

**PURPOSE AND NEED AND STUDY AREA DEFINED  
&  
DETAILED STUDY ALTERNATIVES CARRIED  
FORWARD**

NC 111 (Catherine Lake Road) Extension from US 258  
(Richlands Highway) to SR 1308 (Gum Branch Road)

Onslow County

STIP Project U-5733

North Carolina Department of Transportation  
Division 3



**MERGER CONCURRENCE POINT NUMBER 1 & 2**

**October 17, 2018**

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# 1. Introduction

The North Carolina Department of Transportation (NCDOT) proposes to extend NC 111 (Catherine Lake Road) from US 258 (Richlands Highway) to SR 1308 (Gum Branch Road) north of Jacksonville, in Onslow County (**Figure 1**). The project includes a potential new location crossing of the New River.

Because of the potential impacts to human and natural resources, State Transportation Improvement Program (STIP) Project U-5733 will follow the Section 404/NEPA Merger Process. An External Scoping Meeting for the project was held on September 14, 2016. At that time, the Merger Team requested that improve existing alternatives be considered in addition to the proposed new location crossing. The proposed preliminary study area has been expanded per the Merger Team’s request and is discussed in detail in **Section 2.8** (see **Figure 2**).

## 1.1. Project Background

The project is in the 2018-2027 NCDOT STIP which was approved by the NCDOT Board of Transportation on August 3, 2017 and most recently revised September 1, 2018. Though not currently programmed, NCDOT-Division 3 anticipates Federal funding will be utilized for this project. Right-of-way (ROW) and Construction funding are scheduled for Fiscal Year (FY) 2023 and 2025, respectively. The current STIP cost estimate is presented in **Table 1**.

**Table 1. 2018-2027 STIP U-5733 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: cost estimates are subject to change.	

In 2007, NCDOT prepared a Feasibility Report (FS-03030C) for a proposed connector (“Northwest Corridor”) from US 258/NC 24 to US 17. The study evaluated the feasibility for the construction of a new four-lane divided connector utilizing new location and existing sections of SR 1233 (Northwest Corridor Boulevard), SR 1470 (Western Boulevard), SR 1326 (Drummer Kellum Road), and SR 1324 (Ramsey Road). The route described included a new bridge over the New River approximately 2.5 miles south of the new alignment as shown in the current STIP for U-5733.

The NCDOT Feasibility Study divided the connector into two sections. Section 1 extended approximately 6 miles between US 258/NC 24 and SR 1336 (Henderson Drive) and included a new bridge over the New River. Two design options were evaluated for operability, the major difference being the inclusion of a diamond interchange with loop in the southwest quadrant at the intersection of Gum Branch Road and Western Boulevard. At the time of the study (2007), the traffic volume for the proposed connector was estimated to range between 8,300 to 31,700 vehicles per day (vpd) in the 2035 design year. Based to the projected traffic volume, the study recommended that the four-lane divided shoulder section (in 200-foot ROW) with a diamond interchange be pursued for Section 1 of the Northwest Connector. (See **Exhibit 1.**) The estimated total cost of Section 1 was \$99.2 million (2007 dollars). *Note: New River Swamps and Marshes, a Natural Heritage Natural Area, is located on the New River at the location of the alignment described in the 2007 Feasibility Study (see **Figure 4. Environmental Features Map**).*

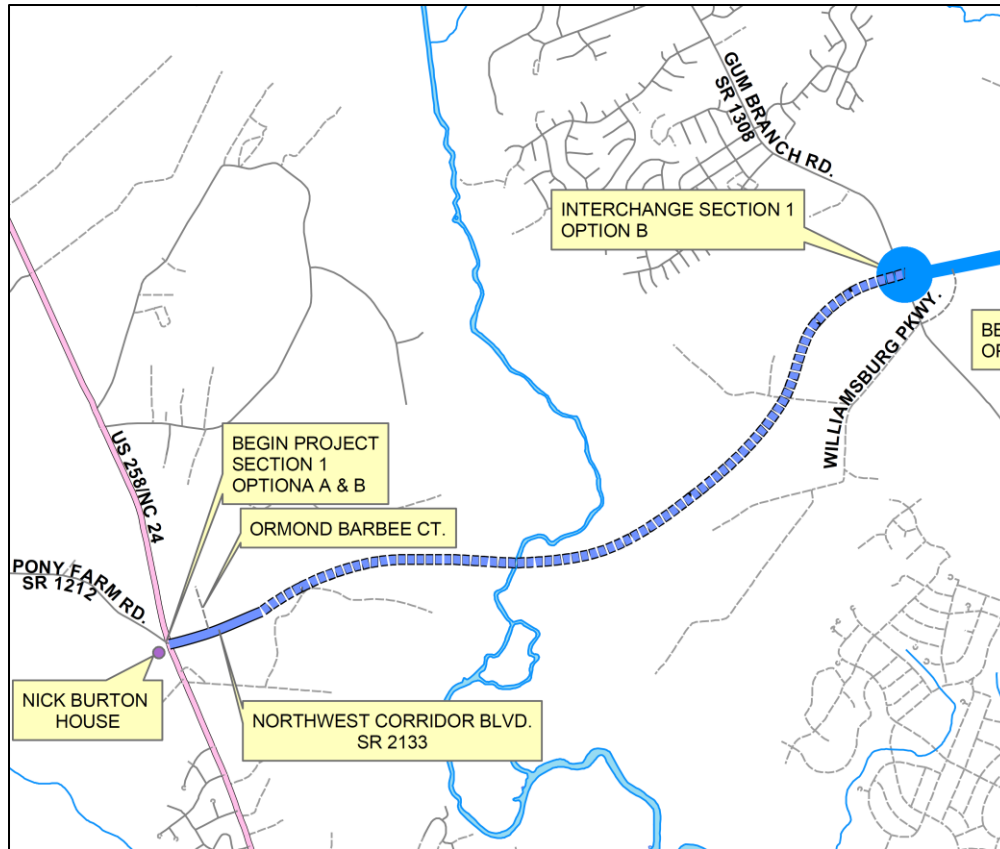


Exhibit 1. Portion of the Proposed Northwest Connector Feasibility Study (FS-03030C) alternatives map (Figure 1) showing only Section 1 from US 258 to Gum Branch Road, including a new crossing of the New River. Note: the feasibility study proposed a new crossing south of U-5733, connecting SR 1212 (Pony Farm Road) to NC 53 (Western Boulevard).

The Jacksonville Urban Area Metropolitan Planning Organization (JUMPO) 2040 Long Range Transportation Plan (LRTP) (2015; Amendment 1, March 2018) included “TIP ID U-5733” in their short term (2016-2025) new location corridor improvements. The JUMPO’s draft Comprehensive Transportation Plan (CTP) (2018) recommends STIP U-5733 be constructed as a Boulevard.

## 1.2. Project Setting

The project area crosses the New River where the channel is relatively narrow; the floodplain, however, varies, up to approximately ½-mile in width. Elevations in the area range from nearly sea level at the New River to almost 30 feet above mean sea level (amsl) along portions of Gum Branch Road. The preliminary project area is predominantly rural in character with dispersed residential and agricultural properties on either side of the New River. There are also some suburban residential developments with access along the major roadways through the preliminary study area. Additionally, several institutional properties are present in the area, including churches and schools, as are private recreational and commercial properties. Two fire departments are included in the preliminary study area: Rhodestown Volunteer Fire Department (116 Rhodestown Fire Department Road) and Half Moon Volunteer Fire Department (4835 Gum Branch Road).

The project is located approximately 5.5 miles north of Jacksonville in Onslow County. Jacksonville is an important regional employment center and functions as the county seat. County administrative offices and major community services (e.g., Onslow Memorial Hospital) are in Jacksonville. Two US Department

of Defense (DOD) installations at Marine Corps Base (MCB) Camp Lejeune and Marine Corps Air Station (MCAS) New River are located on both sides of the New River Inlet directly south of Jacksonville.

The Albert J. Ellis Airport (OAJ) (264 Albert Ellis Road, Richlands) is a county-owned public-use airport located 13 miles northeast of Jacksonville and approximately 6 miles west of the preliminary study area on NC 111. The airport has a single runway and three gates. American Airlines and Delta Air Lines service OAJ providing regional service. The airport averages about 100 operations per day, of which approximately 20 are classified as military.

### 1.3. Nearby STIP Projects & Local Transportation Plan

The 2018-2027 STIP lists three projects in the area of U-5733 (**Table 2**).

STIP	Route	Location/Description	Funding Schedule	
			ROW	Construction
U-4906	SR 1308 (Gum Branch Road)	West of SR 1313 (Mills Field Road) to East of SR 1324 (Ramsey Road) in Jacksonville. Widening.	<i>In progress</i>	2019
U-5319	SR 1308 (Gum Branch Road)	SR 1470 (Western Boulevard) in Jacksonville. Improve intersection.	<i>Complete</i>	2018
U-6081	NC 53 (Western Boulevard)	SR 1308 (Gum Branch Road) to US 17 (Marine Boulevard). Widening.	2025	2027
U-5791A	SR 2714 (Jacksonville Parkway Extension)	NC 53 (Western Boulevard) to SR 1324 (Ramsey Road). Widen to multi-lanes, part on new location.	2022	2024
U-5791B	SR 2714 (Jacksonville Parkway Extension)	SR 1324 (Ramsey Road) to US 17 (New Bern Highway). Widen to multi-lanes, part on new location.	Future (Unfunded)	Future (Unfunded)

\*NCDOT 2018-2027 STIP

## 2. Merger Concurrence Point 1 - Purpose and Need and Study Area Defined

### 2.1. Proposed Action

Per the 2017-2028 STIP, NCDOT proposes to construct an extension of NC 111 (Catherine Lake Road) from US 258 (Richlands Highway) to SR 1308 (Gum Branch Road) on new location. This project would construct a two-lane, controlled access roadway on multi-lane right-of-way (ROW) with a proposed speed limit of 45 miles per hour (mph).

Based on input received from the Merger Team at the September 14, 2016 External Scoping Meeting, conceptual roadway alignments, and associated corridors, were established for three Concept Alternatives:

- 1) New alignment (“Southern” Concept Alternative),
- 2) Improve existing Briarcliff Road with new alignment New River Crossing (“Middle” Concept Alternative), and
- 3) Improve existing Rhodestown Road (“Northern” Concept Alternative).

2.2. Summary of Purpose

The primary purpose of the proposed project is to improve the transportation network in the project study area to benefit mobility and connectivity. The project will achieve improved quality of travel by reducing overall vehicle hours traveled (VHT) in the transportation network. The project will achieve improved connectivity in central Onslow County by reducing travel times in the project vicinity and providing a roadway connection closer to activity centers in Jacksonville.

In addition to reducing overall VHT and travel times, the proposed project is expected to result in secondary benefits for the traveling public. The project will reduce delay on the existing network facilities and improve overall network efficiency and capacity through providing an important connection north of Jacksonville. The project will also bring existing roadway geometries to current design standards, including improvements to the skew condition at the NC 111/US 258 intersection, to improve safety. The JUMPO reported that the NC 111/US 258 intersection had the second highest rate of crashes within its study area.

A range of alternatives to meet the project’s purpose will be analyzed through the Alternatives Screening process. Performance measures to be utilized in the analysis of alternatives will include travel time, travel distance, total number of trips, total network delay, and delay per vehicle.

2.3. Existing Roadway Conditions

The existing facilities within the preliminary study area, and that may be involved in the development of STIP Project U-5733, are identified in the following section. **Table 3** lists basic information about each facility, including NCDOT’s functional classification, 2016 AADT, existing lanes and lane width, existing ROW, and posted speed limit. Additional information about each facility follows the table.

Table 3. Existing Roadway Characteristics					
Facility	Existing Feature			Functional Classification	2016 AADT (vpd*)
	Lanes (width in feet)	ROW (feet) (approx.)	Speed Limit (mph)		
NC 111 (Catherine Lake Road)	2 (10)	60	45	Major Collector	5,000 – 9,999
US 258 (Richlands Highway)	5 (11)	100	55	Other Principal Arterial	10,000 – 34,999
SR 1308 (Gum Branch 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 (Rhodestown 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”					

NC 111 (Catherine Lake Road)

This two-lane road is a designated hurricane evacuation route that terminates at US 258/NC 24 north of Jacksonville and connects to Goldsboro and Tarboro to the north. There are multiple residential subdivisions with access to NC 111 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 258/NC 24 on NC 111.

The JUMPO 2040 LRTP listed the NC 111/US 258 intersection second for the highest rate of crashes within its study area. Seventy-four percent of incidents were rear-end crashes. The JUMPO recommended improvements at this location to address the safety issues, including the realignment of

NC 111 to create a 90-degree angle with US 258/NC 24 and mounting the signal heads on mast arms. These improvements could be made either independently or as part of the recommended NC 111 extension.

The 2040 LRTP also noted that the NC 111 extension to Gum Branch Road (STIP Project U-5733) and widening NC 111 to three lanes from US 258 to Airport Road (outside the current project area; not part of this project) are of particular interest to aviation operations in Jacksonville.

#### US 258 (Richlands Highway)

This five-lane roadway (through the project study area) is also a designated evacuation route and is co-signed with NC 49 through the project area. US 258 stretches from Jacksonville, NC to Hampton, VA with connections to Richlands, Kinston, and Tarboro to the north. US 258 is also in the North Carolina Truck Network (NCTN) and the Strategic Highway Network. Residential, commercial, and agricultural uses directly access this route.

The 2016 AADT presented in **Table 3** may be broken down north and south of NC 111: 20,000-34,999 vpd south of NC 111 and 10,000-19,999 vpd north of NC 111. As mentioned above, the US 258/NC 111 intersection has among the highest crash rate in the JUMPO study area based, in part, on the bad skew of the intersection.

#### SR 1308 (Gum Branch Road)

This two-lane road travels from US 258 in Richlands to NC 24 in Jacksonville. The Gum Branch Road designation is applied to SR 1308 north of Business US 17 (N. Marine Boulevard); south of Business US 17 the road is named Bells Fork Road. Primarily residential use characterizes the Gum Branch Road corridor in the project's study area, though a few agricultural and commercial properties are also present. Several residential subdivisions access Gum Branch Road.

The 2016 AADT for Gum Branch Road presented in **Table 3** may be broken down as follows: 20,000-34,999 vpd at Ramsey Road and 10,000-19,999 vpd at Rhodestown Road. The 2040 LRTP identified Gum Branch Road north of Ramsey Road as one of seven corridors with a volume to capacity ratio (V/C) of greater than 0.84 but less than 1.0, indicating congested roadway conditions (1.0 indicates the roadway operates at capacity).

NCDOT is currently developing STIP Project U-4906 to add 2-foot paved shoulders to each side of Gum Branch Road from east of the Richlands city limits to Timothy Road (SR 1388), and would include two intersection improvements (**Exhibit 2**). South of Timothy Road, STIP Project U-4906 would improve two additional intersections to Ramsey Road (SR 1324). The total project length is 5.3 miles. The purpose of the project is to provide an improved, and wider, paved riding surface, improve operating conditions, and preserve and extend the service life of Gum Branch Road in the project limits. Construction is scheduled for fiscal year 2019.

The March 2016 U-4906 traffic capacity analysis results indicated that all 2040 scenarios show greatly degraded operations due to projected traffic growth on Gum Branch Road between 2015 and 2040. The U-4906 crash analysis showed that crash patterns along Gum Branch Road are comparable to state-wide averages except for wet crashes which are higher than state-wide average for similar two-lane undivided facilities.



The JUMPO submitted two projects for scoring in the STI for the upgrade of Gum Branch Road to a four-lane superstreet north (H170491) and south (H090911) of Ramsey Road. Congestion is the primary need for the projects. STIP Project U-5793 is included as a fiscally-constrained project in the JUMPO’s 2040 LRTP (Amendment 1, March 1, 2018) to upgrade Gum Branch Road to a four-lane superstreet in the 2026–2030 cost band. The project was broken down similarly, with U-5793A making improvements from Summersill School Road to Ramsey Road and U-5793B from Ramsey Road to Country Club Boulevard. STIP Project U-5793 is not currently programmed.

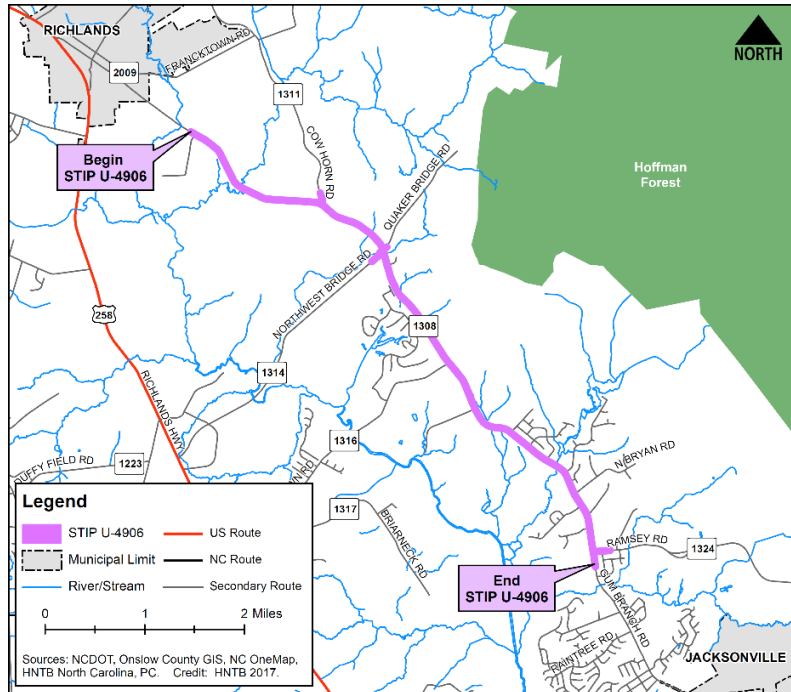


Exhibit 2. STIP U-4906, Onslow County project limits.

#### SR 1324 (Ramsey Road)

This two-lane road tees into Gum Branch Road and extends to the south and east to connect to US 17 (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).

As mentioned above, STIP Project U-4906 will include intersection improvements at Ramsey Road. A lane will be added on westbound Ramsey Road to provide a designated left-turn lane and a designated right-turn lane to Gum Branch Road. A northbound right-turn lane will also be constructed on Gum Branch Road south of Ramsey Road. Construction is scheduled to begin in fiscal year 2019.

Ramsey Road is proposed to be a four-lane divided facility from Gum Branch Road to US 17 (New Bern Highway) as a part of LRTP Project H171302 (Gum Branch Road to Jacksonville Parkway Extension) and as a part of STIP Project U-5791B. These projects would serve future traffic needs and serve in conjunction with the NC 111 extension to provide a connector around the north side of Jacksonville from US 258/NC 24 to US 17. H171302 is included in the 2026-2030 cost band. STIP Project U-5791B is currently programmed but unfunded.

#### SR 1316 (Rhodestown Road)

This two-lane road extends approximately 2.8 miles between Gum Branch Road and Briarneck Road and includes the nearest New River crossing north of STIP Project U-5733. Onslow County Bridge No. 209 carries Rhodestown Road over a Branch of the New 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.

Rhodes town Road provides connections to several residential streets; there are also dispersed, rural residences along its length. The Rock Creek Golf and Country Club access Rhodes town Road and Gum Branch Road north of the Rhodes town Road intersection. Directly opposite the Rhodes town Road/Gum Branch Road intersection is Stateside Elementary School (Onslow County).

During public outreach for STIP Project U-4906, the “bad curve” in Rhodes town Road, east of the New River crossing, was identified as a local concern. NCDOT-Division 3 let a safety project in April 2018 to flatten this curve (W-5601A). The improved roadway is anticipated to be open for traffic by March 30, 2019.

#### SR 1317 (Briarneck Road)

This two-lane, dead-end road extends from US 258/NC 24 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) are listed on Briarneck Road (see **Figure 4**).

### 2.4. Need for the Proposed Project

The need to be addressed by the proposed project is to improve network mobility and connectivity between Gum Branch Road and US 258 in the project area.

#### 2.4.1. Transportation Demand

The rate of annual population growth for Onslow County is expected to closely mirror the state’s annual population growth rate of approximately one percent increase per year through 2037 (**Table 4**).

	<b>2016</b>	<b>2018</b>	<b>2020</b>	<b>2030</b>	<b>2037</b>
<b>Onslow Co.</b>	193,914	197,455	201,816	223,623	238,888
<b>State</b>	10,155,942	10,388,837	10,619,432	11,759,744	12,553,271

\*Source: NC Office of State Budget and Management, last updated October 2, 2017.

Camp Lejeune is an important component of the local economy, if not the main driving force. It should be noted that many of the military personnel stationed at the Camp Lejeune Marine installation are not counted in the county population because it is a federal installation and these individuals are considered within this installation, as opposed to the local or state jurisdiction. From 1985 to 2010, there was a 29.7 percent increase in the number of individuals tied to the Camp Lejeune Marine Base. This includes all personnel, dependents, and civilian employees within a 50-mile radius of the base (*Onslow County Comprehensive Plan*, Section V, Page 16). According to the *Onslow County Comprehensive Plan (2014 Update)*, most of Onslow County’s population growth over the last 30 years can be attributed to the expansion of Camp Lejeune. The 2040 LRTP reported that as of March 2014, the DOD population was 74,461 (including: 48,634 active duty, 19,198 reservists, and 6,629 civilian employees).

Onslow County’s major employers are primarily located in Jacksonville. Jacksonville Onslow Economic Development lists the top five employers in the county as: the Department of Defense (DOD), Onslow County Board of Education, Marine Corps Community Services, Wal-Mart Associates, Inc., and County of Onslow. The Onslow County offices are located in Jacksonville, while DOD and Marine Corps services are located south of Jacksonville. As reported in the 2040 LRTP, the total number of jobs in Onslow County are anticipated to be 122,000 in 2040, according to Woods & Poole Economics employment

projections. The growth rate of jobs is expected to be approximately 1 percent per year in the short-term, decreasing to 0.5 percent per year by 2040.

As an important regional employment center, the Jacksonville area attracts commuters from throughout Onslow County and some neighboring counties. According to the 2040 LRTP, approximately 61 percent of workers within the JUMPO study area live in Onslow County. The remainder commute from neighboring counties of which Carteret and Craven counties account for the largest share with 4 and 3 percent, respectively. The 2040 LRTP identified the longest average commute times (32 minutes) within their study area for the census tract northwest of Jacksonville, between NC 111 and NC 53. The proposed project would provide a more direct connection for commuters around NC 111 to cross the New River and access businesses and services to the southeast, including Onslow Memorial Hospital.

#### 2.4.2. Connectivity

The New River presents a natural barrier to surface transportation in the area. The New River is considered an estuarine water and travels generally north from Jacksonville, bisecting the project’s preliminary study area. The New River Inlet forms at Jacksonville and continues south to the Atlantic Ocean. Though the river channel is relatively narrow north of the inlet, the New River floodway and corresponding floodplain approaches roughly ½-mile in width through the project’s preliminary study area. The floodway and floodplain generally narrow towards the northern extent of the preliminary study area. The nearest crossings to the proposed project are Business US 17 (S. Marine Boulevard) approximately 5.5 miles to the south, and at Rhodestown Road, approximately 2.5 miles to the north. The Business US 17 (S. Marine Boulevard) crossing of the New River is a choke point in downtown Jacksonville, serving not only local traffic, but through-traffic as well.

To understand current travel times in the transportation network and the potential for travel time savings by the introduction of the project, TransCAD’s shortest path tool was used to generate travel estimations. Using the accepted the JUMPO Regional Travel Demand Model (TDM), the top 10 percent highest density household and employment traffic analysis zones (TAZs) were identified; four representative TAZs were selected, one from each quadrant of Onslow County, with the New River and NC 111/Ramsey Road roughly serving as the X and Y axis (**Figure 3**). Travel estimations were generated for the Base Year (BY) (2010) No Build (NB) and Build (B) scenarios and the Future Year (FY) (2040) NB and B scenarios. **Table 5** summarizes the results of this analysis, showing the *cumulative time savings* in minutes for all trips generated between the four selected TAZs by concept alternative.

<b>Table 5. Cumulative Time Savings (Minutes) of All Trips Between the Four Selected TAZs by Concept Alternative</b>				
<b>Scenario</b>	<b>Northern Alternative</b>	<b>Middle Alternative</b>	<b>Southern Alternative</b>	<b>Total Minutes</b>
BY (2010) No Build	N/A	N/A	N/A	155.1
BY (2010) Build*	-5.5	-8.6	-14	N/A
FY (2040) No Build	N/A	N/A	N/A	186.5
FY (2040) Build*	-6.8	-9.1	-20	N/A

\*cumulative travel time savings in minutes generated by all trips between the four selected TAZs

**Table 5** indicates that if STIP Project U-5733 project were in place today, travelers between the four selected TAZs would save a cumulative total of 5.5 minutes with the Northern Alternative; 8.6 minutes with the Middle Alternative; and 14 minutes with the Southern Alternative. These cumulative travel savings increase in the future year to between 6.8 and 20 minutes of cumulative time savings. In all scenarios, the greatest single time savings is realized between NC 111 northeast of the OAJ Airport (TAZ 87) and Half Moon (TAZ 175).

#### 2.4.3. Mobility

From a long-range transportation planning perspective, a radial bypass of the Jacksonville area is needed to complement the region’s transportation network and accommodate projected growth. The limited number of New River crossings force traffic to share the already congested parallel routes of US 258 and Gum Branch Road for longer distances. The JUMPO identified US 258 and Gum Branch Road as two of the roads with the highest recorded AADTs (2012) in the area, each with more than 20,000 vehicles per day (vpd); Gum Branch Road, a two- to three-lane facility, carries roughly the same amount of traffic as the five-lane US 258.

New location facilities typically lead to an increase in vehicle miles travelled (VMT) since there are additional roadway miles being added to the roadway network. The proposed project will reduce pressure on the existing network facilities and improve overall network efficiency and capacity. Further, the Build Alternatives would lead to overall decreases in daily vehicle hours traveled (VHT), VHT daily congested, and VHT PM period for the entire JUMPO Regional TDM (**Table 6**).

Future Year Measurements of Effectiveness (MOEs)	No Build	Northern Alternative		Middle Alternative		Southern Alternative	
		No.	Percent Change	No.	Percent Change	No.	Percent Change
<b>Vehicle Hours Traveled (VHT) (hours)</b>							
VHT	239,172	238,586	-0.2%	238,607	-0.2%	236,655	-1.1%
VHT Daily Congested	4,831	4,786	-0.9%	4,781	-1.0%	4,623	-4.3%
VHT PM Period (15:00–19:00)	73,287	73,112	-0.2%	73,117	-0.2%	57,382	-21.7%
VHT PM (Avg. PM Period Congested)	7,353	7,141	-2.9%	7,363	0.1%	6,887	-6.3%
<b>Vehicle Miles Traveled (VMT) (miles)</b>							
VMT	8,648,292	8,639,847	-0.1%	8,636,479	-0.1%	8,632,926	-0.2%
VMT Daily Congested	71,832	71,707	-0.2%	71,639	-0.3%	71,049	-1.1%
VMT PM Period (15:00–19:00)	2,648,403	2,646,219	-0.1%	2,645,418	-0.1%	2,643,807	-0.2%
VMT PM (Average PM Period Congested)	124,886	120,994	-3.1%	124,482	-0.3%	118,810	-4.9%

#### 2.4.4. Safety Issues

A section crash analysis was conducted for the existing sections of NC 111, US 258, Rhodestown Road, Briarneck Road, and Gum Branch Road within the project area. The section analysis concluded that crash rates along all roads are lower than statewide critical crash rates, except for Briarneck Road. The crash

rates along Briarneck Road in the project study area are higher than statewide critical crash rates except for fatal crashes.

The section crash analysis noted a couple incident clusters on Rhodestown Road and Briarneck Road. A lane departure crash pattern (16 crashes) was identified in the curve between Holly Grove Lane and Cross Creek Drive on Rhodestown Road. It appeared that speed was a factor in several of these incidents. The posted speed limit is 45 mph. This curve is being flattened by an NCDOT safety project (W-5601A, anticipate open for traffic by March 30, 2019). There was also a lane departure crash pattern (7 crashes) in the curve at Briarneck Road and SR 1329 (Rhodestown Fire Department Road). It appeared that speed was a factor in several of these incidents. The posted speed limit is 45 mph.

An intersection crash analysis was conducted for the NC 111/US 258 intersection which confirmed the safety issue at this location previously identified in the JUMPO's 2040 LRTP. Between February 1, 2013 and January 31, 2018, 72 crashes (148.79 crash rate) were recorded within 150 feet of the NC 111/US 258 intersection approaches. Another 23 crashes were collected in the section analysis on the NC 111 approach to US 258 where vehicles were rear-ended after pulling forward to improve their view of vehicles traveling southbound on US 258 in an effort to turn right onto southbound US 258.

## 2.5. Project Study Area

Following the External Scoping Meeting (9/14/16) the proposed study area was expanded to encompass potential routes utilizing existing roads north of the proposed new alignment. The resulting study area encompassed approximately 4,400 acres between US 258 and Gum Branch Road, with Rhodestown Road serving as the northern study area extent (see **Figure 2**).

Subsequently, conceptual roadway design, utilizing basic roadway geometry standards, were applied to three potential routes, consisting of a Northern Alternative (i.e., improve existing Rhodestown Road), a Middle Alternative (i.e., improve existing Briarneck Road with new alignment New River crossing), and a Southern Alternative (i.e., new alignment), cumulatively referred to as the Concept Alternatives. These conceptual alignments were then buffered 250 feet on either side of upgrade existing sections and 750 feet on either side of new alignment sections. The area between the Rhodestown Road and Briarneck Road concepts were filled in to provide potential alternate New River crossing locations. The resultant study area is shown on the **Study Area Map (Figure 2)** and encompasses approximately 1,725 acres, including sufficient area to pursue alignment shifts and apply avoidance and minimization measures during design development. *Note: The study area is preliminary and subject to change. The study area may be revisited following CP 2.*

## 3. Merger Concurrence Point 2 – Detailed Study Alternatives Carried Forward

The identification, consideration, and analysis of alternatives are key to the NEPA process and the goal of objective decision-making. Consideration of alternatives leads to a solution that satisfies the transportation need and avoids and minimizes adverse impacts to environmental and community resources. This identification and consideration includes a No-Build Alternative and an analysis of a reasonable range of Build Alternatives, including improving existing roadways and new location alternatives.

### 3.1. No-Build Alternative

The No-Build Alternative is the baseline comparative alternative for the design year (2040). The No-Build Alternative would not provide any improvements to the roadway network in the project study area.

### 3.2. Build Alternatives

The three Build Alternatives listed below would involve the construction or improvement of a New River crossing between US 258 and Gum Branch Road north of Jacksonville in Onslow County. The improved connection would consist of a two-lane roadway on multi-lane right of way. The two-lane cross section is supported by the Project Level Traffic Forecast, which projects between 8,700 and 20,700 vpd depending on alternative. To achieve the connection necessary for a future northern radial route, all Build Alternatives terminate at the east at Ramsey Road.

- **Northern Alternative** would realign NC 111 to intersect Rhodestown Road, including approximately one-mile of roadway on new location. Improvements would continue on Rhodestown Road and Gum Branch Road to the Ramsey Road intersection. The existing Rhodestown Road bridge over the New River would likely have to be widened to accommodate 12-ft travel lanes and 8-ft shoulders, per current arterial standards. Roadway improvements would be implemented along existing alignments to meet arterial design standards (12-ft travel lanes, 8-ft shoulders with 4 feet paved, 30-ft clear zone). The project would also include the purchase of right of way for a future multi-lane roadway.
- **Middle Alternative** would realign NC 111 to intersect Briarneck Road, including approximately one-mile of roadway on new location. Improvements would continue on Briarneck Road for approximately one mile at which point the alternative would leave Briarneck Road to cross the New River on new location to a new intersection with Gum Branch Road. Improvements would continue on Gum Branch Road to the Ramsey Road intersection. Improvements to existing roadways would meet arterial design standards (12-ft travel lanes, 8-ft shoulders with 4 feet paved, 30-ft clear zone). The project would also include the purchase of right of way for a future multi-lane roadway.
- **Southern Alternative** would realign NC 111 to a new intersection with US 258 and continue on new alignment, including a new location crossing of the New River, to form the fourth leg of the existing Ramsey Road and Gum Branch Road intersection.

“Best Fit” improvements will be evaluated for each Build Alternative to minimize impacts and costs, and accommodate maintenance of traffic during construction.

### 3.3. Analysis of Build Alternatives

The project engineers laid out conceptual roadway alignments on current aerial photography and with field delineated streams and wetlands. Though very early in the design development, the conceptual roadway alignments were laid out to avoid and/or minimize stream and wetland resources identified in the project’s WEX file to the extent practical. All conceptual roadway alignments were then buffered by 500 feet (i.e., 250 feet on either side) resulting in Concept Alternative Corridors. All Concept Alternative Corridors are contained within the preliminary study area. As design development continues, avoidance and minimization measures will be applied to the Build Alternatives within their respective corridor.

Environmental features within these corridors were quantified in GIS and tabulated by Concept Alternate Corridor in **Table 7**. Streams and wetlands represent field delineated resources, though they

had not been verified by the agencies at the time of this report, except for Bachelor’s Delight Creek. When the NRTR was scoped and completed in the spring and summer of 2018, NCDOT assumed improvements to Gum Branch Road would not be included in this project. As a result, the NRTR study area terminated approximately 1,000 feet south of the Middle Concept Alternative intersection with Gum Branch Road (just north of River Winding Road/Timothy Road) and approximately 1,000 feet north of the Ramsey Road intersection with Gum Branch Road. A review of available GIS data identified a single crossing and associated wetlands in this stretch at Bachelor’s Delight Creek. The project would bridge the New River floodway in any alternative; however, the New River is included in the stream counts below.

		<b>Northern Alternative</b>	<b>Middle Alternative</b>	<b>Southern Alternative</b>
Length (mile)		6.5	5.7	4.7
Wetlands (acre)		37*	44*	44
Streams (feet)		10,080*	9,670*	5,990
Floodway		6	13	28
Floodplain (acre)	100 Year	20	13	15
	500 Year	9	8	1
Parcels		383	236	124
*measurement includes 5 acres of wetland or 480 feet of stream associated with the Gum Branch Road crossing of Bachelor’s Delight Creek, calculated based on Onslow County GIS data (i.e., NRTR/WEX did not cover this crossing).				

At this early stage of project development, it is reasonable to assume the Northern and Middle alternatives would require improvements to Gum Branch Road. Gum Branch Road is currently over capacity. STIP Project U-4906 will provide an improved, and wider, paved riding surface, improve operating conditions, and preserve and extend the service life of Gum Branch Road within that project’s limits; however, it will not fully address the projected capacity deficiencies. Either the Northern or Middle alternative would put greater pressure on Gum Branch Road north of Ramsey Road.

#### 4. Project Schedule

**Table 8** provides the tentative milestone schedule for this project (subject to change). The funding schedule is consistent with the 2018-2027 STIP. NCDOT is evaluating an accelerated delivery schedule.

<b>Milestone</b>	<b>Schedule*</b>
Concurrence Point 2A	Winter 2018/2019
Concurrence Point 3/4A	Fall 2019
Final Environmental Document*	Winter 2019/2020
Begin ROW Acquisition	FY 2023
Begin Construction	FY 2027
*tentative, subject to change; *anticipate Federal EA/FONSI	

## 5. Sources

HNTB North Carolina, PC.

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

*Project Level Traffic Forecast: STIP Project U-5733.* August 2018.

*STIP U-5733 Onslow County Community Characteristics Report.* July 2018.

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

North Carolina Department of Transportation (NCDOT).

*2018–2027 State Transportation Improvement Program.* Accessed on-line August 28, 2018 at [connect.ncdot.gov/projects/planning/STIPDocuments1/NCDOT%20Current%20STIP.pdf](https://connect.ncdot.gov/projects/planning/STIPDocuments1/NCDOT%20Current%20STIP.pdf).

*Feasibility Study: City of Jacksonville: Proposed Connector (Northwest Corridor) from US 258/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 August 28, 2018 at [www.osbm.nc.gov/demog/county-projections](http://www.osbm.nc.gov/demog/county-projections).

Onslow County Planning & Development. “Project Tracker”. Accessed on-line August 28, 2018 at [www.onslowcountync.gov/172/Building](http://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: US 258 (Richlands Highway) to SR 1308 (Gum Branch Road). Construct Extension of NC 111 on new location. **STIP Project: U-5733**

#### Project Need:

The need to be addressed by the proposed project is to improve network mobility and connectivity between Gum Branch Road and US 258 in the project area.

#### 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. The project will achieve improved mobility by reducing overall vehicle hours traveled (VHT) in the transportation network. The project will achieve improved connectivity in central Onslow County by reducing travel times in the project vicinity and providing a roadway connection closer to activity centers in Jacksonville.

#### Project Study Area

The project study area boundaries are shown on Figure 2, dated August 2018. The study area encompasses three conceptual roadway alignments between NC 111/US 258 and SR 1308 (Gum Branch Road). Conceptual alignments are buffered 250 feet on either side of upgrade existing sections and 750 feet on either side of new alignment sections. The resultant study area encompasses approximately 1,725 acres, including sufficient area to pursue alignment shifts and apply avoidance and minimization measures during design development.

The Merger Team has concurred on this date of October 17, 2018, on the above project purpose and need and the study area as shown in **Figure 2** for STIP Project U-5733.

USACE \_\_\_\_\_

FHWA \_\_\_\_\_

USEPA \_\_\_\_\_

NCDOT \_\_\_\_\_

USFWS \_\_\_\_\_

NOAA Fisheries \_\_\_\_\_

NCDWR \_\_\_\_\_

NCHPO \_\_\_\_\_

NCWRC \_\_\_\_\_

JUMPO \_\_\_\_\_

NCDCM \_\_\_\_\_

# Section 404/NEPA Merger Project Team Meeting Agreement

## Concurrence Point No. 2 Detailed Study Alternatives Carried Forward

Project Name/Description: US 258 (Richlands Highway) to SR 1308 (Gum Branch Road). Construct Extension of NC 111 on new location. **STIP Project: U-5733**

- \_\_\_ **Northern Alternative** - realign NC 111 to intersect Rhodestown Road; improve Rhodestown Road to Gum Branch Road intersection; purchase right of way for a future multi-lane roadway.
- \_\_\_ **Middle Alternative** - realign NC 111 to intersect Briarneck Road; improve Briarneck Road for approximately one mile; construct new alignment roadway to cross the New River on new location to a new Gum Branch Road intersection; purchase right of way for a future multi-lane roadway.
- \_\_\_ **Southern Alternative** - realign NC 111 to a new intersection with US 258; construct new alignment roadway to cross the New River on new location to the existing Ramsey Road and Gum Branch Road intersection; purchase right of way for a future multi-lane roadway.

The Merger Team has concurred on this date of October 17, 2018, on the above identified detailed study alternatives to be carried forward for STIP Project U-5733.

USACE \_\_\_\_\_

FHWA \_\_\_\_\_

USEPA \_\_\_\_\_

NCDOT \_\_\_\_\_

USFWS \_\_\_\_\_

NOAA Fisheries \_\_\_\_\_

NCDWR \_\_\_\_\_

NCHPO \_\_\_\_\_

NCWRC \_\_\_\_\_

JUMPO \_\_\_\_\_

NCDCM \_\_\_\_\_

**Figure 1. Project Location Map**

**NC 111 (Catherine Lake Rd)  
Extension from US 258  
(Richlands Hwy) to SR 1308  
(Gum Branch Road)  
STIP Project U-5733  
Onslow County**

**Legend**

- U-5733 Study Area
- Municipal Limit
- ETJ
- County Boundary
- Hospitals
- Airport
- US Route
- NC Route
- Secondary Route
- River/Stream

Sources: NCDOT, Onslow County GIS, NC OneMap.  
Credit: HNTB North Carolina, PC., March 2018.

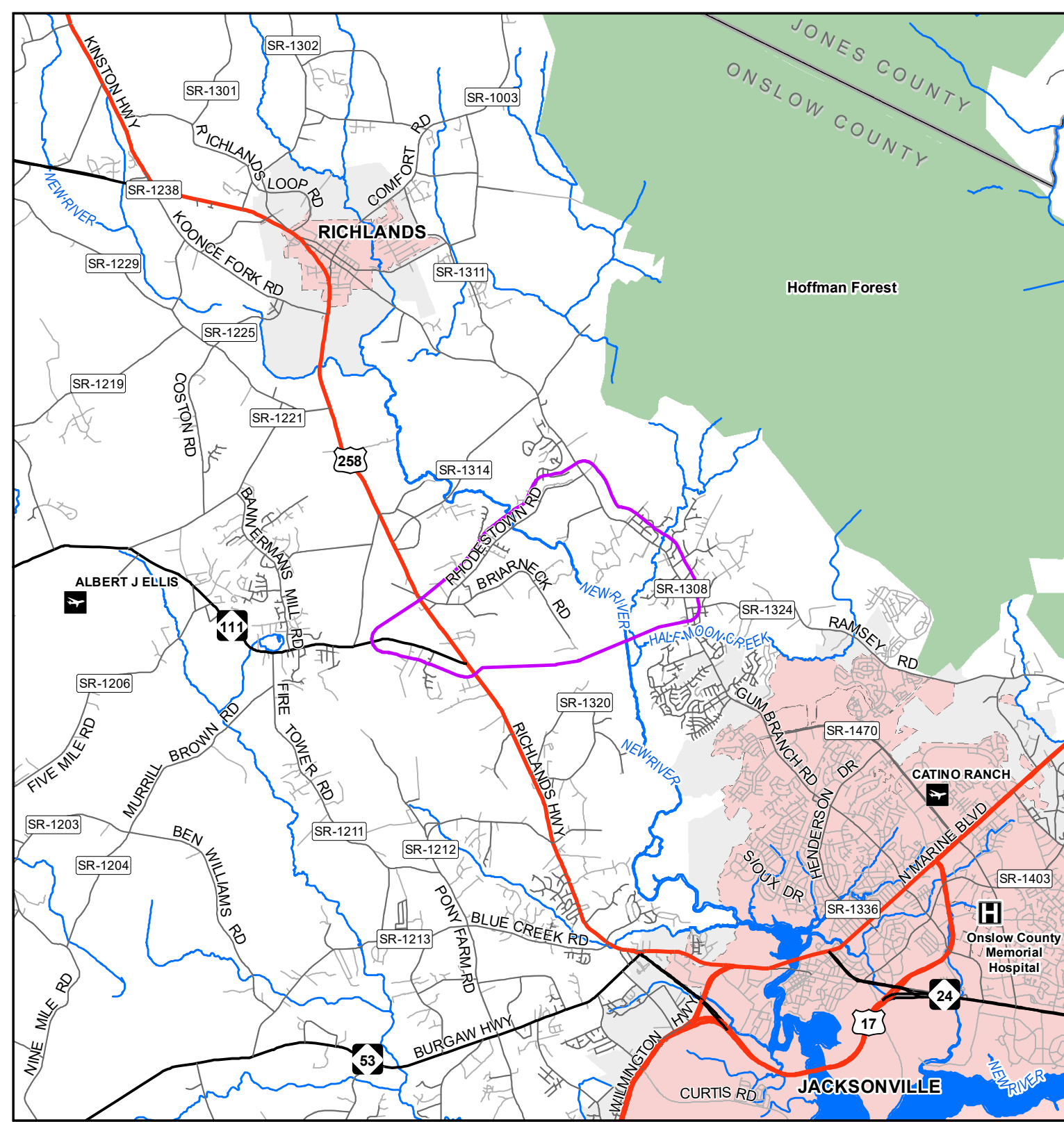
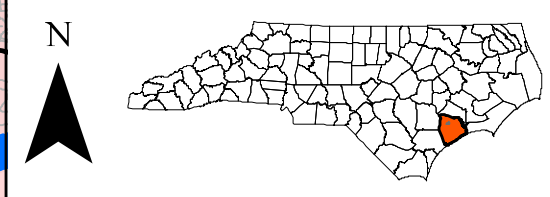
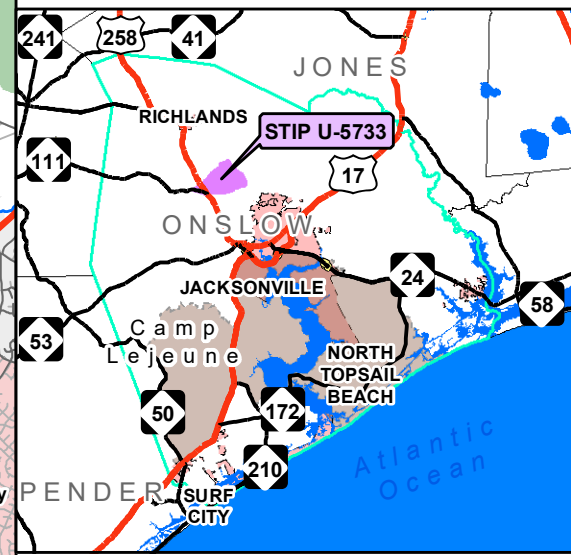
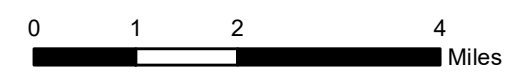

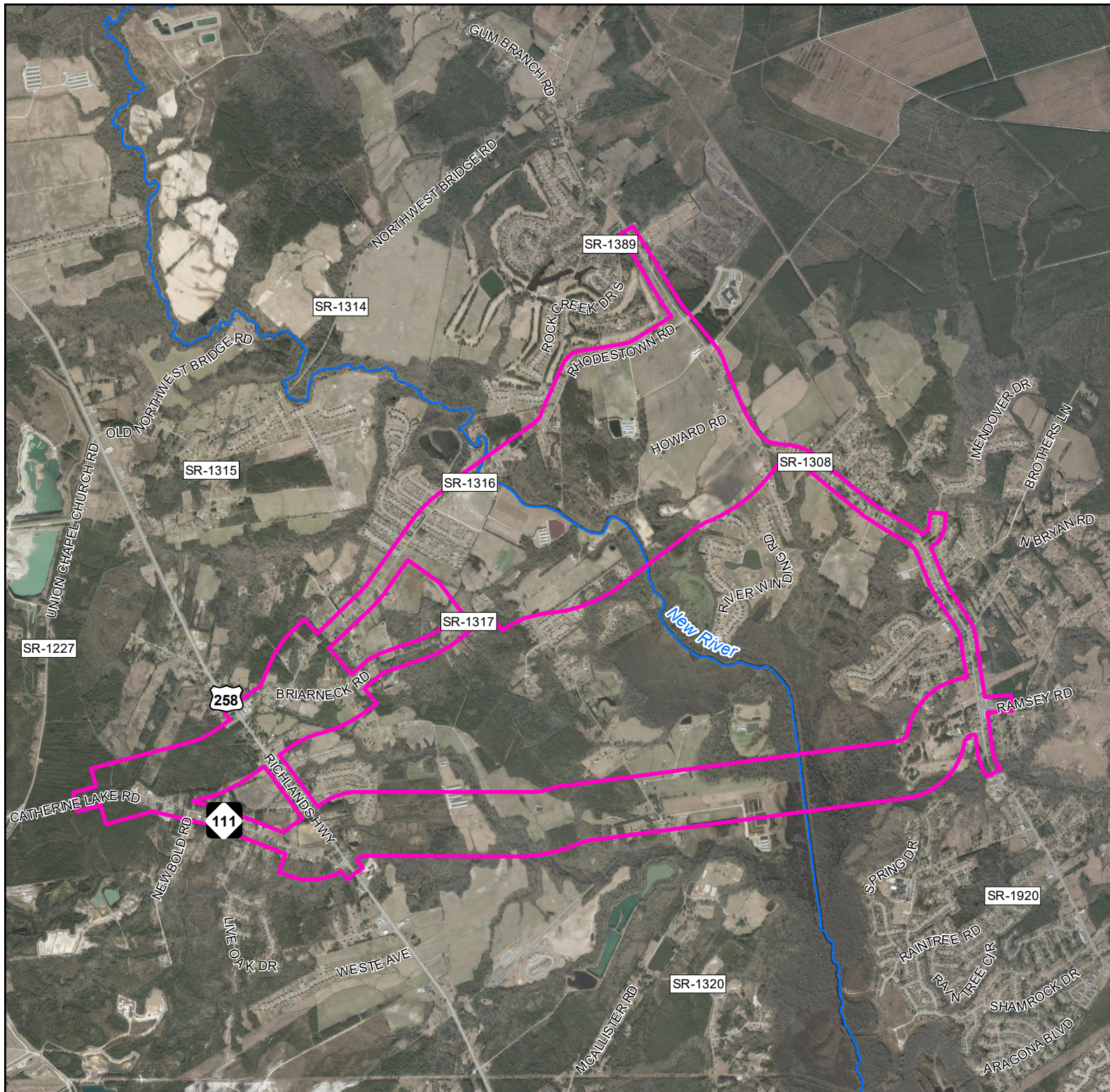


Figure 2. Study Area Map

NC 111 (Catherine Lake Rd)  
Extension from US 258  
(Richlands Hwy) to SR 1308  
(Gum Branch Road)  
STIP Project U-5733  
Onslow County

 Preliminary Study Area  
(CP 1)



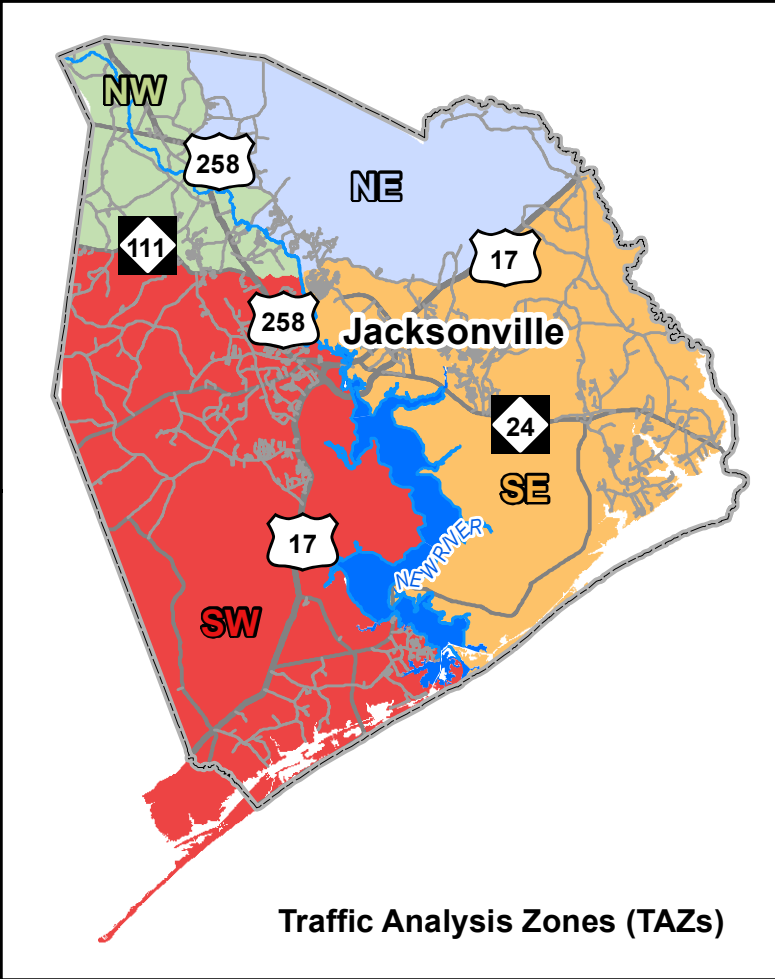
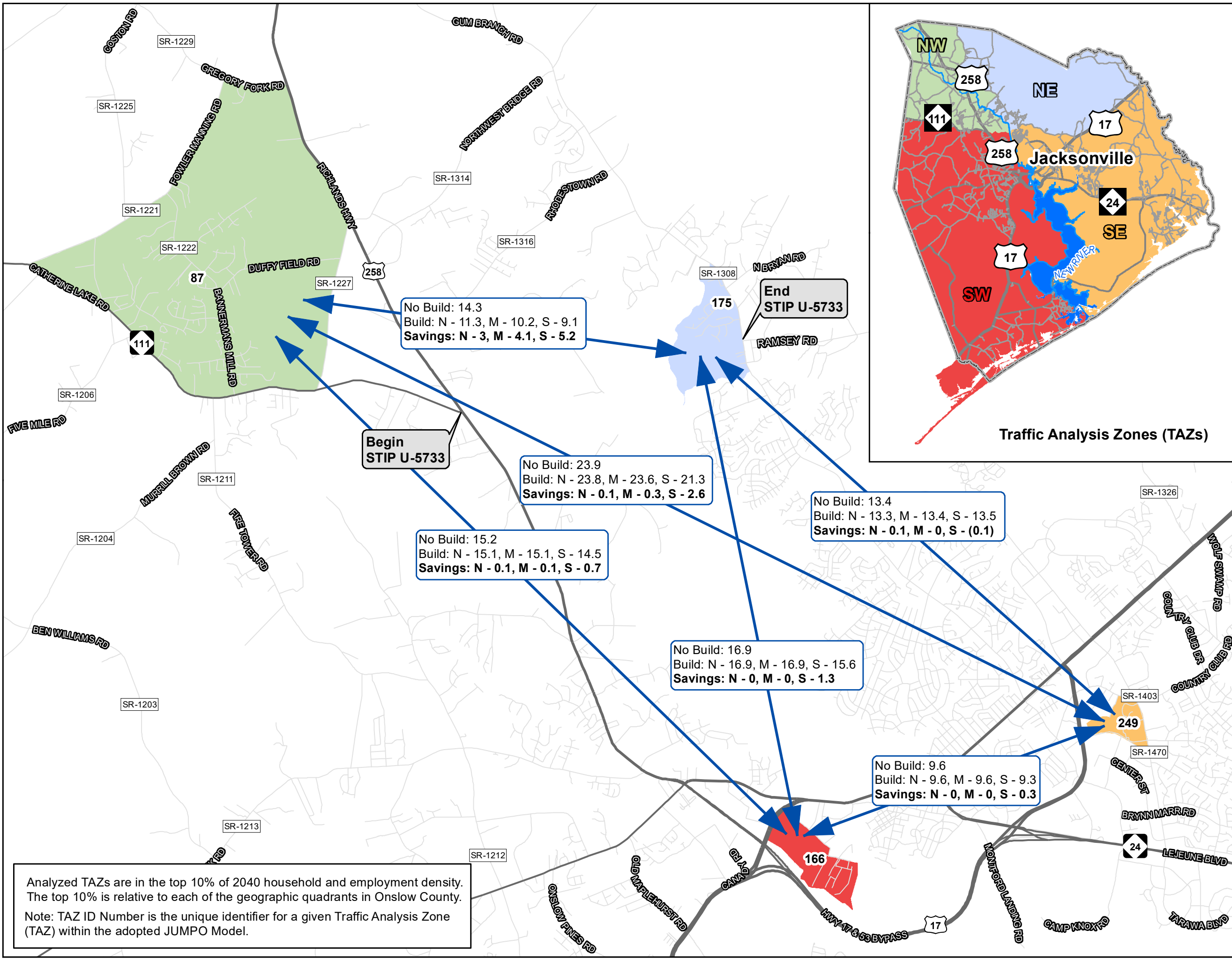
Sources: NCDOT, Onslow Co. GIS, NC OneMap,  
Credit: HNTB North Carolina, PC, August 2018.

0 3,000 6,000  
Feet



**Figure 3. Future Year (2040)  
Travel Time Savings By  
Concept Alternative**

**NC 111 (Catherine Lake Rd)  
Extension from US 258  
(Richlands Hwy) to SR 1308  
(Gum Branch Road)  
STIP Project U-5733  
Onslow County**

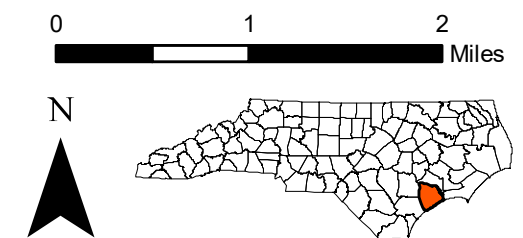


**Legend**

**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
- Road

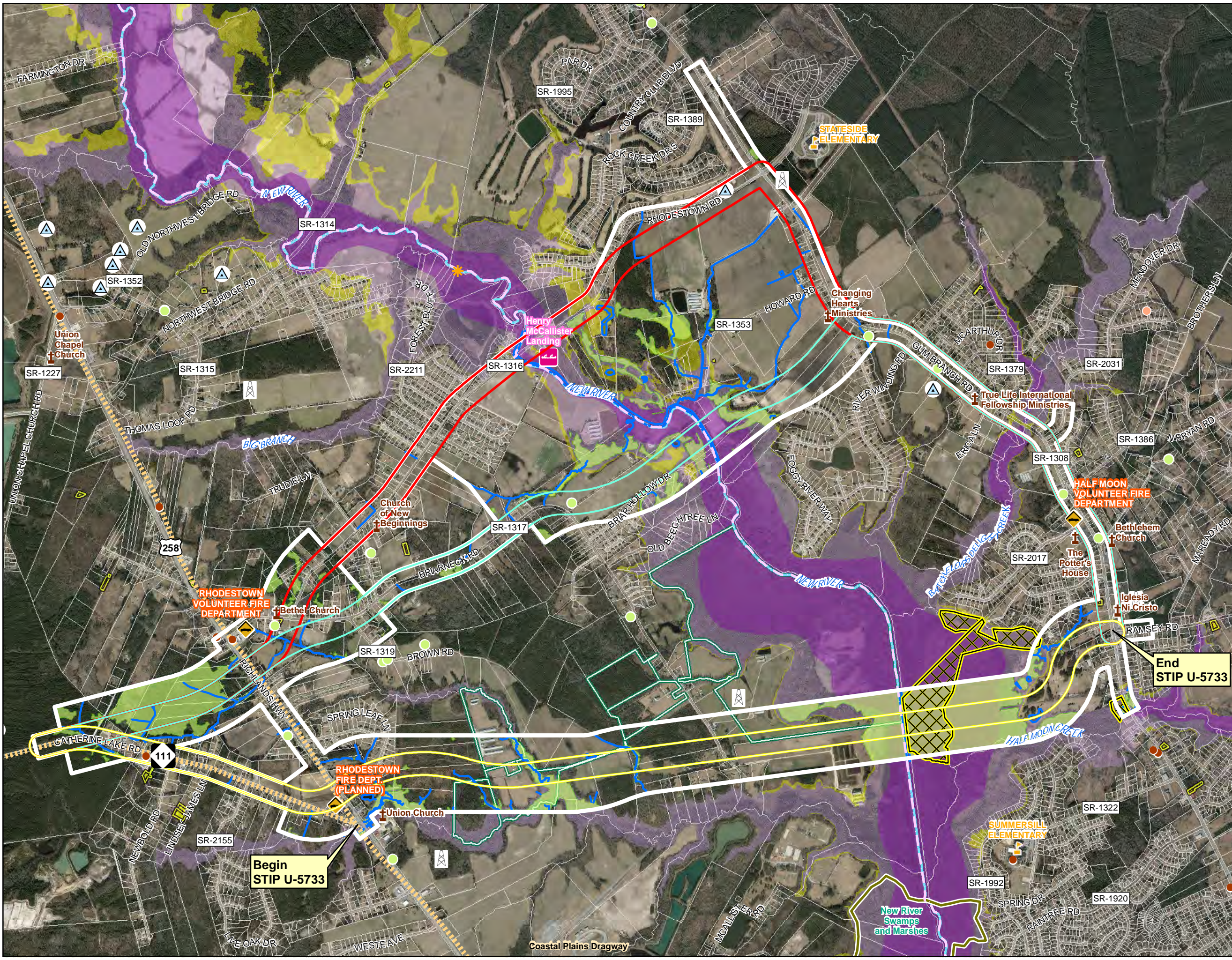
Sources: NCDOT, Onslow Co. GIS, NC OneMap, JUMPO TDM, Credit: HNTB North Carolina, PC, August 2018.



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.

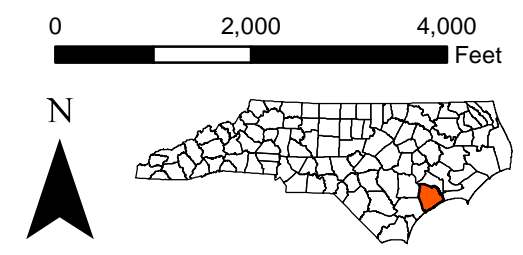
**Figure 4a. Environmental Features Map**

**NC 111 (Catherine Lake Rd)  
Extension from US 258  
(Richlands Hwy) to SR 1308  
(Gum Branch Road)  
STIP Project U-5733  
Onslow County**



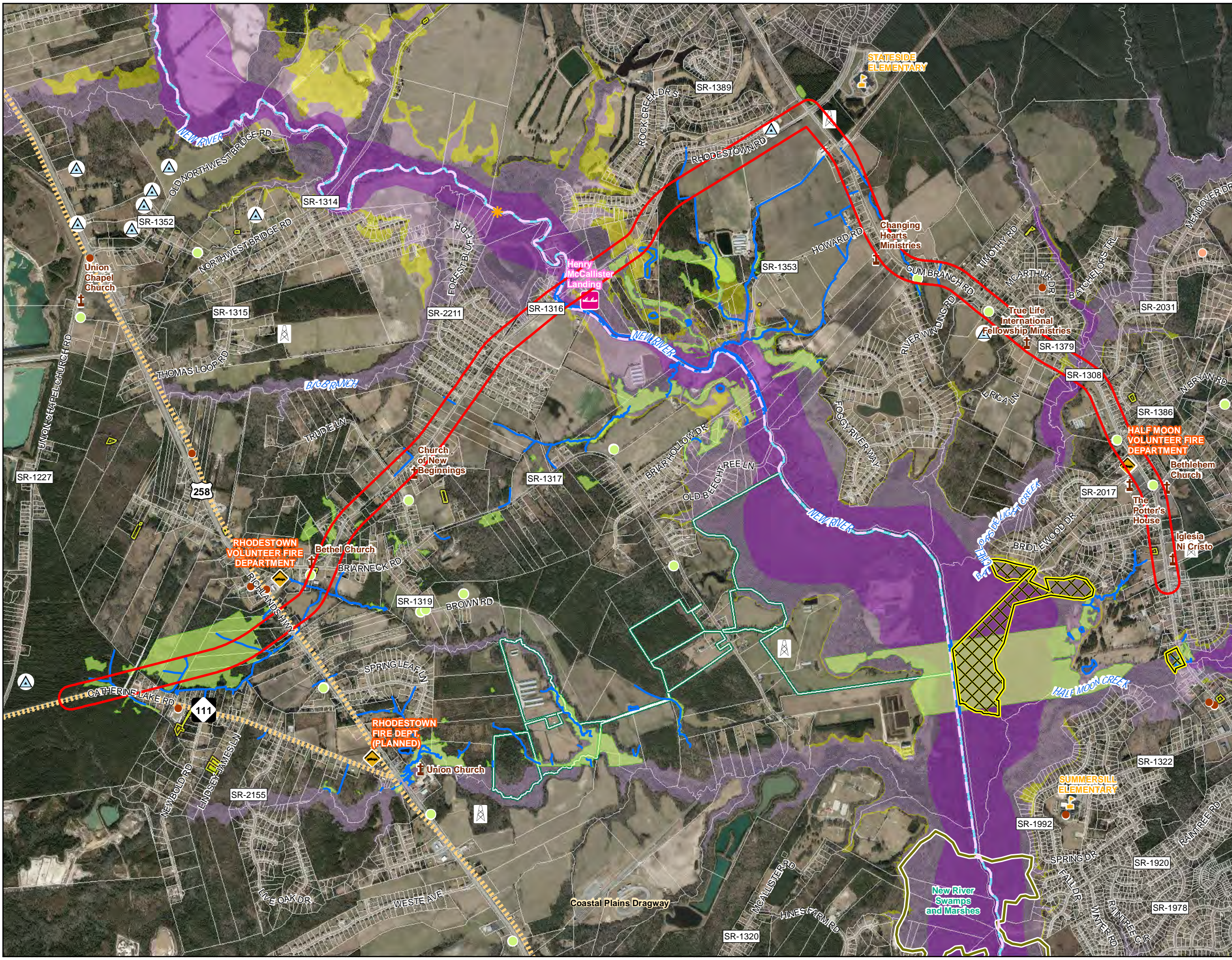
- Preliminary Study Area (CP 1)
- Northern Concept Corridor
- Middle Concept Corridor
- Southern Concept Corridor
- Water Well
- FCC Antennae Structure (06/2012)
- NPDES Permitted Site
- Regional UST
- Hazardous Waste Site
- Potential Historic Resource (HPOWeb Surveyed Only)
- Fire Station
- School
- Church
- Cemetery
- Natural Heritage Natural Area (NHP)
- Voluntary Agriculture District (VAD)
- FEMA Floodway
- FEMA Zone AE (100-yr Floodplain)
- FEMA 500-yr Floodplain
- FEMA Buyout Parcel
- Parcel
- New River
- Jurisdictional Stream
- Jurisdictional Wetland
- Cow Horn-New River Paddle Trail
- Paddle Trail Landing
- NCDOT Hurricane Evacuation Route

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



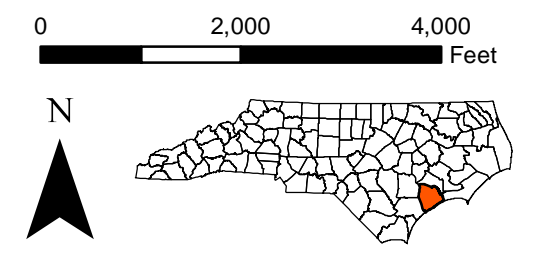
**Figure 4b. Environmental Features Map: Northern Concept Alternative Corridor**

**NC 111 (Catherine Lake Rd)  
Extension from US 258  
(Richlands Hwy) to SR 1308  
(Gum Branch Road)  
STIP Project U-5733  
Onslow County**



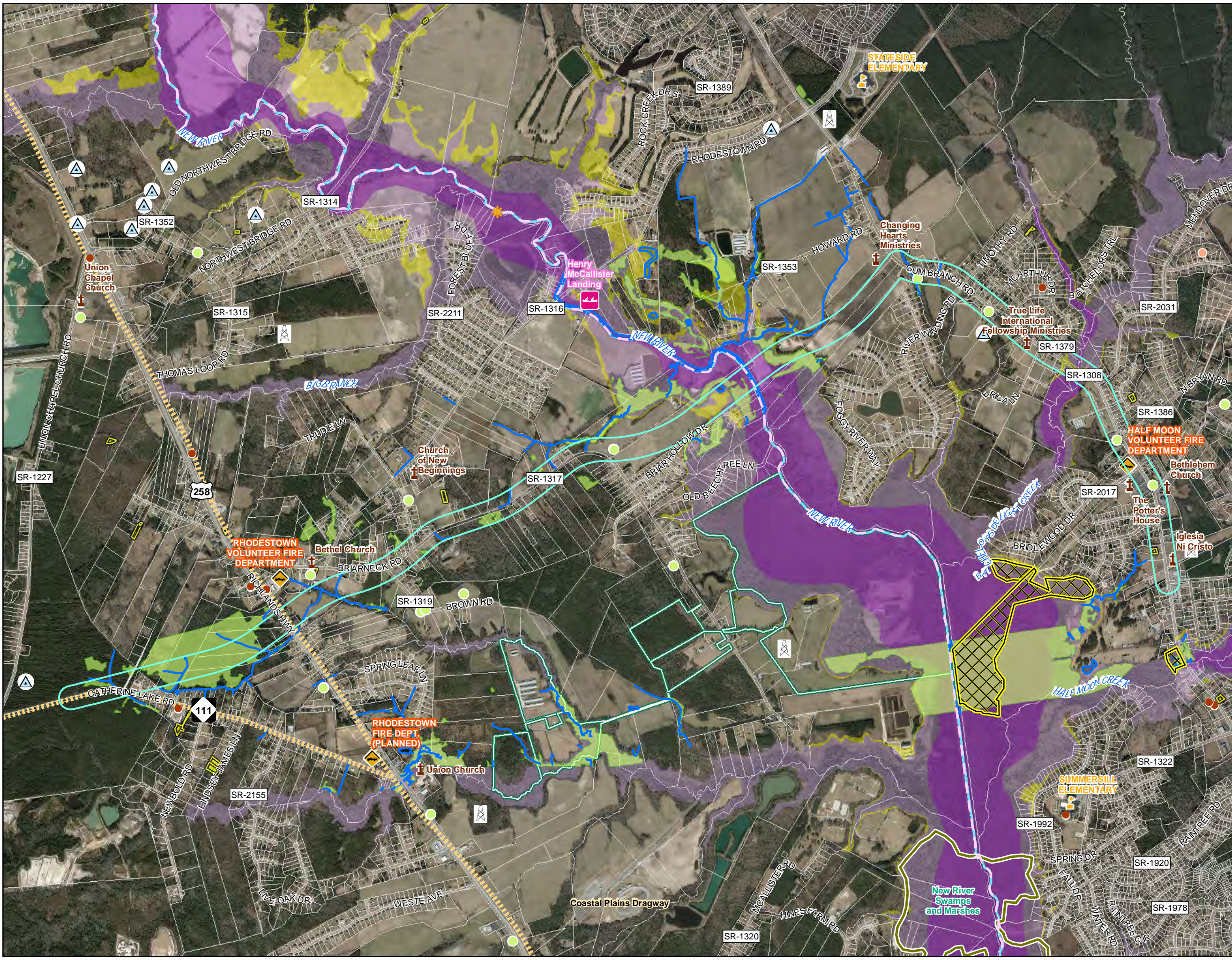
- Northern Concept Corridor
- Water Well
- FCC Antennae Structure (06/2012)
- \* NPDES Permitted Site
- Regional UST
- Hazardous Waste Site
- Potential Historic Resource (HPOWeb Surveyed Only)
- ♠ Fire Station
- 🏫 School
- ✝ Church
- Cemetery
- Natural Heritage Natural Area (NHP)
- Voluntary Agriculture District (VAD)
- FEMA Floodway
- FEMA Zone AE (100-yr Floodplain)
- FEMA 500-yr Floodplain
- FEMA Buyout Parcel
- Parcel
- New River
- Jurisdictional Stream
- Jurisdictional Wetland
- Cow Horn-New River Paddle Trail
- Paddle Trail Landing
- NCDOT Hurricane Evacuation Route

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



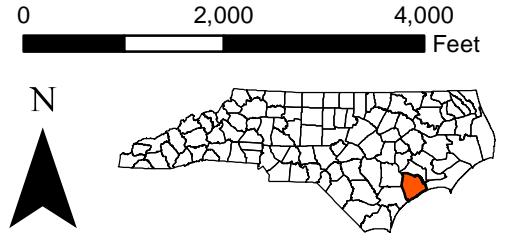
**Figure 4c. Environmental Features Map: Middle Concept Alternative Corridor**

**NC 111 (Catherine Lake Rd)  
Extension from US 258  
(Richlands Hwy) to SR 1308  
(Gum Branch Road)  
STIP Project U-5733  
Onslow County**



- Middle Concept Corridor
- Water Well
- FCC Antennae Structure (06/2012)
- ✦ NPDES Permitted Site
- Regional UST
- Hazardous Waste Site
- Potential Historic Resource (HPOWeb Surveyed Only)
- ⬠ Fire Station
- ⚎ School
- ⚎ Church
- Cemetery
- Natural Heritage Natural Area (NHP)
- Voluntary Agriculture District (VAD)
- FEMA Floodway
- FEMA Zone AE (100-yr Floodplain)
- FEMA 500-yr Floodplain
- FEMA Buyout Parcel
- Parcel
- New River
- Jurisdictional Stream
- Jurisdictional Wetland
- Cow Horn-New River Paddle Trail
- Paddle Trail Landing
- NCDOT Hurricane Evacuation Route

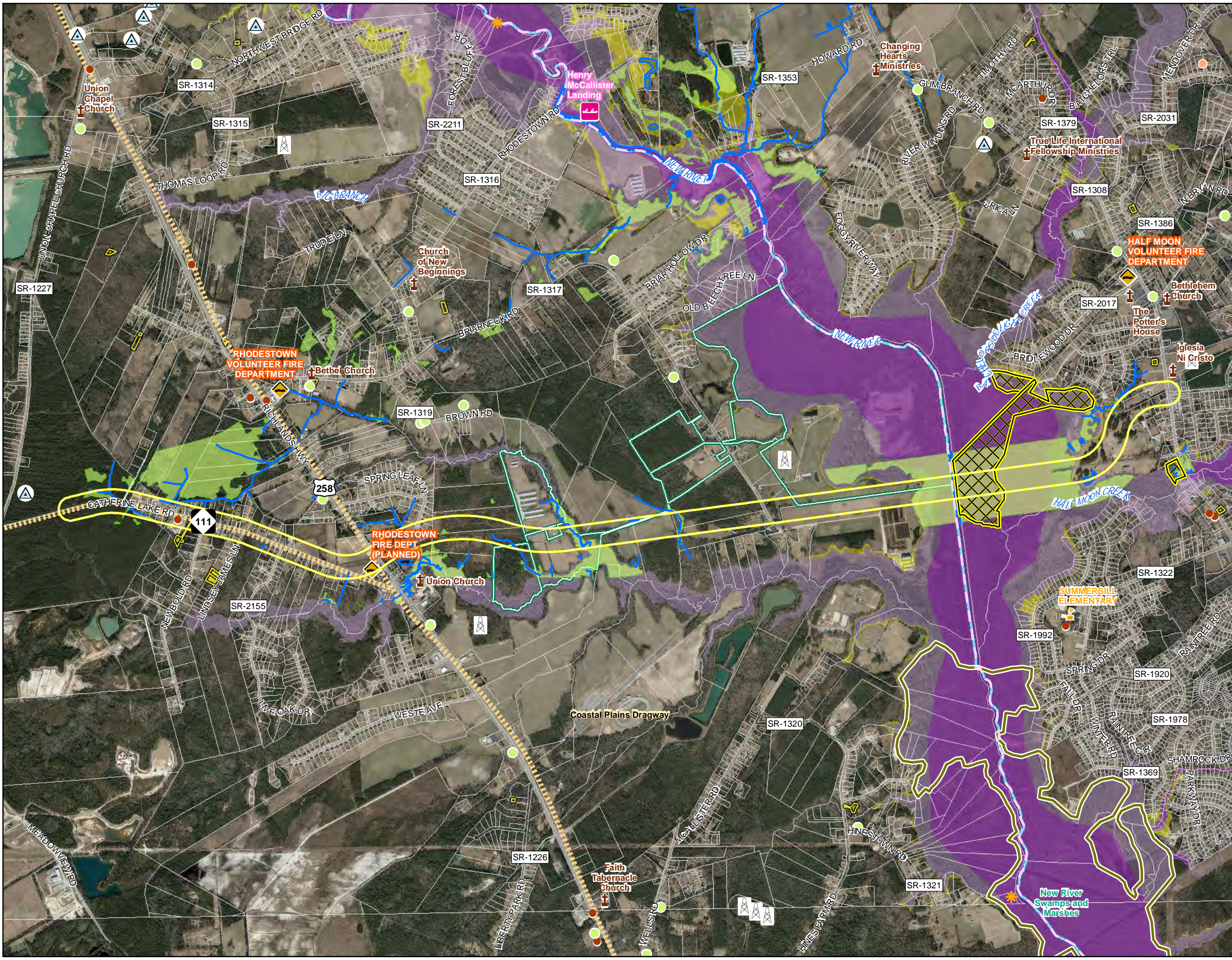
Sources: NCDOT, Onslow Co. GIS, NC OneMap, NCFMP, NC NHP, HPOWeb. Credit: HNTB North Carolina, PC, 2018.





**Figure 4d. Environmental Features Map: Southern Concept Alternative Corridor**

**NC 111 (Catherine Lake Rd)  
Extension from US 258  
(Richlands Hwy) to SR 1308  
(Gum Branch Road)  
STIP Project U-5733  
Onslow County**



- Southern Concept Corridor
- Water Well
- FCC Antennae Structure (06/2012)
- ✱ NPDES Permitted Site
- Regional UST
- Hazardous Waste Site
- Potential Historic Resource (HPOWeb Surveyed Only)
- ♠ Fire Station
- 🏫 School
- ✙ Church
- Cemetery
- Natural Heritage Natural Area (NHP)
- Voluntary Agriculture District (VAD)
- FEMA Floodway
- FEMA Zone AE (100-yr Floodplain)
- FEMA 500-yr Floodplain
- FEMA Buyout Parcel
- Parcel
- New River
- Jurisdictional Stream
- Jurisdictional Wetland
- Cow Horn-New River Paddle Trail
- Paddle Trail Landing
- NCDOT Hurricane Evacuation Route

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

