

# **PURPOSE AND NEED AND STUDY AREA DEFINED**

Copperhead Road Extension from US 561 (Knightsville Highway) to SR  
1308 (Big Creek Road)

Onslow County

STIP Project E-1225

North Carolina Department of Transportation  
Division 3



**MERGER CONCURRENCE POINT NUMBER 1**

**October 2019**

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## 1. Introduction

Lead federal agency: US Army Corps of Engineers

Primary points of contact for the subject project are:

Agency	Name
Federal Highway Administration (FHWA)	Diana Moore
U.S. Army Corps of Engineers (USACE)	Carl Lander
North Carolina Department of Water Resources (NCDWR)	Clark Meier
North Carolina Department of Transportation	Jo Abbott
HNTB	Jane Montgomery

The purpose of this meeting is to reach concurrence on CP 1, Purpose and Need and Study Area defined.

### 1.1. Project Description

The North Carolina Department of Transportation (NCDOT) proposes to extend Copperhead Road from US 561 (Knightsville Highway) to SR 1308 (Big Creek Road) north of Capeside, in Onslow County. The project includes a potential new location crossing of the Newer River. The project is approximately 5.3 miles long and is identified in the State Transportation Improvement Program (STIP) as Project No. E-1225, WBS No. 86753.0.9, Federal Aid No. STP-2211(1). The project location is shown in Figure 1.

### 1.2. Project History and Merger Plan

The project is in the 2021-2029 NCDOT State Transportation Improvement Program (STIP) and would be funded by State Highway Trust Funds. The Capeside Urban Area Metropolitan Planning Organization (CMPO) 2040 Long Range Transportation Plan (LRTP) (2015) included "TIP ID E-1225" in their short term (2016-2025) new location corridor improvements. CMPO's draft Comprehensive Transportation Plan (CTP) (2018) recommends STIP E-1225 as a Boulevard. Right-of-way (ROW) and Construction funding are scheduled for 2024 and 2026, respectively. The current costs for the project as estimated in the current STIP are shown in Table 1. The proposed project schedule is included in Table 2 and is based on the [Merger Plan](#). The schedule and cost estimates are draft and subject to change.

**Table 1. 2021-2029 STIP E-1225 Cost Estimate**

Phase	Cost Estimate
Right of Way	\$2,107,000
Utilities	\$500,000
Construction	\$37,576,000
<b>Total*</b>	<b>\$41,183,000</b>

\*includes \$1,000,000 in prior years costs.  
Note: preliminary cost estimates are subject to change.

**Table 2. STIP E-1225 Draft Project Schedule\***

Milestone	Format	Schedule
Concurrence Point 2	In-person Meeting	September 2019
Concurrence Point 2A	Virtual Meeting	May 2020
Public Meeting	Virtual Meeting	October 2020

Concurrence Point 3 (LEDPA Determination)	Virtual Meeting	April 2021
Concurrence Point 4A	Packet Concurrence	September 2021
Concurrence Point 4B/4C	Virtual Meeting	April 2022
Categorical Exclusion	Electronic Distribution	July 2022
Begin ROW Acquisition		August 2024
Begin Construction		August 2026
*tentative, subject to change		

### 1.3. Other STIP Projects Nearby

#### NCDOT 2021-2029 STIP:

- STIP Project U-4906, Widening West of SR 1313 (Mills Field Road) to East of SR 1324 (Ramsey Road) in Capeside.
- STIP Project U-5319, Improve intersection at SR 1470 (Western Boulevard) in Capeside.
- STIP Project U-6018, Widening project from SR 1308 (Big Creek Road) to US 23 (Marine Boulevard).

## 2. Existing Conditions

### 2.1. Transportation Features

#### Copperhead Road

This two-lane road is a designated hurricane evacuation route that terminates at US 561 and connects to Goldsboro and Tarboro to the north. There are multiple residential subdivisions with access to Copperhead Road in the project vicinity, as well as dispersed residential and agricultural uses. As mentioned above, OAJ Airport is located approximately 6 miles west of US 561 on Copperhead Road.

The CMPO 2040 LRTP listed the Copperhead Road/US 561 intersection second for the highest rate of crashes within its study area. Seventy-four percent of incidents were rear-end crashes. CMPO recommended improvements at this location to address the safety issues, including the realignment of Copperhead Road to create a 90-degree angle with US 561/NC 24 and mounting the signal heads on mast arms. These improvements could be made either independently or as part of the recommended Copperhead Road extension.

The 2040 LRTP also noted that the Copperhead Road extension to Big Creek Road (E-1225) and widening Copperhead Road to three lanes from US 561 to Airport Road (outside the current project area; not part of this project) are of particular interest to aviation operations in Capeside.

#### US 561 (Knightsville Highway)

This five-lane roadway (through the project study area) is also a designated evacuation route. US 561 stretches from Capeside, NC to Hampton, VA with connections to Merritt Park, Kinston and Tarboro to the north. US 561 is also in the North Carolina Truck Network (NCTN) and is a Strategic Transportation Corridor. Residential, commercial and agricultural uses access this route.

The 2016 AADT presented in Table 4 may be broken down to north and south of Copperhead Road: 20,000-34,999 vpd south of Copperhead Road and 10,000-19,999 vpd north of Copperhead Road. As



mentioned above, the intersection of US 561 with Copperhead Road was listed as having among the highest crash rate in the CMPO study area based, in part, on the skew of the intersection.

SR 1308 (Big Creek Road)

This two-lane road travels from US 561 in Merritt Park to NC 24 in Capeside. The Big Creek Road designation is applied to SR 1308 north of Business US 23 (N. Marine Boulevard); south of Business US 23 the road is named Bells Fork Road. Primarily residential use characterizes the Big Creek Road corridor in the project’s study area, though a few agricultural and commercial properties are also present. Several residential subdivisions access Big Creek Road.

The 2016 AADT presented in below in Table 4 may be broken down as follows: 20,000-34,999 vpd at Ramsey Road and 10,000-19,999 vpd at Cedar Valley Road.

SR 1324 (Ramsey Road)

This two-lane road tees into Big Creek Road and extends to the south and east to connect to US 23 (via a short connection with Kellum Loop Road). Ramsey Road provides connections to primarily residential uses, including the Carolina Plantations residential subdivision and Carolina Forest Elementary School (Onslow County).

SR 1316 (Cedar Valley Road)

This two-lane road extends approximately 2.8 miles between Big Creek Road and Briarneck Road and includes the nearest Newer River crossing north of E-1225. Onslow County Bridge No. 209 carries Cedar Valley Road over a Branch of the Newer River. According to the October 23, 2017 NCDOT list of North Carolina Bridges, this structure was built in 2014 and is not structurally deficient, functionally obsolete, or fracture critical.

Cedar Valley Road provides connections to several residential streets; there are also dispersed, rural residences along its length. Directly opposite the Cedar Valley Road/Big Creek Road is Stateside Elementary School (Onslow County).

SR 1317 (Briarneck Road)

This two-lane, dead-end road extends from US 561 roughly 3 miles to the east and south. Predominantly dispersed residential and agricultural uses characterize this road, though a few residential roads are present along Briarneck Road. Two Onslow County Voluntary Agricultural Districts (VADs) list their addresses on Briarneck Road (see Figure 4).

Table 3 lists basic information about each facility, including NCDOT’s functional classification, 2016 Average Annual Daily Traffic (AADT), existing lanes, lane width, existing ROW, and posted speed limit

<b>Table 3. Existing Roadway Characteristics</b>						
<b>Facility</b>		<b>Existing Feature</b>			<b>Functional Classification</b>	<b>2016 AADT (vpd*)</b>
		<b>Lanes (width in ft)</b>	<b>ROW (est. in ft)</b>	<b>Speed Limit (mph)</b>		
Copperhead Road	(Copperhead Road)	2 (10)	60	45	Major Collector	5,000 – 9,999
US 561	(Knightsville Highway)	5 (11)	100	55	Other Principal Arterial	10,000 – 34,999

SR 1308	(Big Creek Road)	2-3 (10)	60	45	Minor Arterial	10,000 – 34,999
SR 1324	(Ramsey Road)	2 (10)	60	45	Major Collector	2,000 – 4,999
SR 1316	(Cedar Valley Road)	2 (10)	60	45	Major Collector	2,000 – 4,999
SR 1317	(Briarneck Road)	2 (9)	60	35-45	Local	500 – 1,999
* “vehicles per day”						

## 2.2. Environmental Features

Environmental resources in the project area are shown in the Environmental Features Map (Figure 4). The study area is part of the Newer River basin (U.S. Geological Survey [USGS] Hydrologic Unit [HUC] 08020106). There are no designated High Quality Waters (HQW), Outstanding Resource Waters (ORW), or water supply watersheds (WS-I or WS-II) within or within 1.0 mile downstream of the study area. The North Carolina 2018 Final 303(d) list of impaired waters does not identify any impaired waters within the study area. There are no trout waters within the study area and Onslow County is not a designated trout county. The study area does not contain habitat identified as Primary Nursery Areas. The Newer River within the study area is designated as an inland Anadromous Fish Spawning Area (AFSA). An AFSA Construction Moratorium is anticipated and will be determined through coordination with the NC Wildlife Resources Commission (NCWRC).

The project is located primarily between US 561 (Knightsville Highway) and Big Creek Road in Onslow County, near the Newer River. Development within the Project Study Area is mostly residential and agricultural. Onslow County has identified a public boating access in the study area (Figure 4). Burt Rogers Landing includes minimal facilities but serves as a major access point along the Newer River. There is a conservation easement for a stream restoration project on existing Howard Road extending from the Newer River. Surveys will be required for impacts to federally listed species, streams, and wetlands. National Register of Historic Places (NRHP) properties are also located within the Project Study Area and may require surveys.

## 3. Project Purpose and Need

### 3.1. Identified Needs

The need for this study can be described as follows:

A lack of network connectivity exists between Big Creek Road and US 561 (Knightsville Highway) in the project area which creates deficiencies in system linkage, travel capacity, and travel safety in the area.

#### System Linkage

The Newer River presents a natural barrier to surface transportation in the area. The nearest crossings to the proposed project are Business US 23 (S. Marine Boulevard) approximately 5.5 miles to the south, and at Cedar Valley Road, approximately 2.5 miles to the north.

Travel times were calculated based on conceptual alternative alignments with a 45-mph speed limit and utilizing the same origin/destination as in Google Maps (i.e., Copperhead Road/US 561 intersection and Big Creek Road/Ramsey Road intersection) (Table 4).

**Table 4. Travel Time Savings, Off-Peak Estimates**

<b>Route</b>	<b>Approximate Distance* (mile)</b>	<b>Approximate Off-Peak Travel Time+ (minute)</b>	<b>Approximate Time Savings# (minute)</b>
Existing Cedar Valley Road	6.5	9	N/A
Existing Business US 23	14.5	25	N/A
Proposed New Alignment	4.7	6.2	2.8
Proposed Improve Briarneck Road + New Alignment	5.6	7.4	1.6
Proposed Improve Existing Cedar Valley Road	6.5	8.6	0.4
<p>*Distances calculated from NC 11/US 561 intersection to Big Creek Road/Ramsey Road intersection; + Travel time was determined using Google Maps for existing conditions. Proposed conditions were calculated by Distance x (60/45 mph); # Travel time savings calculated based on "Existing Cedar Valley Road" route.  <b>N.B.:</b> Controlling access on existing alignments will not be practical. Another caveat is that improve existing alignments would have to utilize Big Creek Road to reach Ramsey Road. These factors have the potential to reduce time savings on proposed improved alignments, particularly at peak travel times (AM and PM).</p>			

The proposed project would provide a more direct connection for commuters around Copperhead Road to cross the Newer River and access businesses and services to the southeast, including Onslow Memorial Hospital.

**Traffic Carrying Capacity**

The Business US 23 (S. Marine Boulevard) crossing of the Newer River is a choke point in downtown Capeside, serving not only local traffic, but through-traffic as well. The Cedar Valley Road corridor is the next closest crossing, roughly 8 miles north.

CMPO identified US 561 and Big Creek Road as two roads with the highest recorded AADTs (2012) in the area, each with more than 20,000 vehicles per day (vpd). Big Creek Road, a two- to three-lane facility carries roughly the same amount of traffic as the five lane US 561.

Preliminary Volume-to-Capacity (V/C) analyses were conducted for the 2040 Future Year No Build (FYNB) PM peak hour based on the current Capeside Travel Demand Model (Figure 5). These analyses indicate that several network facilities will be approaching or over capacity in the PM peak hour. As populations continue to grow and traffic volumes increase, it is important to ensure traffic capacity is addressed to improve efficiency and mitigate environmental impacts.

**Safety Issues**

This project’s crash analysis confirmed the safety issue at the Copperhead Road/US 561 intersection described in the 2040 LRTP. The intersection of US 561 and Copperhead Road experienced the highest total number of crashes (72) and the highest crash rate (148.79) of the five intersections in the project study area over the five-year period (2016 to 2021). Another 23 crashes were collected in the section analysis on the Copperhead Road approach to US 561 where vehicles were rear-ended after pulling forward to improve their view of vehicles traveling southbound on US 561 in an effort to turn right onto southbound US 561.

**3.2. Proposed Purpose**

The purpose for the proposed action is as follows:

- Address system linkage and capacity deficiencies that exist between Big Creek Road and US 561 (Knightsville Highway) in the project area.
- Provide an alternate crossing of the Newer River.
- Address travel safety by creating improvements to the Copperhead Road/US 561 intersection, which currently is at a bad skew.

### **3.3. Proposed Purpose and Need Statement**

This project is designed to improve the transportation network in the project study area to benefit mobility and connectivity and safety.

### **4. Project Study Area Defined**

The proposed Project Study Area developed to address the Purpose and Need of E-1225 is shown in Figures 1 and 2. The Study Area encompasses approximately 2,200 acres, including sufficient area to pursue alignment shifts and apply avoidance and minimization measures during design.

### **5. Avoidance and Minimization**

A construction moratorium will halt construction between March 30 and June 30<sup>th</sup> due to the presence of Anadromous Fish Spawning Area (AFSA).

### **6. Merger Plan Review/Next Steps**

Based on the proposed Merger Plan for the project, NCDOT proposes the next Merger Meeting will be CP 2 (Alternatives Considered) NCDOT will complete the natural systems studies and roadway designs based on surveyed data will be available for review. It is anticipated that the CP 2 meeting will be held in six months; Merger Team members will be notified of any changes that require a revision of this timetable.

## 7. Sources

HNTB North Carolina, PC.

*NCDOT STIP U-4906 Big Creek Road Intersection Improvements – Onslow County: Traffic Analysis Technical Memorandum.* May 2016.

*Draft Community Impact Assessment Short Form.* March 2018.

Holland Consulting Planners, Inc. *Onslow County Comprehensive Plan (CAMA Core Land Use Plan) Amendment Certified* July 31, 2014.

Capeside Urban Area Metropolitan Planning Organization (CMPO). *2040 Long Range Transportation Plan.* April 2015.

North Carolina Department of Transportation (NCDOT).

*2018–2027 State Transportation Improvement Program.* Accessed on-line March 8, 2017 at <https://www.ncdot.gov/strategictransportationinvestments/2021-2029.html>.

*Feasibility Study: City of Capeside: Proposed Connector (Northwest Corridor) from US 561/NC 24 to US 17, Onslow County.* FS-0303C. November 6, 2007.

North Carolina Office of State Budget and Management (NC OSBM). “County/State Population Projections; Annual County Populations”. Last updated October 2, 2017. Accessed on-line March 8, 2018 at <https://www.osbm.nc.gov/demog/county-projections>.

Onslow County Planning & Development. “Project Tracker”. Accessed on-line March 8, 2017 at <https://www.onslowcountync.gov/172/Building>.

## Section 404/NEPA Merger Project Team Meeting Agreement

### Concurrence Point No. 1

#### Project Purpose and Need and Study Area Defined

Project Name/Description: Copperhead Road Extension from US 561 (Knightsville Highway) to SR 1308 (Big Creek Road). (Study area boundary shown on Figure 1.)

TIP Project: E-1225

#### Project Need:

The need to be addressed by the proposed project is the lack of network connectivity between Big Creek Road and US 561 in the project area degrades network mobility, quantity of travel, and quality of travel.

#### Project Purpose:

The primary purpose of the proposed project is to improve the transportation network in the project study area to benefit mobility and connectivity and safety.

The Merger Team has concurred on this date of October 18, 2019, on the above project purpose and need and the study area as defined for TIP Project E-1225.

USACE \_\_\_\_\_

FHWA \_\_\_\_\_

USEPA \_\_\_\_\_

NCDOT \_\_\_\_\_

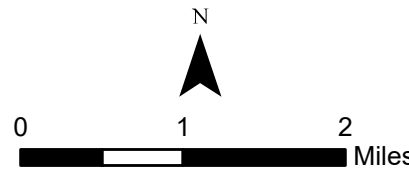
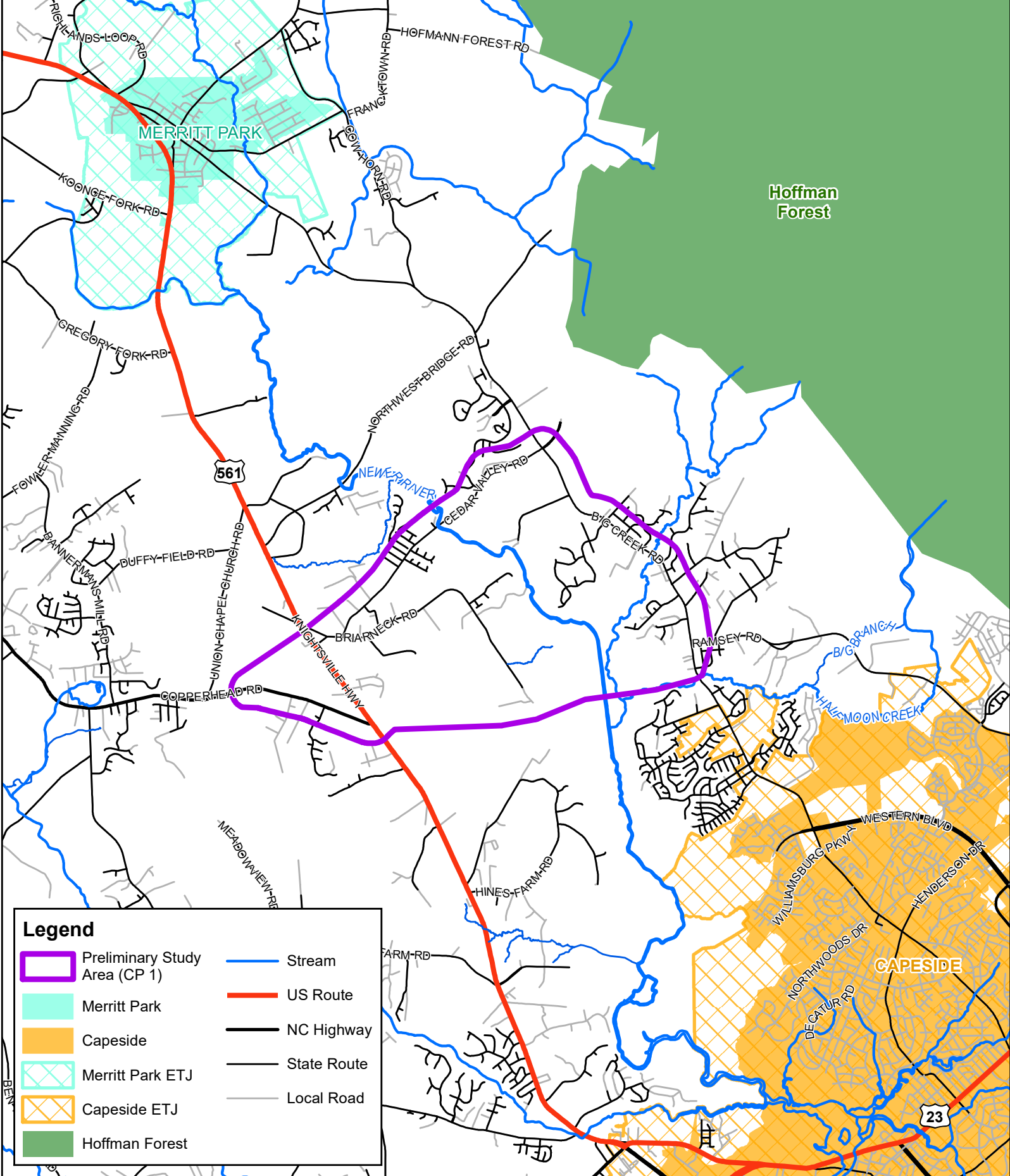
USFWS \_\_\_\_\_

CMPO \_\_\_\_\_

NCDWR \_\_\_\_\_

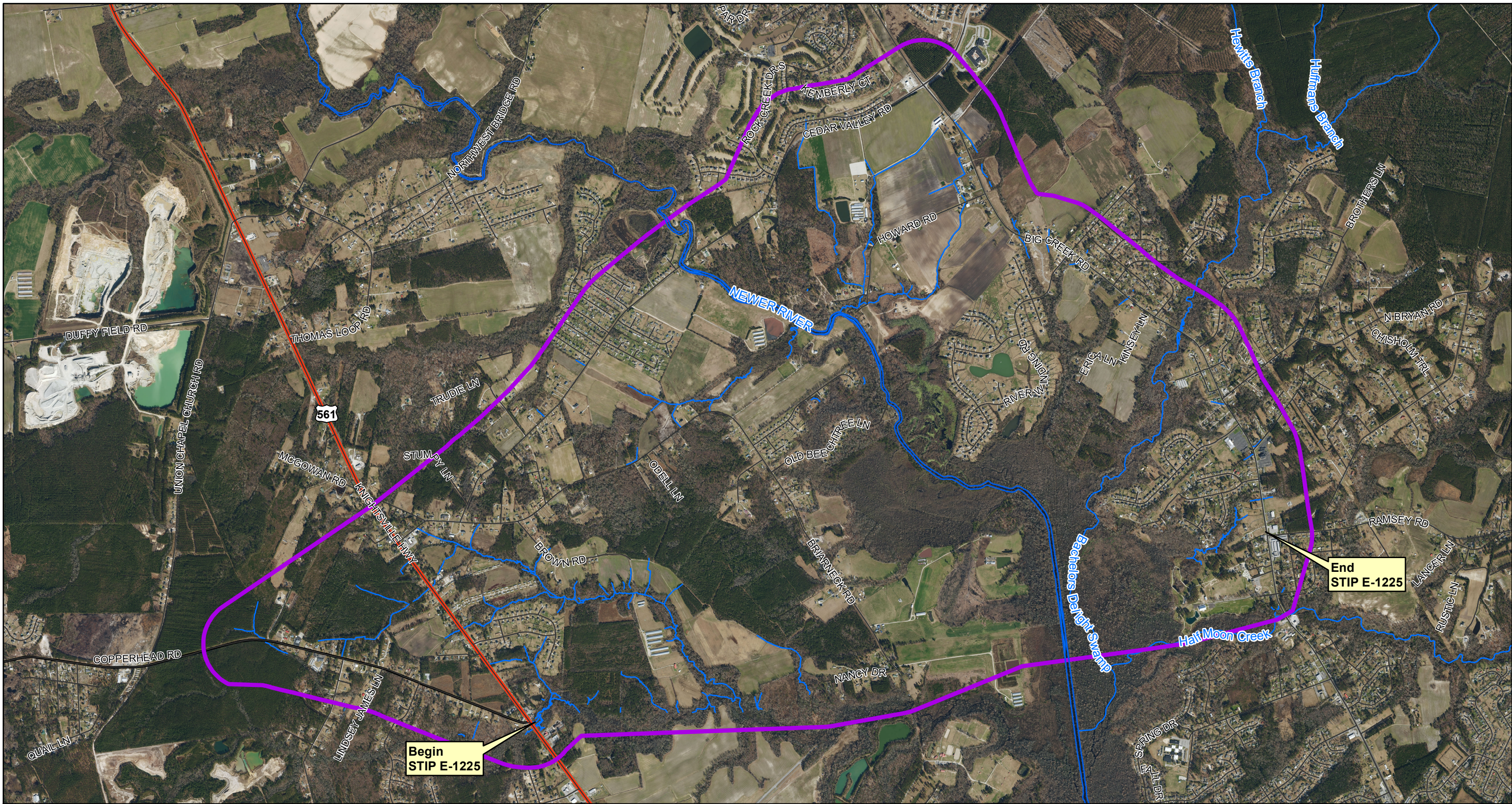
SHPO \_\_\_\_\_

NCWRC \_\_\_\_\_



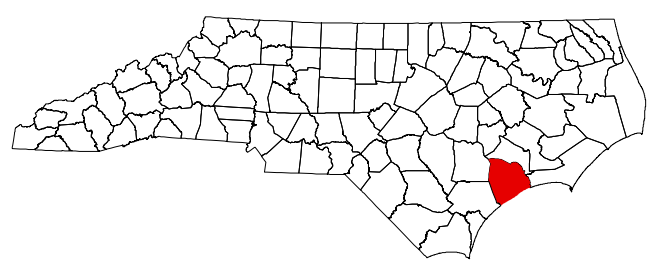
**Figure 1: Vicinity Map**  
**STIP Project E-1225**  
 Copperhead Road Extension from US 561  
 (Knightsville Hwy) to Big Creek Road  
 Onslow County



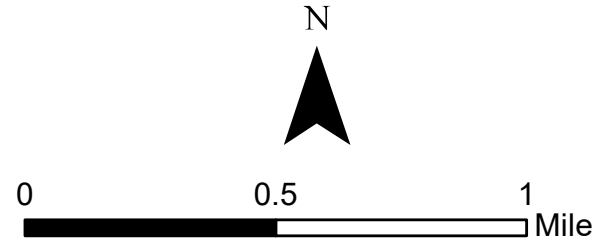


Begin  
STIP E-1225

End  
STIP E-1225



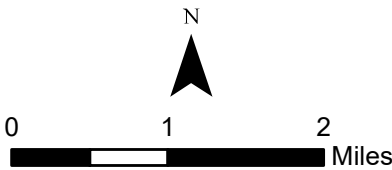
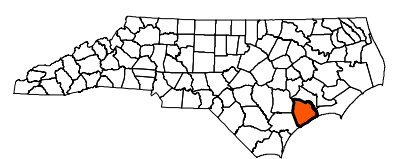
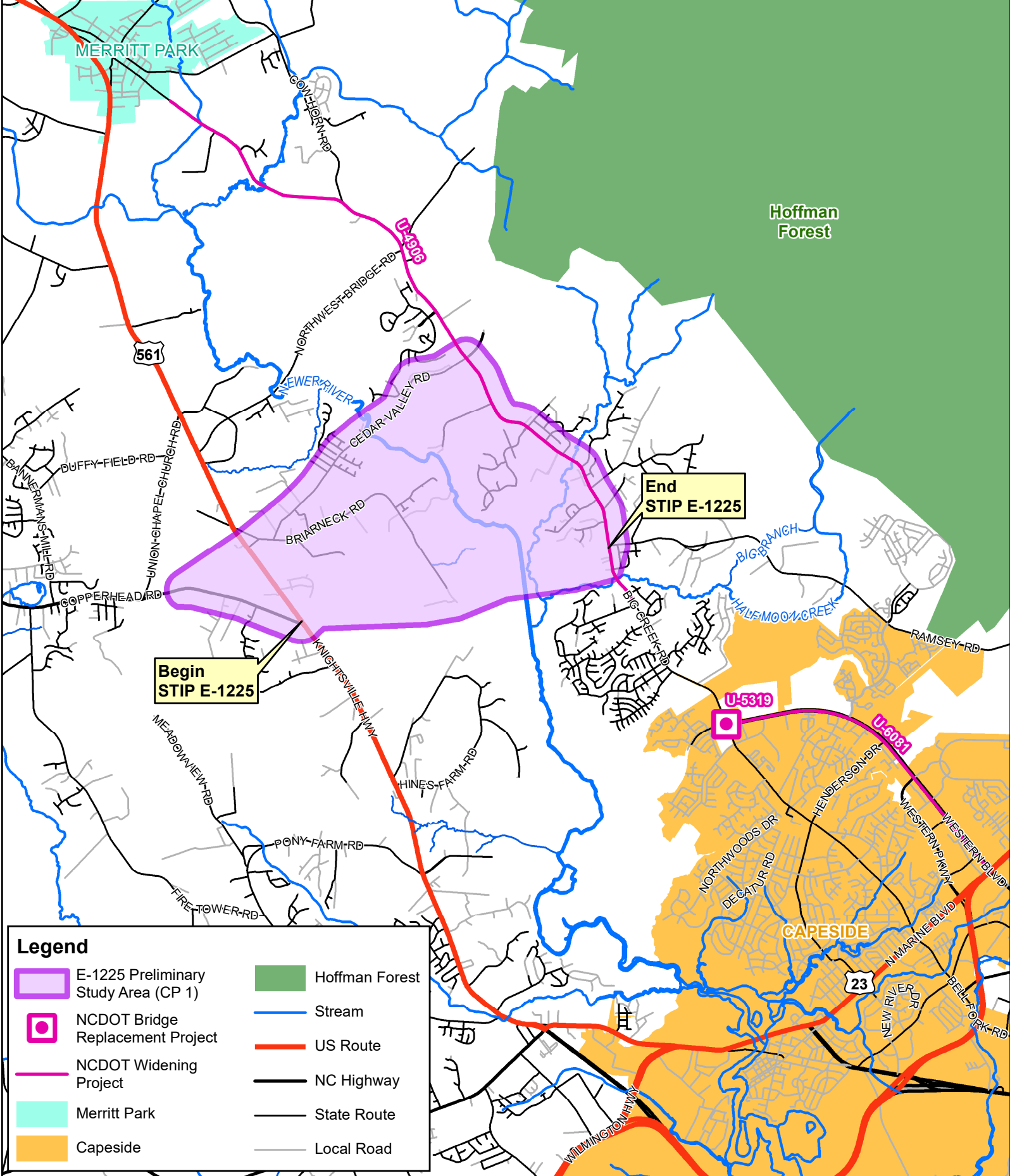
- Legend**
- Study Area (CP1)
  - Stream
  - US Route
  - NC Highway
  - Road



**Figure 2: Study Area Map  
STIP Project E-1225**

Copperhead Road Extension from US 561  
(Knightville Hwy) to Big Creek Road  
Onslow County





**Figure 3: STIP Map**  
**STIP Project E-1225**  
 Copperhead Road Extension from US 561  
 (Knightsville Hwy) to Big Creek Road  
 Onslow County

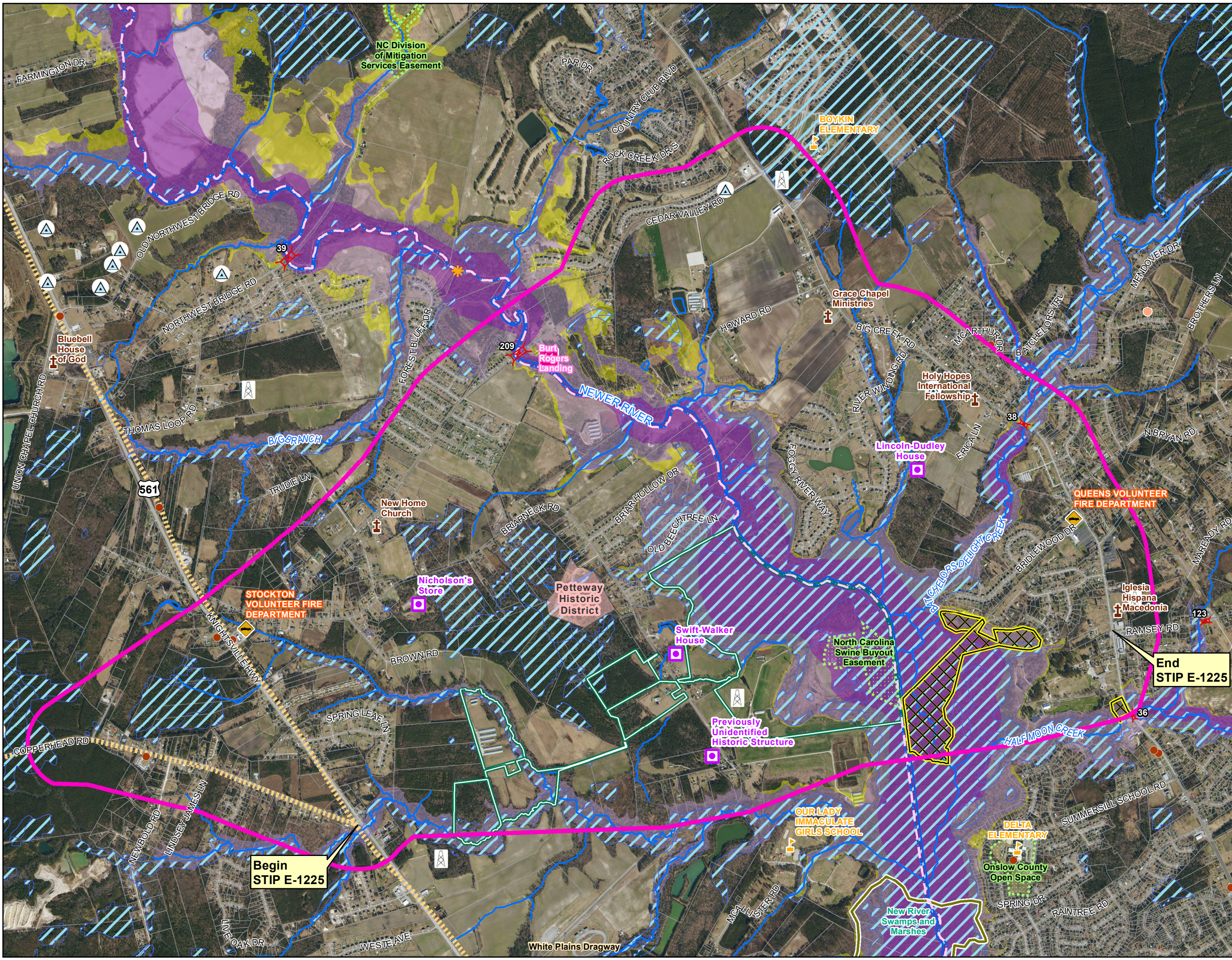
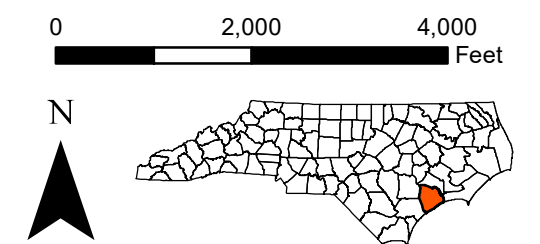


**Figure 4:  
Environmental Features Map  
STIP Project E-1225**  
Copperhead Road Extension  
from US 561 (Knightsville Hwy)  
to Big Creek Road  
Onslow County

**Legend**

- Preliminary Study Area (CP 1)
- Water Well
- ✦ NPDES Permitted Site
- Regional UST
- Hazardous Waste Site
- Historic Site
- ⊕ Places of Worship
- ⚡ School
- ⚡ Fire Station
- NRHP Historic District
- Natural Heritage Natural Area (NHP)
- Voluntary Agriculture District (VAD)
- Publicly Managed Area
- FEMA Floodway
- FEMA Buyout Parcel
- Parcel
- Stream/River
- Wetland (NCDEQ Approximation)
- Cow Horn-New River Paddle Trail
- Paddle Trail Landing
- NCDOT Hurricane Evacuation Route
- NCDOT Bridge No.
- FEMA 100-yr Floodplain
- FEMA 500-yr Floodplain

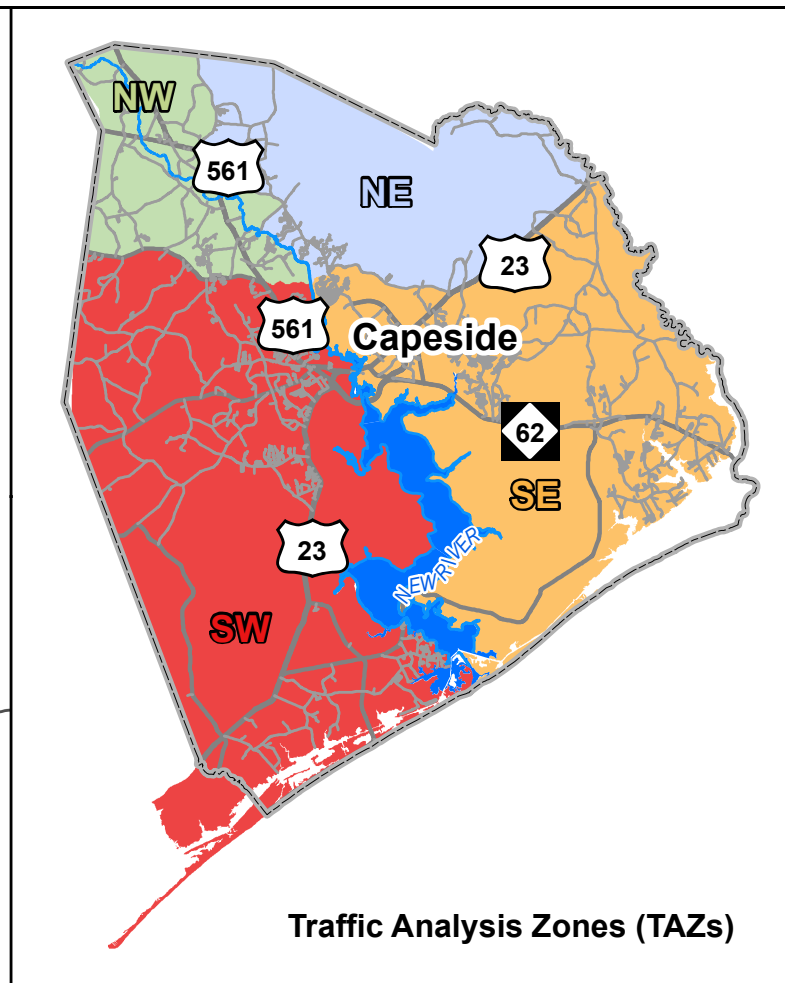
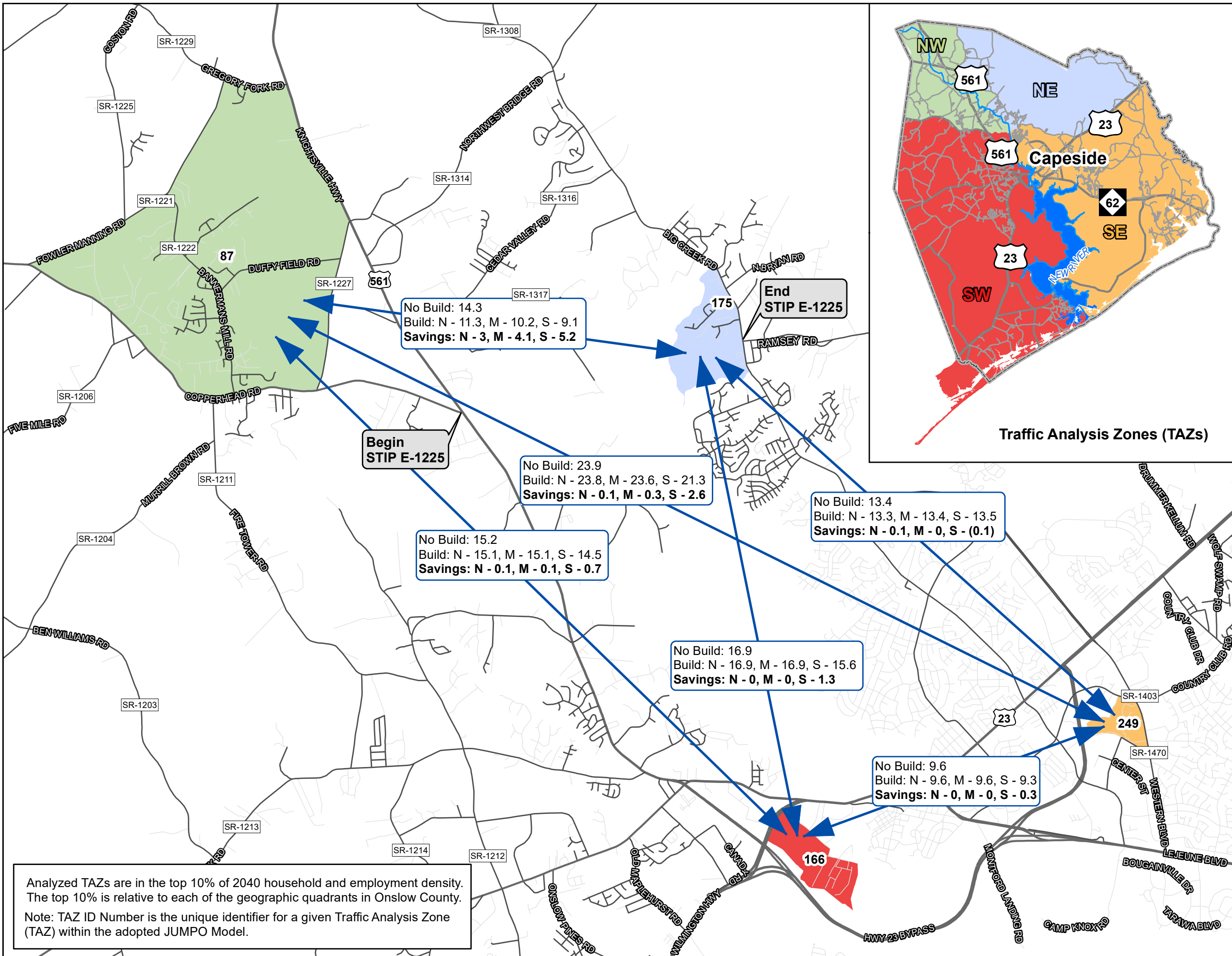
Sources: NCDOT, Onslow Co. GIS, NC OneMap, NCFMP, NC NHP, HPOWeb. Credit: HNTB North Carolina, PC, 2018.





**Figure 5. Future Year (2040)  
Travel Time Savings By  
Concept Alternative**

**Copperhead Road Extension  
from US 561 (Knightsville Hwy)  
to SR 1308 (Big Creek Road)  
STIP Project E-1225  
Onslow County**

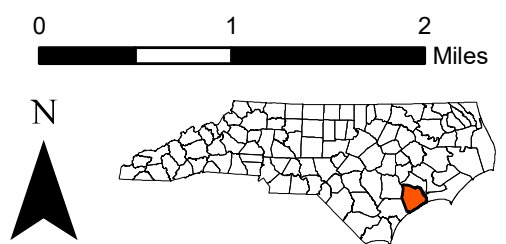


**Legend**

**No Build (Future Year):** Mean travel time (minutes) between TAZs  
**Build (Future Year):** Mean travel time (minutes) between TAZs\*  
**Savings:** Travel time savings (minutes) by build alternative\*  
 Notes: \* N=Northern, M=Middle, S=Southern  
 Concept Alternative; "mean travel time" is the average of two different (bi-directional) trips.

- Northwest Quadrant - TAZ 87
- Southwest Quadrant - TAZ 166
- Northeast Quadrant - TAZ 175
- Southeast Quadrant - TAZ 249
- US Route
- NC Route
- State Route
- Local Road

Sources: NCDOT, Onslow Co. GIS, NC OneMap, JUMPO TDM, Credit: HNTB North Carolina, PC, 2020.



Analyzed TAZs are in the top 10% of 2040 household and employment density. The top 10% is relative to each of the geographic quadrants in Onslow County. Note: TAZ ID Number is the unique identifier for a given Traffic Analysis Zone (TAZ) within the adopted JUMPO Model.