NO.: STP-0068(10)

TIP PROJECT NO. W-5114

I. PURPOSE AND NEED

A. General Description of Project

The North Carolina Department of Transportation (NCDOT) proposes to improve NC 68 from south of SR 2111 (East Harrell Road) to north of SR 4831 (Bartonshire Drive), north of the Town of Oak Ridge in Guilford County. Figure 1 shows the location and the limits of the project. The project is approximately 0.5 mile in length and is a two-lane, two-way facility that crosses the Haw River, between SR 2111 (East Harrell Road) and SR 2029 (West Harrell Road). Figure 2 shows a preliminary plan of the proposed action.

The improvements to NC 68 are federally funded. Project Number W-5114 is included in the NCDOT 2012-2020 Transportation Improvement Program (TIP). Right-of-way acquisition and construction are scheduled in federal fiscal years 2013 and 2014, respectively. The current total estimated cost of the project is $3,032,328, consisting of $482,328 for right-of-way acquisition and $2,550,000 for construction. (See Table 3.)

B. Purpose and Need

The purpose of this project is to improve vehicular safety and traffic operations along NC 68, from south of SR 2111 (East Harrell Road) to north of SR 4831 (Bartonshire Drive).

The need for this project is to reduce the numerous rear-end collisions associated with left-turn movements from NC 68 onto SR 2111 (East Harrell Road) and SR 2029 (West Harrell Road), immediately north and south of Culvert 139. This triple-barrel, box-culvert conveys the Haw River under NC 68, between these two intersections. Numerous collisions, including several fatalities, have occurred along this section of NC 68 in recent years.

The proposed project improvements will relocate the intersection of SR 2111 (East Harrell Road) and NC 68, approximately 450 feet south of the current intersection location, close the intersection of SR 2029 (West Harrell Road) with NC 68, and construct northbound and southbound turn-lanes along NC 68 at the intersections of SR 2111 (East Harrell Road) and SR 4831 (Bartonshire Drive), within the project limits.

1. Traffic Volumes

Estimated Annual Average Daily Traffic (AADT) volumes were developed for the proposed project, for the design-year 2035. These traffic volumes are shown in Figure 3. The traffic forecast estimated that the 2035 AADT volumes along NC 68 will range from 16,200 vehicles per day (vpd), north of SR 4831 (Bartonshire Drive), to 17,600 vpd, between SR 2029 (West Harrell Road) and SR 2111 (East Harrell Road). Twelve percent trucks are expected to use the facility in the year 2035. NC 68 is currently a two-lane, two-way roadway, within the project limits.

2. Safety

A total of 29 crashes were reported within the project limits for the three-year period from October 1, 2007 to September 30, 2010. For crash rate purposes, this roadway section is classified as a two-lane undivided, urban North Carolina Route. Table 1 shows a comparison of the crash rates for the analyzed section of NC 68, versus the 2005-2007 statewide crash rates and the calculated critical rate, with a 95% level of confidence for a comparable route type and configuration.

Table 1: Crash Rate Comparison

Rate	Crashes	Crashes per 100 MVM	Statewide Rate	Critical Rate
Total	29	**497.37**	303.18	430.37
Fatal	0	0.00	1.12	16.90
Non-Fatal Injury	11	**186.66**	97.95	173.95
Night	5	87.75	62.72	125.25
Wet	7	**120.05**	45.48	100.00

MVM = million vehicle miles

Every crash rate category for this section of NC 68, except fatal and night, exceeds both the statewide and critical crash rates for similar-type facilities. The night crash rate category for this section of NC 68 exceeds the statewide crash rate for similar-type facilities. Table 2 categorizes the majority of crashes into two types; rear-end and failure to yield frontal impact.

Table 2: Crash Type Comparison

Type of Crash	Number of Crashes	Percent of Total
Rear-end	22	76%
Angle, left-turn, fixed object	7	24%

The intersection of NC 68 with SR 2111 (East Harrell Road) had the highest number of crashes of the three intersections within the project. The high number of rear-end crashes should be alleviated with the addition of left-turning lanes at both the SR 2111 (East Harrell Road) and at the SR 4831 (Bartonshire Road) intersections, with the realignment of SR 2111 (East Harrell Road) intersection and with the closure of the intersection of SR 2029 (West Harrell Road) with NC 68. One crash, within the project limits during this time period, involved a school bus and another involved a motorcycle.

II. EXISTING CONDITIONS

A. Length of Roadway Section Studied

The total length of the project is approximately 0.5 mile. The Federal Highway Administration (FHWA) has determined that the project, as currently proposed, connects logical termini. It is of sufficient length to address environmental matters on a broad scope, has independent utility and significance, and is a usable and reasonable expenditure, even if no additional transportation improvements are made in the area.

B. Existing Typical Section

Within the project area, NC 68 currently has one travel-lane in each direction.

C. Speed Limits

The speed limit along NC 68 is currently 50 miles per hour.

D. Sidewalks

There are no sidewalks in the project area.

E. Right-of-Way

The existing right-of-way width along this section of NC 68 is approximately 100 feet.

F. Railroad Crossings

There are no railroad crossings along NC 68 in the project limits.

G. Intersecting Roads

All roadways in the project limits have at-grade, stop-sign controlled intersections with NC 68.

H. Structures

Culvert 139, a triple-barrel, box-culvert, conveys the Haw River under NC 68 between the intersections of SR 2111 (East Harrell Road) and SR 2029 (West Harrell Road), within the project limits. The sufficiency rating of this culvert is 81.3. It is not historically significant.

I. Utilities

A Duke Energy electric line, a natural gas line, aerial and buried telephone lines and a telephone "slick site" and boxes are located within the project limits. The project construction is not expected to impact the telephone "slick site" and boxes. The utility relocation necessary to construct this project is estimated to cost approximately $48,128.

J. Bicycle Routes

There are no bicycle routes in the project area.

K. School Bus Data

Guilford County operates 16 bus routes on NC 68 within the project limits, twice daily. There are 8 bus stops along SR 4831 (Bartonshire Dr.), but none along NC 68.

L. Navigable Waters

There are no navigable waters in the project area.

M. Airports

A short, private runway is located approximately one mile west of the project area.

N. Greenways

There are no greenways in the project area.

O. Parks

There are no parks located along NC 68, within the project limits.

P. GeoEnvironmental Sites

There are no GeoEnvironmental sites in the project limits. This determination includes properties with active or abandoned underground storage tank (UST) sites, hazardous waste sites, regulated landfills or unregulated dumpsites, or any other GeoEnvironmental concerns.

III. ALTERNATIVES CONSIDERED

A. Alternatives Considered For Detailed Study

The alternatives studied for the proposed action include the No-Build Alternative and Build Alternatives 1A and 1B. The build alternatives consist of improving vehicular safety along NC 68, by relocating or closing intersections within the project limits and by adding left-turn lanes at these proposed and existing intersections. Both proposed build alternatives for this project, had the same beginning and ending termini along NC 68.

1. No-Build Alternative

The No-Build Alternative offers no improvements to the project area. It assumes that all other projects currently planned or programmed in the NCDOT TIP will be constructed in the project vicinity, as proposed. Continued roadway maintenance and minor improvements along NC 68 are a part of this concept. The No-Build Alternative does not improve vehicular safety along this section of NC 68. Since the No-Build Alternative does not address the purpose and need of the proposed action, it is not recommended.

2. Build Alternatives

Build Alternative 1A proposed relocating the intersection of SR 2111 (East Harrell Road), approximately 450 feet south of its existing location, along NC 68. This build alternative also proposed relocating the intersection of SR 2029 (West Harrell Road), approximately 800 feet north of its existing location along NC 68, and aligning it

opposite the intersection of SR 4831 (Bartonshire Drive) with NC 68. A southbound left-turn lane was also proposed for the relocated SR 2111 (East Harrell Road) intersection. The replacement of an existing, northbound right-turn lane and construction of a proposed, southbound left-turn lane were designed for the existing SR 4831 (Bartonshire Drive) intersection with NC 68. No traffic signal was warranted for the proposed intersection design of existing SR 4831 (Bartonshire Drive) and relocated SR 2029 (West Harrell Road) with NC 68. The length of these proposed hazard elimination improvements along NC 68 were approximately 0.5 mile.

Build Alternative 1B (*Recommended*) proposed relocating the intersection of SR 2111 (East Harrell Road), approximately 450 feet south of its existing location, along NC 68. This build alternative also proposed closing the intersection of SR 2029 (West Harrell Road) with NC 68, and constructing a turn-around feature for the proposed dead-end condition of SR 2029 (West Harrell Road). A southbound, left-turn lane was also proposed for the relocated SR 2111 (East Harrell Road) intersection with NC 68. The replacement of an existing, northbound right-turn lane and construction of a proposed, southbound left-turn lane were designed for the existing SR 4831 (Bartonshire Drive) intersection with NC 68. The length of these proposed hazard elimination improvements along NC 68 were approximately 0.5 mile.

Due to the increased traffic volumes along NC 68 within the project limits, the distance of approximately 300 feet between the existing intersections of SR 2111 (East Harrell Road) and SR 2029 (West Harrell Road) has become a safety hazard for motorists attempting to turn left from NC 68 onto either of these roads or attempting left-turns from these roads onto NC 68. Since a higher number of accidents within the project limits have occurred in connection with the SR 2029 (West Harrell Road) intersection, it was determined that this intersection should be closed, instead of rerouted to enter NC 68 opposite of the SR 4831 (Bartonshire Drive) intersection with NC 68.

Both proposed build alternatives were presented to local citizens during a Citizens Informational Workshop (CIW), held near the project site in the Town of Oak Ridge, on March 14, 2011. After reviewing the CIW comments and concerns, Build Alternative 1B was selected as the recommended design alternative for this project. Build Alternative 1A was not recommended for this project, due to citizens' concerns that the proposed SR 2029 (West Harrell Road) / SR 4831 (Bartonshire Drive) intersection with NC 68 would become too congested to execute left-turns in any direction, since it did not warrant the instillation of a traffic signal. Additionally, Highway Division 7 staff had concerns about the short length of the S-curve designed for the section of proposed SR 2029 (West Harrell Road) that would connect the relocated intersection of SR 2029 (West Harrell Road) and NC 68 to existing SR 2029 (West Harrell Road).

Project environmental impacts were minimized by increasing the proposed side-slopes along NC 68 and along the proposed relocation section of SR 2111 (East Harrell Road) within the project limits, where possible. Due to the design of left-turn lanes at the intersections of NC 68 with relocated SR 2111 (East Harrell Road) and existing SR 4831 (Bartonshire Drive), no extension of Culvert 139 was necessary, as it

would have been if additional through-lanes for the entire project length had been proposed.

IV. PROPOSED IMPROVEMENTS

A. Length of the Proposed Project

The total length of the proposed project is approximately 0.5 mile.

B. Typical Section Description

The proposed action improves NC 68 from a two-lane, two-way facility to a two-lane, two-way facility with left-turn lanes at the relocated SR 2111 (East Harrell Road) intersection and at the existing SR 4831 (Bartonshire Drive) intersection. The typical section for the proposed action is shown in Figure 4. This typical section along NC 68 includes 12-foot travel lanes, 4-foot full-depth, paved shoulders, 4-foot earthen shoulders and drainage ditches.

C. Proposed Right-of-Way

The proposed right-of-way along this section of NC 68 will vary between 110 feet to 175 feet in width. The proposed right-of-way along SR 2111 (East Harrell Road) will vary between 100 feet to 205 feet in width.

D. Access Control

No control-of-access is planned along the proposed action.

E. Intersection Treatment and Type of Control

At-grade, stop-sign controlled intersections will continue to be used at the intersections of relocated SR 2111 (East Harrell Road) and existing SR 4831 (Bartonshire Drive) with NC 68, within the project limits. No intersections are proposed to be signalized.

F. Speed Limit and Design Speed

The speed limit along NC 68 is proposed to remain posted at 50 miles per hour, due to heavy truck traffic within the project limits.

G. Noise Barriers

No noise barriers are proposed as part of this project.

H. Sidewalks

Special accommodations for sidewalks are not included in the proposed action.

I. Bicycle Accommodations

Other than the general provision of 4-foot wide paved shoulders, special accommodations for bicycles are not included in the proposed action.

J. Structures

No extension of Culvert 139 is proposed in this project. A guardrail upgrade along both sides of NC 68, and minimal culvert repair, is proposed.

K. Greenways

There are no existing or proposed greenways along NC 68, in the project limits.

L. Right-of-Way Cost

The right-of-way cost is based on the preliminary design of the proposed action. Right-of-way costs includes: land and damage, utilities and acquisitions. The estimated right-of-way cost for the proposed action is $482,328.

M. Construction Cost

The construction cost is based on the preliminary design of the proposed action. The construction cost estimate includes items such as clearing and grubbing, earthwork, drainage, and paving. The estimated construction cost for the proposed action is $2,550,000. Table 3 shows the right-of-way cost, construction cost and total cost of the proposed project.

N. Total Cost

The total cost of the proposed action is $3,032,328. Table 3 summarizes the right-of-way, construction and total cost of the project.

Table 3: Cost Summary

Cost Item	Proposed Action
Construction Cost	$2,550,000
Right of Way Cost	$482,328
Total Cost	$3,032,328

V. ENVIRONMENTAL EFFECTS

A. Social and Economic Effects

1. Existing Land Use

The proposed project improvements along NC 68 are located in Guilford County, just north of the Town of Oak Ridge. Local land use includes a combination of farmland, small business and low-density residential properties.

2. Community Profile

a. Direct Community Impact Area (DCIA)

The Direct Community Impact Area (DCIA) is the area surrounding a project that will likely be affected during project construction and after project completion. The area adjacent to and very near to existing NC 68, inside the project limits in Figure 5, is the DCIA for this project. The W-5114 DCIA extends from

approximately 1,060 feet south of the SR 2111 (East Harrell Road) and NC 68 intersection to approximately 650 feet north of the SR 4831 (Bartonshire Drive) and NC 68 intersection. This DCIA includes the parcels fronting NC 68 within the project limits, and parcels fronting NC 68, just outside of the project limits.

b. Demographic Study Area

The Demographic Study Area (DSA) represents the total land area covered by the smallest of Block Groups that contain the DCIA. The DSA for this project includes Census Tract 159, Block Groups 1 and 2

c. Community Characteristics

The project area is comprised of farmland, small business and low-density residential areas. Four of these residences front NC 68 and have one access point, per lot.

Two small towns share a municipal boundary that passes through the center of the project area, from east to west. In the southern half of the project is the municipal area of the Town of Oak Ridge, which is home to 5,498 residents with a median household income of $93, 611. In the northern half of the project is the municipal area of the Town of Stokesdale, which is home to 3,701 residents with a median household income of $66,672. This information is from the *US Census American Fact Finder, 2005-2009 Community Survey Estimates*.

d. Population Characteristics

According to the 2000 US Census, the population in the demographic area was 5,430, as shown in Table 4. This number represented a 60.0% (2,180 people) increase in population from 3,250 people in 1990. This compares to a 21.0% increase in population in Guilford County, during the same period. The population increases were not consistent across the demographic area. Census Tract 159, Block Group 1, closest to The Town of Oak Ridge, experienced an increase of 84.0% or 1,373 people during this time. Block Group 2 in Census Tract 159, in the Town of Stokesdale area, experienced a 58.0% increase in population or 949 people during the same time period.

Table 4: Population Characteristics

Population Trends: 1990-2000	1990	2000	Difference	% Change
Census Tract 159, Block Group 1	1,633	2,864	1,373	84%
Census Tract 159, Block Group 2	1,617	2,566	949	58%
Guilford County	347,420	421,048	73,628	21%

Source: US Census Bureau, Summary File 2000

e. Race and Ethnicity

In the demographic area, 91.5% of the population identified themselves as racially White and 6.4% identified themselves as racially Black or African-American, in the 2000 Census. The demographic area has a higher percentage of a racially White population and a much lower percentage of a Black or African-American population, than does Guilford County (64.6% White and 29.2% Black or African-American), as shown in Table 5. According to the 2000 census, only 1.8% of the population, or 98

people, living in the demographic study area identified themselves as ethnically Hispanic or Latino. This is somewhat lower than the Guilford County Hispanic or Latino group, at 3.8%.

Table 5: Race and Ethnicity Source: 2000 US Census

Race / Ethnicity	Census Tract 159 Block Group 1 (Oak Ridge)		Census Tract 159 Block Group 2 (Stokesdale)		Guilford County	
White	2,603	91.8%	2,340	91.2%	271,812	64.6%
Black / African American	193	6.7%	159	6.1%	122,923	29.2%
American Indian / Alaskan	8	---	7	---	2,054	0.5%
Asian	8	---	22	0.9%	9,341	2.2%
Native Hawaiian / Pacific Islander	0	0.0%	0	0.0%	129	0.0%
Some other race alone	15	---	14	---	7,469	1.8%
Two or more races	37	1.2%	24	0.9%	7,320	1.7%
Hispanic or Latino	48	1.7%	50	1.9%	16,183	3.8%
Total Non-White	224	7.8%	202	7.8%	149,362	35.4%
Total	**2,864**	**100%**	**2,566**	**100%**	**421,048**	**100%**

The percentage of the population that identified themselves as racially Non-White is equal for Census Tract 159, Block Groups 1 and 2. These Block Groups have minority population percentages of that are notably lower than the Guilford County totals. NC 68 bisects both of these Block Groups from north to south, while the project area is on the border of both of these groups.

f. Income / Poverty Status

According to the US Census American Fact Finder, 2005-2009 Community Survey Estimates, the median household income in the Town of Stokesdale, in the northern portion of the demographic area, was approximately $66,672. In comparison, the median household income in the Town of Oak Ridge, in the southern portion of the demographic area, was $93,611.

According to the 2000 Census, 9.3% of the population within the demographic area has incomes below the poverty level, as shown in Table 6. The poverty level is fairly consistent across the demographic area. In Census Tract 159, Block Group 1, 4.8% of the population has incomes that are below the poverty level, with 2.3% of the population having incomes less than 50% of the poverty level. In Census Tract 159, Block Group 2, 4.5% of the population has incomes that are below the poverty level, with 1.5% of the population having incomes less than 50% of the poverty level.

Table 6: Income / Poverty Status

Low Income	Population Below Poverty Level		Population Below 50% of Poverty Level	
Block Group 1 (Oak Ridge)	128	4.8%	66	2.3%
Block Group 2 (Stokesdale)	117	4.5%	39	1.5%
Guilford County	43,227	10.6%	20,418	4.9%
North Carolina	958,667	12.2%	431,894	5.5%

Source: US Census Bureau, Summary File 3, Tables P87-88, Table P43 (2000)

g. Community Resources - Facilities and Businesses

There are no community facilities or businesses within the Direct Community Impact Area.

h. Transit

The Piedmont Authority for Regional Transportation, which operates the PART Transit System in Guilford County, answers sporadic, need-based calls through the project area, from citizens requiring transportation within the county. The bus route travels in both directions along this section of NC 68.

i. Community Safety and Emergency Response

Emergency Response Services in the project area are provided by the Town of Oak Ridge and the Town of Stokesdale. Local emergency responses originate in Stokesdale and in Oak Ridge and respond from those towns to Culvert 139, in each direction. Neither area emergency responders, nor area volunteer fire departments, cross the Haw River in response to routine emergency calls.

3. Analysis of Community Impacts

The improvements along this section of NC 68 are likely to have minor impacts on the surrounding community and the community quality of life.

a. Physical, Social and Psychological Aspects

NC 68 currently acts as a physical barrier between the residences on the west side of the roadway and those on the east side. The Direct Community Impact Area (DCIA) is comprised of large, undeveloped, forested parcels and a few residences. The area surrounding the DCIA is becoming more sub-urban in nature and contains no Environmental Justice or Limited English Proficiency populations. There are no notable socio-economic resources or local businesses located in the DCIA. The proposed project will not affect the functioning of the DCIA or alter interactions between local individuals or groups, or change the physical composition of the local area.

The addition of the proposed left-turn lanes will improve motorist safety and will reduce collisions associated with traffic queuing behind vehicles waiting for breaks in on-coming traffic, to execute these left-turns. The project will not impact traffic capacity, significantly reduce local travel time, significantly alter local traffic patterns, affect community cohesion, access or exposure of adjacent parcels, or create new transportation or land use nodes, along this section of NC 68.

b. Visual / Aesthetic Impacts

The proposed action should have little effect on the aesthetics of the project area. The project improvements will only impact the aesthetic qualities of individual properties, where minimal vegetation is to be removed.

c. Economic Conditions

No businesses in the area will be displaced by the roadway project.

d. Mobility

Mobility is defined as the ability to move from one place to another or the potential for that movement. The project should improve overall mobility for motorists traveling to and through the project area, along NC 68. The construction of W-5114 should also improve overall mobility and safety for school buses using this corridor.

e. Community Safety and Emergency Response

The construction of the W-5114 improvements should increase driver safety in the project area by reducing the potential for rear-end collisions, due to vehicles that are stopped on NC 68 awaiting an opportunity to turn left onto SR 2029 (West Harrell Road) from the northbound lane and onto SR 4831 (Bartonshire Drive) and SR 2111 (East Harrell Road) from the southbound lane.

Emergency Response Services from the Town of Oak Ridge, the Town of Stokesdale and Guilford County have indicated that the construction of turn lanes, the temporary closure of the SR 2111 (East Harrell Road) intersection for short-duration construction, and the permanent closure of the SR 2029 (West Harrell Road) intersection, along this section of NC 68, will not disrupt response times during construction, if timely notification is received by the NCDOT prior to construction. This will allow local Emergency Response Services to determine alternate routes for all safety vehicles in the area, during various construction phases. After construction, the project should have no impact on emergency response.

f. Environmental Justice

The statistics reported for income and presence of minorities in the DCIA and in the area Block Groups do not require identification as areas of concern for Environmental Justice, according to the Council on Environmental Quality guidance.

g. Future Land Use Effects

No future land use effects are expected as a result of this project. The roadway safety and operational improvements will result in improved conditions for existing commuters, but will not affect semi-regional commuting patterns.

h. Relocation Impacts

The proposed action will displace no residences, businesses, farms or non-profit organizations. Table 7 shows a summary of the relocation impacts associated with the proposed action.

Table 7: Relocation Impact Summary

Relocation		Proposed Action
Residences	Owners	0
	Tenants	0
	Total	0
	Minority	0
Businesses	Owners	0
	Tenants	0
	Total	0
	Minority	0
Farms		0
Non-Profit Organizations		0

i. Cultural Resources

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

1). Historic Architectural Resources

NCDOT – Human Environment Section, under the provisions of a Programmatic Agreement with FHWA, NCDOT, the North Carolina State Historic Preservation Office (NC-HPO), North Carolina Office of State Archaeology (OSA) and the Advisory Council on Historic Preservation (effective July 1, 2009), reviewed the proposed project and determined that no surveys are required. (Form dated September 6, 2011 in Appendix 1.)

2). Archaeological Resources

The HPO reviewed the intersection improvement undertaking and had no comment for archaeology (ER # 10-2098, December 16th, 2010). However, designs indicated an expanded APE for the relocation of SR 2111 and so further archaeological review was required. Research at the Office of State Archaeology revealed no archaeological sites at the project location. Historic maps, aerials, and soils surveys were referenced to establish context. An archaeological survey was conducted on September 17, 2012, during which the entire APE was visually inspected. Due to slope and ground disturbances, no subsurface testing was warranted. No archaeological resources were identified as a result of the fieldwork, and no further work is recommended for archaeology (The *No Prehistoric or Historic Properties Present Form*, dated October 10, 2012, is in Appendix 1.)

4. Section 4(f) Resources

Section 4(f) of the DOT Act of 1966 protects the use and function of publicly owned parks, recreation areas, wildlife/waterfowl refuges, and historic properties. A transportation project can only use land from a 4(f) resource when there are

no other feasible or prudent alternatives and when the project includes all possible planning to minimize harm to the resource.

No Section 4(f) impacts are expected by the proposed action.

B. Farmland Impacts

North Carolina Executive Order Number 96, *Preservation of Prime Agricultural and Forest Lands*, requires all state agencies to consider the impact of land acquisition and construction projects on prime farmland soils, as designated by the U.S. Natural Resources Conservation Service (NRCS). These soils are determined by the SCS, based on criteria such as crop yield and level of input of economic resources

The project is located in the northwest corner of Guilford County and is surrounded by a mixture of farmland, small businesses and low-density residential land uses. No farmland impacts are expected in the project area, since no farmland soils are eligible for protection under the US Farmland Protection Policy Act (FPPA). Additionally, the project area contains no active agricultural operations and is not located within a Voluntary Agricultural District, or Enhanced Voluntary Agricultural District.

C. Natural Environment Effects

NCDOT Biologists evaluated the natural systems and conducted field work in the project area, in November and December 2010, and in June 2011. Jurisdictional areas identified in the project study area were verified by the U.S. Army Corps of Engineers (USACE) and by the North Carolina Division of Water Quality (NCDWQ), on March 15, 2011.

The area surrounding this section of NC 68 is located in a rural setting, in Guilford County. The study area lies in the piedmont physiographic region of North Carolina. Topography, in the project vicinity, is comprised of gently rolling hills, with narrow, level floodplains along stream corridors (Figure 6). Elevations in the project study area range from 800 to 850 feet above sea level. Land Use in the project vicinity consists primarily of residential development, along with forested land along stream corridors.

1. Soils

The Guilford County Soil Survey identifies eight soil types within the project study area. These soils types are summarized in Table 8.

Table 8: Soils in the Study Area

Soil Series	Mapping Unit	Drainage Class	Hydric Status
Clifford Sandy Loam	CkC	Well Drained	Non-hydric
Hatboro Loam	HaD	Poorly Drained	Hydric
Poplar Forest Sandy Loam, 6 to 10% slopes	PoC	Well Drained	Non-hydric
Poplar Forest Sandy Loam, 10 to 15% slopes	PoD	Well Drained	Non-hydric
Poplar Forest Sandy Loam, 15 to 35% slopes	PoE	Well Drained	Non-hydric
Poplar Forest Clay Loam	PpC2	Well Drained	Non-hydric
Rasalo Fine Sandy Loam	RaB	Well Drained	Non-hydric
Siloam Sandy Loam	SmD	Well Drained	Non-hydric

2. Water Resources

Water resources in the study area are part of the Cape Fear River Basin [U.S. Geological Survey (USGS) Hydrologic Unit 03030002]. Three streams were identified in the study area, as listed in Table 9. The location of each water resource is shown in Figure 7. The physical characteristics of these streams are provided in Table 10.

Table 9: Water Resources in the Study Area

Stream Name	Map ID	NCDWQ Index Number	Best Usage Classification
Haw River	Haw River	16-1(a)	C-NSW
UT to Haw River	SA	16-1(a)	C-NSW
UT to Haw River	SB	16-1(a)	C-NSW

Table 10: Physical Characteristics of Water Resources in the Study Area.

Map ID	Bank Height (ft)	Bankful Width (ft)	Water Depth (in)	Channel Substrate	Velocity	Clarity
Haw River	6-12	20	12-24	Sand, silt, gravel, cobble	Slow	Turbid
SA	3	2-3.5	2-3	Sand, silt	Moderate	Clear
SB	1-2	2-4	2-4	Sand, silt, gravel	Moderate	Clear

One pond is located in the study area, north of SR 2029 (West Harrell Road), as depicted in Figure 7. This pond consists of an artificially excavated pit that is sustained by runoff from the surrounding landscape. Approximately 0.07 acres of the pond are located in the study area. This pond is hydrologically connected to Wetland D (WD) and is therefore jurisdictional, but its impacts are not mitigatable.

The Haw River and its tributaries have not been identified as trout waters by the North Carolina Wildlife Resources Commission (NCWRC). There are no designated, anadromous fish waters or Primary Nursery Areas present in the study area. There are no designated High Quality Waters (HQW), Outstanding Resource

Water (ORW), or water supply watersheds (WS-I or WS-II) within 1.0 mile, downstream, of the study area. The Haw River is listed on The North Carolina 2010 Final 303(d) list of impaired waters. The section of the Haw River located within the project study area is listed due to impaired ecological / biological integrity.

There are no benthic or fish sampling stations within 1.0 mile of the project study area.

3. Biotic Resources

a. Terrestrial Communities

Four terrestrial communities were identified in the study area. These communities were identified as Maintained/Disturbed, Floodplain Forest, Mixed Hardwood Forest, and Non-tidal Freshwater Marsh. Figure 8 shows the location and extent of these terrestrial communities in the study area. A brief description of each community type follows. Scientific names of all species identified are included in Appendix 2.

1.) Maintained / Disturbed

Maintained/Disturbed areas are located throughout the study area, in places where the vegetation is periodically mowed, such as roadside shoulders, residential lawns and utility corridors. The vegetation in this community is comprised of low growing grasses and herbs, including fescue, clover, wild onion, plantain, wild strawberry, Japanese honeysuckle, multiflora rose, and henbit.

2.) Floodplain Forest

The Floodplain Forest occurs along the floodplain of the Haw River, north of East Harrell Road, due to overbank flooding of the Haw River. Included in this community are two wetlands which are classified as Riverine Swamp Forest (WA) and Bottomland Hardwood Forest (WB), using the NCWAM classification. The portion of this community located within the southern floodplain of the Haw River, most closely resembles the Bottomland Hardwood Forest described by Schafale and Weakley. This area is subject to regular overbank flooding from the Haw River. At the time this fieldwork was conducted, the southeastern floodplain was inundated. Based on aerial photography of the study area and field observations of morphological adaptations of vegetation, it is likely that this area is inundated for long durations. Dominant canopy species consist of green ash, red maple, sycamore, beech, river birch, tulip poplar, and paw paw. The shrub/understory stratum consists of young paw paw, blackberry, viburnum, Chinese privet and young red maple. The herbaceous stratum was relatively sparse at the time field work was conducted for this project, due to seasonal conditions, leaf litter accumulation, and frequent flooding. However, herbaceous species

observed on hummocks included wild onion. Dominant vines include cat brier, poison ivy, and Japanese honeysuckle.

The portion of the Floodplain Forest Community, located within the northern portion of the Haw River floodplain, most closely resemble the Piedmont Alluvial Forest described by Schafale and Weakley. Within the study area, the northern floodplain is at a higher elevation and, therefore, is not flooded as frequently as the southern floodplain. However, field observations of morphological adaptations of vegetation and waterlines indicate the occurrence of overbank flooding. Localized seasonal or temporary inundation may occur within depressional areas. Dominant canopy species consist of red maple, sweet gum, ironwood, beech, and paw paw. As the community transitions into upland areas, Virginia pine and shagbark hickory are also observed in the canopy and subcanopy. Dominant shrub/understory species observed include paw paw, red cedar, young red maple and beech, winged elm, ironwood, possum haw, silky dogwood, and Chinese privet. The herbaceous stratum was relatively sparse at the time field work was conducted for this project, due to seasonal conditions and leaf litter accumulation, however wild onion was observed. Dominant vines include poison ivy, Japanese honeysuckle, and catbrier.

3.) Mixed Hardwood Forest

The mixed hardwood forest community is located throughout the project area. Included in this community are three wetlands, which are classified as a Headwater Wetlands (WD & WG) and a Bottomland Hardwood Forest (WE). This community most closely resembles the Dry-Mesic Oak Hickory Forest described by Schafale and Weakley. Dominant canopy and subcanopy species consist of white oak, beech, red maple, American elm, ironwood, hackberry, northern red oak, and southern red oak. Virginia pine is found along the edges of this community adjacent to the maintained/disturbed roadside community. Dominant shrub/understory species include canopy species, multiflora rose, Chinese privet, red cedar, and strawberry bush. Dominant herbaceous and vine species include poison ivy, Japanese honeysuckle, wild onion, Christmas fern.

4.) Non-tidal Freshwater Marsh

Portions of two large non-tidal freshwater marsh communities are located in the eastern and western portion of the study area. Included in this community are two wetlands classified as Non-Tidal Freshwater Marshes (WF & a portion of WA).

These areas are consistently inundated and dominated by herbaceous species; therefore this community lacks a canopy and subcanopy, however a few snags are present. Shrubs are limited to the

drier fringes of the community and consist of swamp rose and buttonbush. Dominant herbaceous species consist of sedges, common rush, smartweed, and arrow arum.

5.) Terrestrial Community Impacts

Terrestrial communities in the study area will be impacted by project construction, as a result of grading and paving of portions of the study area. Terrestrial community impacts are presented in Table 11.

Table 11: Terrestrial Community Coverage in the Study Area

Community	Coverage (ac)	Project Impacts (ac)
Floodplain Forest	8.0	1.08
Mixed Hardwood Forest	24.5	3.86
Non-Tidal Freshwater Marsh	15.6	0.00
Maintained/Disturbed	12.7	2.08
Total	**60.8**	**7.02**

b. Terrestrial Wildlife

Terrestrial communities in the study area are comprised of both natural and disturbed habitats that may support a diversity of wildlife species. *Those species actually observed are indicated with an *.* Mammal species that commonly exploit forested habitats and stream corridors, found within the study area, include eastern cottontail, raccoon, Virginia opossum, and white-tailed deer. Birds that commonly use forest and forest-edge habitats include the American crow, blue jay, Carolina chickadee, tufted titmouse, eastern bluebird, and turkey vulture*. Reptile and amphibian species that may use terrestrial communities located in the study area include the eastern box turtle, eastern five-lined skink, American toad, and black racer.

c. Aquatic Communities

Aquatic communities in the study area consist of perennial streams, as well as a pond. The Haw River could support bluehead chub, redlip shiner and the redbreast sunfish. The tributaries to the Haw River, in the study area, are relatively small in size and would support aquatic communities of spring peeper, northern dusky salamander and various benthic macro-invertebrates. The pond is relatively shallow and small and could support green frogs.

d. Invasive Species

Three species from the *NCDOT Invasive Exotic Plant List for North Carolina* were found to occur in the study area. These species were identified as Chinese privet (Severe Threat), multiflora rose (Severe Threat) and Japanese honeysuckle (Threat). NCDOT will manage invasive plant species, as appropriate.

4.0 Jurisdictional Issues

a. Clean Water Act Waters of the U.S.

Three jurisdictional streams were identified in the study area as listed in Table 12. The location of these streams is shown on Figure 7. USACE stream delineation forms are available upon request. The physical characteristics and water quality designations of each jurisdictional stream are detailed in Section C.2. All jurisdictional streams in the study area have been designated as warm water streams, for the purposes of stream mitigation.

Table 12: Jurisdictional Characteristics of Water Resources in the Study Area

Map ID	Length (ft.)	Proposed Action (ft.)	Classification	Compensatory Mitigation Required	River Basin Buffers	Proposed Action (sq. ft.)
Haw River	950	0.0	Perennial	Yes	Subject	21,780
SA	135	0.0	Perennial	Yes	Not Subject	0.0
SB	485	0.0	Perennial	Yes	Subject	0.0
Total	**1570**	**0.0**				**21,780**

Six jurisdictional wetlands were identified within the study area, as shown in Figure 7. Wetland classification and quality rating data are presented in Table 13. All wetlands in the study area are within the Cape Fear River basin (USGS Hydrologic Unit 03030002). USACE wetland delineation forms and NCDWQ wetland rating forms, for each site, are available upon request Descriptions of the natural communities in each wetland site are presented in Section 3.a. Wetland sites WA and WB are included within the floodplain forest. Sites WD, WE and WG are located in the mixed hardwood forest community. Site WF and a portion of WA are located in the non-tidal freshwater marsh community. WG was determined to be an isolated wetland by USACE representative Andy Williams, during the field review of jurisdictional areas conducted on March 15, 2011.

Table 13: Jurisdictional Characteristics of Wetlands in the Study Area

Map ID	NCWAM Classification	Hydrologic Classification	NCDWQ Wetland Rating	Area (ac)	Proposed Action (ac)
WA	Riverine Swamp Forest / Non-Tidal Freshwater Marsh	Riparian	86	1.64	0.002
WB	Bottomland Hardwood Forest	Riparian	59	0.12	
WD	Headwater Wetland	Riparian	54	0.04	
WE	Bottomland Hardwood Forest	Riparian	53	0.20	
WF	Non-tidal Freshwater Marsh	Riparian	90	0.11	
WG	Headwater Wetland	Isolated	5	0.02	0.02
Total				**2.13**	**0.022**

b. Clean Water Act Permits

Permanent or temporary impacts to jurisdictional wetlands and streams require the appropriate Nationwide or Individual permits prior to construction. The USACE holds the final discretion as to what permit will be required to authorize project construction. I f a Section 404 permit is required, then a Section 401 Water Quality Certification (WQC) from the NCDWQ will be needed.

c. Coastal Area Management Act Areas of Environmental Concern

The proposed project is not located within one of the twenty coastal counties subject to the Coastal Area Management Act (CAMA). Therefore, no CAMA permits will be required.

d. Construction Moratoria

No construction moratoria are anticipated for the proposed project.

e. N.C. River Basin Buffer Rules

Streamside riparian zones within the study area are protected under provisions of the Jordan Lake buffer regulations, administered by NCDWQ. Table 12 indicates which streams are subject to buffer rule protection. Potential impacts to protected stream buffers will be determined once a final alignment and design have been determined.

f. Rivers and Harbors Act Section 10 Navigable Waters

The Haw River has not been designated by the USACE as a Navigable Water, under Section 10 of the *Rivers and Harbors Act*.

g. Wetland and Stream Mitigation

1.) Avoidance and Minimization of Impacts

The Haw River is subject to the Jordan Lake riparian buffer regulations; therefore *NCDOT Design Standards in Sensitive Watersheds* will be required. The NCDOT has avoided and minimized impacts to streams and wetlands to the greatest extent practicable in choosing the preferred alternative, Alternative 1B, and during the project design.

Impacts to the Haw River were minimized due to designing turn-lanes along NC 68, both north and south of the SR 2111 (East Harrell Road) intersection and the SR 4831 (Bartonshire Drive) intersection, instead of installing one center turn-lane for the length of the proposed project. This action would have required the extension of Culvert 139, in both Alternative 1A and Alternative 1B.

Impacts to a pond and Wetland D, on the west side of NC 68, were eliminated in Alternative 1B by the proposed closure of the SR 2029 (West Harrell Road) intersection with NC 68, instead of rerouting SR 2029 to intersect with SR 4831 (Bartonshire Drive), as designed in Alternative 1A.

2.) Compensatory Mitigation of Impacts

The NCDOT will investigate potential on-site stream and wetland mitigation opportunities, if such measures are necessary. If on-site mitigation is not feasible, mitigation will be provided by the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP).

3.) Endangered Species Act Protected Species

As of March 24, 2011, the USFWS lists one federally protected species for Guilford County, as shown in Table 14. A brief description of the habitat requirements follows, along with the Biological Conclusion rendered based on survey results in the study area. Habitat requirements are based on the current best available information, as per referenced literature and USFWS correspondence

Table 14: Federally Protected Species Listed for Guilford County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Isotria medeoloides	Small whorled pogonia	**E**	Yes	**No Effect**

E - Endangered

Small Whorled Pogonia

USFWS Optimal Survey Window: mid-May through early July

Habitat Description: Small whorled pogonia occurs in young, as well as maturing (second to third successional growth) mixed-deciduous or mixed-deciduous/coniferous forests. It does not appear to exhibit strong affinities for a particular aspect, soil type, or underlying geologic substrate. In North Carolina, the perennial orchid is typically found in open, dry deciduous woods, and is often associated with white pine and rhododendron. The species may also be found on dry, rocky, wooded slopes; moist slopes; ravines lacking stream channels; or slope bases near braided channels of vernal streams. The understory structure and composition of occupied sites varies from dense rhododendron thickets, to open/sparse/moderate shrub and herbaceous cover in the orchid's microhabitat, to dense stands of New York fern. Other common characteristics shared by small whorled pogonia sites include historic agricultural use of existing habitat; a proximity to logging roads, streams, or other features that create long persisting breaks in the forest canopy; and a prevalence of leaf litter and decaying vegetation.

Biological Conclusion: **No Effect**. Potential habitat for the small whorled pogonia is present in the project study area, within the mixed hardwood forest community. Surveys for this species were conducted on June 13, 2011, by NCDOT biologists Erica McLamb and Sara Easterly. No specimens were observed during the 4.0 man-hour survey. A review of NCNHP records, updated June 30, 2011, indicates no known occurrences within 1.0 mile of the study area.

4.) Bald Eagle and Golden Eagle Protection Act

Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large, dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.

A desktop, GIS assessment of the project study area, as well as the area within a 1.13-mile radius (1.0 mile plus 660 feet) of the project limits, was performed on December 6, 2010, using 2007 color aerials and 1998 color infrared (color IR) aerials. No water bodies large enough or sufficiently open, to be considered potential feeding sources were identified. Since there was no foraging habitat within the review area, a survey of the project study area and the area within 660 feet of the project limits was not conducted. Additionally, a review of the NCNHP database on December 6, 2010, revealed no known occurrences of this species within 1.0 mile of the project study area. Due to the lack of habitat, known occurrences and minimal impact anticipated from this project, it has been determined that this project will not affect this species.

5.) Endangered Species Act Candidate Species

As of March 24, 2011, the USFWS lists no Candidate species for Guilford County.

6.) Essential Fish Habitat

The Haw River and its tributaries have not been identified by the National Marine Fisheries Service (NMFS), as Essential Fish Habitat.

D. Traffic Noise and Air Quality

Vehicles are a major contributor to decreased air quality because they emit a variety of pollutants into the air. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. New highways or the widening of existing highways increase localized levels of vehicle emissions, but these increases could be offset due to increases in speeds from reductions in congestion and because vehicle emissions will decrease in areas where traffic shifts to the new roadway. Significant progress has been made in reducing criteria pollutant emissions from motor vehicles and improving air quality, even as vehicle travel has increased rapidly.

The project is located in Guilford County, which complies with the National Ambient Air Quality Standards. This project will not add substantial new capacity or create a facility that is likely to meaningfully increase emissions. Therefore, it is not anticipated to create any adverse effects on the air quality of this attainment area.

A qualitative PM 2.5 hot-spot analysis is not required for this project since it is not an air quality concern. The Clean Air Act and 40 CFR 93.116 requirements were met without a hot-spot analysis, since this project has been found not to be of air quality concern under 40 CFR 93.123(b)(1). This project meets the statutory transportation conformity requirements without a hotspot analysis. (See Appendix 1.)

This project does not meet the definition of a Type I Project, per the NCDOT Traffic Noise Abatement Policy. This determination is based on the project scope, which involves only adding a left-turn lane in each direction that will function to eliminate existing, unsafe traffic conditions along NC 68 within the project limits.

During construction of the proposed project, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise disposed of by the Contractor. Any burning done will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. Care will be taken to insure burning will be done at the greatest distance practical from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Burning will be performed under constant surveillance. Also during construction, measures will be taken to reduce the dust generated by construction when the control of dust is necessary for the protection and comfort of motorists or area residents. This evaluation completes the assessment requirements for air quality of the 1990 Clean Air Act Amendments and the NEPA process, and no additional reports are necessary.

VI. COMMENTS AND COORDINATION

A. Citizens Informational Workshop

A Citizens Informational Workshop (CIW) was held near the project site in the Town of Oak Ridge, on March 14, 2011. Over 60 people attended this workshop in the Oak Ridge Town Hall, on Linville Road. Town of Oak Ridge and Town of Stokesdale staff and elected officials also attended the W-5114 CIW. A Local Officials Meeting was held earlier in the day, in the Oak Ridge Town Hall. Approximately 20 local municipal and various NCDOT staff members discussed the project design and potential impacts.

Two project design alternatives were presented to local, project-area citizens. The first design alternative, 1A, proposed relocating the SR 2111 (East Harrell Road) and SR 2029 (West Harrell Road) intersections with NC 68, to increase the distance between them and constructing left-turn lanes in each direction, at these proposed intersections. The second design alternative, 1B, proposed relocating the SR 2111 (East Harrell Road) intersection with NC 68 further to the south, closing the SR 2029 (West Harrell Road) intersection with NC 68 and constructing left-turn lanes in each direction, at these proposed intersections. Per the public comments received during and after the W-5114 CIW, area residents agreed that the project was needed to reduce the ever-increasing potential for collisions along NC 68, between SR 2111 (East Harrell Road) and SR 4831 (Bartonshire Drive). The majority of local, project-area citizens favored the second project design alternative, 1B, over the first design alternative, 1A.

After reviewing the project comments and concerns presented at the CIW and those sent to NCDOT staff after the workshop, W-5114 Design Alternative 1B was selected as the preferred design alternative for this project. Not only did this alternative increase the distance between the intersections of SR 2111 (East Harrell Road) and SR 4831 (Bartonshire Drive) with NC 68, project environmental impacts were minimized by increasing the proposed side-slopes along NC 68, and along the proposed relocation section of SR 2111 (East Harrell Road) within the project limits, where possible. By constructing turn-lanes instead of building an additional travel-lane in each direction along this section of NC 68, less right-of-way acquisition was necessary and no widening of Culvert 139 at the Haw River was required. Additionally, Design Alternative 1A required more right-of-way acquisition to construct and would have impacted a wetland, a pond and more acreage of terrestrial communities within the project limits, than will Design Alternative 1B.

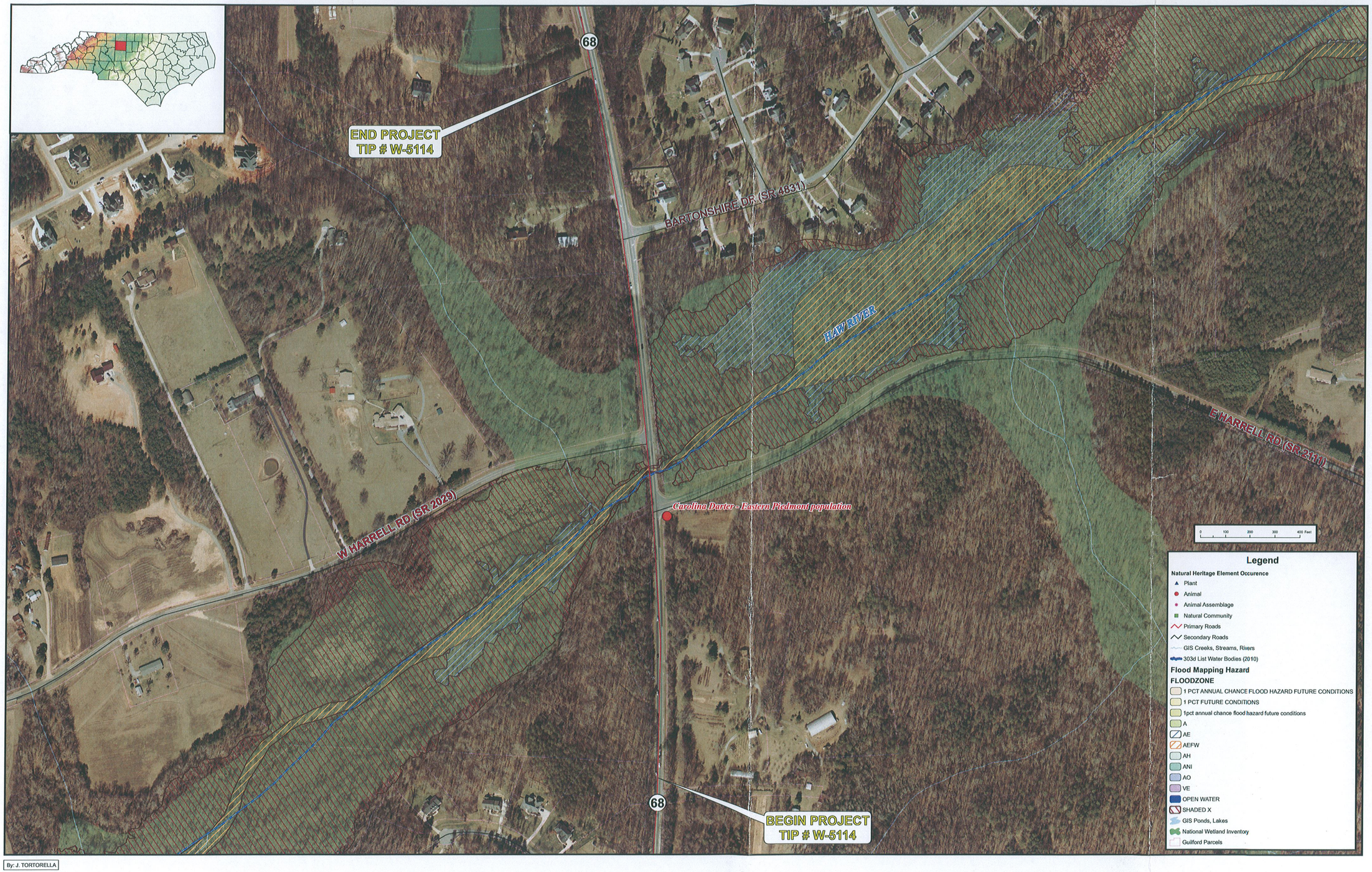
A press release was issued in October 2011, advising local citizens of the preferred project alternative selection. On October 20, 2011, a project webpage was added to the NCDOT website, displaying the preferred W-5114 project alternative selection.

B. Agency Coordination

NCDOT Project Development staff consulted with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), the US Fish and Wildlife Service (USFWS), the North Carolina Wildlife Resources Commission (NCERC), the North Carolina Department of Environment and Natural Resources -

Division of Water Quality (NCDWQ), the Greensboro Urban Area Metropolitan Planning Organization (GUAMPO) and both the Town of Oak Ridge and the Town of Stokesdale municipal staff, during the planning, development and public involvement phases of this project. The USACE staff also verified project stream and wetland delineation on-site with NCDOT staff, prior to the final reporting of these findings. Per the NCDOT Cultural Resources staff, no survey by the North Carolina Historic Preservation Office (HPO) was required for this project.

FIGURES



By: J. TORTORELLA

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

SCOPING MEETING MAP
NC 68 - HAW RIVER CROSSING
GUILFORD COUNTY
TIP PROJECT W-5114

N

County: GUILFORD

Div: 7 | TIP# W-5114

WBS: 41877.1.1

JANUARY 2011

Figure 1

CITIZENS INFORMATIONAL WORKSHOP MAP

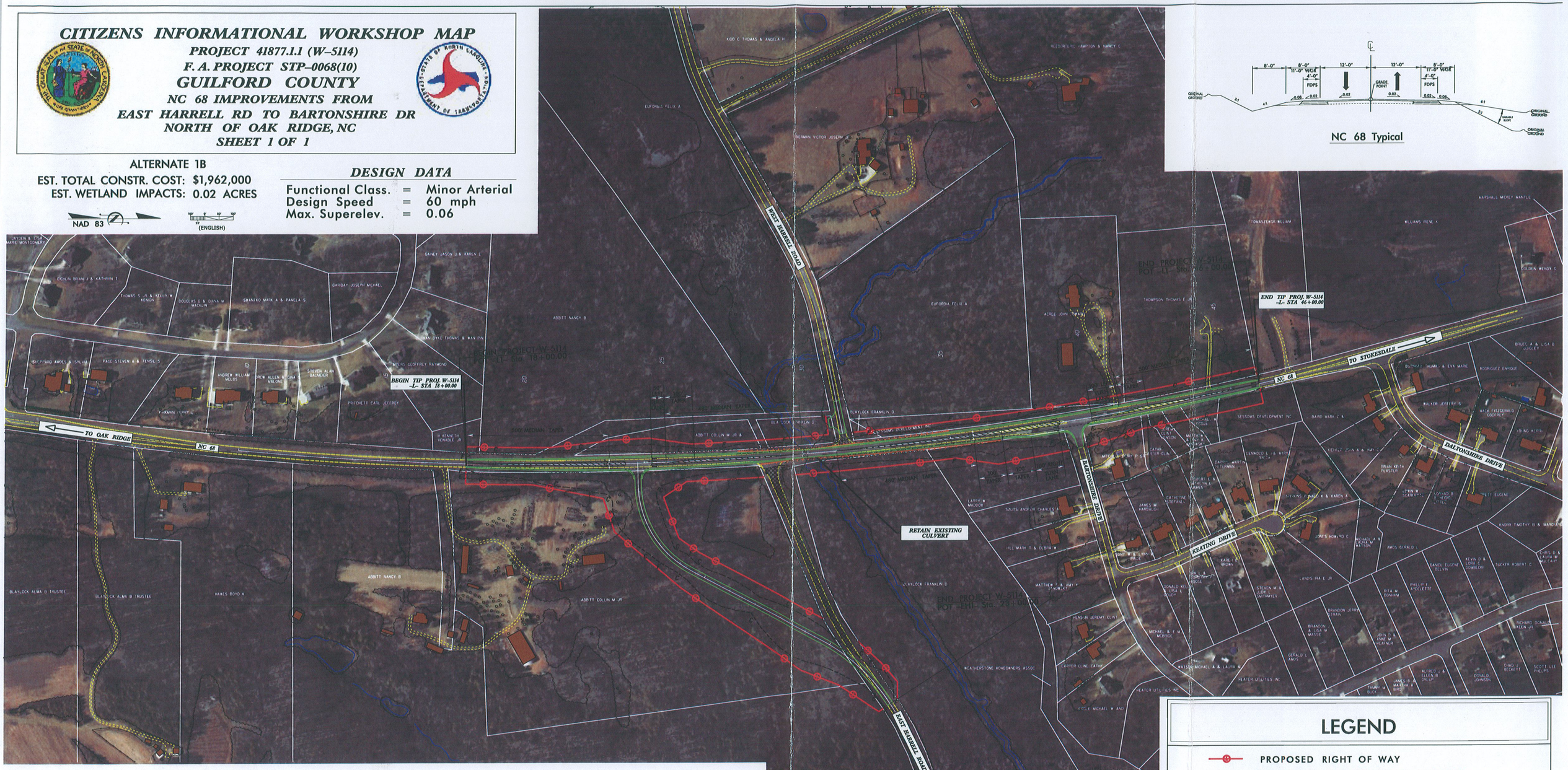
PROJECT 41877.1.1 (W-5114)
F. A. PROJECT STP-0068(10)
GUILFORD COUNTY
NC 68 IMPROVEMENTS FROM EAST HARRELL RD TO BARTONSHIRE DR NORTH OF OAK RIDGE, NC
SHEET 1 OF 1

ALTERNATE 1B
EST. TOTAL CONSTR. COST: $1,962,000
EST. WETLAND IMPACTS: 0.02 ACRES

NAD 83 (ENGLISH)

DESIGN DATA

Functional Class.	=	Minor Arterial
Design Speed	=	60 mph
Max. Superelev.	=	0.06



NC 68 CURVE DATA

PI Sta 28+15.86
△ = 17° 45' 00.0" (LT)
D = 0° 30' 17.3"
L = 3,516.18'
T = 1,772.29'
R = 11,350.00'
V = 60 MPH
INC = 34'
e = 0.02

EAST HARRELL CURVE DATA

PI Sta 12+79.11
△ = 60° 30' 00.0" (LT)
D = 16° 22' 12.8"
L = 369.57'
T = 204.11'
R = 350.00'
V = 35 MPH
INC = 24'
e = 0.06

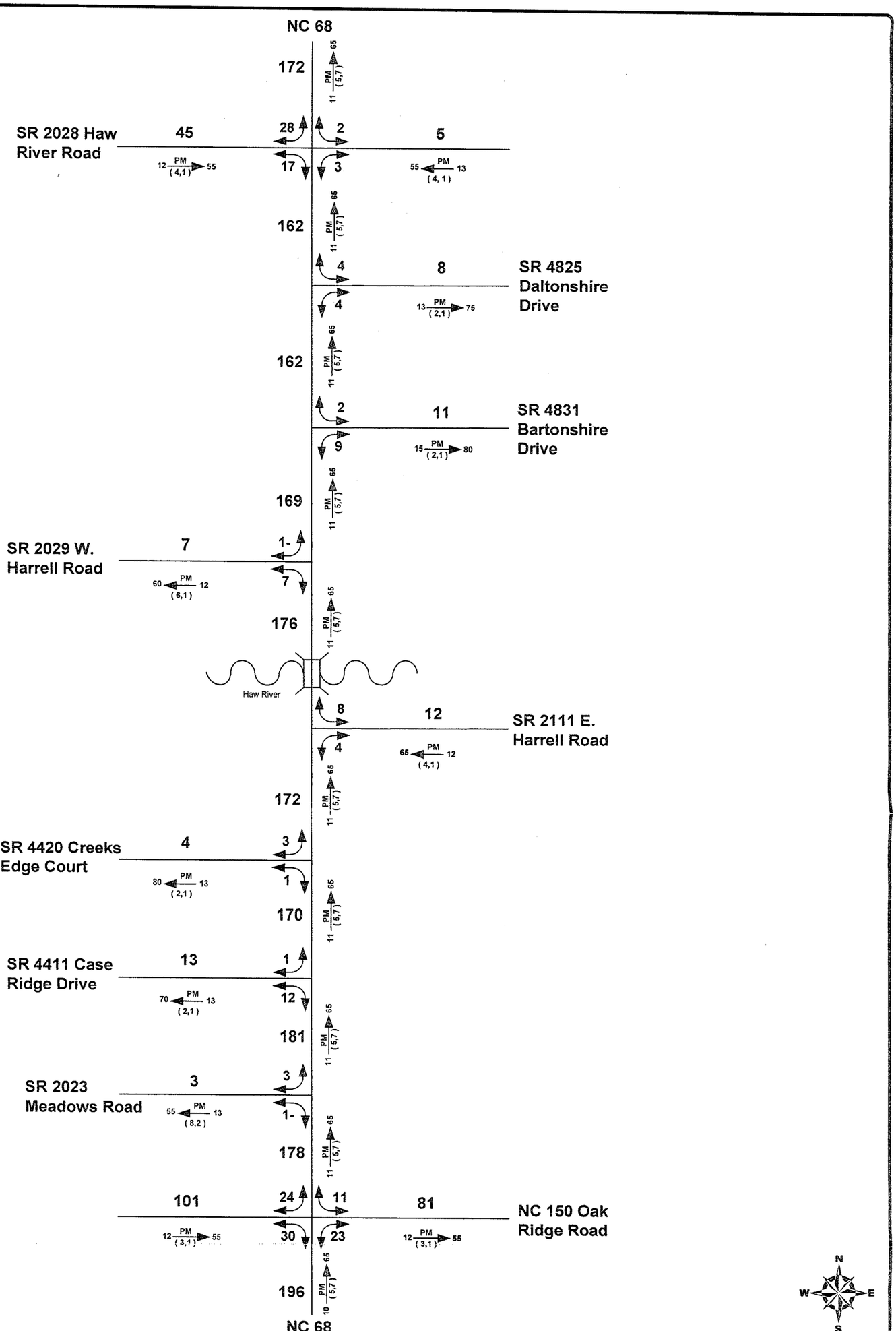
PI Sta 21+34.47
△ = 29° 00' 00.0" (RT)
D = 8° 48' 53.0"
L = 328.99'
T = 168.10'
R = 650.00'
V = 45 MPH
INC = 24'
e = 0.06

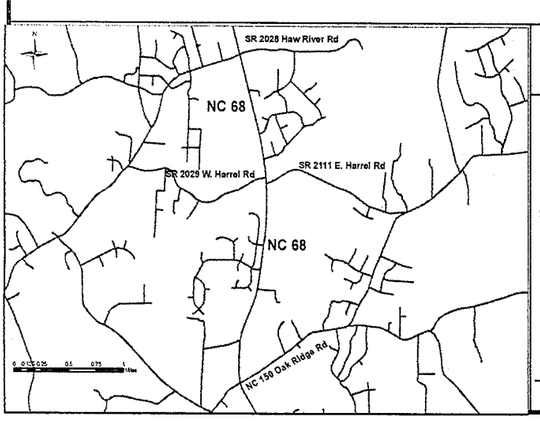
LEGEND

- PROPOSED RIGHT OF WAY
- TEMPORARY CONSTRUCTION EASEMENT
- EXISTING ROADWAY
- PROPOSED ROADWAY
- WLB — WETLAND LIMITS BOUNDARY
- LAKES, RIVER, STREAMS AND PONDS
- PAVEMENT REMOVAL
- EXISTING RIGHT OF WAY AND PROPERTY LINES

INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION | **PRELIMINARY PLANS** DO NOT USE FOR CONSTRUCTION

Figure 2





2035 ANNUAL AVERAGE DAILY TRAFFIC

No Build
SHEET 1 OF 1

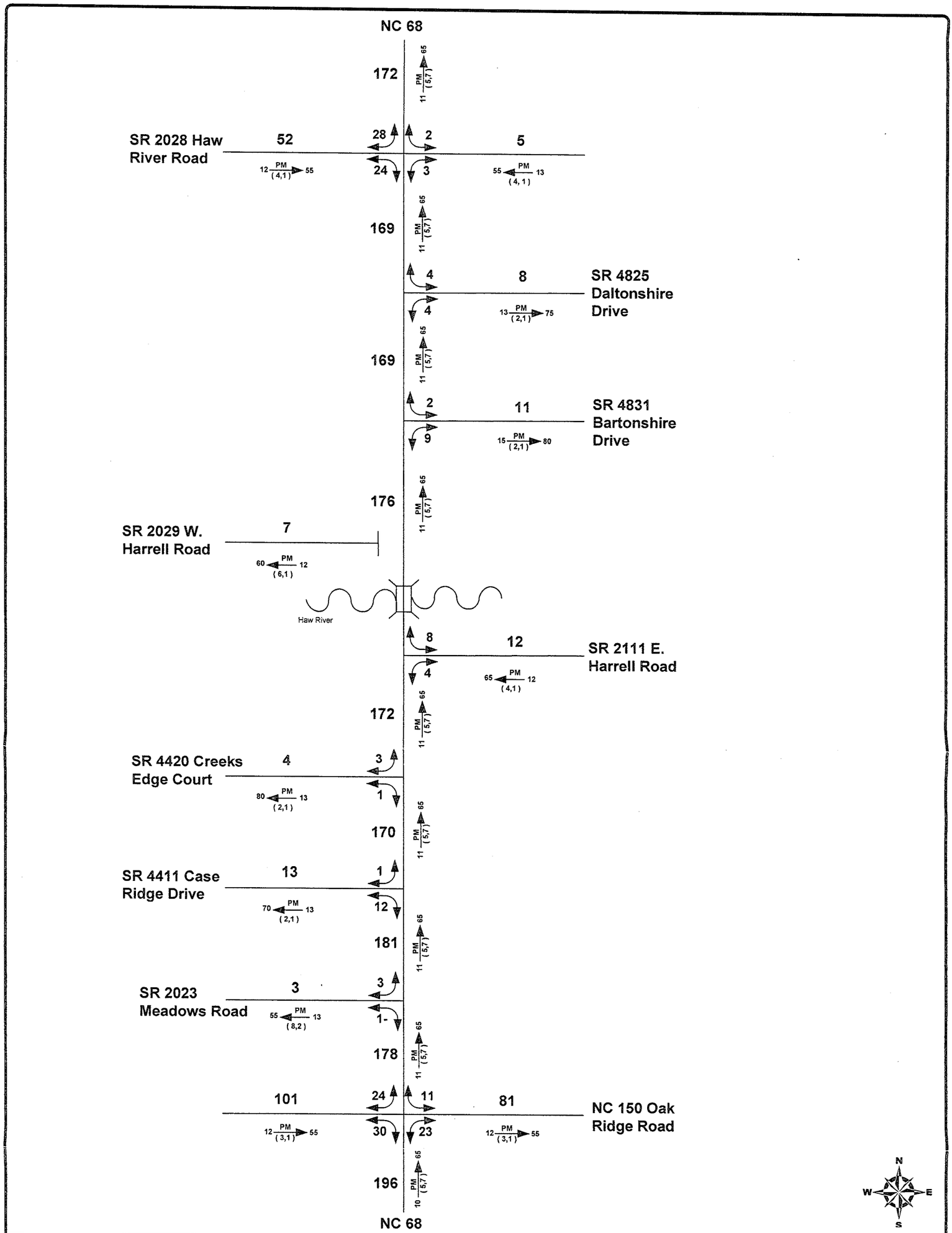
LEGEND

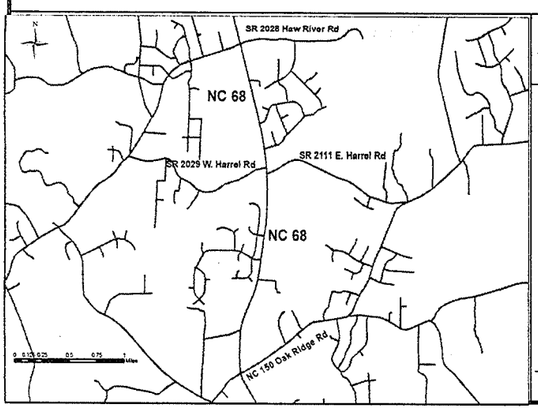
DHV PM D (d, t)

###	No. of Vehicles Per Day (VPD) in 100s	DHV	Design Hourly Volume
		PM	PM Peak Period
1-	Less than 50 VPD	D	Peak Hour Directional Split
X	Movement Prohibited	→	Indicates Direction of D
-------	Roadway	(d,t)	Duals, TT-STs (%)

TIP: W-5114	**WBS:** 41877.1.1
COUNTY: Guilford	**DIVISION:** 7
DATE: June 15, 2011	
PREPARED BY: Paul Schroeder, PhD PE	
LOCATION: NC 68 from NC 150 to SR 2028	
PROJECT: Alleve safety issue along NC 68 associated with W. Harrell & E. Harrell Roads	

Figure 3





2035 ANNUAL AVERAGE DAILY TRAFFIC

Build Alternative 1B
SHEET 1 OF 1

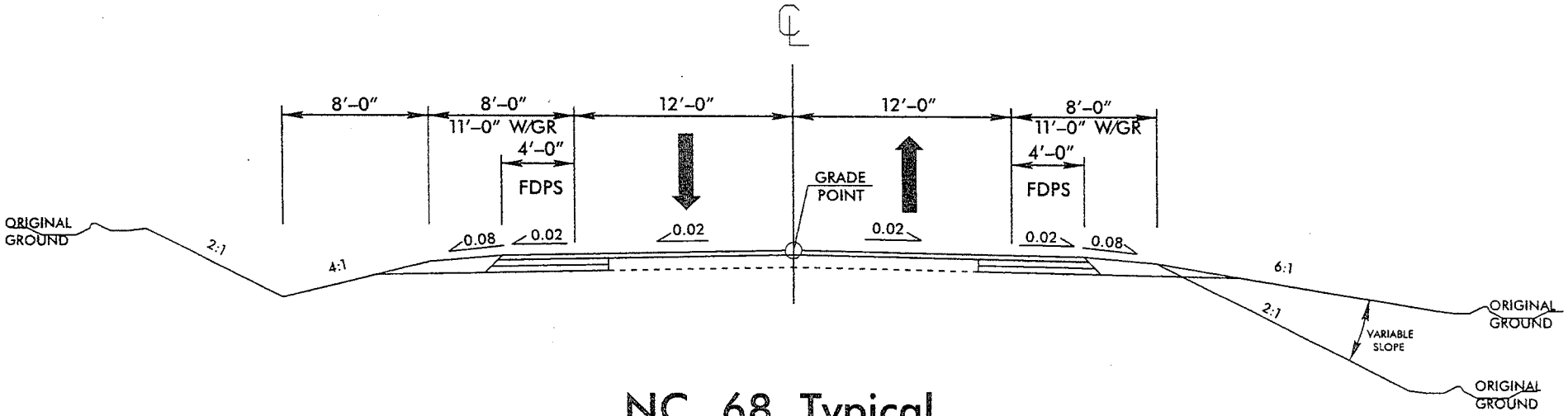
LEGEND

DHV PM (d, t) D

###	No. of Vehicles Per Day (VPD) in 100s	DHV	Design Hourly Volume
		PM	PM Peak Period
1-	Less than 50 VPD	D	Peak Hour Directional Split
X	Movement Prohibited	→	Indicates Direction of D
------	Roadway	(d,t)	Duals, TT-STs (%)

TIP: W-5114	**WBS:** 41877.1.1
COUNTY: Guilford	**DIVISION:** 7
DATE: June 15, 2011	
PREPARED BY: Paul Schroeder, PhD PE	
LOCATION: NC 68 from NC 150 to SR 2028	
PROJECT: Alleve safety issue along NC 68 associated with W. Harrell & E. Harrell Roads	

Figure 3A



NC 68 Typical

Alternative 1B

Figure 4

Direct Community Impact Area

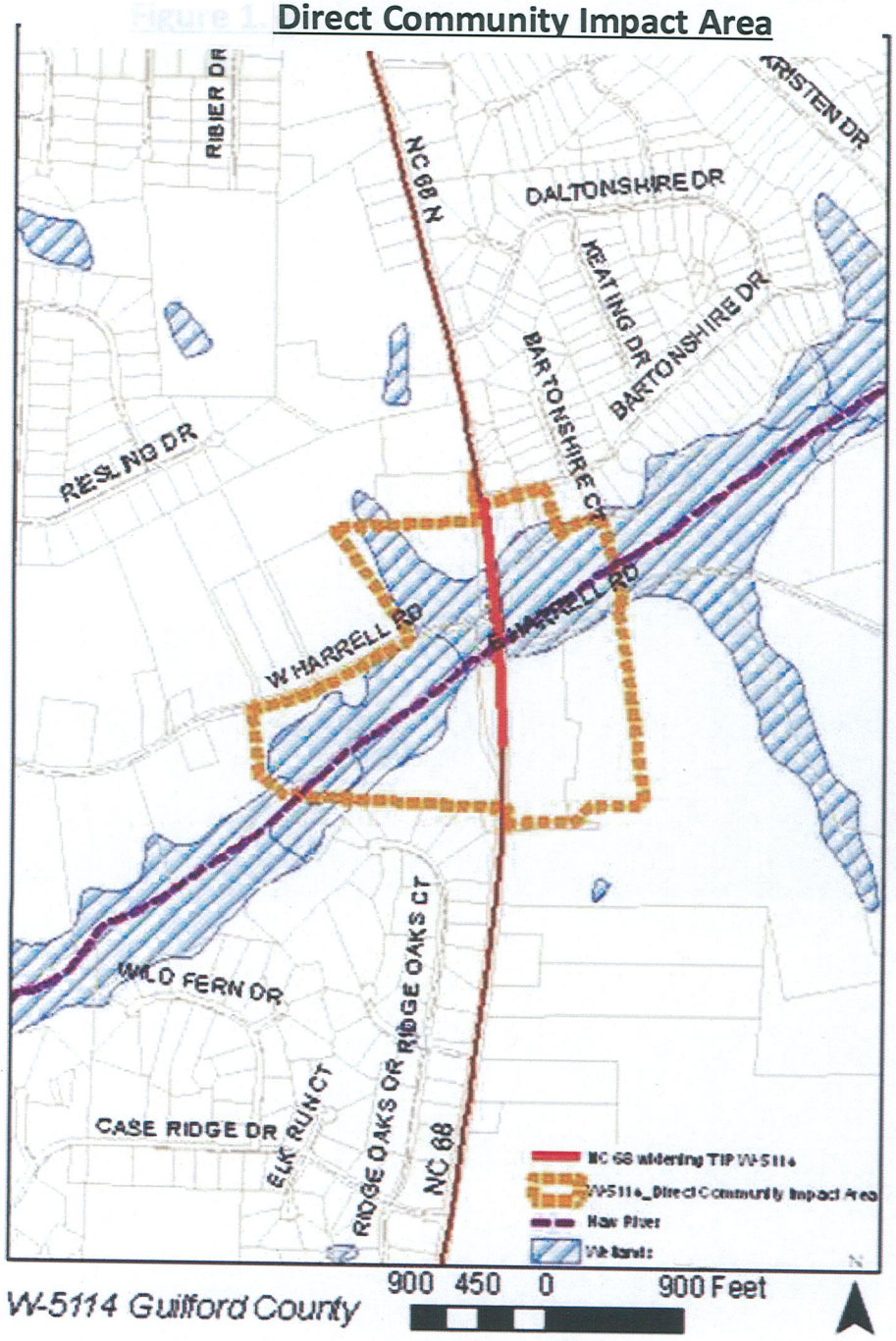


Figure 5

Notable Community Characteristics:

- The Direct Community Impact Area (DCIA) is comprised of a few undeveloped, large, forested parcels.
- The area surrounding the DCIA is becoming more suburban in nature.
- Nearby residents and local officials are aware of the present danger and frequency of accidents when attempting left turns at West Harrell and East Harrell Rds.
- Wetlands, a 303(d) section of the Haw River located in the 100-yr and 500-yr flood zones, and environmental constraints are present in the DCIA.
- There are no EJ or LEP populations in the Direct Community Impact Area.

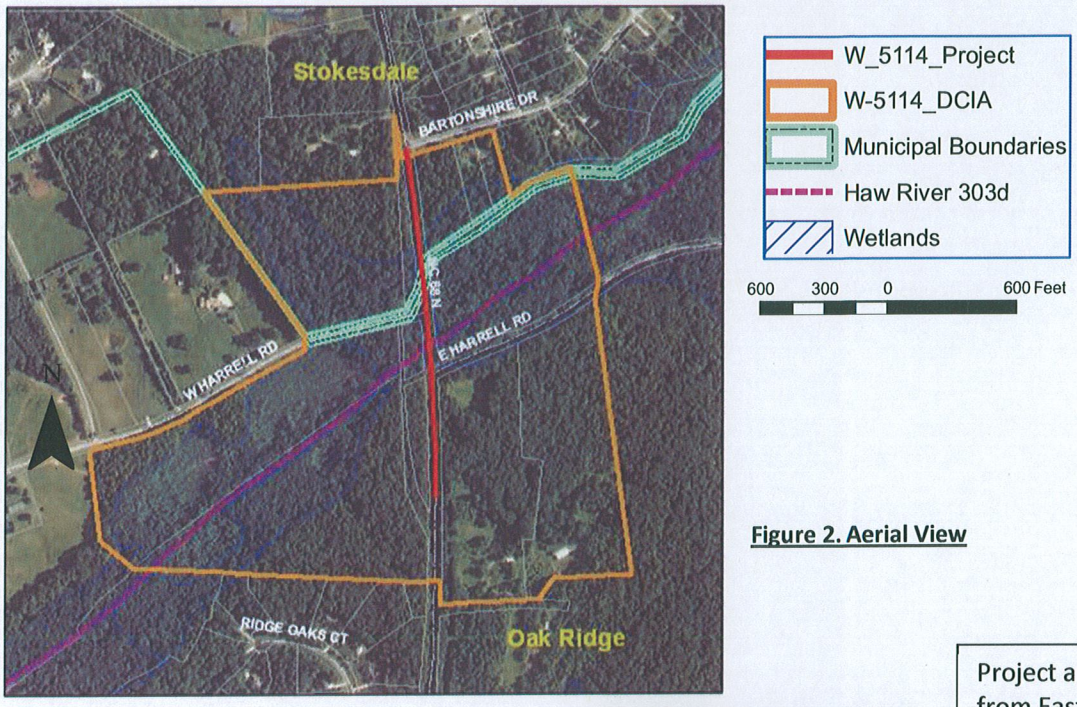
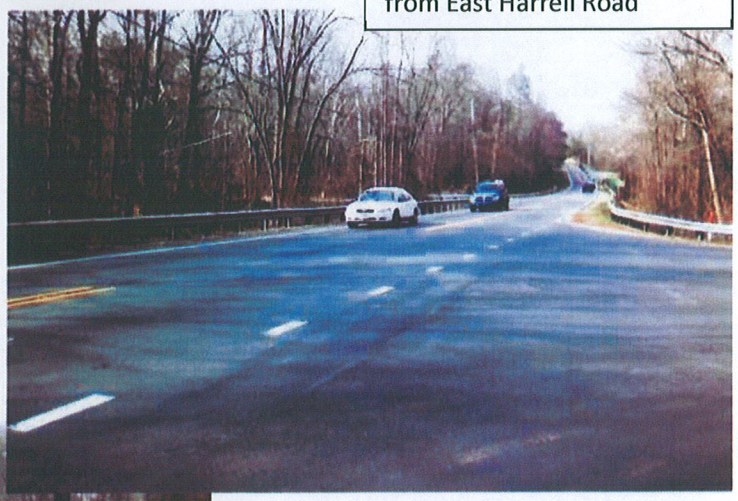


Figure 2. Aerial View

Project area looking north from East Harrell Road



Project area looking south from West Harrell Road

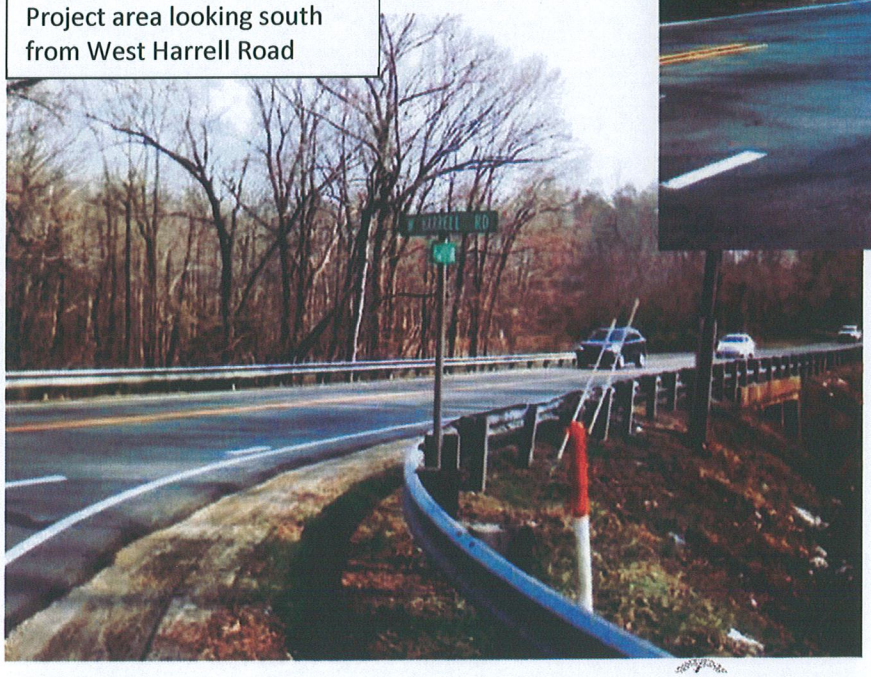


Figure 5A

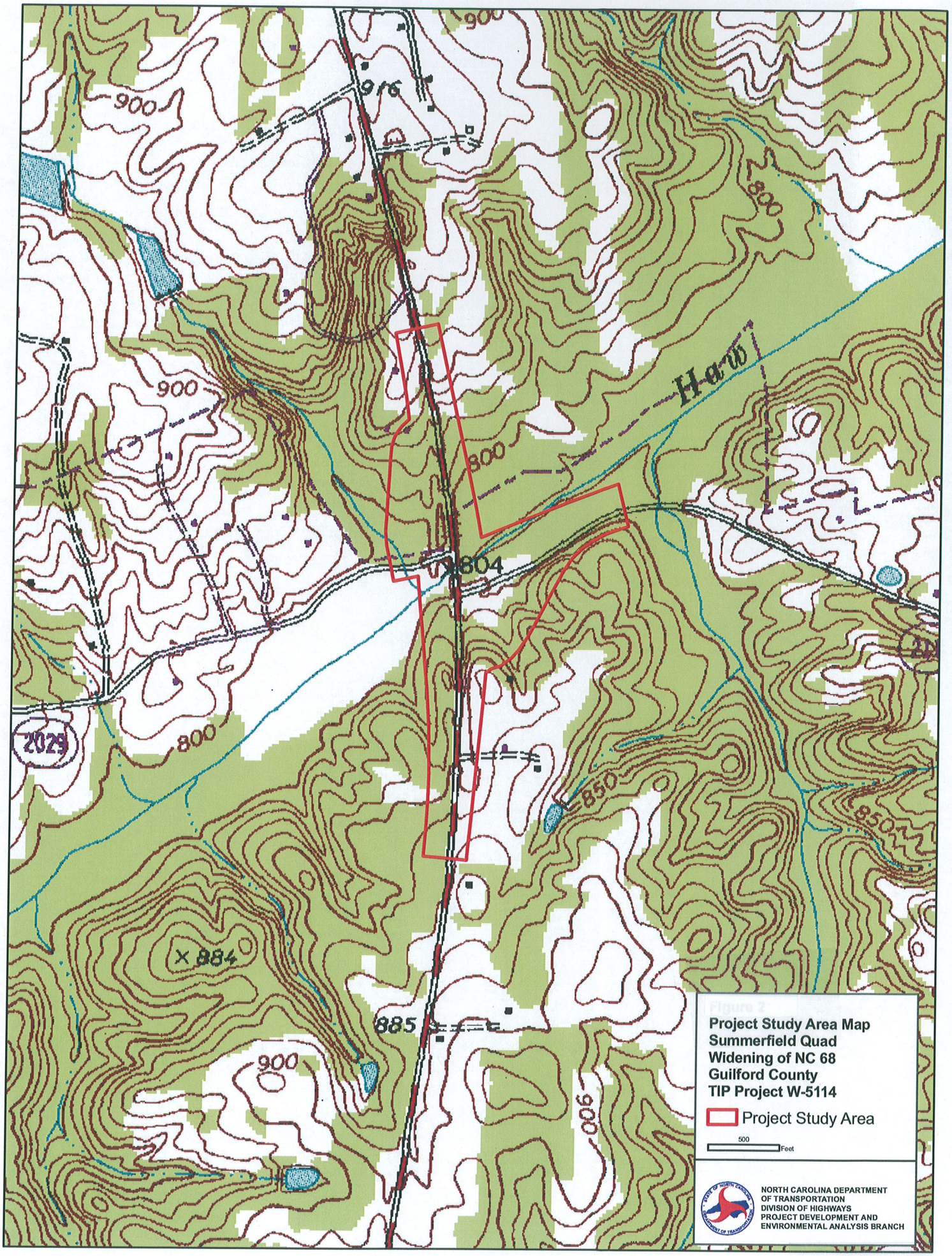

900
900
800
Haw
800
804
2029
800
850
850
884
885
900
900
Project Study Area Map
Summerfield Quad
Widening of NC 68
Guilford County
TIP Project W-5114
Project Study Area
500
Feet
NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS BRANCH

Figure 6

Figure 7

Jurisdictional Features Map
Widening of NC 68
Guilford County
TIP Project W-5114

Project Study Area
Streams
Wetlands
Pond
250
Feet

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

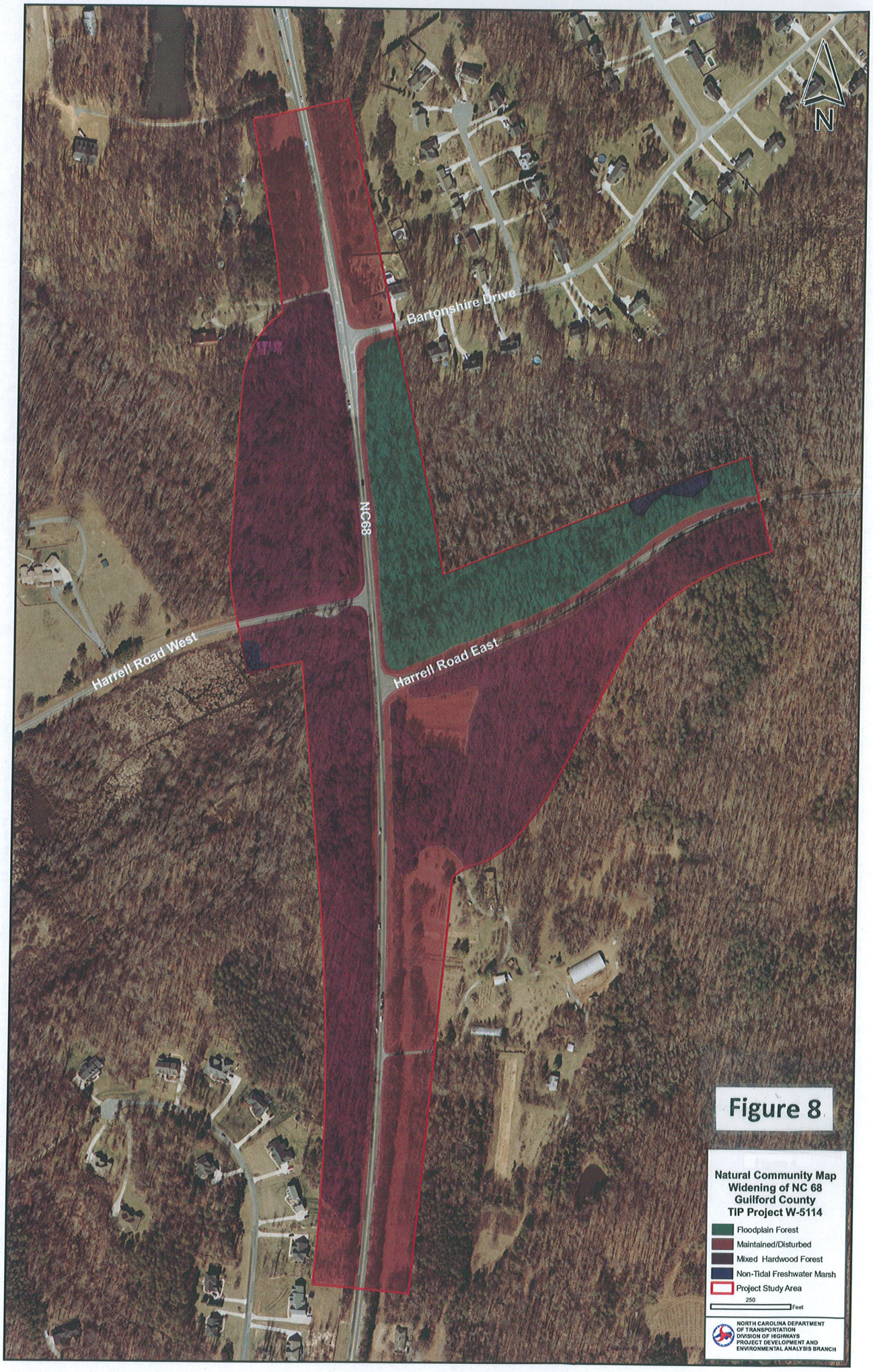


Figure 8

Natural Community Map
Widening of NC 68
Guilford County
TIP Project W-5114

- Floodplain Forest
- Maintained/Disturbed
- Mixed Hardwood Forest
- Non-Tidal Freshwater Marsh
- Project Study Area

250 Feet

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

APPENDIX 1

Agency Comments

North Carolina Department of Environment and Natural Resources
Division of Water Quality
Coleen H. Sullins
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

November 15, 2010

MEMORANDUM

To: Karen Reynolds, NCDOT

From: Amy Euliss, NC Division of Water Quality, Office

Subject: Scoping comments on proposed improvements to NC 68 from south of SR 2111 (East Harrell Road) to SR 4831 (Bartonshire Drive), in Guilford County, Federal Aid Project No. STP-0068 (10), WBS # 41877, TIP no. W-5114.

Reference your correspondence dated November 8, 2010 in which you requested comments for the referenced project. Preliminary analysis of the project reveals the potential for multiple impacts to streams and jurisdictional wetlands in the project area. More specifically, impacts to:

Stream Name	River Basin	Stream Classification(s)	Stream Index Number	303(d) Listing
Haw River	Cape Fear	WSV;NSW	16-(1)	Yes, ecological/ biological integrity
UT to Haw River	Cape Fear	WSV;NSW	16-(1)	Yes, ecological/ biological integrity

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

Project Specific Comments:

1. Haw River and its unnamed tributaries are class WS V; NSW waters of the State. NCDWQ is very concerned with sediment and erosion impacts that could result from this project. NCDWQ recommends that highly protective sediment and erosion control BMPs be implemented to reduce the risk of nutrient runoff to Haw River and its unnamed tributaries. NCDWQ requests that road design plans provide treatment of the storm water runoff through best management practices as detailed in the most recent version of NCDWQ's *Stormwater Best Management Practices*.

2. Haw River and its unnamed tributaries are class WSV; NSW; 303(d) waters of the State. Haw River and its unnamed tributaries are on the 303(d) list for impaired use for aquatic life due to ecological and biological integrity. NCDWQ is very concerned with sediment and erosion impacts that could result from this project. NCDWQ recommends that the most protective sediment and erosion control BMPs be implemented in accordance with *Design Standards in Sensitive Watersheds* to reduce the risk of nutrient runoff to Haw River and its unnamed tributaries. NCDWQ requests that road design

plans provide treatment of the storm water runoff through best management practices as detailed in the most recent version of NCDWQ's *Stormwater Best Management Practices*.

3. This project is within the Jordan Lake Basin. Riparian buffer impacts shall be avoided and minimized to the greatest extent possible pursuant to 15A NCAC 2B .0267.

General Project Comments:

4. The environmental document shall provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping. If mitigation is necessary as required by 15A NCAC 2H.0506(h), it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. Appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.

5. Environmental assessment alternatives shall consider design criteria that reduce the impacts to streams and wetlands from storm water runoff. These alternatives shall include road designs that allow for treatment of the storm water runoff through best management practices as detailed in the most recent version of NCDWQ *Stormwater Best Management Practices*, such as grassed swales, buffer areas, preformed scour holes, retention basins, etc.

6. After the selection of the preferred alternative and prior to an issuance of the 401 Water Quality Certification, NCDOT is respectfully reminded that they will need to demonstrate the avoidance and minimization of impacts to wetlands (and streams) to the maximum extent practical. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(h)}, mitigation will be required for impacts of greater than 1 acre to wetlands. In the event that mitigation is required, the mitigation plan shall be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as wetland mitigation.

7. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(h)}, mitigation will be required for impacts of greater than 150 linear feet to any single stream. In the event that mitigation is required, the mitigation plan shall be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as stream mitigation.

8. NCDWQ is very concerned with sediment and erosion impacts that could result from this project. NCDOT shall address these concerns by describing the potential impacts that may occur to the aquatic environments and any mitigating factors that would reduce the impacts.

9. If a bridge is being replaced with a hydraulic conveyance other than another bridge, NCDWQ believes the use of a Nationwide Permit may be required. Please contact the US Army Corp of Engineers to determine the required permit(s).

culvert

10. If the old ~~bridge~~ is removed, no discharge of bridge material into surface waters is allowed unless otherwise authorized by the US ACOE. Strict adherence to the Corps of Engineers guidelines for bridge demolition will be a condition of the 401 Water Quality Certification.

11. Whenever possible, NCDWQ prefers spanning structures. Spanning structures usually do not require work within the stream or grubbing of the streambanks and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges shall allow for human and wildlife passage beneath the structure. Fish passage and navigation by canoeists and boaters shall not be blocked. Bridge supports (bents) shall not be placed in the stream when possible.

12. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to the most current version of NCDWQ's *Stormwater Best Management Practices.*

13. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.

14. If temporary access roads or detours are constructed, the site shall be graded to its preconstruction contours and elevations. Disturbed areas shall be seeded or mulched to stabilize the soil and appropriate native woody species should be planted. When using temporary structures the area shall be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact allows the area to re-vegetate naturally and minimizes soil disturbance.

15. Placement of culverts and other structures in waters, streams, and wetlands shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and down stream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWQ. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWQ for guidance on how to proceed and to determine whether or not a permit modification will be required.

16. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation, floodplain benches, and/or sills may be required where appropriate. Widening the stream channel shall be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

17. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3624/Nationwide Permit No. 6 for Survey Activities.

18. Sediment and erosion control measures sufficient to protect water resources must be implemented and maintained in accordance with the most recent version of North Carolina Sediment and Erosion Control Planning and Design Manual and the most recent version of NCS000250.

19. All work in or adjacent to stream waters shall be conducted in a dry work area unless otherwise approved by NCDWQ. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures should be used to prevent excavation in flowing water.

20. Sediment and erosion control measures shall not be placed in wetlands and streams.

21. Borrow/waste areas shall avoid wetlands to the maximum extent practical. Impacts to wetlands in borrow/waste areas could precipitate compensatory mitigation.

22. While the use of National Wetland Inventory (NWI) maps, NC Coastal Region Evaluation of Wetland Significance (NC-CREWS) maps and soil survey maps are useful tools, their inherent inaccuracies require that qualified personnel perform onsite wetland delineations prior to permit approval.

23. Heavy equipment shall be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams. This equipment shall be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

24. In most cases, NCDWQ prefers the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure shall be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed and restored to the natural ground elevation. The area shall be stabilized with grass and planted with native tree species. Tall fescue shall not be used in riparian areas.

25. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed.

Thank you for requesting our input at this time. NCDOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Amy Euliss at (336) 771-4959.

cc: Andy Williams, US Army Corps of Engineers, Raleigh Field Office
Federal Highway Administration
Chris Militscher, Environmental Protection Agency (electronic copy only)
Travis Wilson, NC Wildlife Resources Commission (electronic copy only)
Wetlands/401 Transportation Permitting Unit
File Copy

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

November 18, 2010

Gregory J. Thorpe, Ph.D.
North Carolina Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Dr. Thorpe:

This letter is in response to your request for comments from the U.S. Fish and Wildlife Service (Service) on the potential environmental effects of the proposed improvements to NC 68 from south of SR 2111 (East Harrell Road) to SR 4831 (Bartonshire Dr.) in Guilford County, North Carolina (TIP No. W-5114). These comments provide information in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543).

The Service does not have any specific concerns for this project. We recommend the following general conservation measures to avoid or minimize environmental impacts to fish and wildlife resources:

1. Wetland and forest impacts should be avoided and minimized to the maximum extent practical. Highway shoulder and median widths should be reduced through wetland areas;

2. Crossings of streams and associated wetland systems should use existing crossings and/or occur on a bridge structure wherever feasible. Bridges should be long enough to allow for sufficient wildlife passage along stream corridors. Where bridging is not feasible, culvert structures that maintain natural water flow and hydraulic regimes without scouring or impeding fish and wildlife passage should be employed;

3. Bridges and approaches should be designed to avoid any fill that will result in damming or constriction of the channel or flood plain. To the extent possible, piers and bents should be placed outside the bank-full width of the stream. If spanning the flood plain is not feasible, culverts should be installed in the flood plain portion of the approach to restore some of the hydrological functions of the flood plain and reduce high velocities of flood waters within the affected area;

4. Bridge designs should include provisions for roadbed and deck drainage to flow through a vegetated buffer prior to reaching the affected stream. This buffer should be large enough to alleviate any potential effects from run-off of storm water and pollutants;

5. Off-site detours should be used rather than construction of temporary, on-site bridges. For projects requiring an on-site detour in wetlands, such detours should be aligned along the side of the existing structure which has the least and/or least quality of fish and wildlife habitat. At the completion of construction, the detour area should be entirely removed and the impacted areas be planted with appropriate vegetation, including trees if necessary;

6. If unavoidable wetland or stream impacts are proposed, a plan for compensatory mitigation to offset unavoidable impacts should be provided early in the planning process;

7. Wherever appropriate, construction in sensitive areas should occur outside fish spawning and migratory bird nesting seasons. In waterways that may serve as travel corridors for fish, in-water work should be avoided during moratorium periods associated with migration, spawning and sensitive pre-adult life stages;

8. Best Management Practices (BMP) for Construction and Maintenance Activities should be implemented; and

9. Activities within designated riparian buffers should be avoided or minimized.

Section 7(a)(2) of the Endangered Species Act requires that all federal action agencies (or their designated non-federal representatives), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally threatened or endangered species. A biological assessment/evaluation may be prepared to fulfill the Section 7(a)(2) requirement and will expedite the consultation process. To assist you, a county-by-county list of federally protected species known to occur in North Carolina and information on their life histories and habitats can be found on our web page at http://nc-es.fws.gov/es/countyfr.html .

Although the North Carolina Natural Heritage Program (NCNHP) database does not indicate any known occurrences of listed species near the project vicinity, use of the NCNHP data should not be substituted for actual field surveys if suitable habitat occurs near the project site. The NCNHP database only indicates the presence of known occurrences of listed species and does not necessarily mean that such species are not present. It may simply mean that the area has not been surveyed. If suitable habitat occurs within the project vicinity for any listed species, surveys should be conducted to determine presence or absence of the species.

If you determine that the proposed action may affect (i.e. likely to adversely affect or not likely to adversely affect) a listed species, you should notify this office with your determination, the results of your surveys, survey methodologies and an analysis of the effects of the action on listed species, including consideration of direct, indirect and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e. no beneficial or adverse, direct or indirect effect) on listed species, then you are not required to contact our office for concurrence.

We reserve the right to review any federal permits that may be required for this project, at the public notice stage. Therefore, it is important that resource agency coordination occur early in

the planning process in order to resolve any conflicts that may arise and minimize delays in project implementation. In addition to the above guidance, we recommend that the environmental documentation for this project include the following in sufficient detail to facilitate a thorough review of the action:

1. A clearly defined and detailed purpose and need for the proposed project;

2. A description of the proposed action with an analysis of all alternatives being considered;

3. A description of the fish and wildlife resources, and their habitats, within the project impact area that may be directly or indirectly affected;

4. The extent and acreage of waters of the U.S., including wetlands, that are to be impacted by filling, dredging, clearing, ditching, or draining. Wetland boundaries should be determined by using the 1987 Corps of Engineers Wetlands Delineation Manual and verified by the U.S. Army Corps of Engineers;

5. The anticipated environmental impacts, both temporary and permanent, that would be likely to occur as a direct result of the proposed project. The assessment should also include the extent to which the proposed project would result in indirect and cumulative effects to natural resources;

6. Design features and construction techniques which would be employed to avoid or minimize impacts to fish and wildlife resources, both direct and indirect, and including fragmentation and loss of habitat;

7. Design features, construction techniques, or any other mitigation measures which would be employed at wetland crossings and stream channel relocations to avoid or minimize impacts to waters of the US; and,

8. If unavoidable wetland or stream impacts are proposed, project planning should include a compensatory mitigation plan for offsetting the unavoidable impacts.

The Service appreciates the opportunity to comment on this project. If you have any questions regarding our response, please contact Mr. Gary Jordan at (919) 856-4520, ext. 32.

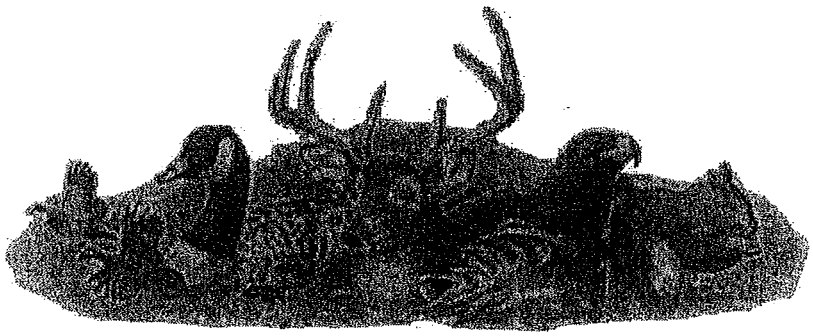
Sincerely,

Gary Jordan

for Pete Benjamin
Field Supervisor

cc: Travis Wilson, NCWRC, Creedmoor, NC
Chris Militscher, USEPA, Raleigh, NC

W-5114



North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

MEMORANDUM

TO: Karen Reynolds, Project Planning Engineer
Project Development and Environmental Analysis, NCDOT

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: January 7, 2011

SUBJECT: Response to the start of study notification from the N. C. Department of Transportation (NCDOT) regarding fish and wildlife concerns for the proposed improvements for NC 68, from south of SR 2111 to SR 4831, Guilford County, North Carolina.

This memorandum responds to a request from the NCDOT for our concerns regarding impacts on fish and wildlife resources resulting from the subject project. Biologists on the staff of the N. C. Wildlife Resources Commission (NCWRC) have reviewed the proposed improvements. Our comments are provided in accordance with certain provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

At this time we do not have any specific concerns related to this project. To help facilitate document preparation and the review process, our general informational needs are outlined below:

1. Description of fishery and wildlife resources within the project area, including a listing of federally or state designated threatened, endangered, or special concern species. Potential borrow areas to be used for project construction should be included in the inventories. A listing of designated plant species can be developed through consultation with:

   NC Natural Heritage Program
   Dept. of Environment & Natural Resources
   1601 Mail Service Center
   Raleigh, NC 27699-1601.
   WWW.ncnhp.org

and,

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

NCDA Plant Conservation Program

P. O. Box 27647
Raleigh, N. C. 27611
(919) 733-3610

2. Description of any streams or wetlands affected by the project. The need for channelizing or relocating portions of streams crossed and the extent of such activities.

3. Cover type maps showing wetland acreages impacted by the project. Wetland acreages should include all project-related areas that may undergo hydrologic change as a result of ditching, other drainage, or filling for project construction. Wetland identification may be accomplished through coordination with the U. S. Army Corps of Engineers (COE). If the COE is not consulted, the person delineating wetlands should be identified and criteria listed.

4. Cover type maps showing acreages of upland wildlife habitat impacted by the proposed project. Potential borrow sites should be included.

5. The extent to which the project will result in loss, degradation, or fragmentation of wildlife habitat (wetlands or uplands).

6. Mitigation for avoiding, minimizing or compensating for direct and indirect degradation in habitat quality as well as quantitative losses.

7. A cumulative impact assessment section which analyzes the environmental effects of highway construction and quantifies the contribution of this individual project to environmental degradation.

8. A discussion of the probable impacts on natural resources which will result from secondary development facilitated by the improved road access.

9. If construction of this facility is to be coordinated with other state, municipal, or private development projects, a description of these projects should be included in the environmental document, and all project sponsors should be identified.

Thank you for the opportunity to provide input in the early planning stages for this project. If we can further assist your office, please contact me at (919) 528-9886.

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

January 10, 2011

Regulatory Division

Action ID No. SAW-2011-00086, W-5114, Federal-Aid Project STP-0068(10), NC68 from South of SR 2111 (East Harrell Road) to SR 4831 (Bartonshire Drive), Guilford County, North Carolina.

Mr. Gregory J. Thorpe, Ph.D., Manager
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

Dear Mr. Thorpe:

Reference is made to your letter of November 8, 2010, regarding the Start of Study for North Carolina Department of Transportation (NCDOT) project W-5114, which is located along NC 68, from south of SR 2111 (East Harrell Road) to SR 4831 (Bartonshire Road), in Guilford County, North Carolina. The letter requested any information that the U.S. Army Corps of Engineers (USACE) might have that would be helpful in evaluating potential environmental impacts associated with the project and to identify any permits or approvals that may be required by the USACE.

We have reviewed the subject documents and determined that, based upon a review of the information provided and available maps, aerial photographs, and data, construction of project is likely to impact streams and wetlands within the work corridor. Specifically, the Haw River, a Traditionally Navigable Water (TNW) and several unnamed tributaries are located within, or in close proximity to, the project boundaries provided. Also, the National Wetlands Inventory (NWI) data indicates a large wetland may be present. Furthermore, our records indicates that the Carolina Darter (*Etheostoma collis lepidinion*), which is a federally listed species of concern, may also be present within the project area.

Please be aware that impacts associated with the discharge of fill into jurisdictional waters of the United States are subject to our regulatory authority pursuant to Section 404 of the Clean Water Act. Any discharge of excavated or fill material into waters of the United States and/or any adjacent wetlands would require Department of the Army (DA) permit authorization. The type of DA authorization required (i.e., general or individual permit) will be determined by the location, type, and extent of jurisdictional area impacted by the project, and by the project design and construction limits.

Until additional data is furnished which details the extent of the construction limits of the proposed project, and an onsite inspection is completed with regard to determinations of the present of jurisdictional waters on the project property, we are unable to verify that the project will not have jurisdictional impacts, or to provide specific comments concerning DA permit requirements. To assist you with determining permitting requirements, we recommend that you perform a detailed delineation of the streams and/or wetlands present on the project site. When this information becomes available, it should be forwarded to our office for review and comment, as well as a determination of DA permit eligibility.

Should you have any further questions related to DA permits for this project, please contact me at 919-554-4884, extension 26.

Sincerely,

Andrew Williams

Andrew Williams
Regulatory Project Manager
Raleigh Field Office

Copy Furnished:

Ms. Amy Euliss
NC DENR Winston-Salem Regional Office
Division of Water Quality
585 Waughtown Street
Winston-Salem, NC 27107

Determination of Project Categorization for $PM_{2.5}$ Hotspot Requirements

Project Name: NC 68-Haw River Crossing
Project Number: W-5114
Location: Guilford County
Document Type: CE
Project Status: PE
FHWA Contact: Edward Dancausse
NCDOT Contact: Eric Midkiff

- ❑ Project Description: NC 68, from 600 feet south of R 2111 (East Harrell Road) to SR 483 (Bartonshire Drive), crossing the Haw River

- ❑ Is this project in a conforming Plan/TIP?

  Yes. This project is a hazard elimination project or safety project with the sole intent of reducing rear end collisions through construction of left turn lanes; therefore, it is identified as exempt in the 93.127 conformity regulation. The TIP number is W-5114.

- ❑ Is the project on a new or expanded highway or expressway that serves a significant volume of diesel truck traffic, such as a facility with greater than 125,000 annual average daily traffic (AADT) and 8% or more of such AADT is diesel truck traffic?

  No. This project is to improve safety along NC 68, within the project limits, by constructing a left-turn lane or other accommodations for East Harrell and West Harrell Roads. For the year 2011 the highest AADT volume on any segment of this project is 2184 trucks are anticipated to use the facility in 2011. This number is less than the 10,000 trucks per day that can be calculated using 125,000 AADT and 8 % trucks of the design year of 2025. For the design year 2035 the highest AADT volume on any segment of this project is 19,600 with 12% Trucks. Based on these numbers, 2352 trucks are anticipated to use the facility in 2035. This number is not larger than the 10,000 trucks per day that can be calculated using 125,000 AADT and 8 % trucks.

- ❑ Does the project construct new exit ramps or other highway facility improvements that connect a highway or expressway to a major freight, bus, or intermodal terminal?

  No.

- ❑ Does the project expand an existing highway or other facility that affects a congested intersection (Operates at LOS D, E, or F) that has a significant increase in the number of diesel trucks?

  No. All intersections operate at LOS 'C' or better in the Design Year of 2035. There is no change in Design Year traffic volumes between the Build and No-Build alternatives.

- ❑ Does the highway project involve a significant increase in the number of diesel transit buses and / or diesel trucks?

  No. The current and future truck percentages are anticipated to be similar. There is no change in Design Year traffic volumes between the Build and No-Build alternatives.

Since W-5114 was found not to be an air quality concern under 40 CFR 91.123(b)(1), a qualitative PM 2.5 hot-spot analysis is not required. The following statement will be added to the environmental document for the proposed project:

> A qualitative PM 2.5 hot-spot analysis is not required for this project since it is not an air quality concern. The Clean Air Act and 40 CFR 93.116 requirements were met without a hot-spot analysis, since this project has been found not to be of air quality concern under 40 CFR 93.123(b)(1). This project meets the statutory transportation conformity requirements without a hotspot analysis.

Project Tracking No. (Internal Use)

11-08-0103

NO SURVEY REQUIRED FORM

PROJECT INFORMATION

Project No:	W-5114	*County:*	Guilford
WBS No:	41877	*Document:*	PCE
F.A. No:		*Funding:*	☐ State ☒ Federal

Federal (USACE) Permit Required? ☒ Yes ☐ No *Permit Type:* 401 Water Quality

Project Description:

NC 68 Hazard Elimination Improvements from 600 feet south of SR 2111 (East Harrell Rd) to SR 4831 (Bartonshire Dr.) crossing the Haw River.

SUMMARY OF CULTURAL RESOURCES REVIEW

Brief description of review activities, results of review, and conclusions:

Review of HPO quad maps, relevant background reports, historic designations roster, and indexes was undertaken on September 6, 2011. Based on this review, there were no existing NR, SL, LD, DE, or SS properties in the Area of Potential Effects (APE). Aerial photographs and HPO GIS indicates there is one structure in the APE to the southeast of the project limits. According to Guilford County Tax Data this is a circa 1963 single family residence.

Brief Explanation of why the available information provides a reliable basis for reasonably predicting that there are no unidentified historic properties in the APE:

Using HPO GIS website, Guilford County Tax Data, and Google Street view provide reliable information regarding the structures in the APE. These combined utilities are considered valid for the purposes of determining the likelihood of historic resources being present.

SUPPORT DOCUMENTATION

See attached: Maps

FINDING BY NCDOT CULTURAL RESOURCES PROFESSIONAL

NO SURVEY REQUIRED

Shelby Gallup — Oct 23, 2012

NCDOT Cultural Resources Specialist — Date

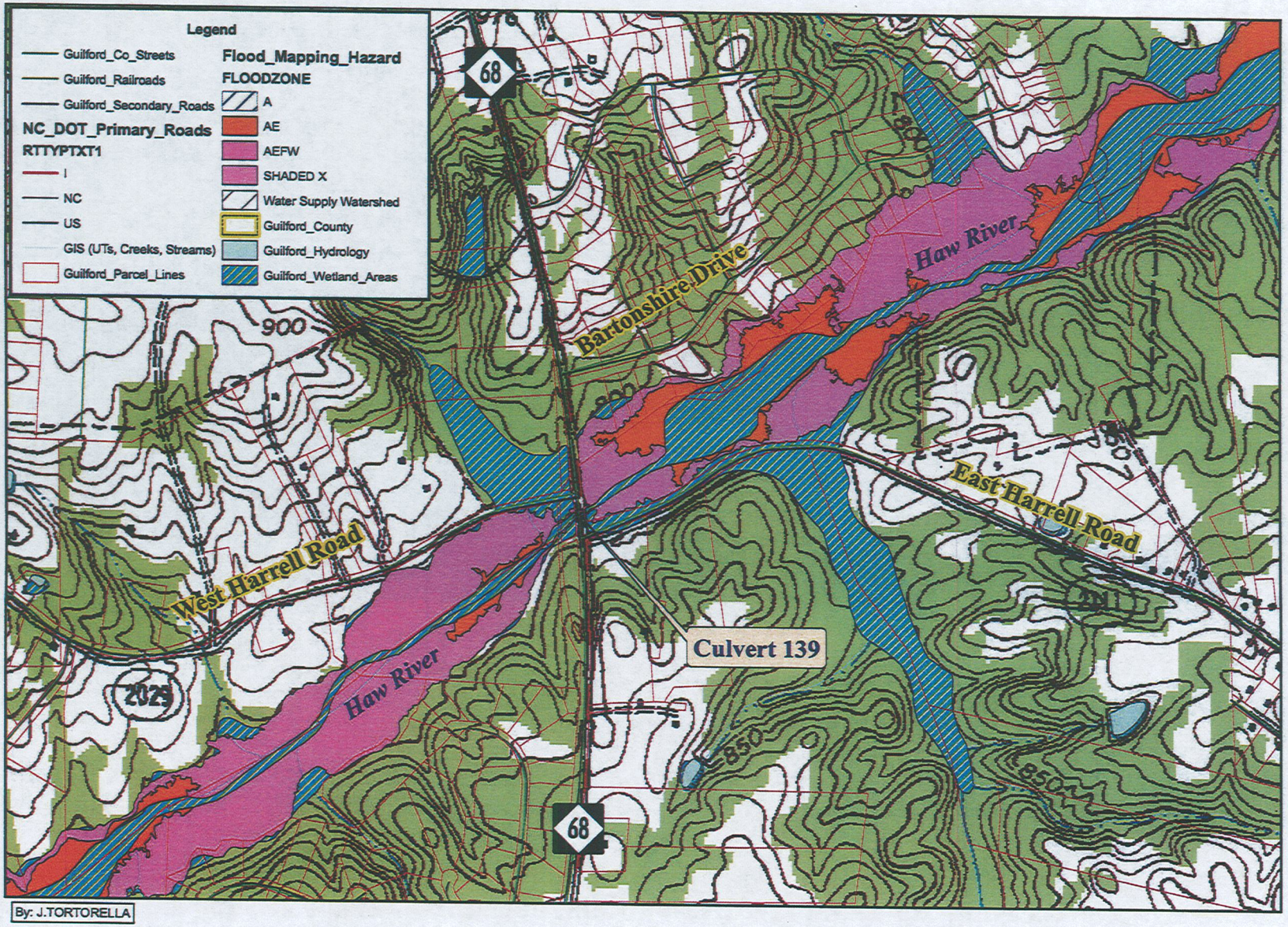
NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS BRANCH

SCOPING MEETING MAP
NC 68 - HAW RIVER CROSSING
GUILFORD COUNTY
TIP PROJECT W-5114

N

County: GUILFORD	
Div: 7	TIP#: W-5114
WBS: 41877.1.1	
JANUARY 2011	

Figure
1



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

GIS ENVIRONMENTAL FEATURES
NC 68 - HAW RIVER CROSSING

GUILFORD COUNTY
TIP PROJECT W-5114

N

County:	GUILFORD
Div: 7	TIP# W-5114
WBS:	41877.1.1
Date:	AUGUST 2009

Figure 1

HPOGIS

Guilford County

Project Tracking No. (Internal Use)

11-08-0103

NO PREHISTORIC OR HISTORIC PROPERTIES PRESENT/AFFECTED FORM

PROJECT INFORMATION

Project No:	W-5114, NC 68	*County:*	Guilford
WBS No:	41877.1.1	*Document:*	CE / PCE
F.A. No:		*Funding:*	☐ State ☒ Federal

Federal (USACE) Permit Required? ☒ Yes ☐ No *Permit Type:* 401 WQ

Project Description: NCDOT proposes a Hazard Elimination Improvement on NC 68 from 600 ft south of SR 2111 (East Harrell Rd.) to SR 4831 (Bartonshire Dr.), crossing the Haw River. The undertaking involves constructing left turn lanes. Easton Harrell Road will be relocated, intersecting with NC 68 further south. New ROW will be required. The APE for the project is the extent of all construction, including areas of fill/cut for the relocated roadway.

SUMMARY OF FINDINGS

The North Carolina Department of Transportation (NCDOT) reviewed the subject project and determined:

Historic Architecture/Landscapes

☐ There are no National Register-listed or Study Listed properties within the project's area of potential effects.

☐ There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.

☐ There are no properties within the project's area of potential effects.

☐ There are properties over fifty years old within the area of potential effects, but they do not meet the criteria for listing on the National Register.

☐ All properties greater than 50 years of age located in the APE have been considered and all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.

☐ There are no historic properties present or affected by this project. (*Attach any notes or documents as needed*)

Archaeology

☒ There are no National Register-listed or Study Listed properties within the project's area of potential effects.

☒ No subsurface archaeological investigations are required for this project.

☐ Subsurface investigations did not reveal the presence of any archaeological resources.

☐ Subsurface investigations did not reveal the presence of any archaeological resources considered eligible for the National Register.

☐ All identified Archaeological sites located within the APE have been considered and all compliance for archaeological resources with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.

☒ There are no historic properties present or affected by this project. (*Attach any notes or documents as needed*)

SUMMARY OF CULTURAL RESOURCES REVIEW

Brief description of review activities, results of review, and conclusions:
A file and map search was conducted at the Office of State Archaeology. No previously documented archaeological sites were noted in the nearby vicinity of the project APE. USGS topographic mapping and aerial photography was examined. The project was the subject of an environmental/archaeological review through HPO/OSA (ER 10-2098), which recommended no archaeological survey based on low probability for impacts to significant archaeological resources. However, since that review (ER # 12-16-2010), the undertaking design has been more refined and includes the relocation of SR SR 2111 (East Harrel Road). This was believed to expand the APE from the previous OSA review, and required further consideration.

Additional work included compiling historic maps and aerials, researching soil descriptions and types as they relate to local archaeology, and fieldwork. At this location, the USGS shows what appears to be a previous crossing of the Haw River along NC 68 just west of the current bridge – this modifies the probability of intact sites in the west half of the APE, though nothing was noted on the east. The area around the Haw River floodplain, a location with higher than normal probability for the presence of archaeological sites, was considered to merit subsurface testing. However, soils were either frequently flooded, or, in the case of relocating SR 2111, traverses sloped terrain. OSA mapping showed sites on similar landforms downriver.

Fieldwork was conducted on September 17th, 2012 by NCDOT archaeologists Brian Overton and Shane Petersen. The entire APE was visually inspected; however the focus of the work was on the southeast quadrant where the road will be realigned. The northwestern quadrant did have an abandoned bridge abutment, confirming the suspicion from review of maps and aerials of a preexisting road. While outside of the APE, it contributes to the landform disturbances and erosion between that older transportation feature and the current roadway. The APE in most of the other areas is already heavily disturbed by the existing NC 68 roadway or is otherwise expansions of fill into low and frequently flooded soils.

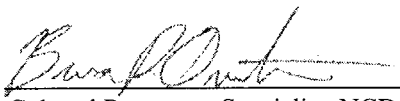
The southeast quadrant was found to be wooded and sloped. The degree of slope, which the soils descriptions put at 6-15 percent, was considered too great for likely historic or Native American habitation. This led to the conclusion that the ROW expansions that resulted from realigning SR 2111 would not require subsurface testing.

No archaeological sites were identified within the APE for the project. The potential to encounter intact and significant cultural remains that might be considered eligible for listing on the National Register of Historic Places is unlikely due to previous disturbances (farming, roadway construction) and sloped topography. No further work is recommended for archaeology on this project. Should construction activities encounter archaeological remains, or the suspicion of cultural deposits, the Archaeology Group should be contacted as soon as possible for consultation.

SUPPORT DOCUMENTATION

See attached: excerpt and notated USGS mapping (Summerfield), photograph and design mapping

Signed:



Cultural Resources Specialist, NCDOT — 10/10/2012 Date

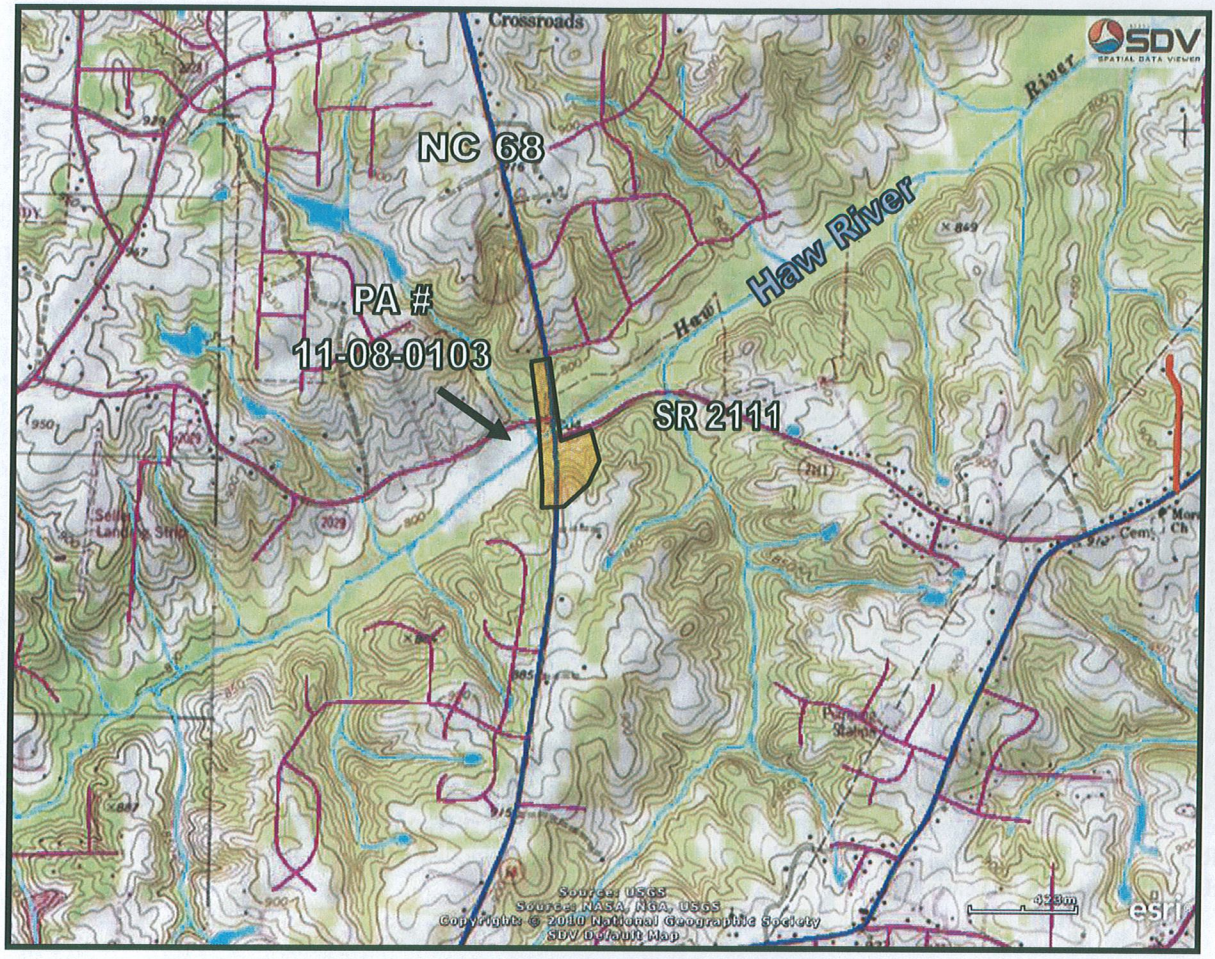


Figure 1. Excerpts of USGS mapping (Summerfield) showing intersection of SR 2111 (Harrell Road) with NC 68 at the Haw River (TIP W-5114, PA 11-08-0103). Note the earlier road is represented in the contours west of NC 68.

Figure 2. Photograph of along NC 68 facing north with intersection of East Harrell Road (SR 2111) to the right, the Haw River bridge in the background (W-5162, PA # 11-08-0103). Note the disturbances to the right of the guardrail. East Harrell Road is to be realigned.

PROJECT REFERENCE NO.	SHEET NO.
W-5114	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

NAD 83/NSRS 2007

TRAFFIC DIAGRAM
2014 ADT
2034 ADT
16,238 / 17,155 -L- 16,550 / 17,550
400 / 400
713 / 796
MC 68
1,113 / 1,196
-Y1-
E. HARRELL RD.

BEGIN TIP PROJ. W-5114
BEGIN CONSTRUCTION
-L- POC STA. 13+90.00

-L- POC STA 17+76.94
-Y1- POT STA 10+00.00

NANCY B. ABBITT

WOODS

S 08°39'45" E 512.00'

100' TAPER LT & RT

330' TAPER LT & RT

S 15°33'45" E 89.00'

EXISTING R/W

4' P.S.

MC 68 21' BST

MATCH EXIST.

+20.00 IMC

+00.00

BM#1
-BL- STA 50+08.75
89' LEFT
ELEV. 809.23'

GRAU 350 TL-3

N 88° 20' 27.0" E

PC-Sta. 10+71.50

150' LEFT TURN TAPER

WOODS

COLLIN M. JR & NANCY ABBITT

N 00°51'52" E 1246.41'

MATCH LINE -Y1- STA. 14+00.00 SHEET 6

BILLY RAY MOORE

EXISTING R/W

60.00'

N 28°33'56" E

WOODS

TIE TO EXIST. GUARDRAIL

N 04°45'56" E 239.68'

OBLITERATE AND GRADE TO DRAIN

HMW RIVER

50' TAPER LT & RT

WEST HARRELL RD

SR 2811

STOKESDALE CITY LIMITS
OAK RIDGE CITY LIMITS

40' R/W TO EIP

S 02°36'48" W 57.01'

N 04°45'56" E 97.97'

S 30°18'05" E 32.57'

4' P.S.

WOODS

FRANKLIN D. BLAYLOCK

OBLITERATE AND GRADE TO DRAIN

TIE TO EXIST. GUARDRAIL

HMW RIVER

BL-9 STA 21+21.5 PINC

MATCH LINE -L- STA. 26+50.00 SHEET 5

-L-	-Y1-
PI Sta 25+47.70	PI Sta 12+83.67
Δ = 14° 59' 20.1" (LT)	Δ = 63° 55' 50.6" (LT)
D = 0° 30' 18.1"	D = 16° 51' 06.1"
L = 2,967.92'	L = 379.37'
T = 1,492.48'	T = 212.17'
R = 11,345.00'	R = 340.00'
SE = SEE PLANS	SE = SEE PLANS
RO = SEE PLANS	RO = SEE PLANS

PROP PAINT STRIPING
PAVEMENT REMOVAL

FOR -L- PROFILE, SEE SHEET NO. 7
FOR -Y1- PROFILE, SEE SHEET NO. 8

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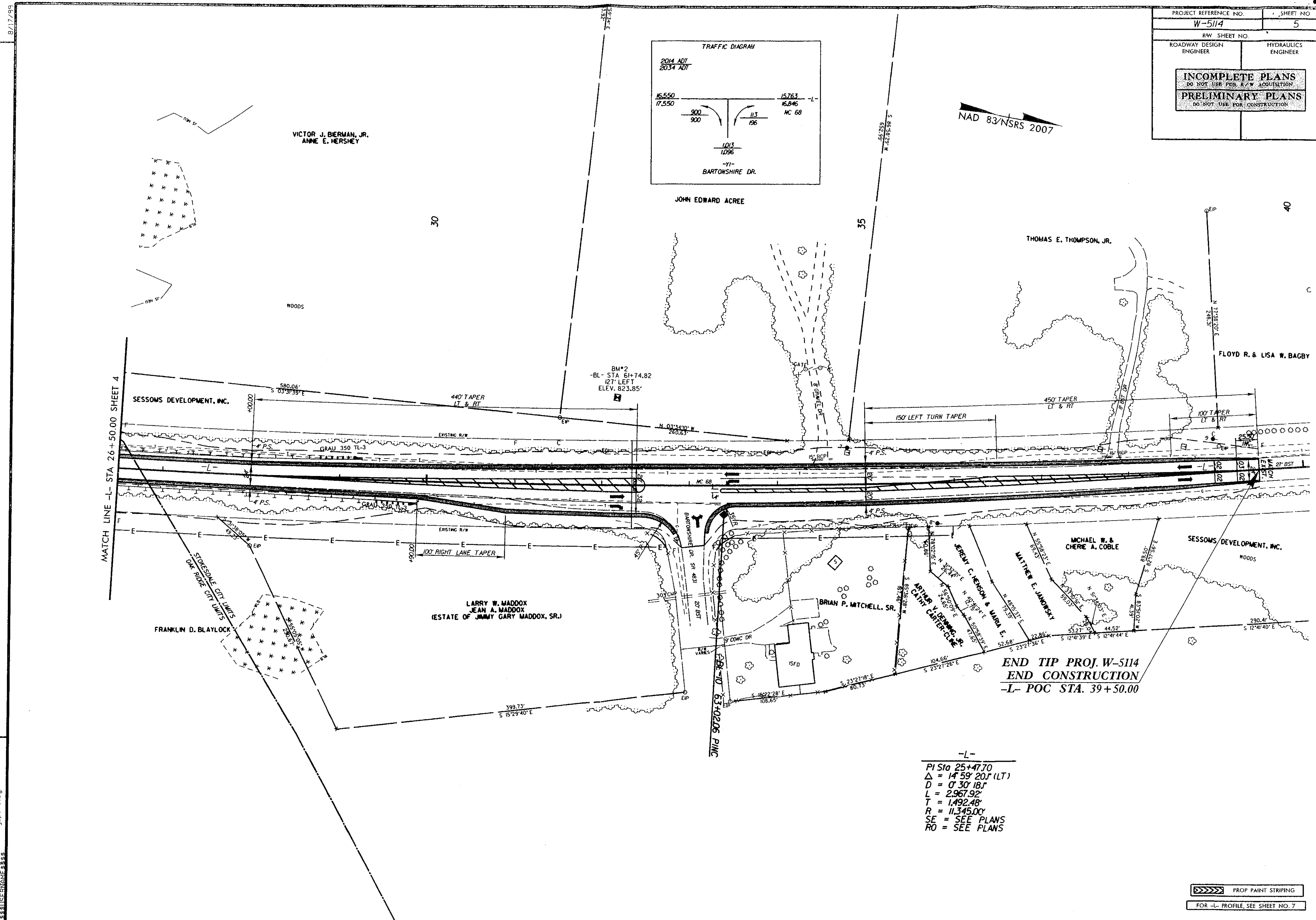

PROJECT REFERENCE NO.
W-5114
SHEET NO.
5
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
TRAFFIC DIAGRAM
2014 ADT
2034 ADT
16,550
17,550
15,763
16,846
-L-
NC 68
900
900
113
196
1,013
1,096
-Y1-
BARTONSHIRE DR.
NAD 83/NSRS 2007
VICTOR J. BIERMAN, JR.
ANNE E. HERSHEY
JOHN EDWARD ACREE
THOMAS E. THOMPSON, JR.
FLOYD R. & LISA W. BAGBY
WOODS
BM#2
-BL- STA 61+74.82
127' LEFT
ELEV. 823.85'
SESSOMS DEVELOPMENT, INC.
580.06'
S 03°31'39" E
440' TAPER LT & RT
N 03°34'10" W
260.63'
150' LEFT TURN TAPER
450' TAPER LT & RT
100' TAPER LT & RT
MATCH LINE -L- STA 26+50.00 SHEET 4
EXISTING R/W
GRAU 350 TL-3
4' P.S.
NC 68
100' RIGHT LANE TAPER
BARTONSHIRE DR. SR 1431
20' BST
27' BST
30" CMP
STOKESDALE CITY LIMITS
OAK RIDGE CITY LIMITS
LARRY W. MADDOX
JEAN A. MADDOX
(ESTATE OF JIMMY GARY MADDOX, SR.)
FRANKLIN D. BLAYLOCK
BRIAN P. MITCHELL, SR.
9' CONC DR
ISFD
JEREMY C. HENSON & MARIA E.
ARTHUR V. DEMING, JR.
CATHY CARTER-CLINE
MATTHEW E. JANOWSKY
MICHAEL W. & CHERIE A. COBLE
SESSOMS DEVELOPMENT, INC.
WOODS
399.73'
S 15°29'40" E
108.65'
80.73'
104.66'
S 23°27'26" E
52.68'
S 23°27'36" E
22.85'
53.27'
44.52'
290.41'
S 12°41'40" E
END TIP PROJ. W-5114
END CONSTRUCTION
-L- POC STA. 39+50.00
63+02.06 PINC
30
35
40
-L-
PI Sta 25+47.70
Δ = 14° 59' 20.5" (LT)
D = 0° 30' 18.5"
L = 2,967.92'
T = 1,492.48'
R = 11,345.00'
SE = SEE PLANS
RO = SEE PLANS
PROP PAINT STRIPING
FOR -L- PROFILE, SEE SHEET NO. 7
REVISIONS
8/17/99
09-FEB-2012 15:02
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PROJECT REFERENCE NO.	SHEET NO.
W-5114	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
8/17/99

WOODS

FRANKLIN D. BLAYLOCK

EXISTING R/W

OUTERATE AND GRADE TO DRAIN

100' TAPER LT & RT

25.5' INC.

POT Sta 23+18.66

NAD 83/NSRS 2007

PT Sta 14+50.81

MATCH LINE -Y1- STA 14+00.00 SHEET 4

N 24° 24' 36.4" E

PC Sta 17+07.88

N 56° 13' 38.0" E

PT Sta 22+96.51

END CONSTRUCTION
-Y1- POT STA. 22+60.00

WOODS

COLLIN M. JR & NANCY ABBITT

S 65°05'36" E
1400.0'

-Y1-

PI Sta 12+83.67	PI Sta 20+10.00
Δ = 63° 55' 50.6" (LT)	Δ = 31° 49' 01.6" (RT)
D = 16° 51' 06.1"	D = 5° 24' 18.9"
L = 379.37'	L = 588.63'
T = 212.17'	T = 302.12'
R = 340.00'	R = 1060.00'
SE = SEE PLANS	SE = SEE PLANS
RO = SEE PLANS	RO = SEE PLANS
DS = 35 mph	DS = 55 mph

PAVEMENT REMOVAL

FOR -Y1- PROFILE, SEE SHEET NO. 8

09-FEB-2012 15:02
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APPENDIX 2

Scientific Names of Species Identified in Project Area

Appendix B: Scientific Names of Species Identified in Report

Plants

Common Name	Scientific Name
American elm	*Ulmus americana*
Arrow arum	*Peltandra virginica*
Beech	*Fagus grandifolia*
Blackberry	*Rubus argutus*
Buttonbush	*Cephalanthus occidentalis*
Catbriar	*Smilax rotundifolia*
Chinese privet	*Lingustrum sinese*
Christmas fern	*Polystichum acrostichoides*
Clover	*Trifolium* sp.
Common rush	*Juncus effusus*
Fescue	*Festuca* sp.
Green ash	*Fraxinus pennsylvanica*
Hackberry	*Celtis laevigata*
Henbit	*Lamium amplexicaule*
Ironwood	*Carpinus caroliniana*
Japanese honeysuckle	*Lonicera japonica*
Multiflora rose	*Rosa multiflora*
Northern red oak	*Quercus rubra*
Paw paw	*Asimina triloba*
Plantain	*Plantago* sp.
Poison ivy	*Toxicodendron radicans*
Possumhaw	*Viburnum nudum*
Red cedar	*Juniperus virginiana*
Red maple	*Acer rubrum*
River birch	*Betula nigra*
Sedge	*Carex* sp.
Shagbark hickory	*Carya ovata*
Silky dogwood	*Cornus amomum*
Smartweed	*Polygonum* sp.
Southern red oak	*Quercus falcata*
Strawberry bush	*Euonymus americanus*
Swamp rose	*Rosa palustris*
Sweetgum	*Liquidambar styraciflua*
Sycamore	*Platanus occidentalis*
Tulip poplar	*Liriodendron tulipifera*
Viburnum	*Viburnum* sp.
Virginia pine	*Pinus virginiana*
White oak	*Quercus alba*
Wild onion	*Allium* sp.

Wild strawberry	*Fragaria virginiana*
Winged elm	*Ulmus alata*

Animals

Common Name	Scientific Name
American crow	*Corvus brachyrhynchos*
Black racer	*Coluber constrictor*
Blue jay	*Cyanocitta cristata*
Bluehead chub	*Nocomis leptocephalus*
Carolina chickadee	*Poecile carolinensis*
Eastern bluebird	*Sialia sialis*
Eastern box turtle	*Terrapene carolina*
Eastern cottontail	*Sylvilagus floridanus*
Five-lined skink	*Eumeces anthracinus*
Green frog	*Rana clamitans*
Northern dusky salamander	*Desmognathus fuscus fuscus*
Raccoon	*Procyon lotor*
Redbreast sunfish	*Lepomis auritus*
Redlip shiner	*Notropis rubricroceus*
Spring peeper	*Pseudacris cruicifer*
Tufted titmouse	*Baeolophus bicolor*
Turkey vulture	*Cathartes aura*
Virginia opossum	*Didelphis virginiana*
White-tailed deer	*Odocoileus virginianus*