

FEASIBILITY STUDY

**New Route (Aviation Parkway Extension/Northern Durham Parkway)
from I-540 in Raleigh to US 501 (Roxboro Road) in Durham**

Wake and Durham Counties

Division 5

U-4721



**Prepared by the
Program Development Branch
N. C. Department of Transportation**

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I. General Description

This feasibility study describes the proposed new route (Aviation Parkway Extension/Northern Durham Parkway) from I-540 in Raleigh to US 501 (Roxboro Road) in Durham, a distance of approximately 18.8 miles. The project location is shown on Figure 1. As part of the study, combinations of the following cross-sections were investigated, the details of which are as follows:

- ◆ Three-lane curb and gutter section on 100 feet of right of way.
- ◆ Four-lane divided curb and gutter section on 130 feet of right of way.
- ◆ Four-lane divided freeway section on 250 feet of right of way.
- ◆ Four-lane divided freeway section on 300 feet of right of way.

This is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the proposed project including cost, and to identify potential problems that may require consideration in the planning and design phases.

II. Background

The purpose of this project is to provide a new connector from northern Durham to Raleigh as an alternative route for US 501 and US 70.

SR 3097 (Aviation Parkway) is designated as a principal arterial in the North Carolina Statewide Functional Classification. SR 3097 is currently a four-lane divided shoulder section with varying pavement widths from 80-140 feet from edge of pavement to edge of pavement.

SR 1815 (Mineral Springs Road) is designated as a collector in the North Carolina Statewide Functional Classification. SR 1815 is currently a two-lane and three-lane shoulder section with varying pavement widths from 22-37 feet from edge of pavement to edge of pavement.

SR 1675 (Glenn School Road) is designated as a collector in the North Carolina Statewide Functional Classification. SR 1675 is currently a two-lane shoulder section with a pavement width of from 20 feet from edge of pavement to edge of pavement.

SR 1004 (Old Oxford Highway) is designated as a minor arterial in the North Carolina Statewide Functional Classification. SR 1004 is currently a two-lane shoulder section with a pavement width of from 22 feet from edge of pavement to edge of pavement.

SR 1631 (Snow Hill Road) is designated as a minor arterial in the North Carolina Statewide Functional Classification. SR 1631 is currently a two-lane shoulder section with a pavement width of 21 feet from edge of pavement to edge of pavement.

The Aviation Parkway Extension/Northern Durham Parkway is designated as a freeway from I-540 to I-85 and a boulevard from I-85 to US 501 on the Strategic Highway Corridor Vision Plan for Division 5. Currently, the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization has requested a revision to the Strategic Highway Corridor Vision Plan to change the North Durham Parkway from US 70 to US 501 to a boulevard designation.

The 2035 Durham-Chapel Hill-Carrboro Long-Range Transportation Plan identifies the roadway cross-section for the Aviation Parkway Extension/Northern Durham Parkway as the following:

- Section AA as a four-lane freeway
- Sections AB, AC, and B as a four-lane divided facility
- Section C as a two-lane facility on four-lane right of way.

The following unfunded State Transportation Improvement Program (STIP) projects are located within the project study area:

- I-4743: Add additional lanes along I-85/US 15 from US 70 to SR 1632 (Red Mill Road).
- U-4720: Upgrade US 70 from Lynn Road to proposed Northern Durham Parkway/Aviation Parkway Extension to a freeway.
- U-5518: Upgrade US 70 (Glenwood Avenue) from west of SR 3067 (T.W. Alexander Drive) to I-540 to improve capacity, safety, and traffic operations.

There are several existing bridges in the project study area. Please see Table 5 for detailed bridge information.

It is anticipated that the Northern Durham Parkway will have railroad impacts, since it will intersect the Norfolk Southern Corporation Railway. At this location, there is one track that carries approximately 2 trains per day.

III. Traffic and Safety

There are existing traffic signals located at the following intersections within the project study area:

- SR 3097 (Aviation Parkway) and SR 1644 (Globe Road)
- SR 1815 (Mineral Springs Road) and NC 98 (Wake Forest Highway)
- SR 1675 (Glenn School Road) and Wal-Mart driveway
- I-85 southbound ramps and SR 1675 (Glenn School Road)

The estimated current year Average Daily Traffic (ADT) along Section AA (Aviation Parkway Extension) as a freeway with Sections AB, AC, and B as a boulevard and Section C as a boulevard or three-lane section ranges from 10,500 vehicles per day (vpd) to 17,500 vpd. For the design year 2040, the traffic volume along Section AA is estimated to range between 18,900 vpd to 30,300 vpd. Truck traffic is estimated to make up approximately 3 – 4 percent of the daily traffic.

The estimated current year ADT along Section AA as a freeway with Sections AB and AC as a freeway, Section B as a boulevard, and Section C as a boulevard or three-lane section ranges from 17,400 vpd to 25,100 vpd. For the design year 2040, the traffic volume along Section AA is estimated to range between 28,300 vpd to 40,400 vpd. Truck traffic is estimated to make up approximately 3 – 4 percent of the daily traffic.

The estimated current year ADT along Section AB (Northern Durham Parkway) as a boulevard with Section AA as a freeway, Sections AC and B as a boulevard, and Section C as a boulevard or three-lane section ranges from 16,900 vpd to 18,900 vpd. For the design year 2040, the traffic volume along Section AB is estimated to range between 18,700 vpd to 27,900 vpd. Truck traffic is estimated to make up approximately 3 – 4 percent of the daily traffic.

The estimated current year ADT along Section AB as a freeway with Sections AA and AC as a freeway, Sections B as a boulevard, and Section C as a boulevard or three-lane section ranges from 31,600 vpd to 35,800 vpd. For the design year 2040, the traffic volume along Section AB is estimated to range between 40,900 vpd to 41,300 vpd. Truck traffic is estimated to make up approximately 3 percent of the daily traffic.

The estimated current year ADT along Section AC (Northern Durham Parkway) as a boulevard with Section AA as a freeway, Sections AB, B as a boulevard, and Section C as a boulevard or three-lane section ranges from 9,400 vpd to 16,600 vpd. For the design year 2040, the traffic volume along Section AC is estimated to range between 14,500 vpd to 21,700 vpd. Truck traffic is estimated to make up approximately 3 percent of the daily traffic.

The estimated current year ADT along Section AC as a freeway with Sections AA and AB as a freeway, Section B as a boulevard, and Section C as a boulevard or three-lane section ranges from 33,300 vpd to 33,400 vpd. For the design year 2040, the traffic volume along Section AC is estimated to range between 41,200 vpd to 43,500 vpd. Truck traffic is estimated to make up approximately 3 percent of the daily traffic.

The estimated current year ADT along Section B (Northern Durham Parkway) as a boulevard with Section AA as a freeway, Sections AB and AC as a freeway or a boulevard, and Section C as a boulevard or three-lane section ranges from 8,700 vpd to 14,200 vpd. For the design year 2040, the traffic volume along Section B is estimated to range between 17,000 vpd to 27,600 vpd. Truck traffic is estimated to make up approximately 3 - 4 percent of the daily traffic.

The estimated current year ADT along Section C as a boulevard or a three-lane section with Section AA as a freeway, Sections AB and AC as a freeway or a boulevard, and Section B as a boulevard ranges from 4,100 vpd to 10,300 vpd. For the design year 2040, the traffic volume along Section C is estimated to range between 12,800 vpd to 21,800 vpd. Truck traffic is estimated to make up approximately 4 - 5 percent of the daily traffic.

The Aviation Parkway Extension/Northern Durham Parkway is projected to operate at a level of service (LOS) D or better under the estimated design year 2040 traffic volumes.

Between 2008 and 2011, 9 total crashes were reported along SR 1004 (Old Oxford Highway) from SR 1631 (Snow Hill Road) to SR 1638 (Stanley Road). The crash rate for SR 1004 is 141.47 crashes per 100 million vehicle miles (crashes/100MVM) traveled. This rate is lower than the statewide rate of 339.65 crashes/100MVM for two-lane undivided rural secondary routes. There was 1 fatal crash, 3 non-fatal injury crashes, and 5 property damage only crashes. The most prevalent types of crashes were Rear End (44%), Left Turn (22%), Animal (11%), Fixed Object (11%), and Ran Off Road (11%).

Between 2008 and 2011, 39 total crashes were reported along SR 1631 (Snow Hill Road). The crash rate for SR 1631 is 236.17 crashes per 100 million vehicle miles (crashes/100MVM) traveled. This rate is lower than the statewide rate of 339.65 crashes/100MVM for two-lane undivided rural secondary routes. There were no fatal crashes, 13 non-fatal injury crashes, and 26 property damage only crashes. The most prevalent types of crashes were Animal (21%), Rear End (21%), Left Turn (13%), Ran Off Road (13%), Angle (10%), Sideswipe (10%), and Fixed Object (10%).

Between 2009 and 2011, 116 total crashes were reported along US 70 (Glenwood Avenue) from SR 2095 (Page Road) to SR 2028 (T.W. Alexander Drive). The crash rate for US 70 is 259.63 crashes per 100 million vehicle miles (crashes/100MVM) traveled. This rate is lower than the statewide rate of 313.25 crashes/100MVM for four or more lane divided with no control of access United States routes. There was 1 fatal crash, 21 non-fatal injury crashes, and 94 property damage only crashes. The most prevalent type of crashes was Rear End (63%).

Between 2009 and 2011, 104 total crashes were reported along SR 2028/3067 (T.W. Alexander Drive) from SR 1973 (Page Road) to US 70 (Glenwood Avenue). The crash rate for US 70 is 339.20 crashes per 100 million vehicle miles (crashes/100MVM) traveled. This rate is higher than the statewide rate of 327.30 crashes/100MVM for four or more lane divided with no control of access North Carolina routes. There was 1 fatal crash, 28 non-fatal injury crashes, and 75 property damage only crashes. The most prevalent types of crashes were Rear End (34%), Angle (22%), Left Turn (19%), and Sideswipe (10%).

IV. Description of Alternatives

It is proposed to construct a new route (Aviation Parkway Extension/Northern Durham Parkway) from I-540 in Raleigh to US 501 (Roxboro Road) in Durham utilizing existing sections of SR 3097 (Aviation Parkway), Northern Durham Parkway, SR 1815 (Mineral Springs Road), SR 1675 (Glenn School Road), SR 1004 (Old Oxford Highway), and SR 1631 (Snow Hill Road), a distance of approximately 18.8 miles. The project location is shown on Figure 1. For evaluation purposes, the project was divided into segments. The details are below:

SECTION AA: This section along the Aviation Parkway Extension is from I-540 to US 70 (Glenwood Avenue), a distance of approximately 2.6 miles. This section utilizes an existing section of SR 3097 (Aviation Parkway) with a portion on new location. Included in the costs shown below are the realignment of World Trade Boulevard, a new interchange at the junction of SR 3097 and SR 1644 (Globe Road), roadway improvements along SR 1644, a new bridge at the junction of SR 3097 and Collingdale Way, new dual bridges over SR 2028 (T.W. Alexander Drive), and a new interchange at the junction of the Northern Durham Parkway and US 70.

Cross-section: Four-lane divided freeway section, 114 feet from edge of pavement to edge of pavement, with 12-foot lanes, a 46-foot depressed grass median, 5-foot paved inside shoulders, and 10-foot paved outside shoulders on 300 feet of right of way.

With this proposed cross-section, it is anticipated that there will be zero (0) residences and zero (0) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$108,200,000.

Right-of-way.....	\$45,500,000
Utility Relocation.....	\$3,200,000
<u>Construction.....</u>	<u>\$59,500,000</u>
Total Cost (Section AA).....	\$108,200,000

SECTION AB: This section along the Northern Durham Parkway is from US 70 (Glenwood Avenue) to NC 98 (Wake Forest Highway), a distance of approximately 4.3 miles. This section utilizes small portions of the existing Northern Durham Parkway and SR 1815 (Mineral Springs Road) with the majority on new location. Included in the costs shown below are new dual bridges over Lick Creek, a new dual bridge over unnamed tributary, and the realignment of SR 1815 (Mineral Springs Road).

Option 1 Cross-section: Four-lane divided curb and gutter section, 92 feet from face to face of curb, with 12-foot lanes, a 30-foot raised grass median, 5-foot bike lanes, 5-foot sidewalks, and 15-foot berms on 130 feet of right of way.

With this proposed cross-section, it is anticipated that there will be eleven (11) residences and one (1) business relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$37,100,000.

Right-of-way.....	\$6,300,000
Utility Relocation.....	\$1,600,000
<u>Construction.....</u>	<u>\$29,200,000</u>
Total Cost (Section AB – Option 1).....	\$37,100,000

Option 2 Cross-section: Four-lane divided freeway section, 104 feet from edge of pavement to edge of pavement, with 12-foot lanes, a 46-foot depressed grass median, 5-foot paved inside shoulders, and 10-foot paved outside shoulders on 250 feet of right of way.

With this proposed cross-section, it is anticipated that there will be thirty-four (34) residences and three (3) business relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$80,000,000.

Right-of-way.....	\$23,700,000
Utility Relocation.....	\$2,000,000
<u>Construction.....</u>	<u>\$54,300,000</u>
Total Cost (Section AB – Option 2).....	\$80,000,000

SECTION AC: This section along the Northern Durham Parkway is from NC 98 (Wake Forest Highway) to I-85, a distance of approximately 3.8 miles. This section utilizes small portions of the existing SR 1815 (Mineral Springs Road) and SR 1675 (Glenn School Road) with the majority on new location. Included in the costs shown below are the realignment of SR 1815 (Mineral Springs Road), the replacement of existing Bridge No. 82 with dual bridges over Little Lick Creek, new dual bridges over Chunky Pipe Creek, new dual bridges over Panther Creek, two (2) new dual bridges over unnamed tributaries, a new rail bridge at the junction with Norfolk Southern Corporation Railway, and the replacement of existing Bridge No. 195 with dual bridges over I-85.

Option 1 Cross-section: Four-lane divided curb and gutter section, 92 feet from face to face of curb, with 12-foot lanes, a 30-foot raised grass median, 5-foot bike lanes, 5-foot sidewalks, and 15-foot berms on 130 feet of right of way.

With this proposed cross-section, it is anticipated that there will be nine (9) residences and one (1) business relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$41,100,000.

Right-of-way.....	\$4,900,000
Utility Relocation.....	\$700,000
Construction.....	\$35,500,000
<u>Total Cost (Section AC - Option 1).....</u>	<u>\$41,100,000</u>

Option 2 Cross-section: Four-lane divided freeway section, 104 feet from edge of pavement to edge of pavement, with 12-foot lanes, a 46-foot depressed grass median, 5-foot paved inside shoulders, and 10-foot paved outside shoulders on 250 feet of right of way.

With this proposed cross-section, it is anticipated that there will be thirty-eight (38) residences and thirty (30) business relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$105,200,000.

Right-of-way.....	\$32,000,000
Utility Relocation.....	\$2,000,000
Construction.....	\$71,200,000
<u>Total Cost (Section AC – Option 2).....</u>	<u>\$105,200,000</u>

SECTION B: This section along the Northern Durham Parkway is from I-85 the beginning of Section C, a distance of approximately 3.8 miles. This section utilizes existing sections of SR 1675 (Glenn School Road) and SR 1004 (Old Oxford Highway) with the majority on new location. Included in the costs shown below are new dual bridges over Ellerbe Creek, the realignment of SR 1004, and the replacement of Bridge No. 24 with dual bridges over the Eno River.

Cross-section: Four-lane divided curb and gutter section, 92 feet from face to face of curb, with 12-foot lanes, a 30-foot raised grass median, 5-foot bike lanes, 5-foot sidewalks, and 15-foot berms on 130 feet of right of way.

With this proposed cross-section, it is anticipated that there will be one (1) residence and zero (0) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$29,700,000.

Right-of-way.....	\$2,500,000
Utility Relocation.....	\$500,000
<u>Construction.....</u>	<u>\$26,700,000</u>
Total Cost (Section B).....	\$29,700,000

SECTION C: This section along the Northern Durham Parkway is from SR 1004 (Old Oxford Highway) to US 501 (Roxboro Road), a distance of approximately 4.3 miles. This section utilizes existing section of SR 1631 (Snow Hill Road) with a portion on new location. All options under Section C include the realignment of SR 1004 and the widening of Culvert No. 3 at an unnamed tributary, the costs of which shown below.

Option 1 Cross-section: Three-lane undivided curb and gutter section, 50 feet from face to face of curb, with 12-foot lanes, 5-foot bike lanes, 5-foot sidewalks, and 15-foot berms on 100 feet of right of way.

With this proposed cross-section, it is anticipated that there will be one (1) residence and zero (0) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$21,700,000.

Right-of-way.....	\$5,700,000
Utility Relocation.....	\$1,700,000
<u>Construction.....</u>	<u>\$14,300,000</u>
Total Cost (Section C – Option 1).....	\$21,700,000

Option 2 Cross-section: Four-lane divided curb and gutter section, 92 feet from face to face of curb, with 12-foot lanes, a 30-foot raised grass median, 5-foot bike lanes, 5-foot sidewalks, and 15-foot berms on 130 feet of right of way.

With this proposed cross-section, it is anticipated that there will be one (1) residence and zero (0) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction, is estimated to be \$33,900,000.

Right-of-way.....	\$7,400,000
Utility Relocation.....	\$1,700,000
<u>Construction.....</u>	<u>\$24,800,000</u>
Total Cost (Section C – Option 2).....	\$33,900,000

Intelligent Transportation System (ITS) deployment is included in the total cost of this project. The cost of ITS deployment is \$4,700,000.

V. Community Issues

A detailed investigation was not conducted for this feasibility study, however possible impacts to Little River Elementary School, Glenn Elementary School, Southern High School, and Oak Grove Elementary School are anticipated. A portion of the project study area impacts Falls Lake, which is classified as a state park with game lands. No impacts to community facilities are anticipated with this project.

Maps at the Survey and Planning Branch of the North Carolina State Historic Preservation Office were used to determine if any historic properties on the National Register of Historic Places (NRHP) or state study lists exist within the project study area. The following properties were found to be potentially historic property:

- Snow Hill Farm Tenant House
- General Harris Log House
- Stanley House
- Penny Family Farm
- Mason House
- Evans Farm
- Chappell Log House
- Harris Log House
- Copley Log House
- Dr. William Norwood Hicks Farm
- Haas-Thrower House

VI. Natural Environment Issues

The following is a preliminary review of environmental issues that might have a potential impact to the project. The information obtained for the environmental screening is from a Geographic Information System (GIS) database. The purpose of the environmental screening is to identify potential environmental issues early in the process.

Stream Classification

The project study area is located in the Neuse River Basin. The Aviation Parkway Extension/Northern Durham Parkway crosses several water bodies within the project study area. Lick Creek, Little Lick Creek, Chunky Pipe Creek, Panther Creek, Ellerbe Creek, Eno River, and Cabin Branch have a stream classification of WS-IV NSW. Brier Creek has a stream classification of C NSW. These water bodies will likely need to be surveyed and have the appropriate coordination with the North Carolina Department of Environment and Natural Resources (NCDENR) and the U.S. Army Corps of Engineers (USACE) during any environmental document study. Portions of the project study area are also located in a water supply watershed, a high quality water zone, and a 100-year floodplain.

Wetlands

The Aviation Parkway Extension/Northern Durham Parkway crosses wetlands associated with Brier Creek, Lick Creek, Little Lick Creek, Chunky Pipe Creek, Panther Creek, Ellerbe Creek, Eno River, Cabin Branch, and several jurisdictional wetland areas. Permitting with the U.S. Army Corps of Engineers (USACE) will likely need to be obtained before construction of the project, and appropriate mitigation measures should be taken if deemed necessary.

Threatened and Endangered Species

Several threatened and endangered species were identified in the project study area. Please see Table 3 for detailed information. Several rare and unique natural areas were identified in the project study area. Please see Table 4 for detailed information.

VII. Recommendations

SECTIONS AA, AB (OPTIONS 1 & 2), AC (OPTIONS 1 & 2), B, C-OPTION 2:

It was found that the four-lane divided sections would be able to accommodate the projected 2040 design year traffic volumes and operate at an acceptable level of service. The total combined estimated cost for the project is shown in Tables 1 and 2.

SECTION C – OPTION 1: It was found that the three-lane undivided curb and gutter section would not be able to accommodate the projected 2040 design year traffic volumes.

**Table 1:
Total Project Cost with Section AA as a Freeway and Sections AB, AC, B, and C as a Boulevard**

Section	Right of way Cost	Utility Relocation Cost	Construction Cost	Total Cost	Residences Relocated	Businesses Relocated
Section AA	\$45,500,000	\$3,200,000	\$59,500,000	\$108,200,000	0	0
Section AB	\$6,300,000	\$1,600,000	\$29,200,000	\$37,100,000	11	1
Section AC	\$4,900,000	\$700,000	\$35,500,000	\$41,100,000	9	1
Section B	\$2,500,000	\$500,000	\$26,700,000	\$29,700,000	1	0
Section C – Option 2	\$7,400,000	\$1,700,000	\$24,800,000	\$33,900,000	1	0
ITS Deployment				\$4,700,000		
Total Cost	\$66,600,000	\$7,700,000	\$175,700,000	\$254,700,000	22	2

**Table 2:
Total Project Cost with Sections AA, AB, and AC as a Freeway and Sections B and C as a Boulevard**

Section	Right of way Cost	Utility Relocation Cost	Construction Cost	Total Cost	Residences Relocated	Businesses Relocated
Section AA	\$45,500,000	\$3,200,000	\$59,500,000	\$108,200,000	0	0
Section AB Option 2	\$23,700,000	\$2,000,000	\$54,300,000	\$80,000,000	34	3
Section AC Option 2	\$32,000,000	\$2,000,000	\$71,200,000	\$105,200,000	38	30
Section B	\$2,500,000	\$500,000	\$26,700,000	\$29,700,000	1	0
Section C Option 2	\$7,400,000	\$1,700,000	\$24,800,000	\$33,900,000	1	0
ITS Deployment				\$4,700,000		
Total Cost	\$111,100,000	\$9,400,000	\$236,500,000	\$361,700,000	74	33

VIII. Other Alternatives Considered

In later planning and design phases, NCDOT will investigate intersection improvements, including superstreets to enhance traffic operations along the corridor.

Table 3.

Threatened and endangered species within the project corridor.

Scientific Name	Common Name	Federal Status	State Status	County
<i>Ephemerum cohaerens</i>	Northern Short-lived Moss		SR-T	Durham
<i>Berberis canadensis</i>	American Barberry		SR-T	Durham
<i>Carex meadii</i>	Mead's Sedge		SR-P	Durham
<i>Ruellia purshiana</i>	Pursh's Wild-petunia		SR-O	Durham
<i>Scirpus pendulus</i>	Rufous Bulrush		SR-O	Durham
<i>Solidago rigida var. glabrata</i>	Southeastern Bold Goldenrod		SR-P	Durham
<i>Baptisia australis var. aberrans</i>	Prairie Blue Wild Indigo		T	Durham
<i>Ruellia humilis</i>	Low Wild-petunia		T	Durham
<i>Scutellaria leonardii</i>	Shale-barren Skullcap		SR-P	Durham
<i>Silphium terebinthinaceum</i>	Prairie Dock		SR-P	Durham
<i>Parthenium auriculatum</i>	Glade Wild Quinine		SR-T	Durham
<i>Liatris squarrulosa</i>	Earle's Blazing-star		SR-P	Durham
<i>Matelea decipiens</i>	Glade Milkvine		SR-P	Durham
<i>Aphanorrhagna serratum</i>	A Moss		SR-O	Durham
<i>Dibusa angata</i>	A Caddisfly		SR	Durham
<i>Necturus lewisi</i>	Neuse River Waterdog		SC	Durham
<i>Noturus furiosus</i>	Carolina Madtom	FSC	T	Durham
<i>Weissia ludoviciana</i>	A Moss		SR-T	Durham
<i>Symphotrichum laeve var. concinnum</i>	Narrow-leaf Aster		SR-P	Durham
<i>Hexalectris spicata</i>	Crested Coralroot		SR-P	Durham
<i>Echinacea laevigata</i>	Smooth Coneflower	E	E-SC	Durham
<i>Eupatorium godfreyanum</i>	Godfrey's Thoroughwort		SR-P	Durham

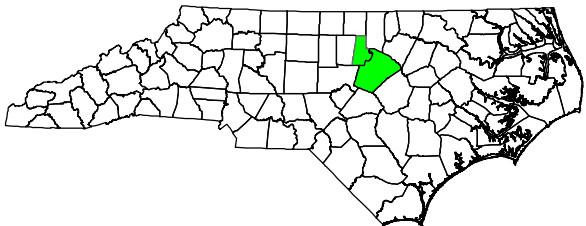
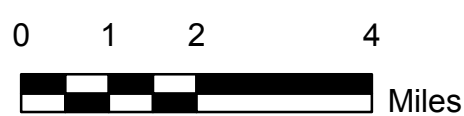
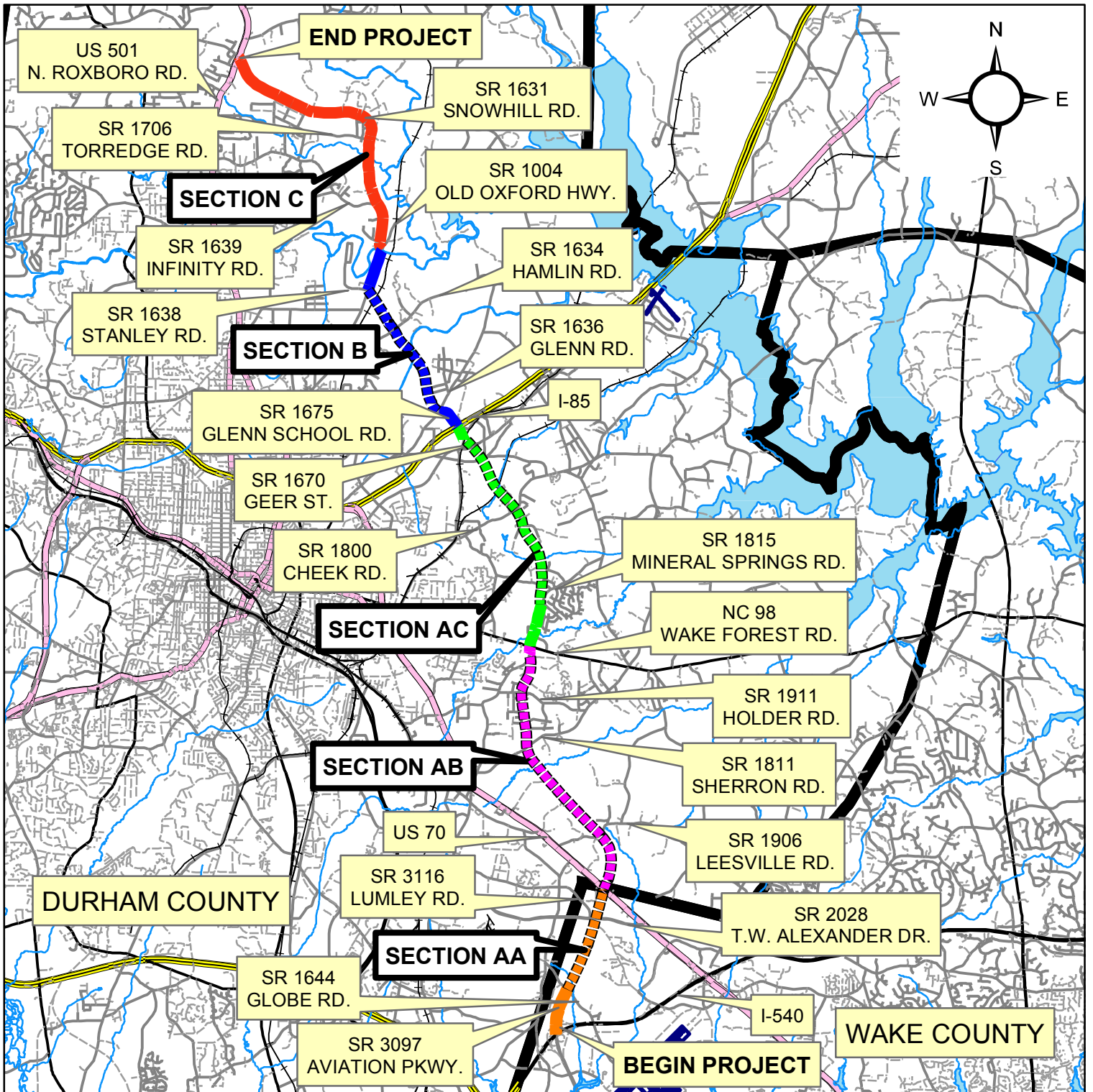
Rare and Unique Natural Areas within the project corridor.

Table 4.

Name	Area Type
Piedmont/Low Mountain Alluvial Forest	Natural Community
Xeric Hardpan Forest	Natural Community
Upland Depression Swamp Forest	Natural Community
Cabin Branch Creek Bottomland-Swamp RHA	Dedicated Nature Preserve, Significant Natural Heritage Area
Eno River Diabase Sill RHS	Dedicated Nature Preserve, Significant Natural Heritage Area, Natural Heritage Program Managed Area
Penny's Bend/Eno River Bluffs RHA	Dedicated Nature Preserve, Significant Natural Heritage Area
Catsburg RHA	Dedicated Nature Preserve, Significant Natural Heritage Area, Macrosite
Lower Eno River/Little River Bottomlands	Significant Natural Heritage Area
Upper Lick Creek Slopes	Significant Natural Heritage Area, Macrosite
Butner-Falls of Neuse Game Land	Natural Heritage Program Managed Area
Neuse Headwaters Triassic Bottomlands	Macrosite

Table 5. Existing Bridges

Structure Number	Facility Carried	Feature Intersected	Structure Description	Structure Length	Vertical Clearance	Horizontal Clearance	Year Constructed	Sufficiency Rating
3	SR 1631	Creek	3 Lines of 140 x 96 CMPA	43'	N/A	20'	1989	95.5
24	SR 1004	Eno River	Reinforced concrete deck on girders	180'	N/A	24'	1951	58.7
82	SR 1815	Lick Creek	Steel Plank Floor on I-Beams	51'	N/A	27.8'	1975	60.1
195	SR 1675	I-85	Reinforced concrete deck on I-beams	180'	16' 2"	26'	1955	63.7



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PROGRAM DEVELOPMENT BRANCH

U-4721

**NEW ROUTE (AVIATION PARKWAY EXTENSION/
NORTHERN DURHAM PARKWAY)**

FROM I-540 IN RALEIGH
TO US 501 (N. ROXBORO ROAD) IN DURHAM

WAKE & DURHAM COUNTIES

DIVISION 5 FIGURE 1