PUBLIC NOTICE

US Army Corps
Of Engineers
Wilmington District

Issue Date: April 10, 2019
Comment Deadline: May 9, 2019
Corps Action ID #:SAW-2004-00821
TIP Project No. U-4738

The Wilmington District, Corps of Engineers (Corps) has received an application from the North Carolina Department of Transportation (NCDOT) regarding a potential future requirement for Department of the Army authorization to discharge dredged or fill material into waters of the United States associated with a new transportation project that would extend from the vicinity of US 17 and I-140 in Brunswick County to US 421 in southern New Hanover County.

Specific alternative alignments and location information are described below and shown on the attached plans. This Public Notice and all attached plans are also available on the Wilmington District Web Site at:
https://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Public-Notices/
**Viewing the on-line version will better display color and grant the ability to view exploded views.

This public notice provides information on the various alternatives that are being considered for the subject project and also announces the availability of the Draft Environmental Impact Statement (DEIS) for the subject project. The DEIS can be viewed on NCDOT's website at: www.ncdot.gov/projects/cape-fear-crossing.

Applicant: North Carolina Department of Transportation (NCDOT)
c/o Mr. John Conforti, REM
Project Management Unit
1595 Mail Service Center
Raleigh, North Carolina 27699

Authority

The Corps will evaluate this application to compare alternatives that have been carried forward for study pursuant to applicable procedures under Section 404 of the Clean Water Act (33 U.S.C. 1344).

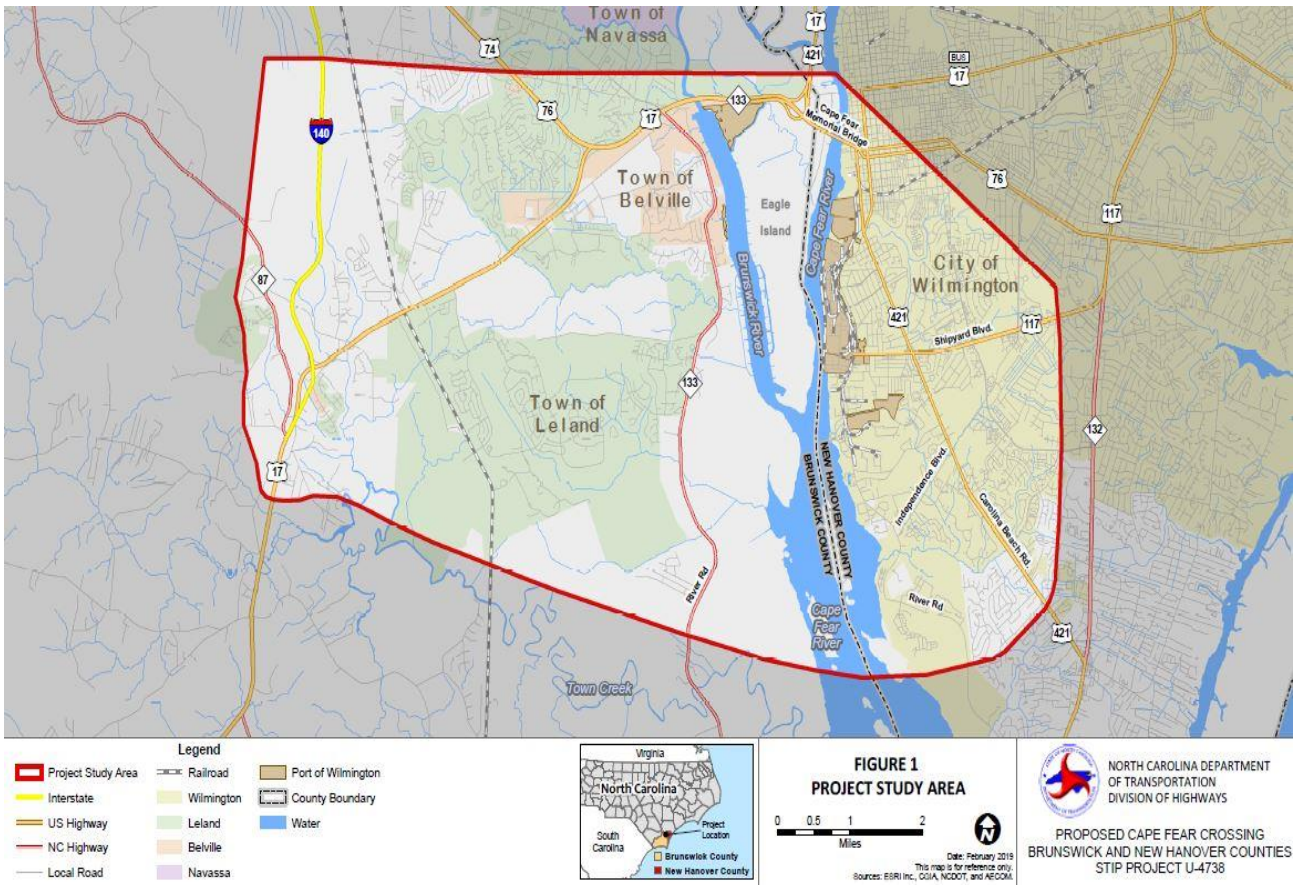
In order to more fully integrate Section 404 permit requirements with the National Environmental Policy Act of 1969, and to give careful consideration to our required public interest review and 404(b)(1) compliance determination, the Corps is soliciting public comment on the merits of this proposal and on the alternatives evaluated in the

DEIS. At the close of this comment permit, the District Commander will evaluate and consider the comments received as well as the expected adverse and beneficial effects of the proposed road construction to select the least environmentally damaging practicable alternative (LEDPA). The District Commander is not authorizing construction of the planned roadway at this time. A final Department of the Army permit could be issued, if at all, only after our review process is complete, impacts to the aquatic environment have been minimized to the maximum extent practicable and a compensatory mitigation plan for unavoidable impacts has been approved.

Location

For project U-4738, the North Carolina Department of Transportation (NCDOT) proposes to construct a transportation project that would extend from the vicinity of US 17 and I-140 in Brunswick County to US 421 in southern New Hanover County, a distance of approximately 12 miles. Limited and full control of access is proposed. The project is more specifically located near its Southern Boundary of Latitude 34°11'19.36" N and Longitude 78°04'41.69" W and near its Northern Boundary of Latitude 34°10'26.22" N and Longitude 77°56'52.12" W .

The project vicinity and study area are shown in Figure 1.



Existing Site Conditions

Brunswick and New Hanover counties are in the Coastal Plain physiographic region of the state, which is characterized by gently rolling plains and swampy tidewater along the Atlantic Coast. The project study area includes several tributaries of Town Creek (Bishop Branch, Morgan Branch, and Goodland Branch), Mallory Creek, Little Mallory Creek, Jackeys Creek, and the Cape Fear River.

Most of the project study area is in a relatively undeveloped portion of Brunswick County, with the exception of the US 17 corridor between Lanvale Road and US 74/76; however, new residential and commercial development is underway, particularly near the western and southern portions of the project study area. The project study area extends into the City of Wilmington and terminates east of US 421. There are several low-density, single-family neighborhoods near the western portion of the project study area. The Spring Hill community, a predominantly African-American neighborhood, is located near US 17 and SR 1414 (Goodman Road). A large (5,000 to 6,000 acres) mixed-use development with approximately 12,000 home sites and 300 acres of commercial land is within the project study area in Brunswick County. This development, called Brunswick Forest, is roughly bounded by US 17, NC 133, and Town Creek. In addition, local planners indicated that property along NC 133 is experiencing rapid residential development. Much of the land along Town Creek is held in conservation by the North Carolina Coastal Land Trust (NCCLT).

US 117 (Shipyard Boulevard) is a commercial corridor that terminates in the Port of Wilmington. Independence Boulevard, north of Shipyard Boulevard, is a heavily traveled commercial street with many commercial centers, restaurants, and offices. South of Shipyard Boulevard, Independence Boulevard is more residential in nature.

The Port of Wilmington, operated by the North Carolina State Ports Authority (NCSPA), is located on the eastern bank of the Cape Fear River within the project study area. The Port is a designated foreign trade zone, and is one of the nation's strategic seaports.

Applicant's Stated Purpose

The purpose of the proposed action is to improve traffic flow and enhance freight movements beginning in the vicinity of US 17 and I-140 in Brunswick County, across the Cape Fear River to US 421 near the Port of Wilmington in southern New Hanover County.

The purpose and need for this project was agreed upon by federal, state, and local agency representatives in June 2013.

Project Description

As described in Chapter 2 of the DEIS, numerous preliminary alternatives were developed, evaluated, and screened during the alternatives evaluation process, and include: No Build Alternative, Transportation System Management Alternatives, Transportation Demand Management Alternatives, and Build alternatives. The Build Alternatives included upgrading existing US 17 to a freeway facility, new location concepts, and a hybrid of those two options.

The No-Build Alternative assumes the local transportation system would evolve as currently planned, but without implementation of the proposed project. With the exception of routine maintenance, no change would take place along the existing corridors within the study area.

Although the No Build or "no action" option is not consistent with the project purpose and need nor local plans, it was retained through the environmental review with other alternatives.

Transportation management options would not meet the project purpose and need, and were therefore eliminated from further consideration.

Following a series of quantitative screenings and public and agency input, 12 Build Alternatives that meet the project purpose and need, were carried forward as Detailed Studied Alternatives (DSAs). Following additional coordination with state and federal regulatory agencies, six of the remaining DSAs were eliminated from further consideration, resulting in six new-location alternatives under consideration in the DEIS. **Figure 2** includes the following six DSAs carried forward for detailed study:

- Alternative B
- Alternative M Avoidance
- Alternative N Avoidance
- Alternative Q
- Alternative T
- Alternative V Arterial Widening

New Location Build Alternatives

On August 17, 2017, the Merger Team concurred with the decision to carry forward six new-location alternatives. This section provides a description of the DSAs. Additional descriptions of the DSAs are presented in the DEIS. All alternatives include a new crossing of the Cape Fear River.

Alternative B

This alternative begins at I-140 and, after a proposed interchange with US 17, travels between the Brunswick Forest and Mallory Creek developments then crosses the Cape

Fear River to Shipyard Boulevard. Upgrades along NC 133 in the vicinity of the proposed interchange with Alternative B would include a four-lane divided facility.

Alternative B is proposed as a four-lane divided freeway for its entirety and is 11.1 miles in length.

Alternative M Avoidance (MA)

This alternative begins at the I-140/US 17 interchange, avoids the Snee Farm and Stoney Creek subdivisions, and travels south of Brunswick Forest, and crosses the Cape Fear River to Independence Boulevard.

Alternative MA is proposed as a four-lane divided freeway for its entirety. Upgrades to US 421 from Independence Boulevard to Shipyard Boulevard as a part of Alternative MA are proposed as a six-lane arterial widening typical section. Upgrades along NC 133 in the vicinity of the proposed interchange with Alternative MA would include a four-lane divided facility. Alternative MA is 12.3 miles in length.

Alternative N Avoidance (NA)

This alternatives begins at the I-140/US 17 interchange, avoids the Snee Farm and Stoney Creek subdivisions, and travels south of Brunswick Forest, and cross the Cape Fear River to connect with Shipyard Boulevard.

Alternative NA is proposed as a four-lane divided freeway for its entirety. Upgrades along NC 133 in the vicinity of the proposed interchange with Alternative NA would include a four-lane divided facility. Alternative NA is 12.2 miles in length.

Alternative Q

This alternative begins at the I-140/US 17 interchange, upgrades existing US 17 for approximately two miles northward, then continues on new location between the Brunswick Forest and Mallory Creek developments, largely avoiding impacts to Brunswick Forest, and crosses the Cape Fear River to Independence Boulevard.

Alternative Q is proposed as a six-lane arterial widening to the outside typical section on US 17 from I-140 to West Gate Drive/Grandiflora Drive, where the alternative begins on new location to the south and east, where a four-lane divided freeway will carry it across the Cape Fear River to Independence Boulevard. Upgrades to US 421 from Independence Boulevard to Shipyard Boulevard are proposed as a six-lane arterial widening typical section. Upgrades along NC 133 in the vicinity of the proposed interchange with Alternative Q would include a four-lane divided facility. Alternative Q is 11.5 miles in length.

Alternative T

This alternative begins at the I-140/US 17 interchange, upgrades existing US 17 for approximately 2 miles northward, then continues on new location parallel to Wire Road through the Brunswick Forest development and crosses the Cape Fear River to Shipyard Boulevard.

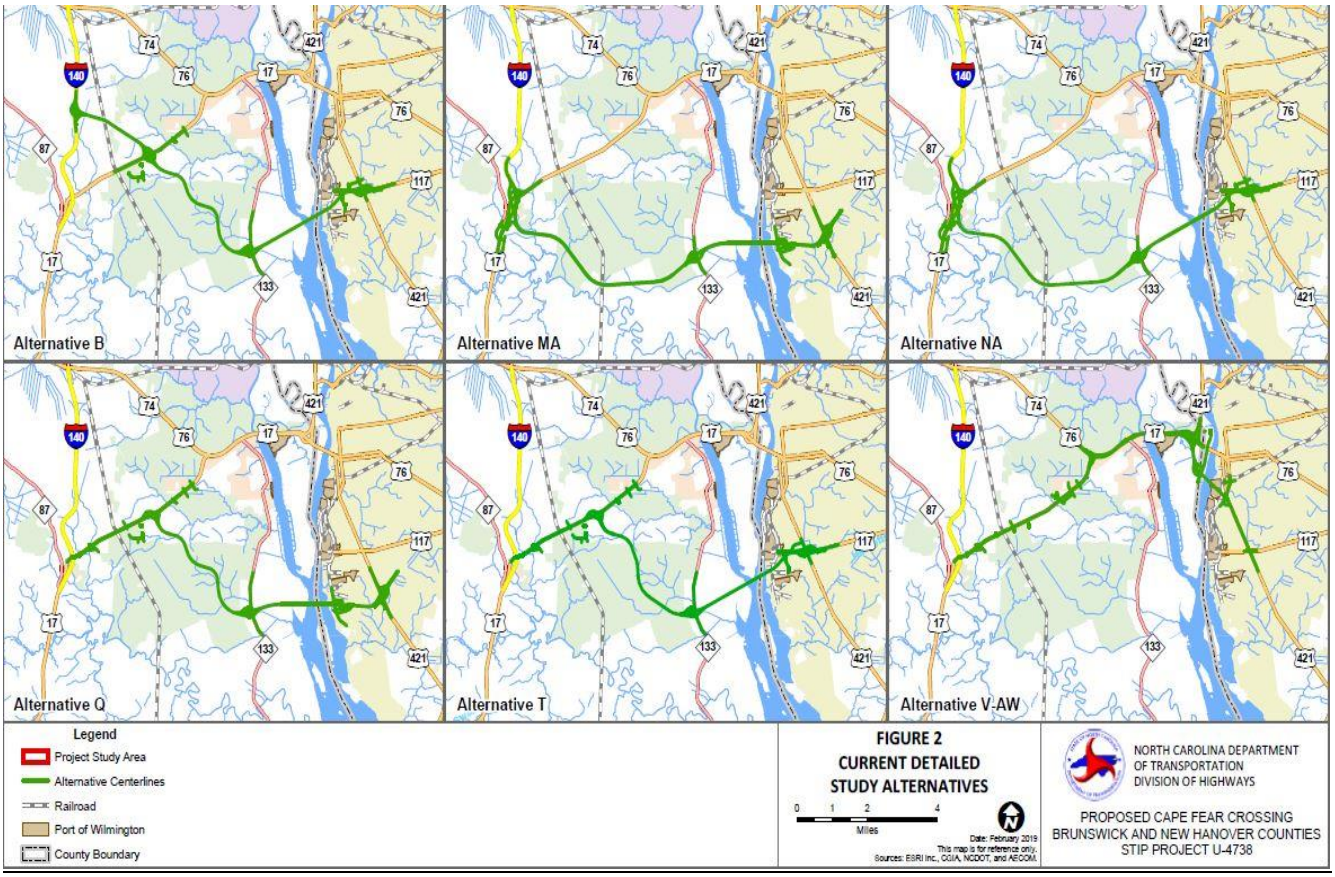
Alternative T is proposed as a six-lane arterial widening to the outside typical section on US 17 from I-140 to West Gate Drive/Grandiflora Drive, where the alternative begins on new location to the south and east, a four-lane divided freeway will carry it across the Cape Fear River to Shipyard Boulevard. Upgrades to US 421 are proposed as a four-lane arterial widening typical section, with some additional improvements to accommodate the additional traffic volumes. Upgrades along NC 133 in the vicinity of the proposed interchange with Alternative T would include a four-lane divided facility. Alternative T is 11.4 miles in length.

Alternative V-Arterial Widening (V-AW)

This alternative begins at the I-140/US 17 interchange and will include upgrading US 17 to the US 17/US 421 interchange west of Wilmington, where it then travels south along Eagle Island on new location and crosses the Cape Fear River to terminate at US 421 and Shipyard Boulevard just north of the Port of Wilmington.

Alternative V-AW is proposed as a six-lane arterial widening to the outside on US 17 from I-140 (western terminus) to SR 1438 (Lanvale Road). From SR 1438 (Lanvale Road) to US 74/76, an eight-lane arterial widening to the outside typical section is proposed. The roadway would be widened to an eight-lane freeway from US 74/76 to US 421. A fixed-span bridge crossing the Cape Fear River is proposed to terminate at US 421 in the City of Wilmington and include capacity and access management upgrades to US 421 to Shipyard Boulevard. Alternative V-AW is 11.8 miles in length.

Current detailed study alternatives are shown on the next page:



A breakdown of the detailed study alternatives impacts and costs are displayed in the following table:

Summary Comparison of Current Detailed Study Alternatives

FEATURE[1]	Current Detailed Study Alternative					
	B	**MA**	**NA**	**Q**	**T**	**V-AW**
Length (miles)	11.1	12.3	12.2	11.5	11.4	11.8
Delineated Wetland Impacts (acres)	98.5	64.2	58.8	45.7	39.7	140.2
Delineated Stream Impacts (linear feet)	2,528	8,779	5,806	4,962	1,667	2,075
Residential Relocations	129	46	143	24	168	163
Business Relocations	80	43	84	45	86	82
Federally-Protected Species Habitat	yes	yes	yes	yes	yes	yes

	B	MA	NA	Q	T	V-AW
CAMA wetlands (acres)	1.8	2.3	2.3	1.8	1.8	89.1
Land Managed for Conservation and Open Space (acres)	0.0	0.0	0.0	0.0	0.0	76.5
Farmland Soils (acres)	477.5	550.1	490.1	413.3	367.0	151.4
Forest (acres)	110.3	178.6	161.7	106.3	84.7	10.7
Historic Properties adverse effect (no.)	0	0	0	0	0	1
Potential Noise Receptor Impacts	1167	552	1052	779	1367	1508
Floodplains (acres)	16.6	44.2	42.5	34.0	29.8	218.2
Total Cost (in millions)	$760.0	$774	$763	$745	$733	$511

Impact calculations are based on preliminary design slope stake limits plus an additional 40 feet.
Noise receptors counted 700 feet of centerline along existing roadways and 600 feet of new locations.

Water Resources

Water resources in the study area are part of the Cape Fear River Basin (U.S. Geological Survey [USGS] Hydrologic Unit 03030005).

No water supply watersheds (WS-I or WS-II), High Quality Waters (HQW), or Outstanding Resource Waters (ORW) are within 1.0 mile downstream of the study area.

The North Carolina Final 2016 Section 303(d) list of impaired waters identifies no waters within the study area as impaired due to sedimentation or turbidity. Additionally, no benthic and/or fish monitoring sites are located within one mile downstream of the project study area.

North Carolina Division of Marine Fisheries (NCDMF) maps indicate the Cape Fear River as coastal anadromous fish spawning areas (AFSA) in the project study area (North Carolina Department of Environmental Quality [NCDEQ] 2008). The Brunswick River is listed as joint AFSA waters between NCDMF and the North Carolina Wildlife Resources Commission (NCWRC) in the project study area. Alligator Creek is also listed as inland AFSA water under the jurisdiction of NCWRC within the project study area. Additionally, NCDMF lists the Cape Fear and Brunswick rivers as primary nursery areas (PNA) within the project study area.

Impacts to Water Resources

All of the Build Alternatives have the potential to cause adverse impacts to waters of the United States. These impacts are described below.

Impacts to water resources in the project area may result from activities associated with project construction of any of the DSAs. Activities that would result in impacts are clearing and grubbing on stream banks, riparian canopy removal, in-stream construction, fertilizers and pesticides used in re-vegetation, and pavement/culvert installation. The following impacts to surface water resources could result from the construction activities mentioned above:

- Increased sedimentation and siltation downstream of the crossing and increased erosion in the project area;
- Alteration of stream discharge because of silt loading and changes in surface and groundwater drainage patterns;
- Changes in light incidence and water clarity because of increased sedimentation and vegetation removal;
- Changes in and destabilization of water temperature because of vegetation removal;
- Alteration of water levels and flows because of interruptions and/or additions to surface and groundwater flow from construction;
- Increased nutrient loading during construction via runoff from exposed areas;
- Increased concentrations of toxic compounds in roadway runoff; and
- Increased potential for release of toxic compounds such as fuel and oil from construction equipment and other vehicles.

The proposed project would impact surface waters, wetlands, and ponds, as described in the following sections. Construction activities associated with the project will strictly follow NCDOT's Best Management Practices for Construction and Maintenance Activities (NCDOT 2003a) and *Best Management Practices for Protection of Surface Waters* (NCDOT 1997). Sedimentation control guidelines will be strictly enforced during the construction stages of the
project.

Streams, Ponds and Wetlands

Impacts to Waters of the U.S. would occur at various locations throughout the length of the project, at stream crossings, wetland areas, and ponds. Anticipated impacts by stream are presented for the detailed study alternatives in the DEIS.

Total Stream Impacts

Delineated Stream Impacts (linear feet)	Alternative					
	B	MA	NA	Q	T	V-AW
# of stream crssoings	8	22	17	14	8	11
total stream (feet)	2,528	8,779	5,806	4,962	1,667	2,075

Anticipated impacts by wetland are presented for the detailed study alternatives in the DEIS.

Total Wetland Impacts

Acres	Alternative					
	B	MA	NA	Q	T	V-AW
Riparian Wetlands	16.1	26.3	21.8	20.3	13.5	35.4
Non-Riparian Wetlands	82.4	37.9	37.0	25.4	26.2	104.8
Total	98.5	64.2	58.8	45.7	39.7	140.2
CAMA AECs	1.8	2.3	2.3	1.8	1.8	89.1

Fifty-three ponds and one named lake (Greenfield Lake) are located in the detailed study alternative corridors.

The DEIS includes additional details about Waters of the U.S.

Cultural Resources

This project is subject to Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. § 470f), and implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified as Title 36, Part 800 of the *Code of Federal Regulations*. Section 106 requires federal agencies to take into account the effects of their undertakings (federally funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places (NRHP) and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

Determination of Effect to Historic Resources According to Section 106

Resource	B	M Avoidance	N Avoidance	Q	T	V-AW
USS North Carolina	No Effect	No Effect	No Effect	No Effect	No Effect	No Adverse Effect
Wilmington Historic District	No Effect	No Effect	No Effect	No Effect	No Effect	**Adverse Effect**
Southern and Northwest Sections of Lake Forest Defense Housing	No Effect	No Effect	No Effect	No Effect	No Effect	No Adverse Effect
Sunset Park Historic District	No Effect	No Effect	No Effect	No Effect	No Effect	**Adverse Effect**

Resource	B	M Avoidance	N Avoidance	Q	T	V-AW
Sunset Park School	No Effect	No Effect	No Effect	No Effect	No Effect	*No Adverse Effect with commitments*
Jacob and Sarah Horowitz House	No Effect	No Effect	No Effect	No Effect	No Effect	**Adverse Effect**
Hanover Heights Historic District	*No Adverse Effect with commitments*	No Effect	*No Adverse Effect with commitments*	No Effect	*No Adverse Effect with commitments*	No Effect
Wilmington National Guard Armory	No Effect	No Effect	No Effect	No Effect	No Effect	*No Adverse Effect with commitments*
DH Lippitt House/Clarendon House	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Goodman House & Doctor's Office	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect

Federally Threatened and Endangered Species

The 17 federally protected species found in Brunswick and New Hanover counties and the biological conclusions regarding the potential effects of the project are summarized in the table below. Concurrence with these findings will be requested from US Fish and Wildlife Service after selection of a preferred alternative.

Federally Protected Species listed for Brunswick and New Hanover counties

Scientific Name	Common Name	Federal Status[a]	Habitat Present	Biological Conclusion
Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	E	Yes	MA-NLAA
Acipenser brevirostrum	Shortnose sturgeon	E	Yes	MA-NLAA
Alligator mississippiensis	American alligator	T(S/A)	Yes	Not Required
Calidris canutus rufa	Rufa red knot	T	No	No Effect
Caretta	Loggerhead sea turtle	T	Yes	MA-NLAA
Charadrius melodus	Piping plover	T	No	No Effect
Chelonia mydas	Green sea turtle	T	No	MA-NLAA
Dermochelys coriacea	Leatherback sea turtle	E	No	No Effect
Eretmochelys imbricata	Hawksbill sea turtle	E	No	No Effect
Lepidochelys kempii	Kemp's ridley sea turtle	E	No	MA-NLAA
Mycteria americana	Wood stork	E	Yes	MA-NLAA
Myotis septentrionalis	Northern long-eared bat	T	Yes	MA-LAA
Picoides borealis	Red-cockaded woodpecker	E	Yes	MA-NLAA
Trichechus manatus	West Indian manatee	E	Yes	MA-NLAA
Amaranthus pumilus	Seabeach amaranth	T	No	No Effect
Carex lutea	Golden sedge	E	Yes	No Effect
Lysimachia asperulaefolia	Rough-leaved loosestrife	E	Yes	No Effect
Thalictrum cooleyi	Cooley's meadowrue	E	Yes	No Effect

[a] E - Endangered; T - Threatened; T(S/A) - Threatened due to similarity of appearance; MA-NLAA – May Affect-Not Likely to Adversely Affect

Mitigation Evaluation

Mitigation has been defined in the National Environmental Policy Act (NEPA) regulations to include efforts that: a) avoid; b) minimize; c) rectify; d) reduce or eliminate; or e) compensate for adverse impacts to the environment [40 CFR 1508.20 (a-e)]. Practicable alternative analysis must be fully evaluated before compensatory mitigation can be discussed.

Avoidance and Minimization

During development of the detailed study alternatives, efforts were made to avoid and minimize impacts to wetlands and streams wherever practicable.

Because of the number of streams and wetlands present in the project study area, total avoidance of surface waters is not practicable. Alternative alignments were developed in an effort to minimize impacts to streams and wetlands. The NEPA/Section 404 Merger Team concurred on May 30, 2017, on the streams that should be bridged by the alternatives. NCDOT will continue to attempt to avoid and minimize impacts to streams and wetlands to the greatest extent practicable in selecting the preferred alternative and during project final design.

Compensatory Mitigation

The purpose of compensatory mitigation is to replace the lost functions and values from a project's impacts to Waters of the United States, including wetlands and streams.

NCDOT will investigate potential on-site stream and wetland mitigation opportunities once the preferred alternative has been selected. On-site mitigation will be used as much as possible. Off- site mitigation needed to satisfy the federal CWA requirements for this project will be provided by the NCDEQ Division of Mitigation Services in accordance with applicable In-Lieu Fee mitigation programs.

Evaluation

The decision whether to issue a permit (which will come after the Least Environmentally Damaging Practicable Alternative Corridor is chosen, being considered now) will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values (in accordance with Executive Order 11988), land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation,

water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving the discharge of dredged or fill materials in waters of the United States, the evaluation of the impact of the activity on the public interest will include application of the Environmental Protection Agency's 404(b)(1) guidelines.

Commenting Information

The Corps of Engineers is soliciting comments from the public; Federal, State and local agencies and officials, including any consolidate state viewpoint or written position of the Governor; Indian Tribes and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to select the least environmentally damaging practicable alternative (LEDPA). To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects and the other public interest factors listed above. Comments are used in the preparation of a Corps of Engineers Environmental Assessment (EA) and/or an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

**NCDOT has scheduled two Public Hearings for this project on April 29 and April 30, 2019. See the following website for more details:
http://www.ncdot.gov/projects/cape-fear-crossing

Written comments pertinent to the proposed work, as outlined above, will be received by the Corps of Engineers, Wilmington District, until 5pm, May 9, 2019. Comments should be submitted to Mr. Brad Shaver, Wilmington Regulatory Field Office, 69 Darlington Ave., Wilmington, North Carolina 28403.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

April 3, 2019

Mr. Brad Shaver
Department of the Army Corps of Engineers
Wilmington District Office
69 Darlington Avenue
Wilmington, N.C. 28403

Dear Mr. Shaver:

SUBJECT: **SECTION 404 - NEPA MERGER PROCESS Application** for a Department of the Army (DOA) Permit pursuant to Section 404 of the Clean Water Act to discharge dredged or fill material into waters of the United States for the proposed Cape Fear Crossing project in Brunswick and New Hanover counties, North Carolina
Federal Aid Project No: STPNHF-0017(150)
State Project No: 40114.1.2
TIP No: U-4738

The following application, including separate attachments for (1) ENG Form 4345 and (2) project study area mailing list and list of property owners with jurisdictional impacts, is submitted for your consideration. As you are aware, this project was selected for treatment under the Merger Process. At this juncture, the Regulatory Division has provided concurrence with Purpose and Need (CP 1), and with the selection of Detailed Study Alternatives (DSAs) and bridging decisions (CP 2 and 2A). A Draft Environmental Impact Statement (DEIS) has been prepared and is being distributed with this application.

The following information is a summary of relevant project details and is being provided to assist in the Section 404 regulatory review of the project. This letter and attachments should provide sufficient information for the issuance of a Public Notice for the project.

Please issue your public notice at the earliest opportunity so that we can jointly proceed toward selecting the LEDPA (least environmentally damaging, practicable alternative) which meets the purpose and need of the project following analysis of public input. Once the LEDPA is selected and approved, efforts will be undertaken to further minimize impacts to wetlands and riparian buffers in the LEDPA corridor and to propose suitable compensatory mitigation to offset unavoidable impacts.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
PROJECT MANAGEMENT UNIT
1595 MAIL SERVICE CENTER
RALEIGH, NC 27699-1595

Telephone: (919) 707-6015
Fax: (919) 250-4224
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DIRVE
RALEIGH, NC 27610

If you have any questions, or need additional information, please contact Mr. John Conforti at (919) 707-6015 or Mr. Jason Dilday at (919) 707-6111.

Sincerely,

John Conforti, REM
Project Management Unit

CC: Mr. Scott McLendon, USACE, Wilmington (Cover Letter Only)
Ms. Joanne Steenhuis, NCDWR (7 copies)
Ms. Renee Gledhill-Early, State HPO
Mr. Travis Wilson, NCWRC
Ms. Amanetta Somerville, USEPA
Mr. Gary Jordan, USFWS
Mr. Ron Lucas, FHWA
Ms. Brenda Moore, PE, Roadway Design Unit
Ms. Tatia White, PE, Roadway Design Unit
Mr. Kevin Fischer, PE, Structures Management Unit
Mr. Paul Atkinson, PE, Hydraulics Unit
Ms. Karen Collette, PE, Division 3 Engineer
Ms. Krista Kimmel, PE, Division 3
Mr. Phil Harris, III, PE Environmental Analysis Unit
Mr. Jason Dilday, Environmental Analysis Unit
Mr. Chris Kreider, PE, Geotechnical Unit
Mr. J.S. Alavi, PE, Transportation Planning Division

Introduction

The proposed project is located within Brunswick and New Hanover counties in North Carolina and is commonly referred to as the Cape Fear Crossing. The North Carolina Department of Transportation (NCDOT) proposes to construct a transportation project that would extend from the vicinity of US 17 and I-140 in Brunswick County to US 421 in southern New Hanover County, a distance of approximately 12 miles. The proposed project would include a crossing of the Cape Fear River (**Figure 1**). The proposed project is designated in the current federally-approved NCDOT *2018-2027 State Transportation Improvement Program (STIP)* as project number U-4738 and is described as "US 17 TO US 421 (INDEPENDENCE BOULEVARD-CAROLINA BEACH ROAD) INTERSECTION. CONSTRUCT A NEW FAILITY WITH STRUCTURE OVER THE CAPE FEAR RIVER" (NCDOT 2017a). NCDOT has prepared a DEIS for this project.

Project History

The following is an overview of the project history over the last two decades:

- 1999 and 2001 – Project first included in Wilmington and NCDOT planning documents.
- 2003 - NCDOT prepares feasibility study for project.
- 2005 – WMPO adopts the 2030 LRTP, which includes the newly named "Cape Fear Skyway" as a priority project, and subsequently the project is funded in the 2006-2012 STIP.
- 2010 – Project on hold until WMPO affirms support in 2012 for the NCDOT/NCTA to complete the environmental document. Project renamed "Cape Fear Crossing"
- Early 2015 – WMPO commits STP-DA funds for completion of the environmental document.
- Late 2015 – The 2040 MTP is adopted, listing the project as partially funded priority with tolling component to supplement funding.
- 2017 – WMPO Transportation Advisory Committee passed a resolution to expedite the project.

Purpose and Need

The needs for the proposed project are:

- **Traffic capacity deficiencies:** Without improvements to the existing network, US 17, from south of the Wilmington Bypass interchange to Front Street in Wilmington (over a 10-mile segment), will be over capacity and operating poorly in 2040, with travel times on the US 17 corridor increasing up to 58 percent from the current condition. From the west, this roadway, including the Cape Fear Memorial Bridge, serves as one of the main entry points into the City of Wilmington and the Port of Wilmington. The Cape Fear Memorial Bridge (built in 1969) was not designed to support the area's current and projected future population. Inadequate shoulder widths, median widths, and lane widths hinder its traffic carrying capacity. The opening of the lift-span bridge creates additional delay to the Dawson Street/Wooster Street

corridors and creates additional, periodic congestion on US 17. Future population growth and development in the area will likely increase travel demand.

- **North Carolina port access:** All truck routes around the Port of Wilmington are expected to operate at a poor arterial level of service (LOS) in 2040 (NCDOT 2018a). Future growth projections suggest that congestion levels on the local transportation network could hinder the Port's growth plans and competitiveness. Deficiencies in the existing transportation network diminish the ability to efficiently distribute goods and services from the Port of Wilmington.

The purpose of the proposed action is to improve traffic flow and enhance freight movements beginning in the vicinity of US 17 and I-140 in Brunswick County, across the Cape Fear River to US 421 near the Port of Wilmington in southern New Hanover County.

Costs and Schedule

The construction, right-of-way, and utilities costs for the Detailed Study Alternatives (DSAs) evaluated in the DEIS are included in **Table 1**.

The project is unfunded for right-of-way acquisition and construction in NCDOT's *2018-2027 STIP*.

Table 1: Construction, Right-of-Way, and Utilities Cost Estimates (in millions)

Alternative	Estimated Construction Cost (millions)	Estimated Right-of-Way Cost (millions)	Estimated Utility Relocation Cost (millions)	Total Cost (millions)
Alternative B	$743,300,000	$248,210,000	$3,600,000	$917,620,000
Alternative M Avoidance	$808,130,000	$96,480,000	$2,030,000	$849,170,000
Alternative N Avoidance	$770,170,000	$189,270,000	$2,030,000	$926,740,000
Alternative Q	$775,610,000	$90,040,000	$2,030,000	$813,690,000
Alternative T	$718,930,000	$215,580,000	$2,030,000	$921,020,000
Alternative V-AW	$507,670,000	$107,030,000	$4,480,000	$604,860,000

Source: NCDOT Roadway Design Unit, NCDOT Right of Way Unit, NCDOT Utilities Unit

Alternatives Process and Detailed Study Alternatives (DSAs)

As described in Chapter 2 of the DEIS, numerous preliminary alternatives were developed, evaluated, and screened during the alternatives evaluation process, and include: No Build Alternative, transportation system management alternatives, transportation demand management alternatives, and Build alternatives. The Build alternatives included upgrading existing US 17 to a freeway facility, new location concepts, and a hybrid of those two options.

The No-Build Alternative assumes the local transportation system would evolve as currently planned, but without implementation of the proposed project. With the exception of routine maintenance, no change would take place along the existing corridors within the study area.

Although the No Build or "no action" option is not consistent with the project purpose and need nor local plans, it was retained through the environmental review with other alternatives.

Transportation management options would not meet the project purpose and need, and were therefore eliminated from further consideration.

Following a series of quantitative screenings and public and agency input, 12 Build alternatives that meet the project purpose and need, were carried forward as DSAs. Following additional coordination with state and federal regulatory agencies, six of the remaining DSAs were eliminated from further consideration, resulting in six new-location alternatives under consideration in the DEIS. **Figure 2** includes the following six DSAs carried forward for detailed study:

- Alternative B
- Alternative M Avoidance
- Alternative N Avoidance
- Alternative Q
- Alternative T
- Alternative V Arterial Widening

New Location Build Alternatives

On August 17, 2017, the Merger Team concurred with the decision to carry forward six new-location alternatives. This section provides a description of the DSAs. Additional descriptions of the DSAs are presented in the DEIS. All alternatives include a new crossing of the Cape Fear River.

Alternative B

This alternative begins at I-140 and, after a proposed interchange with US 17, travels between the Brunswick Forest and Mallory Creek developments then crosses the Cape Fear River to Shipyard Boulevard. Upgrades along NC 133 in the vicinity of the proposed interchange with Alternative B would include a four-lane divided facility.

Alternative B is proposed as a four-lane divided freeway for its entirety and is 11.1 miles in length.

Alternative M Avoidance (MA)

This alternative begins at the I-140/US 17 interchange, avoids the Snee Farm and Stoney Creek subdivisions, and travels south of Brunswick Forest, and crosses the Cape Fear River to Independence Boulevard.

Alternative MA is proposed as a four-lane divided freeway for its entirety. Upgrades to US 421 from Independence Boulevard to Shipyard Boulevard as a part of Alternative MA are proposed as a six-lane arterial widening typical section. Upgrades along NC 133 in the vicinity of the proposed interchange with Alternative MA would include a four-lane divided facility. Alternative MA is 12.3 miles in length.

Alternative N Avoidance (NA)

This alternatives begins at the I-140/US 17 interchange, avoids the Snee Farm and Stoney Creek subdivisions, and travels south of Brunswick Forest, and cross the Cape Fear River to connect with Shipyard Boulevard.

Alternative NA is proposed as a four-lane divided freeway for its entirety. Upgrades along NC 133 in the vicinity of the proposed interchange with Alternative NA would include a four-lane divided facility. Alternative NA is 12.2 miles in length.

Alternative Q

This alternative begins at the I-140/US 17 interchange, upgrades existing US 17 for approximately two miles northward, then continues on new location between the Brunswick Forest and Mallory Creek developments, largely avoiding impacts to Brunswick Forest, and crosses the Cape Fear River to Independence Boulevard.

Alternative Q is proposed as a six-lane arterial widening to the outside typical section on US 17 from I-140 to West Gate Drive/Grandiflora Drive, where the alternative begins on new location to the south and east, where a four-lane divided freeway will carry it across the Cape Fear River to Independence Boulevard. Upgrades to US 421 from Independence Boulevard to Shipyard Boulevard are proposed as a six-lane arterial widening typical section. Upgrades along NC 133 in the vicinity of the proposed interchange with Alternative Q would include a four-lane divided facility. Alternative Q is 11.5 miles in length.

Alternative T

This alternative begins at the I-140/US 17 interchange, upgrades existing US 17 for approximately 2 miles northward, then continues on new location parallel to Wire Road through the Brunswick Forest development and crosses the Cape Fear River to Shipyard Boulevard.

Alternative T is proposed as a six-lane arterial widening to the outside typical section on US 17 from I-140 to West Gate Drive/Grandiflora Drive, where the alternative begins on new location to the south and east, a four-lane divided freeway will carry it across the Cape Fear River to Shipyard Boulevard. Upgrades to US 421 are proposed as a four lane arterial widening typical section, with some additional improvements to accommodate the additional traffic volumes. Upgrades along NC 133 in the vicinity of the proposed interchange with Alternative T would include a four-lane divided facility. Alternative T is 11.4 miles in length.

Alternative V-Arterial Widening (V-AW)

This alternative begins at the I-140/US 17 interchange and will include upgrading US 17 to the US 17/US 421 interchange west of Wilmington, where it then travels south along Eagle Island on new location and crosses the Cape Fear River to terminate at US 421 and Shipyard Boulevard just north of the Port of Wilmington.

Alternative V-AW is proposed as a six-lane arterial widening to the outside on US 17 from I-140 (western terminus) to SR 1438 (Lanvale Road). From SR 1438 (Lanvale Road) to US 74/76, an eight-lane arterial widening to the outside typical section is proposed. The roadway would be widened to an eight-lane freeway from US 74/76 to US 421. A fixed-span bridge crossing the Cape Fear River is proposed to terminate at US 421 in the City of Wilmington and include

capacity and access management upgrades to US 421 to Shipyard Boulevard. Alternative V-AW is 11.8 miles in length.

Waters of the United States

Water Resources

Water resources in the study area are part of the Cape Fear River Basin (U.S. Geological Survey [USGS] Hydrologic Unit 03030005).

No water supply watersheds (WS-I or WS-II), High Quality Waters (HQW), or Outstanding Resource Waters (ORW) are within 1.0 mile downstream of the study area.

The North Carolina Final 2016 Section 303(d) list of impaired waters identifies no waters within the study area as impaired due to sedimentation or turbidity. Additionally, no benthic and/or fish monitoring sites are located within one mile downstream of the project study area.

North Carolina Division of Marine Fisheries (NCDMF) maps indicate the Cape Fear River as coastal anadromous fish spawning areas (AFSA) in the project study area (North Carolina Department of Environmental Quality [NCDEQ] 2008). The Brunswick River is listed as joint AFSA waters between NCDMF and the North Carolina Wildlife Resources Commission (NCWRC) in the project study area. Alligator Creek is also listed as inland AFSA water under the jurisdiction of NCWRC within the project study area. Additionally, NCDMF lists the Cape Fear and Brunswick rivers as primary nursery areas (PNA) within the project study area.

Impacts to Water Resources

All of the Build Alternatives have the potential to cause adverse impacts to waters of the United States. These impacts are described below.

Impacts to water resources in the project area may result from activities associated with project construction of any of the DSAs. Activities that would result in impacts are clearing and grubbing on stream banks, riparian canopy removal, in-stream construction, fertilizers and pesticides used in revegetation, and pavement/culvert installation. The following impacts to surface water resources could result from the construction activities mentioned above:

- Increased sedimentation and siltation downstream of the crossing and increased erosion in the project area;
- Alteration of stream discharge because of silt loading and changes in surface and groundwater drainage patterns;
- Changes in light incidence and water clarity because of increased sedimentation and vegetation removal;
- Changes in and destabilization of water temperature because of vegetation removal;
- Alteration of water levels and flows because of interruptions and/or additions to surface and groundwater flow from construction;
- Increased nutrient loading during construction via runoff from exposed areas;
- Increased concentrations of toxic compounds in roadway runoff; and

- Increased potential for release of toxic compounds such as fuel and oil from construction equipment and other vehicles.

The proposed project would impact surface waters, wetlands, and ponds, as described in the following sections. Construction activities associated with the project will strictly follow NCDOT's Best Management Practices for Construction and Maintenance Activities (NCDOT 2003a) and *Best Management Practices for Protection of Surface Waters* (NCDOT 1997). Sedimentation control guidelines will be strictly enforced during the construction stages of the project.

Streams

Sixty-five jurisdictional streams were identified in the study area. The characteristics of project area streams are presented in **Table 2** and the locations of the delineated streams are shown on **Figures 3a-l**.

Table 2. Jurisdictional Streams within the Project Study Area

Map ID	Stream Name	DWQ Index Number	Best Usage Classification	Bank Height (feet)	Bankful Width (feet)	Water Depth (inches)	Channel Substrate	Velocity	Clarity	Length in Study Area (feet)	Jurisdictional Classification	Compensatory Mitigation Required
1SB	UT to Jackeys Creek	18-77-3	C;Sw	0.5–1	0.5	2–6	Sand	Slow	Slightly Turbid	1,218	Perennial	Yes
1SC	UT to Jackeys Creek	18-77-3	C;Sw	0.5–1	2–4	2–4	Sand	Slow	Slightly Turbid	1,268	Intermittent	Yes
										242	Perennial	
2SC	UT to Piney Branch	18-77-3-1	C;Sw	4–8	3–4	4–6	Silt/Sand	Moderate	Slightly Turbid	1,226	Intermittent	Yes
										464	Perennial	
Piney Branch	Piney Branch	18-77-3-1	C;Sw	3–5	3–7	6–12	Sand	Moderate	Clear	1,345	Perennial	Yes
3SA	UT to Mallory Creek	18-78	C;Sw	2–3	2–3	6–12	Silt/Sand	Moderate	Clear	574	Intermittent	Yes
3SB	UT to Mallory Creek	18-78	C;Sw	3–4	2–3	6–12	Silt/Sand	Moderate	Clear	1,121	Intermittent	Yes
3SC[a]	UT to Mallory Creek	18-78	C;Sw	—	—	—	—	—	—	3,239	Perennial	Yes
5SA	UT to Barnards Creek	18-80	C;Sw	0.5	2–4	2–6	Silt/Sand	Slow	Clear	717	Intermittent	Yes
5SB	UT to Barnards Creek	18-80	C;Sw	4–6	2–4	2–6	Silt/Sand	Slow	Slightly Turbid	730	Intermittent	Yes
5SD	UT to Barnards Creek	18-80	C;Sw	4–6	2–4	2–6	Silt/Sand	Slow	Slightly Turbid	153	Intermittent	Yes
5SF	UT to Barnards Creek	18-80	C;Sw	0.5–2	2–3	2–8	Sand	Moderate	Slightly Turbid	938	Intermittent	Yes
5SG	UT to Barnards Creek	18-80	C;Sw	0.5	3–4	24–36	Sand	Moderate	Slightly Turbid	2,923	Perennial	Yes
5SH	UT to Barnards Creek	18-80	C;Sw	0.5	2–4	6–12	Sand	Moderate	Clear	483	Perennial	Yes
5SI	UT to Barnards Creek	18-80	C;Sw	0.5	2–4	6–12	Sand	Moderate	Slightly Turbid	499	Perennial	Yes
5SJ	UT to Barnards Creek	18-80	C;Sw	0.5	3–4	24–36	Sand	Moderate	Slightly Turbid	413	Perennial	Yes

Map ID	Stream Name	DWQ Index Number	Best Usage Classification	Bank Height (feet)	Bankful Width (feet)	Water Depth (inches)	Channel Substrate	Velocity	Clarity	Length in Study Area (feet)	Jurisdictional Classification	Compensatory Mitigation Required
5SK	UT to Barnards Creek	18-80	C;Sw	0.5–2	2–5	2–18	Si/Sa/G	Moderate	Slightly Turbid	388	Intermittent	Yes
										631	Perennial	
5SX	UT to Barnards Creek	18-80	C;Sw	0.5–1	2–4	12–24	Silt/Sand	Slow	Clear	1,252	Perennial	Yes
5SZ	UT to Barnards Creek	18-80	C;Sw	0.5–2	3–5	2–8	Sand	Moderate	Slightly Turbid	423	Intermittent	Yes
										824	Perennial	
Marina	Cape Fear River - Marina	18-(71)	SC	4–10	400	>120	Silt/Sand	Slow	Turbid	1,443	Perennial	Yes
Morgan Branch	Morgan Branch	18-81-7	C;Sw	2–7	4–40	12–>120	Silt/Sand	Moderate	Slightly Turbid	2,517	Perennial	Yes
6SC	UT to Jackeys Creek	18-77-3	C;Sw	2–3	3–5	6	Sand	Slow	Slightly Turbid	1,082	Intermittent	Yes
Jackeys Creek	Jackeys Creek	18-77-3	C;Sw	1–2	6–10	10–24	Sand	Slow	Turbid	601	Perennial	Yes
7SB	UT to Jackeys Creek	18-77-3	C;Sw	1–2	1–2	4–6	Sand	Slow	Slightly Turbid	237	Perennial	Yes
8SA	UT to Brunswick River	18-77	SC	0.5–1	4–5	6–18	Silt/Sand	Slow	Slightly Turbid	708	Perennial	Yes
8SB	UT to Brunswick River	18-77	SC	2–4	3–4	2–6	Sand	Slow	Slightly Turbid	135	Perennial	Yes
8SC	UT to Brunswick River	18-77	SC	4–5	3–4	1–5	Sand	Slow	Slightly Turbid	305	Intermittent	Yes
Alligator Creek	Alligator Creek	18-75	SC;Sw	4–10	100	>120	Silt/Sand	Moderate	Turbid	1,138	Perennial	Yes
Brunswick River	Brunswick River	18-77	SC	4–10	300	>120	Silt/Sand	Moderate	Turbid	1,079	Perennial	Yes
9SA	UT to Cape Fear River	18-(71)	SC	4–10	40	>120	Silt/Sand	Moderate	Turbid	708	Perennial	Yes
Cape Fear River	Cape Fear River	18-(71)	SC	4–10	3,000	>120	Silt/Sand	Moderate	Turbid	5,176	Perennial	Yes

Map ID	Stream Name	DWQ Index Number	Best Usage Classification	Bank Height (feet)	Bankful Width (feet)	Water Depth (inches)	Channel Substrate	Velocity	Clarity	Length in Study Area (feet)	Jurisdictional Classification	Compensatory Mitigation Required
Bishop Branch	Bishop Branch	18-81-7-1	C;Sw	1–2	5–10	10–24	Silt/Sand	Moderate	Turbid	5,865	Perennial	Yes
10SA	UT to Morgan Branch	18-81-7	C;Sw	1–2	2–4	6–10	Sand	Slow	Slightly Turbid	473	Perennial	Yes
10SB	UT to Bishop Branch	18-81-7-1	C;Sw	0.5–1.5	2–4	6–12	Silt	Slow	Turbid	2,685	Intermittent	Yes
10SD	UT to Bishop Branch	18-81-7-1	C;Sw	1–2	2–3	4–8	Silt/Sand	Slow	Slightly Turbid	23	Intermittent	Yes
10SE	UT to Bishop Branch	18-81-7-1	C;Sw	0.5–1	5–6	6–12	Sand	Slow	Turbid	1,453	Perennial	Yes
										222	Intermittent	
10SF[b]	UT to Bishop Branch	18-81-7-1	C;Sw	—	—	—	—	—	—	1,387	Perennial	Yes
10SG	UT to Morgan Branch	18-81-7	C;Sw	0.5	2–4	1–5	Sand	Moderate	Slightly Turbid	1,387	Perennial	Yes
10SH	UT to Morgan Branch	18-81-7	C;Sw	0.5	2–4	1–5	Sand	Slow	Slightly Turbid	877	Perennial	Yes
10SI	UT to Morgan Branch	18-81-7	C;Sw	0.5	3–5	12	Sand	Slow	Slightly Turbid	3,239	Perennial	Yes
10SJ	UT to Morgan Branch	18-81-7	C;Sw	0.5	1–2	1–3	Sand	Slow	Slightly Turbid	93	Intermittent	Yes
10SK	UT to Morgan Branch	18-81-7	C;Sw	0.5–1	5–15	12–36	Sand	Slow	Slightly Turbid	114	Perennial	Yes
10SL	UT to Morgan Branch	18-81-7	C;Sw	0.5–1	5–12	12–36	Sand	Slow	Slightly Turbid	889	Perennial	Yes
10SN[b]	UT to Morgan Branch	18-81-7	C;Sw	—	—	—	—	—	—	113	Intermittent	Yes
10SO[b]	UT to Morgan Branch	18-81-7	C;Sw	—	—	—	—	—	—	281	Intermittent	Yes
13SA	UT to Greenfield Lake	18-76-1	C;Sw	0.5–1	1–2	4	Sand	Slow	Clear	451	Perennial	Yes
Mallory Creek[c]	Mallory Creek	18-78	C;Sw	2–10	8–25	12–96	Silt/Sand	Moderate	Slightly Turbid	7,857	Perennial	Yes
Little Mallory Creek	Little Mallory Creek	18-78-1	C;Sw	2–10	2–30	4–96	Silt/Sand	Moderate	Slightly Turbid	2,527	Perennial	Yes

Map ID	Stream Name	DWQ Index Number	Best Usage Classification	Bank Height (feet)	Bankful Width (feet)	Water Depth (inches)	Channel Substrate	Velocity	Clarity	Length in Study Area (feet)	Jurisdictional Classification	Compensatory Mitigation Required
Goodland Branch	Goodland Branch	18-81-8	C;Sw	—	—	—	—	—	—	1,358	Perennial	Yes
20SA	UT to Town Creek	18-81	C;Sw	1–2	2–4	2–6	Silt/Sand	Slow	Clear	692	Intermittent	Yes
20SC	UT to Goodland Branch	18-81-8	C;Sw	0.5–1	2–3	0–6	Silt/Sand	Slow	Clear	1,175	Intermittent	Yes
20SD	UT to Goodland Branch	18-81-8	C;Sw	0.5–1	3–4	0–6	Silt/Sand	Slow	Clear	214	Intermittent	Yes
20SE	UT to Goodland Branch	18-81-8	C;Sw	0.5–1	3–4	0–6	Silt/Sand	Slow	Clear	1,469	Perennial	Yes
20SF	UT to Goodland Branch	18-81-8	C;Sw	0.5–1	2–3	0–6	Silt/Sand	Moderate	Clear	581	Intermittent	Yes
20SY	UT to Town Creek	18-81	C;Sw	0.5–1	3–5	4–12	Silt/Sand	Slow	Slightly Turbid	612	Perennial	Yes
Greenfield Creek	Greenfield Creek	18-76	SC;Sw	4–6	10–15	12–24	Silt/Sand	Moderate	Turbid	1,080	Perennial	Yes
26SB	UT to Greenfield Creek	18-76	SC;Sw	4–6	10–15	12–24	Silt/Sand	Moderate	Turbid	1,004	Perennial	Yes
26SC	UT to Greenfield Creek	18-76	SC;Sw	4–5	10	12–24	Si/Sa/G	Moderate	Slightly Turbid	114	Perennial	Yes
5XSA	UT to Piney Branch	18-77-3-1	C;Sw	1–2	3–4	6–12	Silt/Sand	Moderate	Clear	845	Perennial	Yes
5XSB	UT to Piney Branch	18-77-3-1	C;Sw	4–6	8–10	6–18	Silt/Sand	Moderate	Clear	183	Perennial	Yes
9XSB	UT to Greenfield Lake	18-76-1	C;Sw	6–8	10–12	6–18	Si/Sa/G	Moderate	Clear	285	Perennial	Yes
9XSC	UT to Greenfield Lake	18-76-1	C;Sw	0.5–1	2–3	0–6	Silt/Sand	Slow	Clear	481	Intermittent	Yes
29XSA	UT to Sturgeon Creek	18-77-1	C;Sw	1–1.5	3–4	4–12	Silt/Sand	Moderate	Clear	166	Intermittent	Yes
										133	Perennial	
29XSB	UT to Sturgeon Creek	18-77-1	C;Sw	1–1.5	3–4	2–8	Silt/Sand	Moderate	Clear	236	Perennial	Yes
32XSA	UT to Jackeys Creek	18-77-3	C;Sw	6–8	8–10	6–12	Silt	Slow	Clear	913	Perennial	Yes
32XSB	UT to Jackeys Creek	18-77-3	C;Sw	6–8	10–12	6–12	Silt	Moderate	Clear	1,231	Perennial	Yes

Long-term impacts to streams along the proposed project would be limited to stream reaches within the footprint of the roadway. Impacts to stream reaches adjacent to the footprint would be temporary and localized during construction. Long-term impacts to adjacent reaches resulting from construction are expected to be negligible.

Permanent impacts to jurisdictional streams for each DSA are summarized in **Table 3**. Impact numbers for each stream segment and alternative are shown in **Table 4**. NCDOT will investigate potential on-site stream and wetland mitigation opportunities once a preferred alternative has been selected. On-site mitigation will be used as much as possible. Off-site mitigation needed to satisfy the federal CWA requirements for this project will be provided by the NCDEQ Division of Mitigation Services in accordance with applicable In-Lieu Fee mitigation programs.

Table 3: Jurisdictional Stream Impacts

	Alternative					
	B	M Avoidance	N Avoidance	Q	T	V-AW
Total Stream Crossings (#)	8	22	17	14	8	11
Total Stream Length (feet)	2,528	8,779	5,806	4,962	1,667	2,075

Note: Impacts were calculated using the functional design construction slope stake limits plus 40 feet.

Table 4: Impacted Streams

Stream ID	Stream Name	Best Usage Classification	Alternative	Stream Impact (linear feet)
Alligator Creek	Alligator Creek	SC	V-AW	534
Bishop Branch	Bishop Branch	C;Sw	MA, NA	321
Brunswick River	Brunswick River	SC	V-AW	216
Goodland Branch	Goodland Branch	C;Sw	MA, NA	373
Greenfield Creek	Greenfield Creek	SC	V-AW	55
Jackeys Creek	Jackeys Creek	C;Sw	B, Q, T, V-AW	B: 138; Q: 136, T: 135; V-AW: 154
Little Mallory Creek	Little Mallory Creek	C;Sw	MA, NA	255
Mallory Creek	Mallory Creek	SC	B, MA, NA, Q, T	B: 302; MA: 236; NA: 237; Q: 297; T: 301
Morgan Branch	Morgan Branch	C;Sw	Q, T, V-AW	Q, T: 250; V-AW: 372
Piney Branch	Piney Branch	C;Sw	B, Q, T	B, Q: 479; T: 462
5SA	UT to Barnards Creek	C;Sw	MA, Q	605
5SB	UT to Barnards Creek	C;Sw	MA, Q	316

Stream ID	Stream Name	Best Usage Classification	Alternative	Stream Impact (linear feet)
5SF	UT to Barnards Creek	C;Sw	MA, Q	938
5SG	UT to Barnards Creek	C;Sw	MA, Q	1,210
5SZ	UT to Barnards Creek	C;Sw	MA, Q	105
10SB	UT to Bishop Branch	C;Sw	MA, NA	703
10SF	UT to Bishop Branch	C;Sw	MA, NA	222
8SA	UT to Brunswick River	SC	V-AW	490
20SC	UT to Goodland Branch	C;Sw	MA, NA	415
20SD	UT to Goodland Branch	C;Sw	MA, NA	214
20SE	UT to Goodland Branch	C;Sw	MA, NA	513
20SF	UT to Goodland Branch	C;Sw	MA, NA	333
13SA	UT to Greenfield Lake	C;Sw	B, NA, T	202
26SC	UT to Greenfield Lake	SC	V-AW	56
7SB	UT to Jackeys Creek	C;Sw	V-AW	41
1SB	UT to Jackeys Creek	C;Sw	B	55
3SB	UT to Mallory Creek	C;Sw	B, Q	301
10SA	UT to Morgan Branch	C;Sw	Q, T, V-AW	33
10SG	UT to Morgan Branch	C;Sw	MA, NA	440
10SH	UT to Morgan Branch	C;Sw	MA, NA	MA: 131; NA: 129
10SO	UT to Morgan Branch	C;Sw	MA, NA	281
2SC	UT to Piney Branch	SC	B	1,011
5XSA	UT to Piney Branch	SC	B, Q, T	40
29XSB	UT to Sturgeon Creek	C;Sw	V-AW	51
10SE	UT to Town Creek	C;Sw	MA, NA	208
20SA	UT to Town Creek	C;Sw	MA, NA	565
20SY	UT to Town Creek	C;Sw	MA, NA	393
21XSC	UT to Town Creek	C;Sw	Q, T	Q: 251; T: 244

Note: Impacts were calculated using the functional design construction slope stake limits plus 40 feet.

MA = Alternative M Avoidance, NA = Alternative N Avoidance, UT = Unnamed Tributary

Wetlands

Water bodies such as rivers, lakes, and streams are subject to jurisdictional consideration under the Section 404 program. However, by regulation, wetlands are also considered "Waters of the United States." Wetlands are described as:

> Those areas that are inundated or saturated by groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a

> prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas (33 CFR 328.3(b) [1986]).

Wetlands are defined by the presence of three criteria: hydrophytic vegetation, hydric soils, and evidence of wetland hydrology during the growing season. Open water systems and wetlands receive similar treatment and consideration with respect to Section 404 review.

Jurisdictional wetlands within the project area were delineated and located using Global Positioning System (GPS) technology. **Figures 3a-l** shows the location of the delineated wetlands.

The North Carolina Department of Natural Resources (NCDENR) has prepared a wetlands assessment procedure entitled *Guidance for Rating Wetlands in North Carolina*. The NCDENR procedure rates wetlands according to six functional attributes: water storage, bank/shoreline stabilization, pollutant removal, wildlife habitat, aquatic life value, and recreational/educational value. Each attribute is given a rating from "1" to "5." A higher rating for a functional attribute indicates a higher value for that attribute to the environment. A different multiplier is used with each attribute so that the highest possible sum of the six products is "100." These attributes are weighted (by the multiplier) to enhance the results in favor of water quality functions. Pollutant removal is weighted to be the most important wetland attribute. Water storage, bank/shoreline stabilization, and aquatic life functions are given equal weight as secondary attributes, and wildlife habitat and recreation/education functions are given minimal credit.

Table 5 lists the delineated wetlands and their NCDENR rating.

One hundred and thirty-eight jurisdictional wetlands were identified within the DSA corridors (**Figures 3a-l**). North Carolina Wetland Assessment Method (NCWAM) wetland classification, hydrologic classification, and NCDENR wetland rating data are presented in **Table 5**.

Table 5: Section 404 Jurisdictional Wetlands within the Project Study Area

Map ID	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating[a]	Acres in Study Area
1WR	Pocosin	Non-riparian	32	113.0
1WS	Pocosin	Non-riparian	24	6.2
1WT	Headwater Forest	Riparian	24	0.6
1WV	Headwater Forest	Non-riparian	23	8.6
1WW	Pocosin	Non-riparian	31	7.4
1WX	Headwater Forest	Non-riparian	23	0.4
1WY	Pine Flat	Non-riparian	40	32.6
1WZ	Pocosin	Non-riparian	27	2.2
2WA	Pine Flat	Non-riparian	31	75.9
2WB	Headwater Forest	Non-riparian	13	3.8
2WC	Bottomland Hardwood Forest	Riparian	47	4.6
2WE	Headwater Forest	Non-riparian	10	0.0
3WA	Headwater Forest	Riparian	64	4.5
	Riverine Swamp Forest			28.6
3WB	Pocosin	Non-riparian	14	1.5
3WC	Headwater Forest	Riparian	25	1.4
3WD	Pocosin	Non-riparian	18	1.1
3WE	Pocosin	Non-riparian	4	0.2
3WF	Pocosin	Non-riparian	4	0.1
3WG	Non-Riverine Swamp Forest	Riparian	59	7.1
3WH	Pocosin	Non-riparian	14	0.5
3WI	Pocosin	Riparian	23	0.3
3WJ	Headwater Forest	Riparian	23	1.0
5WD	Headwater Forest	Non-riparian	16	3.3
5WF	Headwater Forest	Non-riparian	8	0.1
5WG	Headwater Forest	Non-riparian	8	0.1
5WH	Headwater Forest	Riparian	37	16.5
5WI	Headwater Forest	Riparian	13	1.0
5WJ	Pine Flat	Non-riparian	30	2.9
5WK	Pocosin	Non-riparian	4	0.0
5WL	Bottomland Hardwood Forest	Riparian	42	8.7
5WM	Pocosin	Non-riparian	10	0.1
5WO	Salt/Brackish Marsh	Tidal	56	9.6
5WP	Headwater Forest	Riparian	18	0.8

Map ID	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating[a]	Acres in Study Area
5WQ	Headwater Forest	Riparian	18	0.3
6WA[a]	Seep	Riparian	10	0.1
6WB	Headwater Forest	Riparian	10	2.1
6WC	Bottomland Hardwood Forest	Riparian	28	0.9
6WD	Pocosin	Non-riparian	14	0.5
6WE	Pocosin	Non-riparian	14	14.5
6WF	Pocosin	Non-riparian	18	2.3
6WG	Pocosin	Non-riparian	26	31.8
7WA	Headwater Forest	Non-riparian	10	2.3
7WB	Hardwood Flat	Non-riparian	47	62.6
7WC	Headwater Forest	Non-riparian	16	0.7
7WD	Pocosin	Non-riparian	24	8.0
7WE	Headwater Forest	Non-riparian	26	13.9
7WF	Bottomland Hardwood Forest	Riparian	49	2.2
7WG	Headwater Forest	Riparian	16	0.6
8WA	Salt/Brackish Marsh	Tidal	70	47.8
8WB	Headwater Forest	Riparian	28	2.3
8WC	Non-Riverine Swamp Forest	Riparian	20	1.4
8WD	Bottomland Hardwood Forest	Riparian	24	1.1
8WE	Basin Wetland	Non-riparian	11	0.3
9WA	Salt/Brackish Marsh	Tidal	70	270.5
9WB	Estuarine Woody Wetland	Tidal	74	94.2
10WA	Riverine Swamp Forest	Riparian	68	52.5
10WB	Riverine Swamp Forest	Riparian	60	10.4
10WC	Bottomland Hardwood Forest	Riparian	33	2.5
10WD	Headwater Forest	Non-riparian	10	1.6
10WE	Bottomland Hardwood Forest	Riparian	35	3.8
10WF	Pocosin	Non-riparian	20	6.4
10WG	Headwater Forest	Riparian	28	0.6
10WH/WI	Headwater Forest	Riparian	31	1.5
10WJ	Headwater Forest	Riparian	31	0.6
10WK	Headwater Forest	Non-riparian	16	0.3
10WL	Seep	Riparian	16	0.0
10WM	Headwater Forest	Riparian	48	2.8

Map ID	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating[a]	Acres in Study Area
10WN	Headwater Forest	Non-riparian	27	0.8
10WO	Headwater Forest	Non-riparian	18	0.2
10WP	Pocosin	Non-riparian	26	3.1
10WQ	Headwater Forest	Non-riparian	18	0.4
10WR	Non-Riverine Swamp Forest	Riparian	22	0.7
10WS	Seep	Non-riparian	14	0.1
10WT	Headwater Forest	Non-riparian	18	0.8
10WU	Headwater Forest	Non-riparian	45	2.1
13WA	Salt/Brackish Marsh	Tidal	42	2.7
13WD	Salt/Brackish Marsh	Tidal	42	1.5
14WA	Headwater Forest	Riparian	27	5.8
14WB	Headwater Forest	Non-riparian	20	3.3
14WC	Pocosin	Non-riparian	12	0.2
15WA	Riverine Swamp Forest	Riparian	64	88.0
15WB	Basin Wetland	Non-riparian	10	0.2
20WA	Riverine Swamp Forest	Riparian	43	2.8
20WB	Headwater Forest	Non-riparian	24	0.6
20WC	Headwater Forest	Non-riparian	39	2.8
20WD	Pine Flat	Non-riparian	56	8.3
20WF	Pocosin	Non-riparian	53	0.2
	Pine Flat			42.2
20WG	Bottomland Hardwood Forest	Riparian	53	8.2
20WH	Riverine Swamp Forest	Riparian	30	2.9
20WI	Riverine Swamp Forest	Riparian	30	2.3
20WJ	Headwater Forest	Riparian	21	2.2
20WK	Headwater Forest	Riparian	21	0.8
20WL	Pine Flat	Non-riparian	46	24.0
20WM	Headwater Forest	Non-riparian	17	1.0
20WZ	Pine Flat	Non-riparian	36	18.5
21WA	Headwater Forest	Non-riparian	22	4.9
21WB	Headwater Forest	Non-riparian	16	0.2
21WC	Basin Wetland	Non-riparian	16	0.2
21WD	Headwater Forest	Non-riparian	36	1.6
21WE	Headwater Forest	Non-riparian	32	0.5

Map ID	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating[a]	Acres in Study Area
21WF	Salt/Brackish Marsh	Tidal	64	13.5
21WG	Pine Flat	Non-riparian	17	12.4
21WH	Headwater Forest	Non-riparian	16	0.5
21WI	Pocosin	Non-riparian	14	1.3
21WJ	Headwater Forest	Non-riparian	18	3.5
21WK	Pocosin	Non-riparian	22	2.2
22WA	Salt/Brackish Marsh	Tidal	0	362.9
26WA	Riverine Swamp Forest	Riparian	34	14.1
26WB	Headwater Forest	Non-riparian	19	0.2
26WC	Riverine Swamp Forest	Riparian	25	0.4
26WD	Salt/Brackish Marsh	Tidal	57	0.8
1XWB	Headwater Forest	Riparian	34	0.5
1XWC	Headwater Forest	Riparian	36	0.5
3XWA	Headwater Forest	Riparian	27	0.7
3XWC	Non-Tidal Freshwater Marsh	Riparian	49	1.3
5XWA	Headwater Forest	Riparian	26	0.5
6XWA	Headwater Forest	Riparian	19	0.2
6XWB	Headwater Forest	Riparian	24	5.2
6XWC	Pocosin	Non-riparian	11	0.2
6XWD	Headwater Forest	Riparian	23	1.0
9XWA	Headwater Forest	Riparian	72	0.6
13XWA	Basin Wetland	Non-riparian	16	0.4
13XWB	Basin Wetland	Non-riparian	13	0.1
13XWC	Basin Wetland	Non-riparian	18	0.1
21XWA	Pine Flat	Non-riparian	20	13.0
28XWA	Pine Flat	Non-riparian	19	0.2
28XWB	Hardwood Flat	Non-riparian	39	1.0
28XWC	Headwater Forest	Non-riparian	21	0.1
29XWA	Headwater Forest	Riparian	44	0.4
32XWA	Headwater Forest	Riparian	40	0.9
33XWA	Headwater Forest	Riparian	30	0.2
35XWB	Headwater Forest	Riparian	48	0.3
35XWC	Headwater Forest	Riparian	29	0.6
47XWA	Headwater Forest	Riparian	47	0.1

Map ID	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating[a]	Acres in Study Area
48XWA	Non-Riverine Swamp Forest	Non-riparian	53	1.5
51XWA	Bottomland Hardwood Forest	Riparian	28	9.9
51XWB	Bottomland Hardwood Forest	Non-riparian	20	0.1
52XWA	Headwater Forest	Non-riparian	23	0.6
			Total	**1,673.2**

[a] *Wetland rating procedure from* A Field Guide to North Carolina Wetlands. *Wetlands are rated on a scale of 1 to 100, with 100 indicating the highest quality.*

Wetland impacts, including Coastal Area Management Act (CAMA) wetlands, for the DSAs are presented in **Table 6**. CAMA areas of environmental concern (AEC) were identified in the project study area in the form of public trust waters, estuarine waters, and coastal wetlands. CAMA wetland impacts are presented in **Table 6**.

Table 6: Section 404 Jurisdictional Wetland Impacts

	Alternative					
	B	M Avoidance	N Avoidance	Q	T	V-AW
Riparian Wetlands (acres)	16.1	26.3	21.8	20.3	13.5	35.4
Non-Riparian Wetlands (acres)	82.4	37.9	37.0	25.4	26.2	104.8
TOTAL (acres)	98.5	64.2	58.8	45.7	39.7	140.2
CAMA AECs	1.8	2.3	2.3	1.8	1.8	89.1

***** NCDOT will investigate potential on-site stream and wetland mitigation opportunities once a preferred alternative has been selected. On-site mitigation will be used as much as possible. Off-site mitigation needed to satisfy the federal CWA requirements for this project will be provided by the NCDEQ Division of Mitigation Services in accordance with applicable In-Lieu Fee mitigation programs.
Note: Impacts were calculated using the functional design construction slope stake limits plus 40 feet.

Ponds

Fifty-three ponds and one named lake (Greenfield Lake) are located in the detailed study alternative corridors. The name and location of each pond is shown on **Figures 3a-l**. In addition to the ponds, 62 surface waters in the project study area were identified by the US Army Corps of Engineers as tributaries to Waters of the United States. These features were not assigned an individual map ID.

Floodplains

Protection of floodplains and floodways is required by EO 11988, *Floodplain Management*; US DOT Order 5650.2, *Floodplain Management and Protection*; and Title 23, Section 650 of the *Code of Federal Regulations*. The intent of these regulations is to avoid or minimize encroachment within the 100-year (base) floodplain by transportation projects, where practicable, and to avoid supporting land use development that is incompatible with floodplain values.

Natural and beneficial floodplain values of these floodplains include natural moderation of floods, open space, and wildlife habitat. **Figure 4** shows floodplains in the project study area.

The existing and proposed roadways for the DSAs include 42 crossings of FEMA floodplains. **Table 7** and **Figures 5a-l** include an inventory of the proposed crossings and the proposed hydraulic features at the floodplain locations.

Table 7: Summary of Hydraulic Recommendations

Site Number	Alternative	Feature Under Structure	Proposed Structure
1 [a]	MA, NA	Bishop Branch	Extend existing 3 at 8x6 box culvert
2	MA, NA	Bishop Branch	Bridge at 520 feet to span wetlands
2A	MA, NA	Bishop Branch	Bridge at 660 feet to span main wetlands
3	MA, NA	Morgan Branch	Bridge at 980 feet to span wetlands
4	MA, NA	Goodland Branch	3 at 6x6 box culvert
5	MA, NA	UT to Goodland Branch	2 at 6x6 box culvert
6	MA, NA	UT to Goodland Branch	1 at 6x6 box culvert
7	MA, NA	UT to Town Creek	1 at 6x6 box culvert
8	MA, NA	Little Mallory Creek	1 at 8x6 box culvert
10	B, MA, NA, Q, T	Mallory Creek	Span CAMA wetlands
11	B, MA, NA, Q, T	UT to Mallory Creek	Bridge at 15,705 feet (Alternatives B, T) 16,353 feet (Alternative Q) 16,403 feet (Alternative MA) 15,842 feet (Alternative NA)
11A	B, MA, NA, Q, T	UT to Mallory Creek	Bridge at 15,705 feet (Alternative B, T) 16,353 feet (Alternative Q) 16,403 feet (Alternative MA) 15,842 feet (Alternative NA)
12	MA, Q	Cape Fear River	Bridge at 16,353 feet (Alternative Q) 16,403 feet (Alternative MA)
13	MA, Q	UT to Barnards Creek	Bridge at 16,353 feet (Alternative Q) 16,403 feet (Alternative MA)
14	MA, Q	UT to Barnards Creek	3 at 6x6 box culvert
15	MA, Q	UT to Barnards Creek	2 at 6x6 box culvert
16 [a]	MA, Q	UT to Barnards Creek	2 at 6x6 box culvert
18 [a]	MA, NA, Q, T, V-AW	UT to Morgan Branch	3 at 8x6 box culvert
19 [a]	Q, T, V-AW	Morgan Branch	3 at 8x6 box culvert

Site Number	Alternative	Feature Under Structure	Proposed Structure
20 [a]	MA, NA	UT to Morgan Branch	Widen existing bridge
21 [a]	MA, NA	UT to Morgan Branch	Widen existing bridge
22	B	UT to Morgan Branch	1 at 8x6 box culvert
23	B	UT to Morgan Branch	1 at 8x6 box culvert
24	B	UT to Jackeys Creek	Bridge at 142 feet
26	B, Q, T	UT to Piney Branch	1 at 7x6 box culvert
27	B, Q, T	Piney Branch	3 at 7x6 box culvert
28	B, Q	Mallory Creek Tributary	Downstream bridge at 440 feet and upstream bridge at 510 feet to span wetlands
29	B, Q	Mallory Creek	Bridge at 800 feet to span main wetlands
30	T	Mallory Creek	Bridge at 770 feet to span main wetlands
33 [a]	B, MA, NA, Q, T	Mallory Creek	Bridge at 95 feet
34	B, Q, T	Mallory Creek	Bridge at 15,705 feet (Alternatives B, T) 16,353 feet (Alternative Q)
35	B, NA, T	Cape Fear River	Bridge at 15,705 feet (Alternatives B, T) 15,842 feet (Alternative NA)
36 [a]	B, Q, T, V-AW	Jackeys Creek	Bridge at 240 feet
37	V-AW	UT to Jackeys Creek	2 at 6x6 box culvert
38 [a]	V-AW	Brunswick River	Widen existing bridge
39 [a]	V-AW	Alligator Creek	Widen existing bridge
41	V-AW	Cape Fear River	Bridge at 4,951 feet
42	V-AW	UT to Greenfield Creek	Bridge at 4,951 feet
43	V-AW	Greenfield Creek	Bridge at 4,951 feet
44 [a]	V-AW	Greenfield Creek	Extend 3 at 8x6 box culvert
45	MA, Q	Unnamed Tributary	Bridge at 16,353 feet (Alternative Q) 16,403 feet (Alternative MA)
46	MA, Q	East Fork Creek	2 at 6x6 box culvert

Sources: NCDOT. 2016. *Hydraulic Analysis Report, Cape Fear Crossing, Brunswick and New Hanover Counties, North Carolina*. August 2016.

No practicable alternative exists to completely avoid impacts to floodplains. Efforts are being made to minimize the impacts to floodplains and to diminish the risk to human safety associated with the encroachments.

The construction of the proposed improvements would encroach in several areas on the designated floodplain associated with several local stream systems. **Table 8** summarizes impacts to floodplains and floodways within the project study area from each of the DSAs.

Table 8: FEMA Floodplain and Floodway Impacts (in acres)

Alternative	Impacts to 100-year Floodplain (acres)	Impacts to Floodway (acres)
B	14.3	2.8
M Avoidance	35.7	2.1
N Avoidance	34.0	2.1
Q	31.7	2.6
T	28.8	2.6
V-AW	214.4	0.4

Sources: NCDOT. 2016. *Hydraulic Analysis Report, Cape Fear Crossing, Brunswick and New Hanover Counties, North Carolina.* August 2016.
Note: Impacts were calculated using the functional design construction slope stake limits plus 40 feet.

Brunswick and New Hanover counties participate in the National Flood Insurance Program. Coordination with local authorities and FEMA will occur during the final design if floodway modifications are required to ensure compliance with applicable floodplain management ordinances.

In accordance with Executive Order 11988, the Hydraulics Unit will coordinate with the North Carolina Floodplain Mapping Program (FMP), the delegated state agency for administering FEMA's National Flood Insurance Program, to determine the status of the project with regard to applicability of NCDOT's Memorandum of Agreement with FMP (dated June 5, 2008), or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

Avoidance, Minimization, and Mitigation of Impacts

Avoidance and Minimization of Impacts

During development of the detailed study alternatives, efforts were made to avoid and minimize impacts to wetlands and streams wherever practicable.

Because of the number of streams and wetlands present in the project study area, total avoidance of surface waters is not practicable. Alternative alignments were developed in an effort to minimize impacts to streams and wetlands. The NEPA/Section 404 Merger Team concurred on May 30, 2017, at CP Meeting 2A on the streams that should be bridged by the alternatives. NCDOT will continue to attempt to avoid and minimize impacts to streams and wetlands to the greatest extent practicable in selecting the preferred alternative and during project final design.

Compensatory Mitigation of Impacts

The purpose of compensatory mitigation is to replace the lost functions and values from a project's impacts to Waters of the United States, including wetlands and streams.

NCDOT will investigate potential on-site stream and wetland mitigation opportunities once the preferred alternative has been selected. On-site mitigation will be used as much as possible. Off-site mitigation needed to satisfy the federal CWA requirements for this project will be provided by the NCDEQ Division of Mitigation Services in accordance with applicable In-Lieu Fee mitigation programs.

Buffer Impacts

North Carolina River Basin Buffer Rules do not apply to streams potentially impacted by the detailed study alternatives.

Protected Species

The 17 federally protected species found in Brunswick and New Hanover counties and the biological conclusions regarding the potential effects of the project are summarized in **Table 9**. Concurrence with these findings will be requested from USFWS after selection of a preferred alternative.

Table 9: Federally Protected Species listed for Brunswick and New Hanover counties

Scientific Name	Common Name	Federal Status[a]	Habitat Present	Biological Conclusion
Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	E	Yes	MA-NLAA
Acipenser brevirostrum	Shortnose sturgeon	E	Yes	MA-NLAA
Alligator mississippiensis	American alligator	T(S/A)	Yes	Not Required
Calidris canutus rufa	Rufa red knot	T	No	No Effect
Caretta	Loggerhead sea turtle	T	Yes	MA-NLAA
Charadrius melodus	Piping plover	T	No	No Effect
Chelonia mydas	Green sea turtle	T	No	MA-NLAA
Dermochelys coriacea	Leatherback sea turtle	E	No	No Effect
Eretmochelys imbricata	Hawksbill sea turtle	E	No	No Effect
Lepidochelys kempii	Kemp's ridley sea turtle	E	No	MA-NLAA
Mycteria americana	Wood stork	E	Yes	MA-NLAA
Myotis septentrionalis	Northern long-eared bat	T	Yes	MA-LAA

Scientific Name	Common Name	Federal Status[a]	Habitat Present	Biological Conclusion
Picoides borealis	Red-cockaded woodpecker	E	Yes	MA-NLAA
Trichechus manatus	West Indian manatee	E	Yes	MA-NLAA
Amaranthus pumilus	Seabeach amaranth	T	No	No Effect
Carex lutea	Golden sedge	E	Yes	No Effect
Lysimachia asperulaefolia	Rough-leaved loosestrife	E	Yes	No Effect
Thalictrum cooleyi	Cooley's meadowrue	E	Yes	No Effect

[a] E - Endangered; T - Threatened; T(S/A) - Threatened due to similarity of appearance; MA-NLAA – May Affect-Not Likely to Adversely Affect

The following biological conclusions are a result of integrating the findings from all field visits.

Atlantic Sturgeon
Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat for Atlantic sturgeon consisting of estuarine and riverine habitat of large river systems exists in the study area in the Cape Fear River, Brunswick River, and Alligator Creek. Atlantic sturgeon is an anadromous species, and these waters are listed as AFSA waters by the NCDMF and NCWRC. Additionally, a query of the North Carolina National Heritage Program (NCNHP) Data Explorer on August 14, 2017, indicates an occurrence of Atlantic Sturgeon in the project study area. Atlantic sturgeon was last observed in the study area in 2012.

Shortnose Sturgeon
Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat for shortnose sturgeon consisting of estuarine and riverine habitat of large river systems exists in the study area in the Cape Fear River, Brunswick River, and Alligator Creek. Shortnose sturgeon is an anadromous species, and these waters are listed as AFSA waters by the NCDMF and NCWRC. Additionally, a query of the NCNHP Data Explorer on August 14, 2017, indicates an occurrence of shortnose sturgeon in the project study area. Shortnose sturgeon was last observed in the study area in 1993.

American Alligator
Biological Conclusion: Not Required

Species listed as threatened due to similarity of appearance with another listed species do not require Section 7 consultation with the USFWS. However, suitable habitat is present for American alligator in the project study area in the form of large streams, ponds, rivers, and swamps. A query of the NCNHP Data Explorer on August 14, 2017, indicates a known occurrence within the project study area in the vicinity of Eagle Island. Alligators were also observed in Greenfield Lake and in numerous residential and stormwater ponds during field investigations in 2014 and 2015.

Rufa Red Knot
Biological Conclusion: No Effect

Suitable habitat for rufa red knot does not exist within the project study area. The project study area does not include ocean beach or other open sand habitats that provide suitable habitat for this species. A query of the NCNHP Data Explorer on August 14, 2017, indicates no known rufa red knot occurrence within 1.0 mile of the project study area.

Loggerhead Sea Turtle
Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat for loggerhead sea turtle consisting of near shore creeks and large rivers is present in the project study area. A query of the NCNHP Data Explorer on August 14, 2017, indicates no known occurrences within 1.0 mile of the project study area. Loggerhead sea turtles have been observed by NCWRC in the Cape Fear River between Southport and Wilmington. Any construction activities performed within areas of suitable habitat will adhere to NMFS *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NOAA 2006).

Piping Plover
Biological Conclusion: No Effect

Suitable habitat for piping plover does not exist in the project study area. A query of the NCNHP Data Explorer on August 14, 2017, indicates no known occurrences within 1.0 mile of the project study area.

Green Sea Turtle
Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat for green sea turtle is not prevalent in the project study area. Waters within the project study area are freshwater or brackish and do not contain marine grasses. A query of the NCNHP Data Explorer on August 14, 2017, indicates no known occurrences within 1.0 mile of the project study area. Green sea turtles have been observed by the NCWRC in the Cape Fear River between Southport and Wilmington. Any construction activities performed within areas of suitable habitat will adhere to NMFS *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NOAA 2006).

Leatherback Sea Turtle
Biological Conclusion: No Effect

Suitable habitat for leatherback sea turtle does not exist in the project study area. A query of the NCNHP Data Explorer on August 14, 2017, indicates no known occurrences within 1.0 mile of the project study area.

Hawksbill Sea Turtle
Biological Conclusion: No Effect

Suitable habitat for hawksbill sea turtle is not present in the project study area. A query of the NCNHP Data Explorer on August 14, 2017, indicates no known occurrences within 1.0 mile of the project study area.

Kemp's Ridley Sea Turtle
Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat for Kemp's ridley sea turtle is not prevalent in the project study area. A query of the NCNHP Data Explorer on August 14, 2017, indicates no known occurrences within 1.0 mile of the project study area. Kemp's ridley sea turtles have been observed by NCWRC in the Cape Fear River between Southport and Wilmington. Any construction activities performed within areas of suitable habitat will adhere to NMFS *Sea Turtle and Smalltooth Sawfish Construction Conditions* (NOAA 2006).

Wood Stork
Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat for wood stork is present in the project study area in the form of tidal creeks, tidal marsh, and freshwater swamps. A query of the NCNHP Data Explorer on August 14, 2017, indicates no known occurrence of wood stork within 1.0 mile of the project study area.

Northern Long-Eared Bat
Biological Conclusion: May Affect, Likely to Adversely Affect

The USFWS developed a programmatic biological opinion (PBO) in conjunction with the FHWA, USACE, and NCDOT for the NLEB (*Myotis septentrionalis*) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for NLEB for the NCDOT program is "May Affect, Likely to Adversely Affect." The PBO provides incidental take coverage for NLEB and would ensure compliance with Section 7 of the ESA for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes New Hanover and Brunswick counties. This level of incidental take is authorized from the effective date of a final listing determination through April 30, 2020.

Red-cockaded Woodpecker
Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable RCW foraging and nesting/roosting habitat in the form of open, mature stands of longleaf pine is present throughout the project study area. A query of the NCNHP Data Explorer on August 14, 2017, indicates two historic and one current element occurrence of RCW within 1.0 mile of the project study area. Ground and aerial surveys were conducted by Dr. J.H. Carter III & Associates on behalf of NCDOT in March 2014 (NCDOT 2015b). One previously active RCW cluster, identified as Brunswick Cluster 1 (BRU1), was located within 1.0 mile of the project study area. A foraging habitat analysis completed in September 2018 found that no RCW cavity trees would be removed or impacted by the proposed project (NCDOT 2018b).

West Indian Manatee
Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat for West Indian manatee consisting of large streams, sluggish rivers, and estuarine habitats exists in the project study area. A query of the NCNHP Data Explorer on August 14, 2017, indicates one known occurrence within 1.0 mile of the project study area. The Cape Fear population, located in the lower portions of the Cape Fear and Northeast Cape Fear rivers, was last observed in 2012. Construction activities will adhere to *Guidelines for Avoiding*

Impacts to the West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters (USFWS 2003).

Seabeach Amaranth
Biological Conclusion: No Effect

Suitable habitat for seabeach amaranth, consisting of barrier island beaches where its primary habitat consists of overwash flats at accreting ends of islands, lower foredunes, and upper strands of noneroding beaches (landward of the wrack line), does not exist in the project study area. A query of the NCNHP Data Explorer on August 14, 2017, indicates no occurrences within 1.0 mile of the project study area.

Golden Sedge
Biological Conclusion: No Effect

Suitable habitat for golden sedge consisting of roadside and drainage ditches or power line rights-of-way where mowing and/or very wet conditions suppress woody plants is present in the project study area. Biologists from CAYLX conducted surveys of the study area on June 10-12, 2015. No individuals of golden sedge were found. A query of the NCNHP Data Explorer on August 14, 2017, indicates no occurrences within 1.0 mile of the project study area.

Rough-leaved Loosestrife
Biological Conclusion: No Effect

Suitable habitat for rough-leaved loosestrife consisting of ecotones or edges between longleaf pine uplands and pond pine pocosins, roadside depressions, maintained power and utility line rights-of-way, firebreaks, and trails exists in the project study area. Biologists from CAYLX conducted surveys of the study area on June 10-12, 2015. No individuals of rough-leaved loosestrife were found. A query of the NCNHP Data Explorer on August 14, 2017, indicates one occurrence within 1.0 mile of the project study area. This occurrence was last observed in 2003.

Cooley's Meadowrue
Biological Conclusion: No Effect

Suitable habitat for Cooley's meadowrue consisting of plowed firebreaks, roadside ditches and rights-of-way, and power line easements exists in the project study area. Additionally, soils that are loamy fine sand, sandy loam, or fine sandy loam; at least seasonally moist or saturated, including Foreston, Muckalee, Torhunta, and Woodington soil series, are common in the project study area. Biologists from CAYLX conducted surveys of the study area on June 10-12, 2015. No individuals of Cooley's meadowrue were found. Additionally, a query of the NCNHP Data Explorer on August 14, 2017, indicates no occurrences within 1.0 mile of the project study area.

Wild and Scenic Rivers and Other Protected Lands

In the project area, no water bodies are deserving of special attention as denoted under the federal Wild and Scenic Rivers Act of 1968 (Pub. L. No. 90-542, 82 Stat. 906; codified and amended at 16 U.S.C. 1217-1287 (1982)) or under the Natural and Scenic Rivers Act of 1971 (G.S. 113A-30). There are no state/national forests, or gamelands and preservation areas in the project area.

Thirteen Natural Heritage Program Natural Areas (NHPNA) or managed preservation areas are located within the project study area. The 13 NHPNA sites are listed below.

- Barnards Creek Natural Area
- Battle Royal Bay
- Brunswick River/Cape Fear River Marshes
- Clarendon Plantation Limesinks
- Greenfield Lake
- Little Green Swamp
- Lower Cape Fear River Aquatic Habitat
- Mott Creek Natural Area
- Pleasant Oaks/Goose Landing Plantations
- South Wilmington Sandhills
- Sturgeon Creek Tidal Wetlands
- Town Creek Aquatic Habitat
- Town Creek Marshes and Swamp

In addition, most of Eagle Island is managed as a dedicated nature preserve. NCDOT manages three separate mitigation sites within the project study area. The mitigation sites are plots of land that are owned or maintained by NCDOT for stream, wetland, or threatened and endangered species mitigation credits. One mitigation site is located on Eagle Island, northeast of the US 17/US 74 interchange. Another mitigation site is located in the southwest portion of the project study area near the junction of US 17 and Maco Road Northeast. The third mitigation site is located in the northwestern portion of the project study area on the western side of I-140.

Impacts to preservation areas are included in **Table 10**.

Table 10: Preservation Area Impacts

Preservation Area Impacts (acres)	Alternative					
	B	M Avoidance	N Avoidance	Q	T	V-AW
Barnards Creek Natural Area	0	0	0	0	0	0
Battle Royal Bay	8.10	0	0	0	0	0
Brunswick River/Cape Fear River Marshes	0	0	0	0	0	129.27
Clarendon Plantation Limesinks	0	0	0	0	0	0
Greenfield Lake	0	0	0	0	0	0
Henrytown Savanna	0	0	0	0	0	0
Little Green Swamp	0	0	0	0	0	0
Lower Cape Fear River Aquatic Habitat	21.36	21.92	21.36	21.92	21.36	0.00
Mott Creek Natural Area	0	0	0	0	0	0
Pleasant Oaks/Goose Landing Plantations	0	0	0	0	0	0

Preservation Area Impacts (acres)	Alternative					
	B	M Avoidance	N Avoidance	Q	T	V-AW
South Wilmington Sandhills	0	0	0	0	0	0
Sturgeon Creek Tidal Wetlands	0	0	0	0	0	0
Town Creek Aquatic Habitat	0	0	0	0	0	10.49
Town Creek Marshes and Swamp	0	9.10	9.10	0	0	0
TOTAL	**29.46**	**31.02**	**30.46**	**21.92**	**21.36**	**139.76**

Cultural Resources

This project is subject to Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. § 470f), and implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified as Title 36, Part 800 of the *Code of Federal Regulations*. Section 106 requires federal agencies to take into account the effects of their undertakings (federally funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places (NRHP) and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

Historic Architecture Resources

The determination of effect for each historic architectural resource in the APE is described in this section and summarized in **Table 11**. The estimated property acquisition from each historic architectural resource is listed by alternative in **Table 12**. The historic resources are shown on **Figure 7a-l**.

Table 11: Determination of Effect to Historic Resources According to Section 106

Resource	B	M Avoidance	N Avoidance	Q	T	V-AW
USS North Carolina	No Effect	No Effect	No Effect	No Effect	No Effect	No Adverse Effect
Wilmington Historic District	No Effect	No Effect	No Effect	No Effect	No Effect	**Adverse Effect**
Southern and Northwest Sections of Lake Forest Defense Housing	No Effect	No Effect	No Effect	No Effect	No Effect	No Adverse Effect
Sunset Park Historic District	No Effect	No Effect	No Effect	No Effect	No Effect	**Adverse Effect**

Resource	B	M Avoidance	N Avoidance	Q	T	V-AW
Sunset Park School	No Effect	No Effect	No Effect	No Effect	No Effect	*No Adverse Effect with commitments*
Jacob and Sarah Horowitz House	No Effect	No Effect	No Effect	No Effect	No Effect	**Adverse Effect**
Hanover Heights Historic District	*No Adverse Effect with commitments*	No Effect	*No Adverse Effect with commitments*	No Effect	*No Adverse Effect with commitments*	No Effect
Wilmington National Guard Armory	No Effect	No Effect	No Effect	No Effect	No Effect	*No Adverse Effect with commitments*
DH Lippitt House/Clarendon House	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Goodman House & Doctor's Office	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect

Table 12: Property Acquisition (in acres) of Historic Architectural Resources by Alternative (Right-of-way/Easement)

Resource	B	M Avoidance	N Avoidance	Q	T	V-AW
USS North Carolina	No use	No use	No use	No use	No use	No use
Wilmington Historic District	No use	No use	No use	No use	No use	3.3/2.1
Southern and Northwest Sections of Lake Forest Defense Housing	No use	No use	No use	No use	No use	No use
Sunset Park Historic District	No use	No use	No use	No use	No use	0.02/0.22
Sunset Park School	No use	No use	No use	No use	No use	0.03/0.03
Jacob and Sarah Horowitz House	No use	No use	No use	No use	No use	0.0/0.07
Hanover Heights Historic District	<0.01/0.03	No use	<0.01/0.03	No use	<0.01/0.03	No use
Wilmington National Guard Armory	No use	No use	No use	No use	No use	0.07/0.05

Resource	B	M Avoidance	N Avoidance	Q	T	V-AW
DH Lippitt House/Clarendon House	No use	No use	No use	No use	No use	No use
Goodman House & Doctor's Office	No use	No use	No use	No use	No use	No use

USS North Carolina

Pursuant to Section 106, the HPO has concurred with the determination that Alternative V-AW would have "no adverse effect" on this historic resource from access changes and visual impacts.

Alternatives B, M Avoidance, N Avoidance, Q, and T would not require right-of-way from this property. Pursuant to Section 106, the HPO has concurred with the determination that these alternatives would have "no effect" on this historic resource because no construction activities would directly impact the property.

Wilmington Historic District

As proposed, Alternative V-AW would result in physical impacts to properties within the Wilmington Historic District. Current preliminary plans for Alternative V-AW would require 3.3 acres of right-of-way and 2.1 acres of easement. Pursuant to Section 106, the HPO has concurred with the determination that the project would have an "adverse effect" on this historic resource because construction activities would directly impact the property.

Alternatives B, M Avoidance, N Avoidance, Q, and T would not require right-of-way from the Wilmington Historic District. Pursuant to Section 106, the HPO has concurred with the determination that these alternatives would have "no effect" on this historic resource because no construction activities would directly impact the district.

Southern and Northwest Sections of Lake Forest Defense Housing

None of the alternatives would require right-of-way from this property. As proposed, Alternative V-AW would have minor visual impacts and roadway improvements that stop at the edge of the district. Alternatives B, M Avoidance, N Avoidance, Q, and T would have no physical impacts to the historic district. Pursuant to Section 106, the HPO has concurred with the determination that Alternative V-AW would have "no adverse effect" and Alternatives B, M Avoidance, N Avoidance, Q, and T would have "no effect" on this historic resource because no construction activities would directly impact the property.

Sunset Park Historic District

As proposed, Alternative V-AW would result in physical impacts to properties within the Sunset Park Historic District. Current preliminary plans for Alternative V-AW would require 0.02 acre of right-of-way and 0.22 acre of easement. Due to the close proximity of the structures within the historic district to the roadway, easement impacts would involve the physical taking of approximately five structures. Pursuant to Section 106, the HPO has concurred with the determination that Alternative V-AW would have an "adverse effect" on this historic resource because construction activities would directly impact the property.

Alternatives B, M Avoidance, N Avoidance, Q, and T would not require right-of-way from the Sunset Park Historic District. Pursuant to Section 106, the HPO has concurred with the determination that these alternatives would have "no effect" on this historic resource because no construction activities would directly impact the district.

Sunset Park School

As proposed, Alternative V-AW would involve right-of-way and easement impacts to the parking lot and landscaping of the property, but no impacts to the structure. NCDOT will close the driveway along US 421, but rear access to the parking lot will remain. NCDOT will install landscaping along US 421 in coordination with the property owner and HPO. During construction, NCCDOT will install protective measures around pine trees that flank the school's entrance. Pursuant to Section 106, the HPO has concurred with the determination that Alternative V-AW would have "no adverse effect" because the proposed effects would not degrade the historic character of the structure.

Alternatives B, M Avoidance, N Avoidance, Q, and T would not require right-of-way from this property. Pursuant to Section 106, the HPO has concurred with the determination that these alternatives would have "no effect" on this historic resource because no construction activities would directly impact the property.

Jacob and Sarah Horowitz House

As proposed, Alternative V-AW would result in physical impacts to this property. Current preliminary plans for Alternative V-AW would not require any right-of-way, however approximately 0.07 acre of easement impact would require demolition of the structure due to the close proximity to the roadway. Pursuant to Section 106, the HPO has concurred with the determination that Alternative V-AW would have an "adverse effect" on this historic resource because construction activities would directly impact the property.

Alternatives B, M Avoidance, N Avoidance, Q, and T would not require right-of-way from this property. Pursuant to Section 106, the HPO has concurred with the determination that these alternatives would have "no effect" on this historic resource because no construction activities would directly impact the property.

Hanover Heights Historic District

Alternative B, N Avoidance, and T would involve right-of-way and easement impacts to the property, but no impacts to the Cape Fear Presbyterian Church along Shipyard Boulevard. NCDOT will replant the large plantings in front of the church if impacted during construction. Pursuant to Section 106, the HPO has concurred with the determination that Alternatives B, N Avoidance, and T would have "no adverse effect" on this historic district.

Alternatives M Avoidance, Q, and V-AW would not require right-of-way from this property. Pursuant to Section 106, the HPO has concurred with the determination that these alternatives would have "no effect" on this historic resource because no construction activities would directly impact the property.

Wilmington National Guard Armory

As proposed, Alternative V-AW would involve right-of-way and easement impacts to the property, but no impacts to the building or its access. If necessary, NCDOT will relocate the flag pole and provide a sign perpendicular to US 421. Pursuant to Section 106, the HPO has concurred with the determination that Alternative V-AW would have "no adverse effect" because the proposed effects would not degrade the historic character of the structure.

Alternatives B, M Avoidance, N Avoidance, Q, and T would not require right-of-way from this property. Pursuant to Section 106, the HPO has concurred with the determination that these alternatives would have "no effect" on this historic resource because no construction activities would directly impact the property.

DH Lippitt House/Clarendon House

None of the alternatives would require right-of-way from this property. Pursuant to Section 106, the HPO has concurred with the determination that the project would have "no effect" on this historic resource because no construction activities would directly impact the property.

Goodman House and Doctor's Office

None of the alternatives would require right-of-way from this property. Pursuant to Section 106, the HPO has concurred with the determination that the project would have "no effect" on this historic resource because no construction activities would directly impact the property.

Mitigation

Measures to minimize harm and to mitigate unavoidable "adverse effects" will be developed through coordination among FHWA, HPO, NCDOT, and other consulting parties and documented in a Memorandum of Agreement (MOA) after selection of the preferred alternative. Methods for minimizing harm to historic resources will continue throughout subsequent engineering and design phases of the project.

Archaeological Resources

In order to comply with Section 106 of the NHPA (1966, as amended), FHWA and NCDOT must evaluate the project's impact upon any extant archaeological resources and determine whether additional measures would be necessary to mitigate any adverse effects of the project upon any significant archaeological sites.

A GIS model was developed in 2011 to analyze the potential presence of archaeological resources within the project study area. The methods and findings of this predictive model are reported in detail in the *Terrestrial Archaeological Resources Predictive Model* report (NCDOT 2011) and in the 2017 updated report, which revises the 2011 predictive model corridors using the 12 alternatives chosen for detailed study in 2014 (NCDOT 2017c).

The results of the model show that, excluding areas of water, 38.6 percent of the analysis area was assigned a high likelihood for the presence of either prehistoric or historic resources, and 61.4 percent was assigned a low likelihood for the presence of any archaeological resources. The 2017 updated report also compared the presence of known archaeological sites to the results of the model (NCDOT 2017c). Known site data were obtained in October 2016 from the North

Carolina Office of State Archaeology, and data show that 136 previously recorded archaeological sites are located within the project study area. Of these sites, 114 (83.8 percent) are located completely or partially within areas that were classified by the GIS model as high probability.

Five previously recorded sites lie within one or more of the DSA corridors under consideration. These sites include two in Brunswick County, 31BW602 and 31BW604, and three in New Hanover County, 31NH018, 31NH024, and 31NH560. The two sites in Brunswick County have been recommended as ineligible for the NRHP. Two sites in New Hanover County (31NH018 and 31NH024) have not been evaluated for NRHP eligibility. Site 31NH560 has been recommended ineligible for the NRHP.

Acreage and percentage of high and low probability of an archaeological presence for the DSA functional design corridors within the broader study area were calculated and are shown in **Table 13**.

Table 13: Archaeological Probability for Cape Fear Crossing

Alternative	High (acres)	High (%)	Low (acres)	Low (%)	Total (acres)	Sort by Acreage	Sort by Percent
B	250.7	34.4	478.9	65.6	729.6	6	6
M Avoidance	481.1	62.2	292.4	37.8	773.5	1	2
N Avoidance	370.3	49.0	385.1	51.0	755.4	3	4
Q	390.8	61.3	247.0	38.7	637.8	2	3
T	273.0	43.9	348.4	56.1	621.4	5	5
V-AW	318.0	63.9	179.8	36.1	497.8	4	1

Source: NCDOT (2017c)
Note: Impacts were calculated using the 1,000-foot corridor limits.

Following selection of the preferred alternative, a Phase I field survey will be conducted to identify the presence/absence of archaeological sites within the limits of the preferred alternative and to determine which, if any, resources are eligible for listing on the NRHP.

Hazardous Materials

The presence of soil and/or groundwater contamination, or the existence of hazardous substances within existing or proposed right-of-way areas can adversely affect the cost and schedule to complete a transportation improvement project. Contaminated soil located during construction could require special treatment and disposal and would not be usable to backfill excavations. In addition, locating a transportation project adjacent to a site where hazardous materials are present could result in long-term effects on the site by the transportation activities or, conversely, the hazardous materials could pose a future threat to the viability of the facility and the citizens who use it.

Method

The NCDOT GeoEnvironmental Section of the Geotechnical Engineering Unit investigated the project study area using GIS and field reconnaissance along the DSA corridors and prepared a *Hazardous Materials Report* (NCDOT 2015a). A search of the appropriate environmental agencies' databases was performed to assist in evaluating identified sites.

Findings

Field reconnaissance was conducted on January 14, 2015. Forty potential hazardous sites were identified within the project study area. Thirty-nine of the sites are located in New Hanover County, with the majority located along US 421 between Burnett Boulevard and Shipyard Boulevard. One site is located in Brunswick County at the intersection of Hazels Branch Road and Sloan Road. The report identifies sites that may contain petroleum underground storage tanks (USTs) (31 sites), petroleum storage facilities (3 sites), automotive repair facilities (3 sites), dry cleaning facilities (2 sites), and hazardous waste sites (1 site). No landfills were identified within the DSA corridors.

Table 14 identifies the potential contaminated sites found within the 1,000-foot corridor of each DSA. Preliminary site assessments to identify the nature and extent of any contamination will be performed on these sites prior to right-of-way acquisition.

Table 14: Potentially Contaminated Sites

Alternative	Number of Potentially Hazardous Sites	Anticipated Severity	Potentially Contaminated Properties[a]
B	6	Low	Sites 15, 16, 17
		High	Sites 8, 9, 14
M Avoidance	6	Low	Sites 1, 11, 12, 13, 15
		High	Site 14
N Avoidance	7	Low	Sites 1, 15, 16, 17
		High	Sites 8, 9, 14
Q	0	None	No Sites
T	6	Low	Sites 15, 16, 17
		High	Sites 8, 9, 14,
V-AW	25	Low to High	Sites 10, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37
		High	Site 14

[a] Potentially contaminated site numbers correspond to the *Hazardous Materials Report* (NCDOT 2015a).

Logical Termini/Independent Utility

FHWA regulations (23 CFR 771.111(f)) state that in order to ensure meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully

evaluated, a project must: "connect logical termini and be of sufficient length to address environmental matters on a broad scope; not restrict consideration of alternatives for other reasonably foreseeable transportation improvements; and have independent utility or independent significance."

The DSAs for the proposed project begin in the vicinity of the I-140/US 17 interchange in Brunswick County and end at US 421/US 117 (Shipyard Boulevard) in New Hanover County.

The Cape Fear Crossing Project is needed to improve traffic flow and enhance freight movements across the Cape Fear River. Without improvements to the existing network, US 17, from south of the Wilmington Bypass interchange to Front Street in Wilmington (over a 10-mile long segment), will be over capacity and operating poorly in 2040, with travel times on the US 17 corridor increasing up to 58 percent from the current condition. All the truck routes around the Port of Wilmington are expected to operate at a poor arterial level of service (LOS) in 2040 (NCDOT 2018a). Future growth projections suggest that congestion levels on the local transportation network could hamper the Port's growth plans and competitiveness. Deficiencies in the existing transportation network diminish the ability to efficiently distribute goods and services from the Port of Wilmington.

The project's termini, as described, will be at logical endpoints. The proposed project will not require immediate transportation improvements beyond the termini or along the connecting facilities. Thus, the proposed project has independent utility and its construction will be a useful and reasonable expenditure of funds, even if no additional transportation improvements in the area are made. The proposed project is of sufficient length to allow for evaluation of alternatives and environmental issues on a broad basis and will neither restrict consideration of alternatives nor prohibit implementation of other reasonably foreseeable transportation improvement projects.

Conclusion

This letter, along with the DEIS, should provide sufficient information for the issuance of a Public Notice for the project. Two Corridor Public Hearings have been scheduled as follows:

- **Monday, April 29, 2019**
  John T. Hoggard High School Cafeteria
  4305 Shipyard Boulevard, Wilmington, NC
  Open House: 5 - 6:30 p.m., Hearing: 7 p.m.
- **Tuesday, April 30, 2019**
  North Brunswick High School Gym
  114 Scorpion Drive, Leland, NC
  Open House: 5 - 6:30 p.m., Hearing: 7 p.m.

If you have any questions, or need additional information, please contact Mr. John Conforti at (919) 707-6015 or Mr. Jason Dilday at (919) 707-6111.

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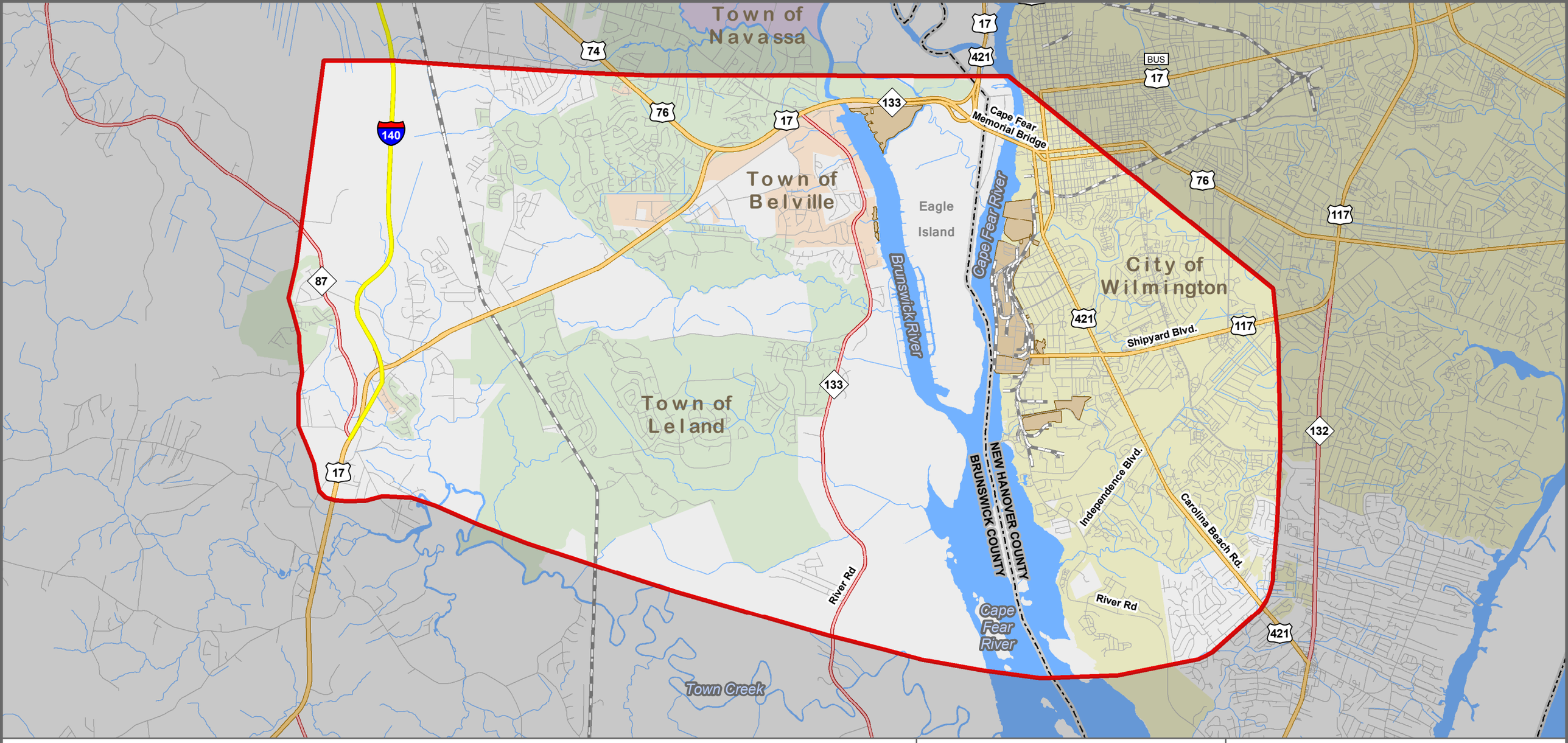


Legend

- Project Study Area
- Interstate
- US Highway
- NC Highway
- Local Road
- Railroad
- Wilmington
- Leland
- Belville
- Navassa
- Port of Wilmington
- County Boundary
- Water

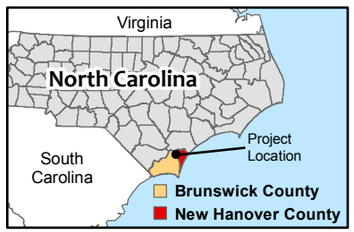


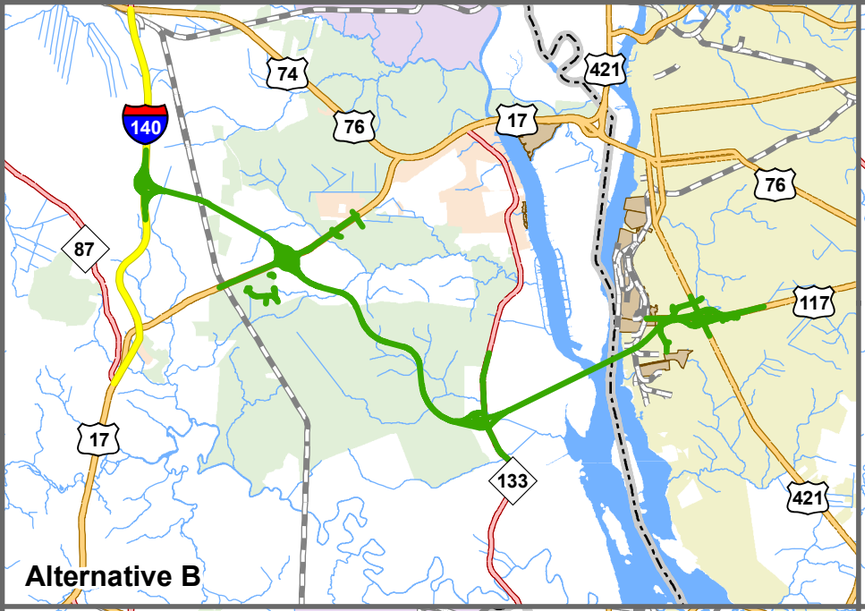
FIGURE 1
PROJECT STUDY AREA

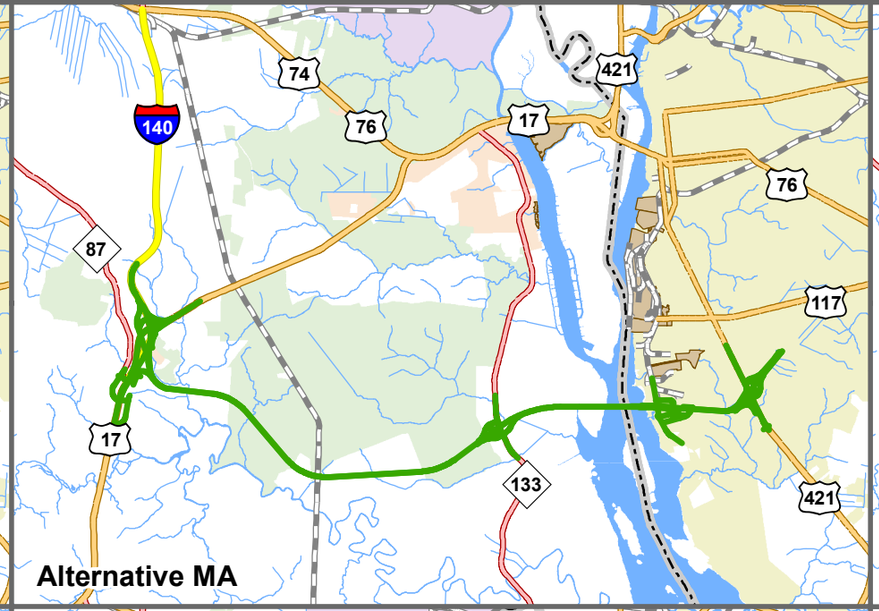
0 0.5 1 2
Miles

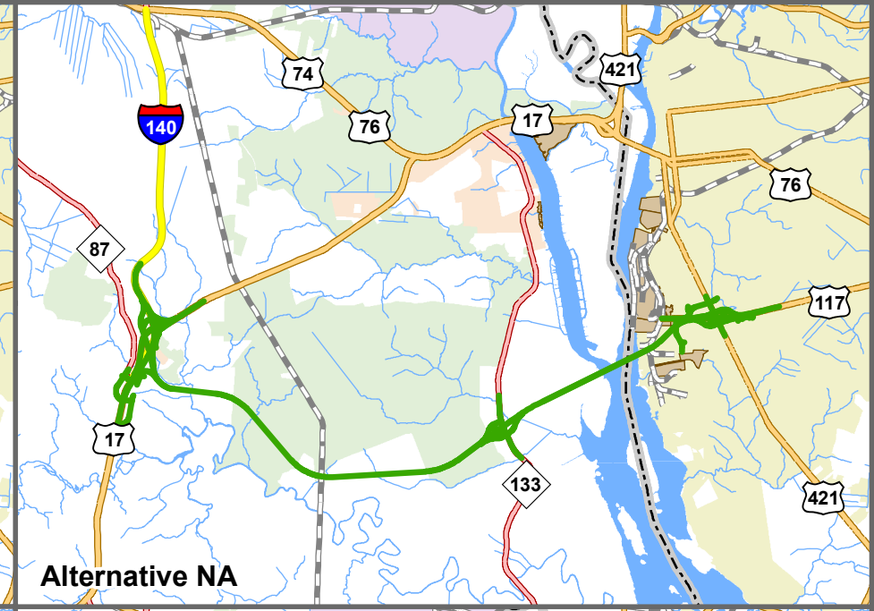
Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

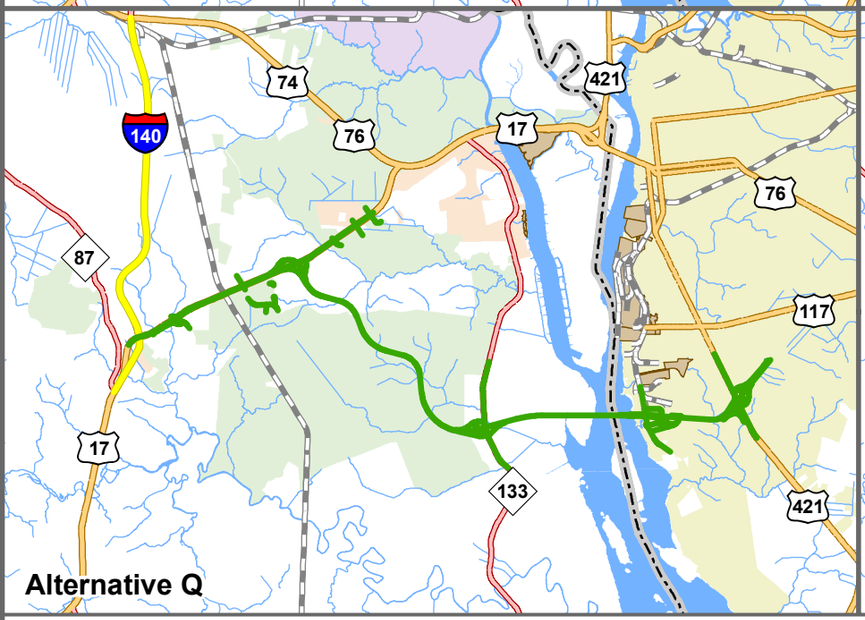
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

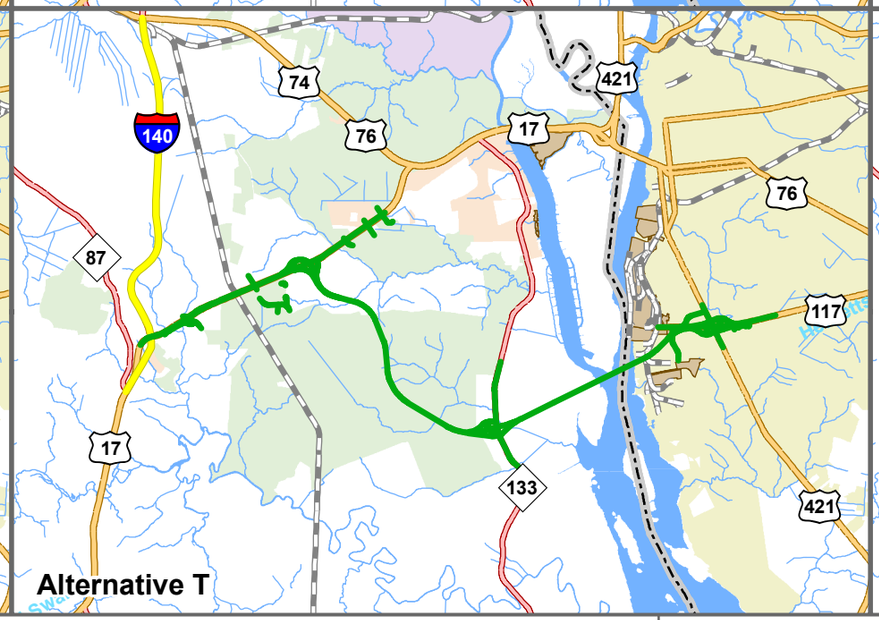
PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

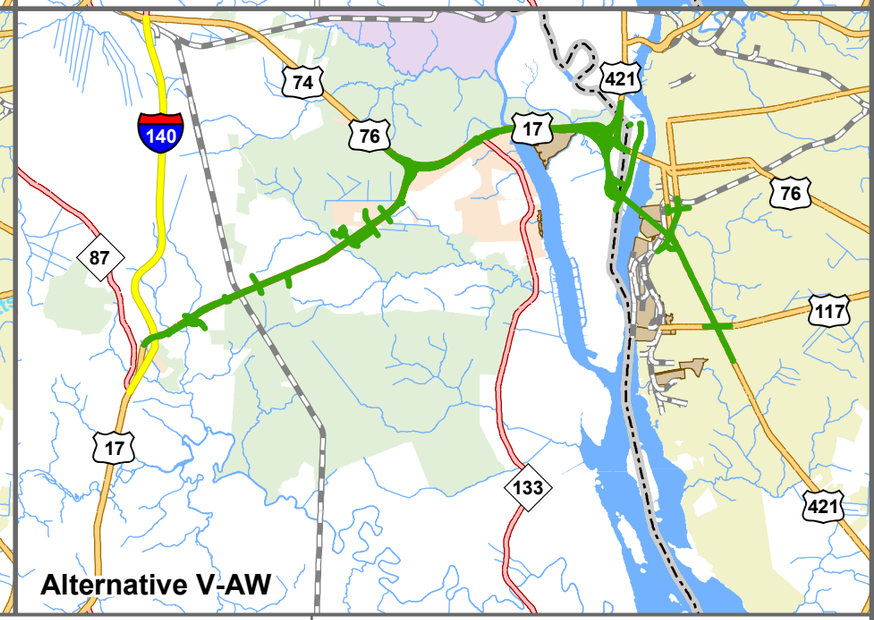












Legend

- Project Study Area
- Alternative Centerlines
- Railroad
- Port of Wilmington
- County Boundary

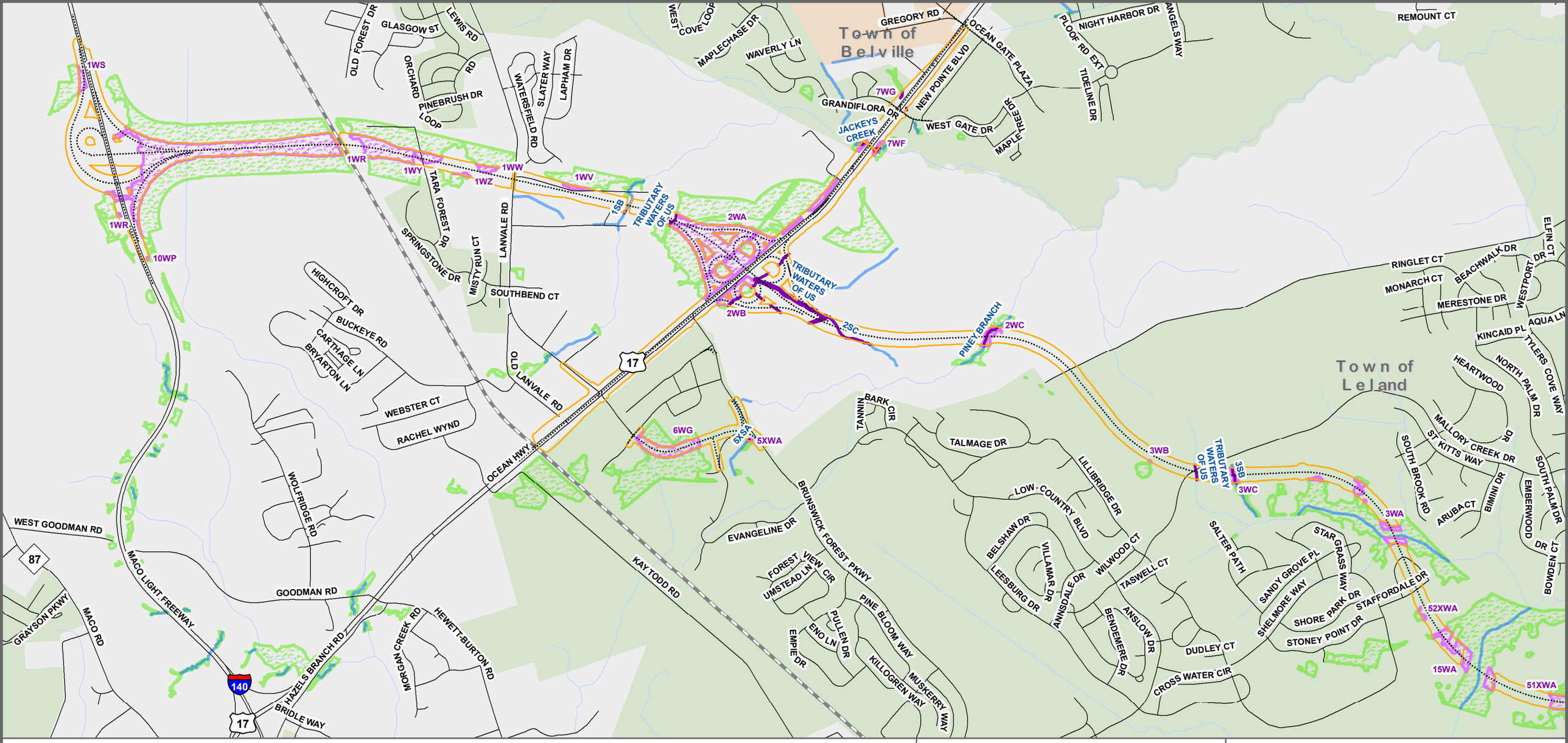
FIGURE 2
CURRENT DETAILED STUDY ALTERNATIVES

0 1 2 4
Miles

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative B Centerline
- Alternative B Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

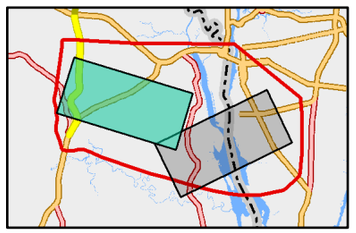


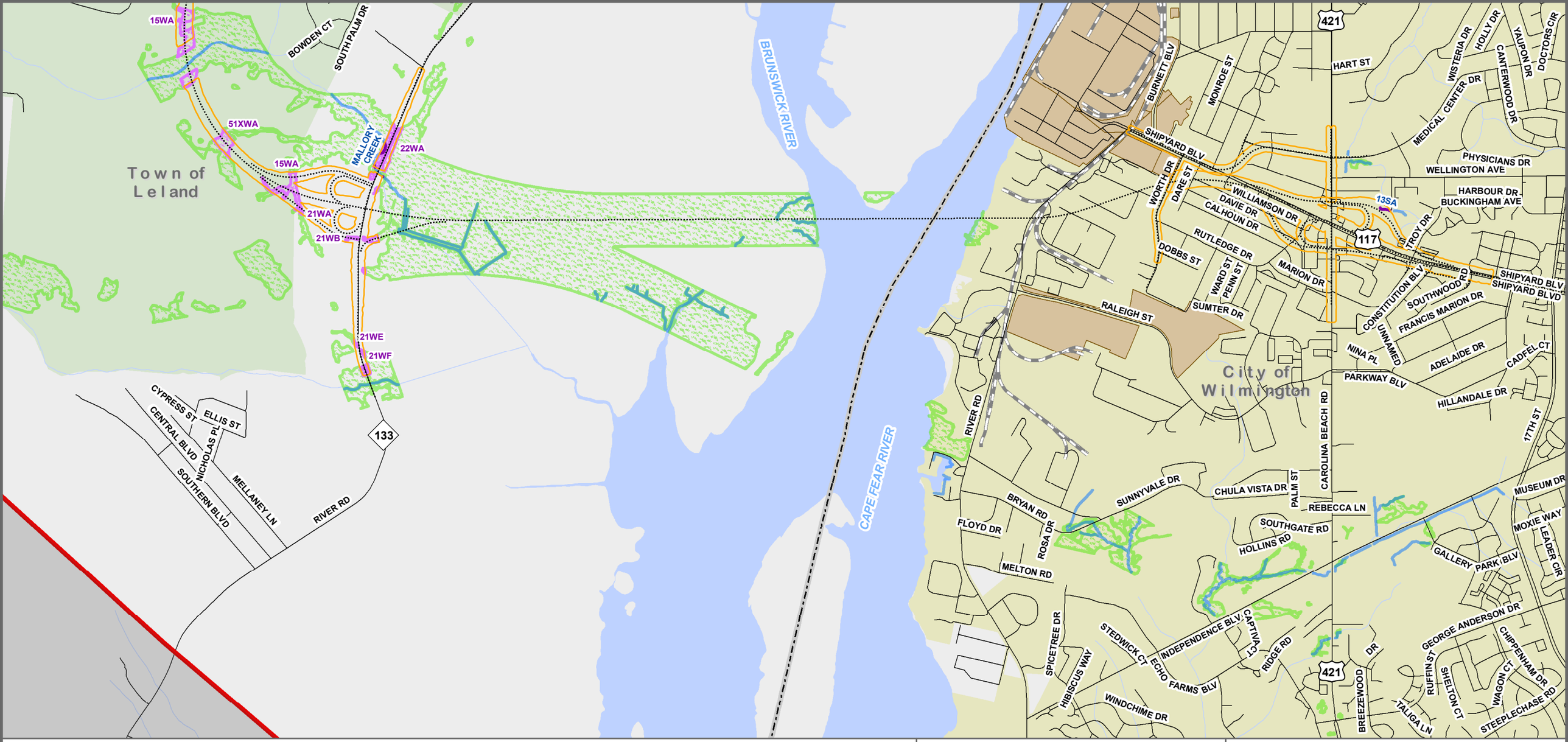
FIGURE 3a
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE B

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative B Centerline
- Alternative B Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

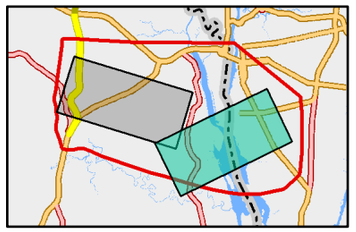


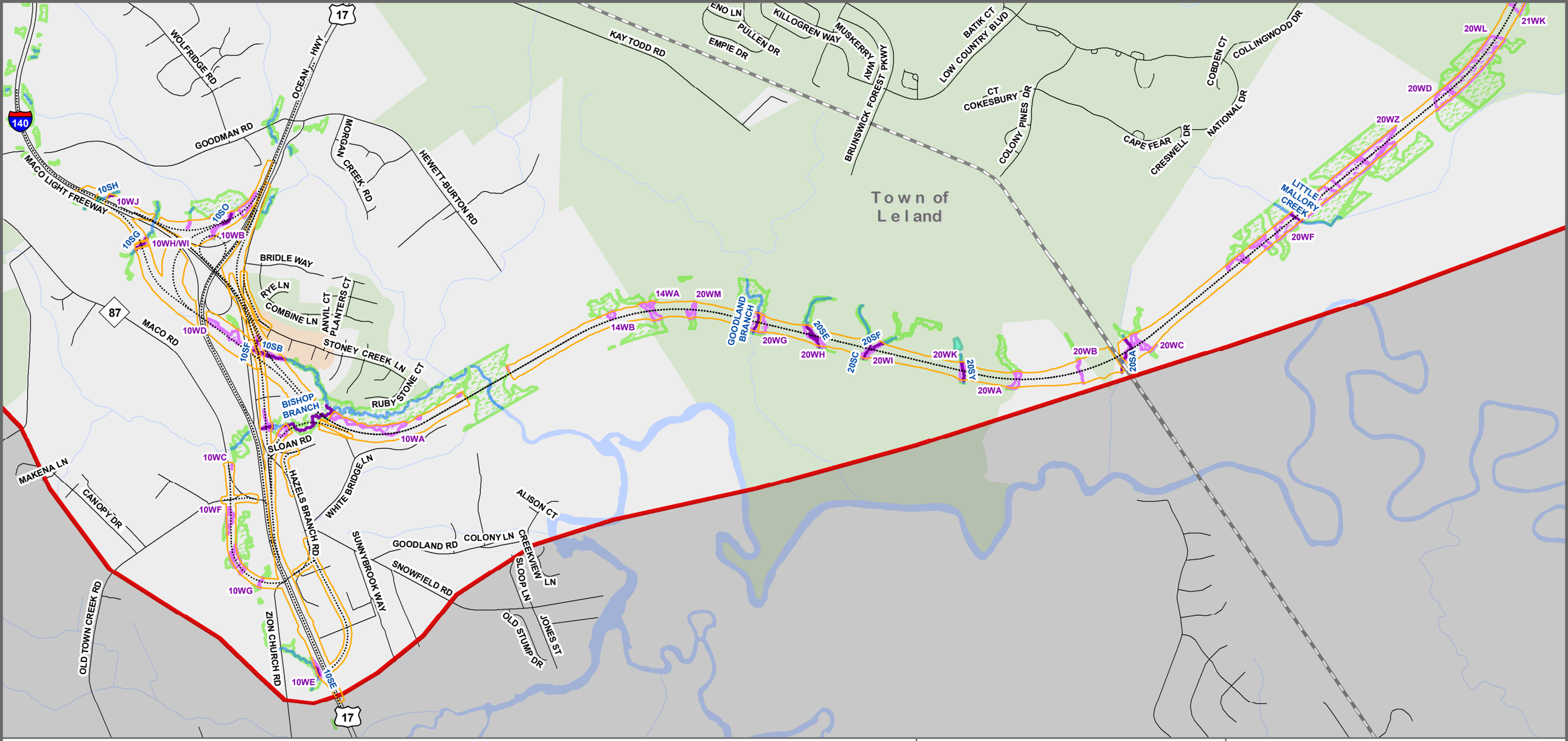
FIGURE 3b
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE B

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative M Avoidance Centerline
- Alternative M Avoidance Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

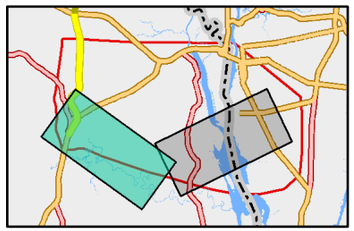


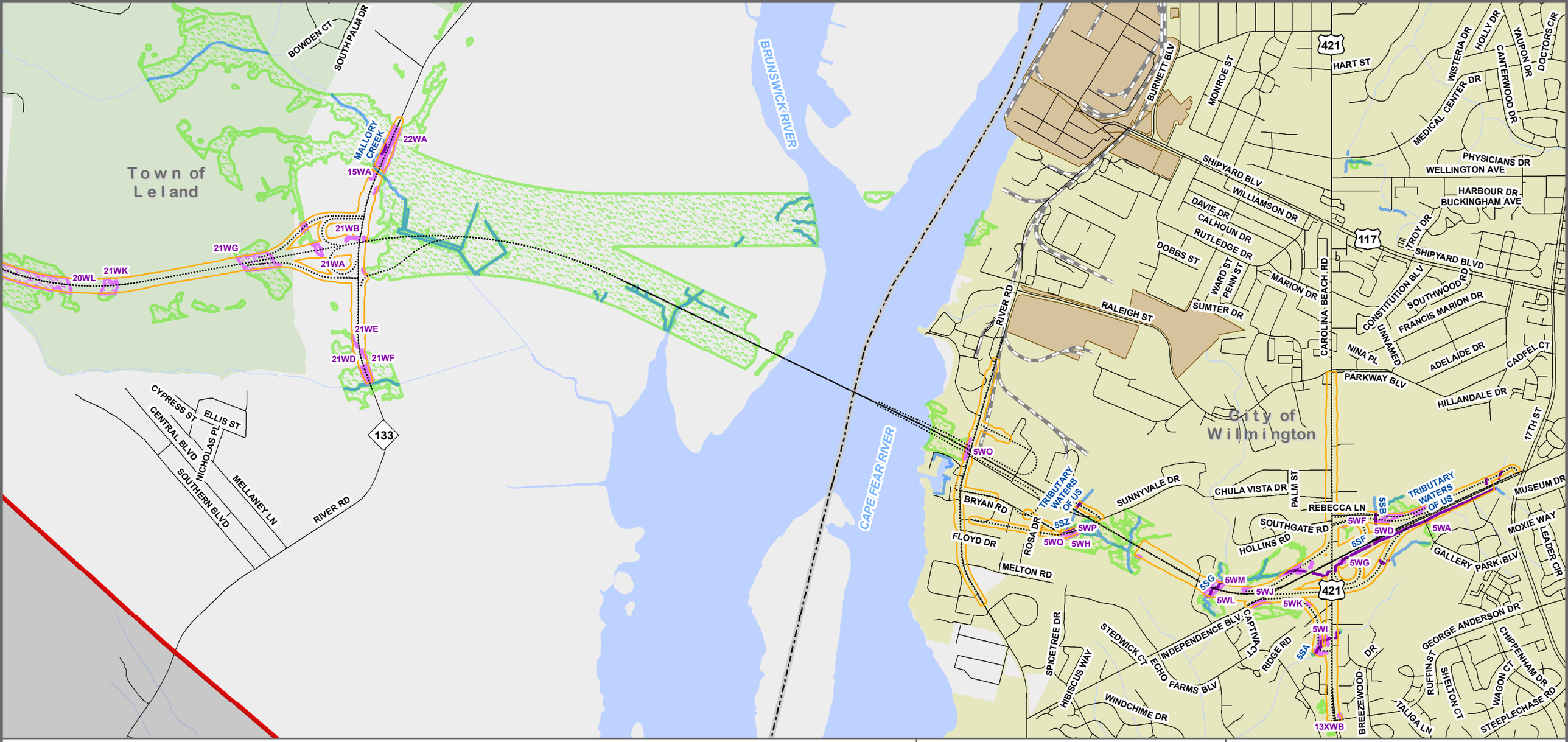
FIGURE 3c
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE M AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative M Avoidance Centerline
- Alternative M Avoidance Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

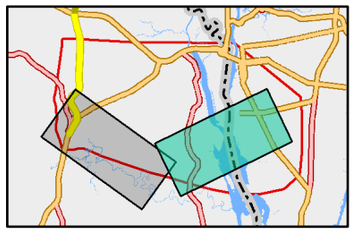


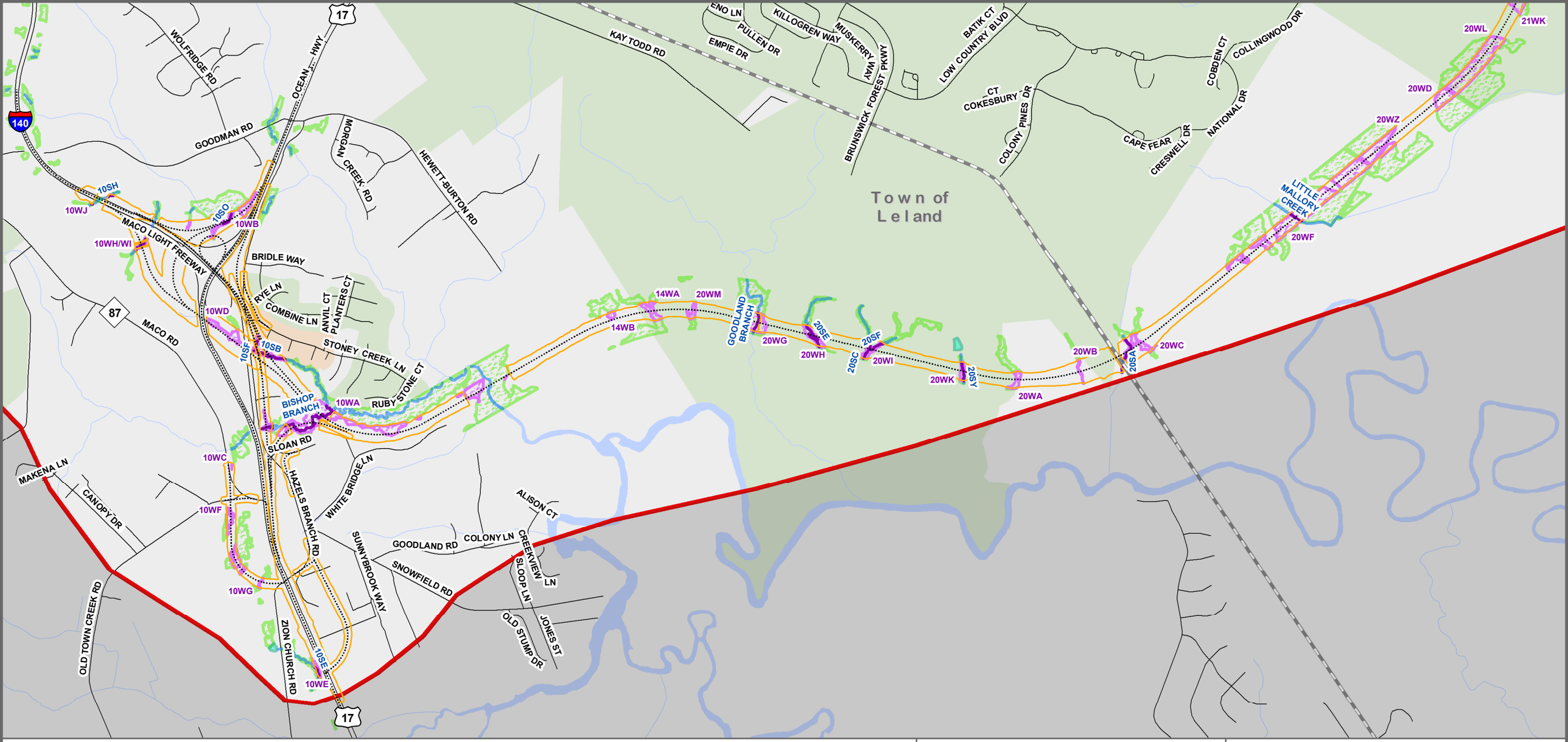
FIGURE 3d
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE M AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative N Avoidance Centerline
- Alternative N Avoidance Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

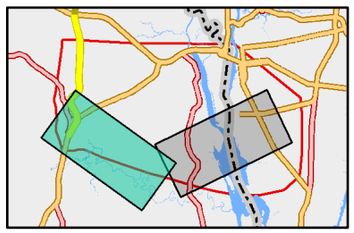


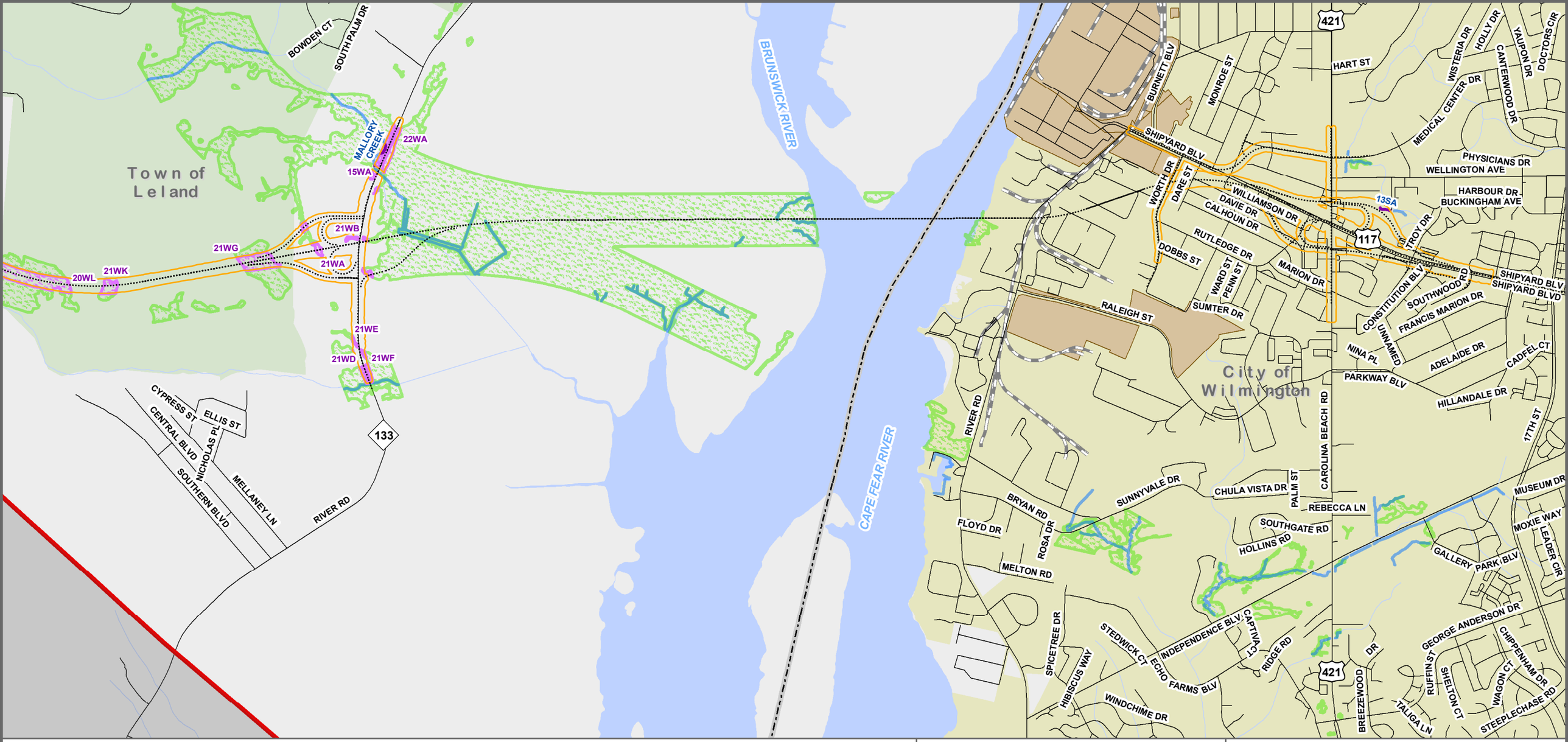
FIGURE 3e
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE N AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative N Avoidance Centerline
- Alternative N Avoidance Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

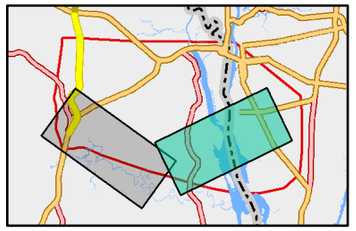


FIGURE 3f
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE N AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Town of Belville

Town of Leland

MACO LIGHT FREEWAY
OLD FOREST DR
GLASGOW ST
LEWIS RD
ORCHARD RD
PINEBRUSH DR LOOP
WATERSFIELD RD
SLATER WAY
LAPHAM DR
WEST COVE LOOP
MAPLECHASE DR
WAVERLY LN
GREGORY RD
17
OCEAN HWY
OCEAN GATE PLAZA
NEW POINTE BLVD
NIGHT HARBOR DR
PLOOF RD EXT
TIDELINE DR
ANGELS WAY
REMOUNT CT
7WG
GRANDIFLORA DR
JACKEYS CREEK
7WF
WEST GATE DR
MAPLE TREE DR
TARA FOREST DR
SPRINGSTONE DR
MISTY RUN CT
LANVALE RD
SOUTHBEND CT
21XWA
TRIBUTARY WATERS OF US
2WA
2WB
2WC
PINEY BRANCH
HIGHCROFT DR
BUCKEYE RD
CARTHAGE LN
BRYARTON LN
OLD LANVALE RD
WEBSTER CT
RACHEL WYND
6WG
5XSA
5XWA
6WE
TANNIN BARK CIR
TALMAGE DR
3WB
TRIBUTARY WATERS OF US
3SB
3WC
3WA
3SC
52XWA
15WA
51XWA
RINGLET CT
BEACHWALK DR
ELFIN CT
MONARCH CT
WESTPORT DR
MERESTONE DR
AQUA LN
KINCAID PL
TYLERS COVE WAY
HEARTWOOD
NORTH PALM DR
MALLORY CREEK DR
ST KITTS WAY
SOUTH BROOK RD
BIMINI DR
SOUTH PALM DR
EMBERWOOD DR
ARUBA CT
BOWDEN CT
WEST GOODMAN RD
87
140
GRAYSON PKWY
MACO RD
GOODMAN RD
6WC
6WA
3XWA
MORGAN BRANCH
MORGAN CREEK RD
HEWETT-BURTON RD
10WB
HAZELS BRANCH RD
WOLFRIDGE RD
OCEAN HWY
EVANGELINE DR
BRUNSWICK FOREST PKWY
KAY TODD RD
FOREST VIEW CIR
UMSTEAD LN
PULLEN DR
ENO LN
EMPIE DR
PINE BLOOM WAY
KILLOGREN WAY
MUSKERRY WAY
LOW COUNTRY BLVD
LILLIBRIDGE DR
BELSHAW DR
LEESBURG DR
VILLAMAR DR
ANNSDALE DR
WILWOOD CT
TASWELL CT
BENDEMERE DR
ANSLOW DR
DUDLEY CT
CROSS WATER CIR
SALTER PATH
STAR GRASS WAY
SANDY GROVE PL
SHELMORE WAY
SHORE PARK DR
STONEY POINT DR
STAFFORDALE DR

Legend

- Project Study Area
- Alternative Q Centerline
- Alternative Q Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

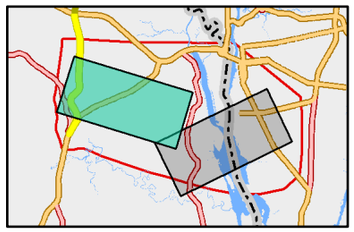


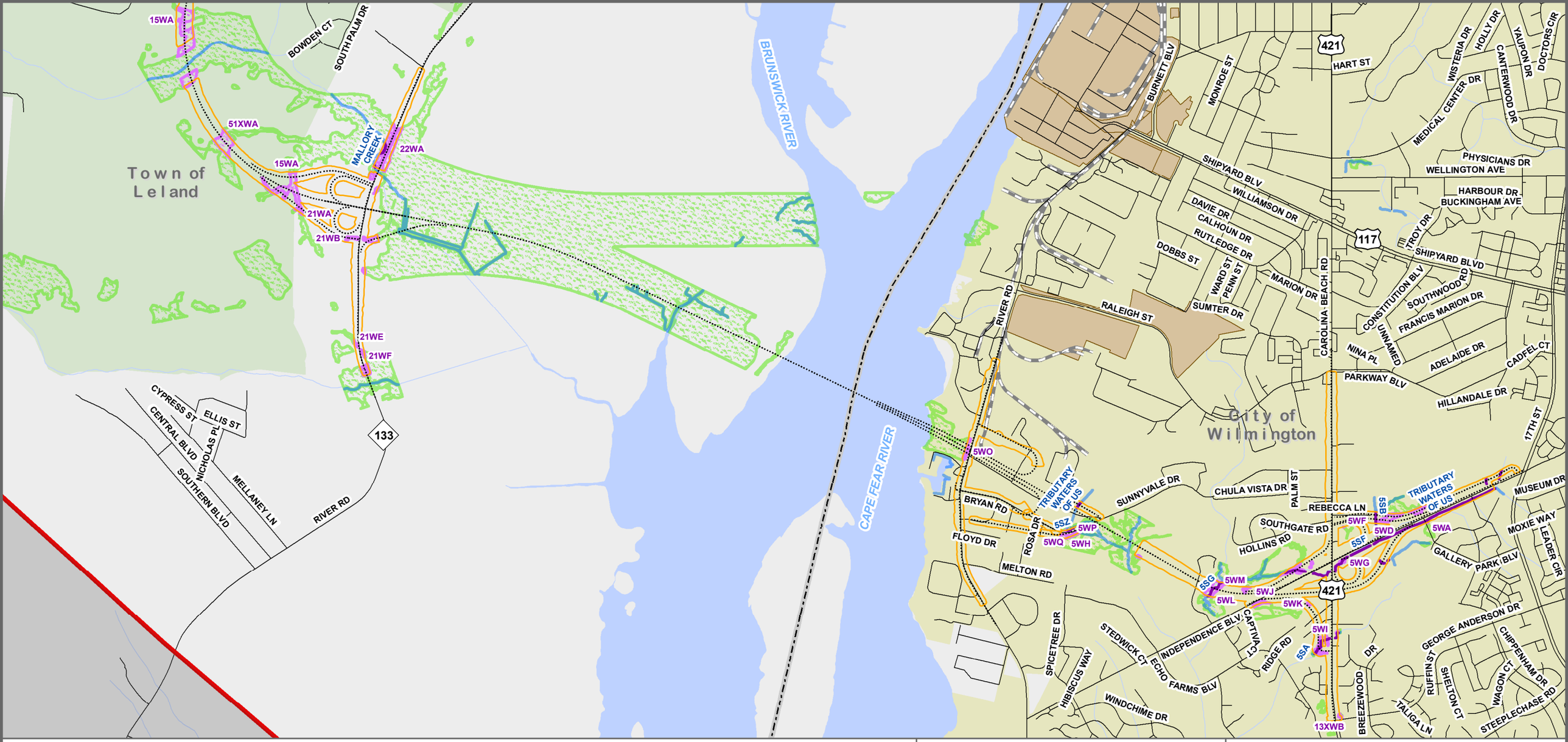
FIGURE 3g
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE Q

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative Q Centerline
- Alternative Q Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

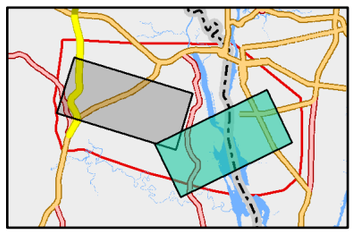


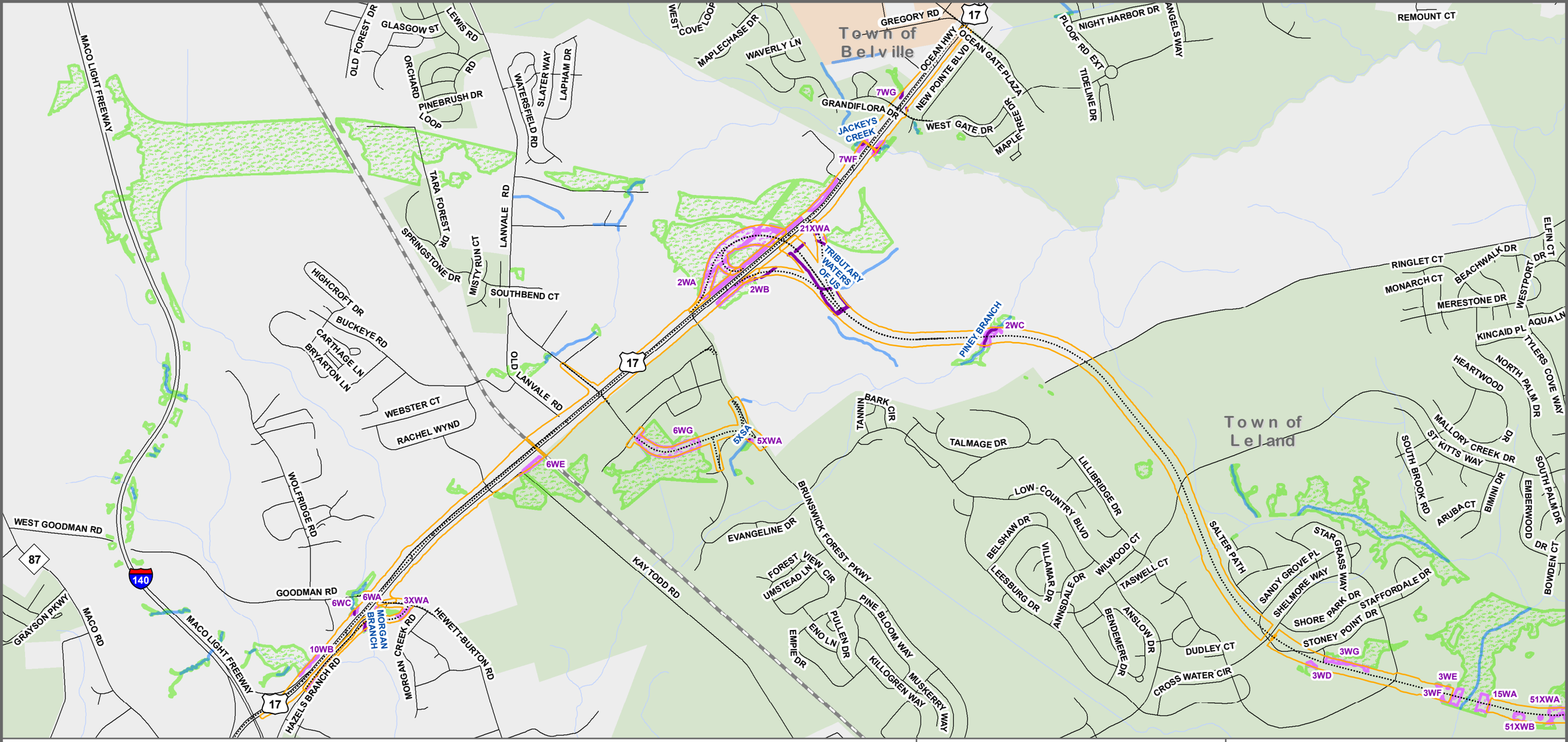
FIGURE 3h
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE Q

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative T Centerline
- Alternative T Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

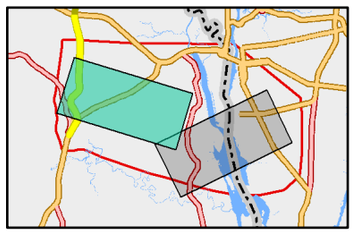


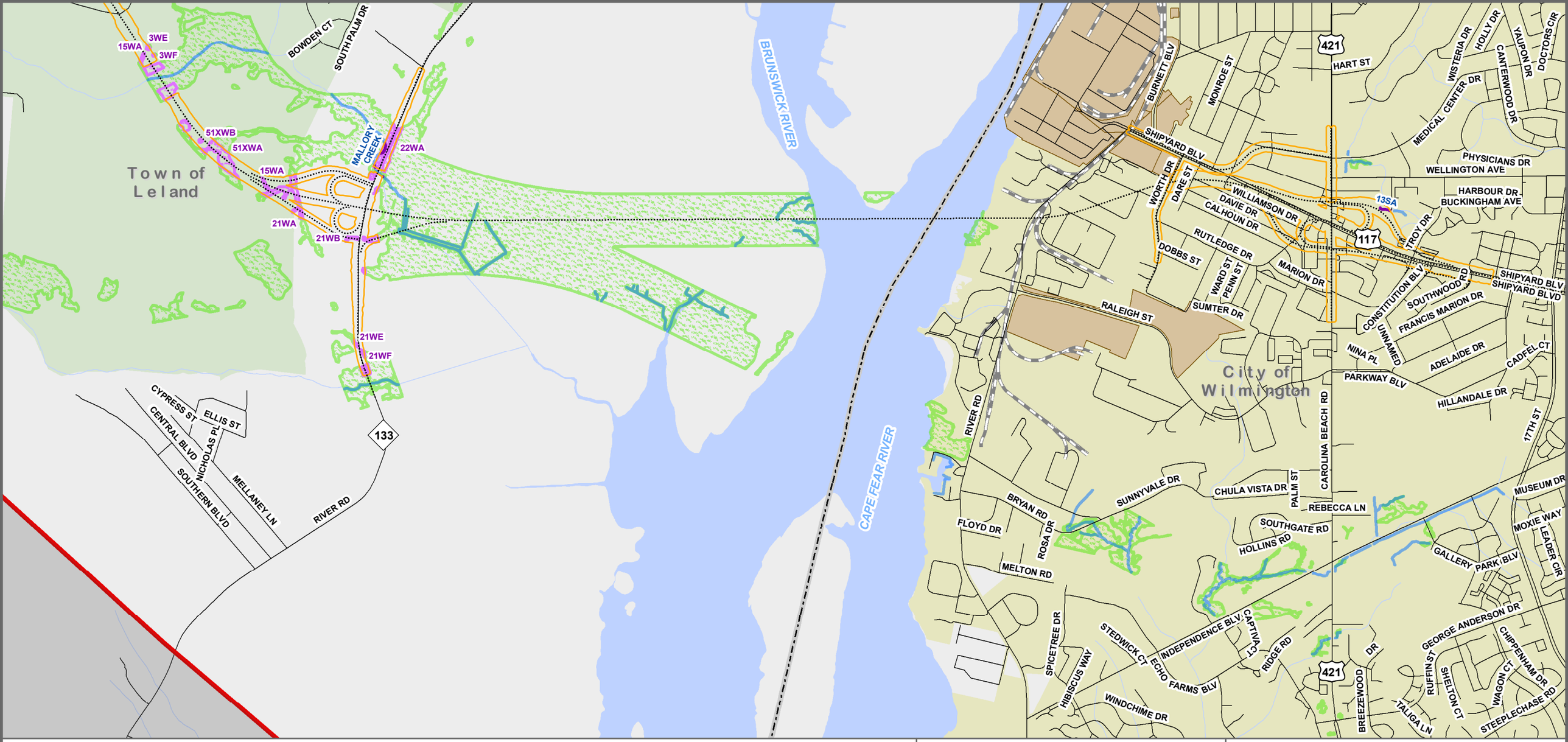
FIGURE 3i
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE T

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative T Centerline
- Alternative T Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

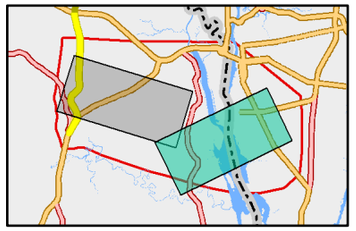


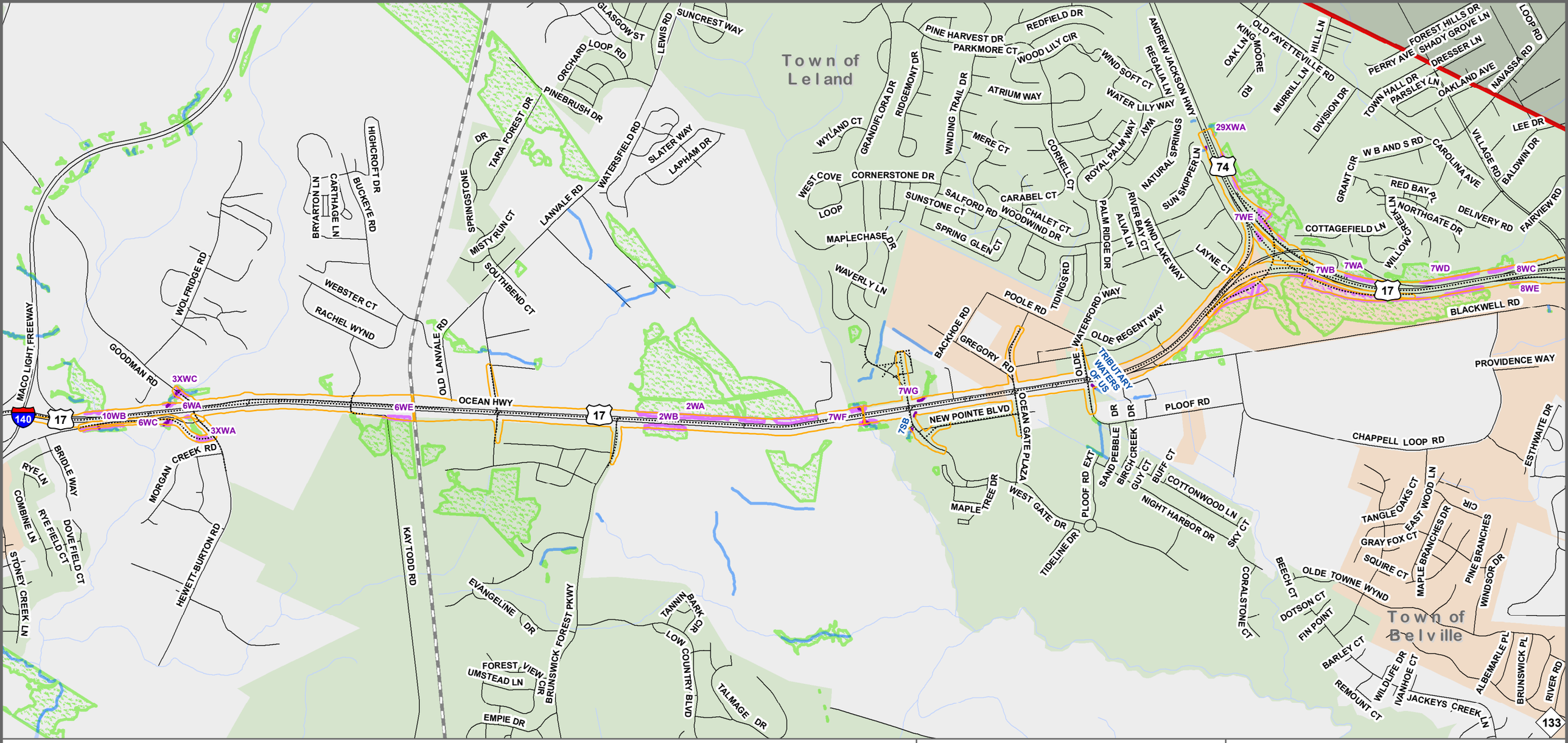
FIGURE 3j
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE T

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative V-AW Centerline
- Alternative V-AW Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

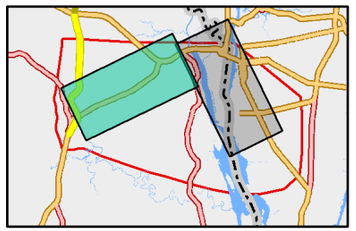


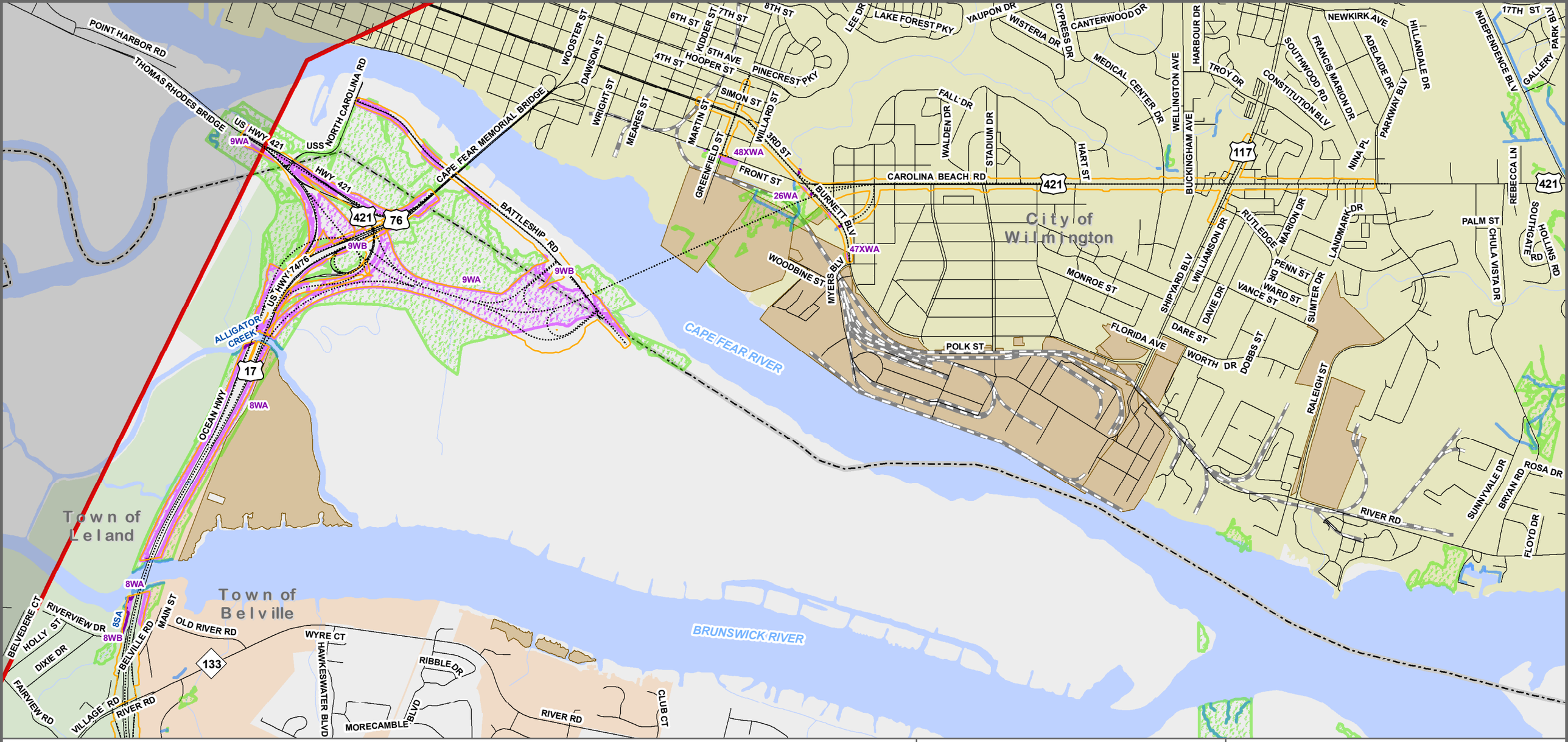
FIGURE 3k
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE V-AW

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Alternative V-AW Centerline
- Alternative V-AW Slope Stakes Plus 40 Feet
- Port of Wilmington
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Stream Impact
- Pond Impact
- Wetland Impact

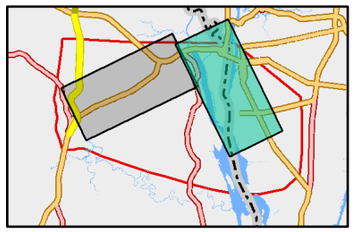


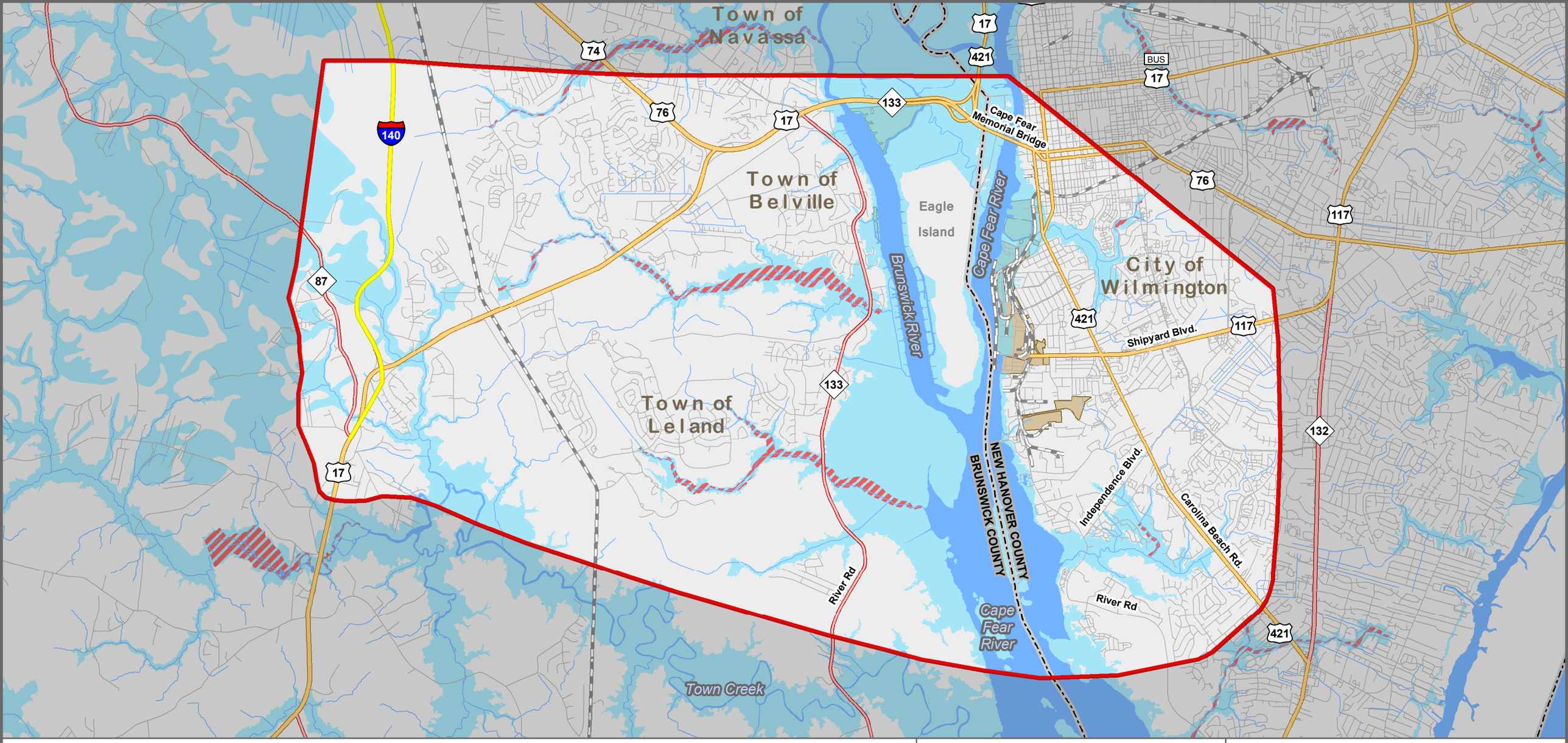
FIGURE 3I
STREAMS, PONDS, AND WETLANDS IMPACTS - ALTERNATIVE V-AW

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Railroad
- Port of Wilmington
- County Boundary

Flood Hazard Zones

- Regulatory Floodway
- 100-year Floodplain

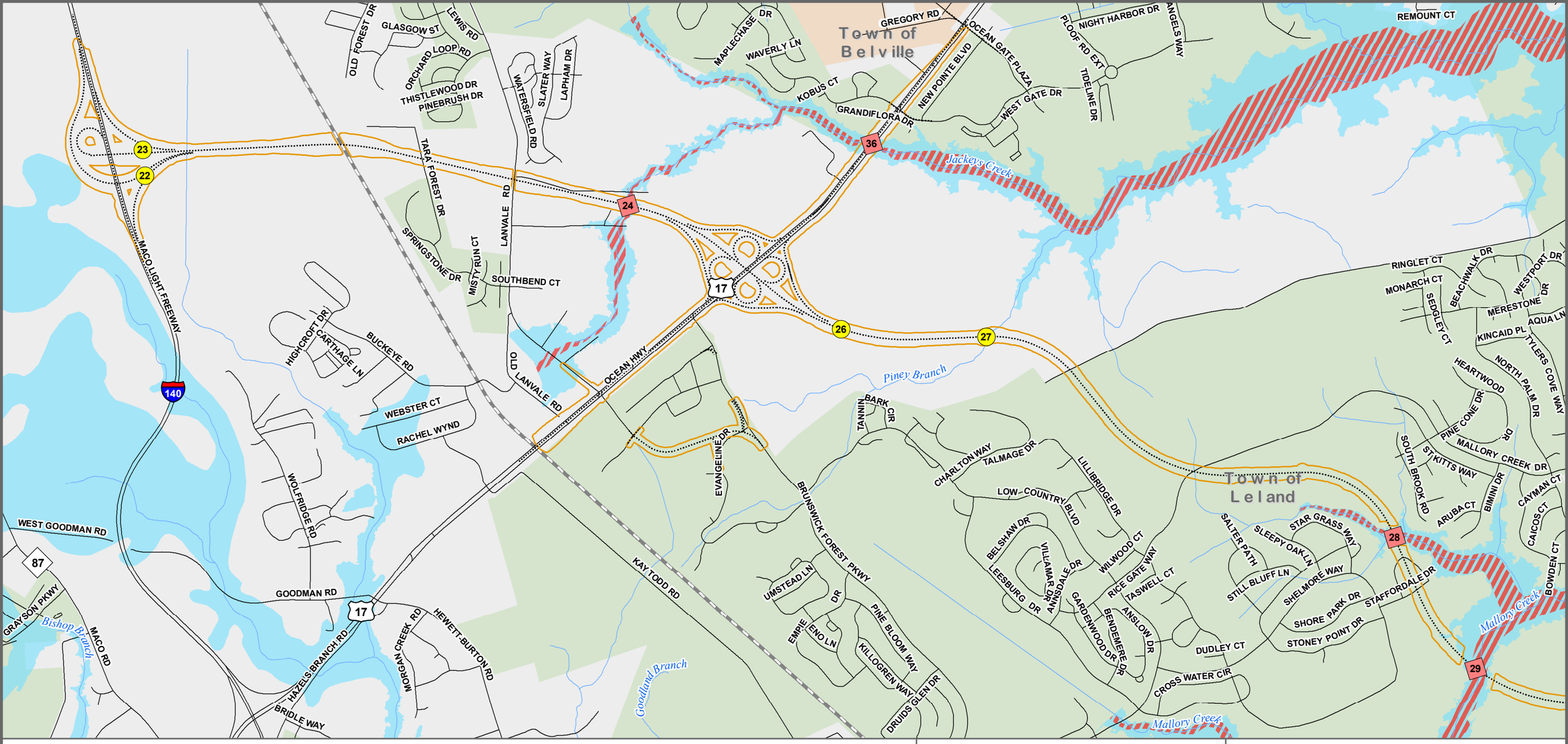
FIGURE 4
FLOODPLAINS AND FLOODWAYS

0 0.5 1 2
Miles

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- Alternative B Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

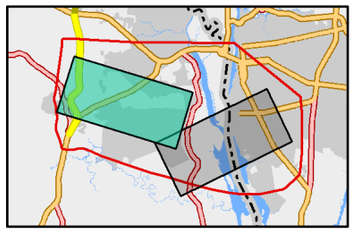


FIGURE 5a
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE B

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Town of Leland

City of Wilmington

Mallory Creek

Little Mallory Creek

Brunswick River

Cape Fear River

BOWDEN CT
SOUTH PALM DR
RIVER RD
CYPRESS ST
ELLIS ST
CENTRAL BLVD
SYKES ST
NICHOLAS PL
SOUTHERN BLVD
MELLANEY LN
29
33
34
10
11A
11
35
133
BURNETT BLV
MONROE ST
421
HART ST
WISTERIA DR
HOLLY DR
MEDICAL CENTER DR
CAMERON CT
PHYSICIANS DR
WELLINGTON AVE
BUCKINGHAM AVE
HARBOUR DR
FLINT DR
DARE ST
SHIPYARD BLV
WILLIAMSON DR
DAVIE DR
CALHOUN DR
RUTLEDGE DR
DOBBS ST
MARION DR
WARD ST
PENN ST
SUMTER DR
RALEIGH ST
117
TROY DR
SHIPYARD BLVD
CONSTITUTION BLV
SOUTHWOOD DR
FRANCIS MARION DR
UNNAMED
NEWKIRK AVE
CADFEL CT
NINA PL
ADELAIDE DR
PARKWAY BLV
HILLANDALE DR
17TH ST
CAROLINA BEACH RD
RIVER RD
SUNNYVALE DR
CHULA VISTA DR
PALM ST
REBECCA LN
SOUTHGATE RD
HOLLINS RD
MUSEUM DR
LEADER CIR
GALLERY PARK BLV
BRYAN RD
FLOYD DR
ROSA DR
MELTON RD
13
INDEPENDENCE BLV
CAPTIVA CT
CRAB APPLE LN
RIDGE RD
GEORGE ANDERSON DR
CHIPPENHAM DR
WAGON CT
SHELTON CT
RUFFIN ST
STEEPLECHASE RD
SPICETREE DR
HIBISCUS WAY
STEDWICK CT
ECHO FARMS BLV
WINDCHIME DR
RYANS CT
TALIGA LN
421

Legend

- Project Study Area
- Centerline
- Alternative B Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

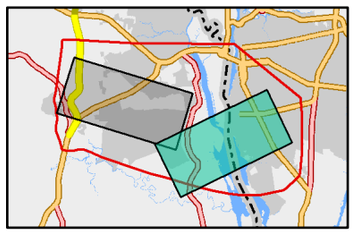


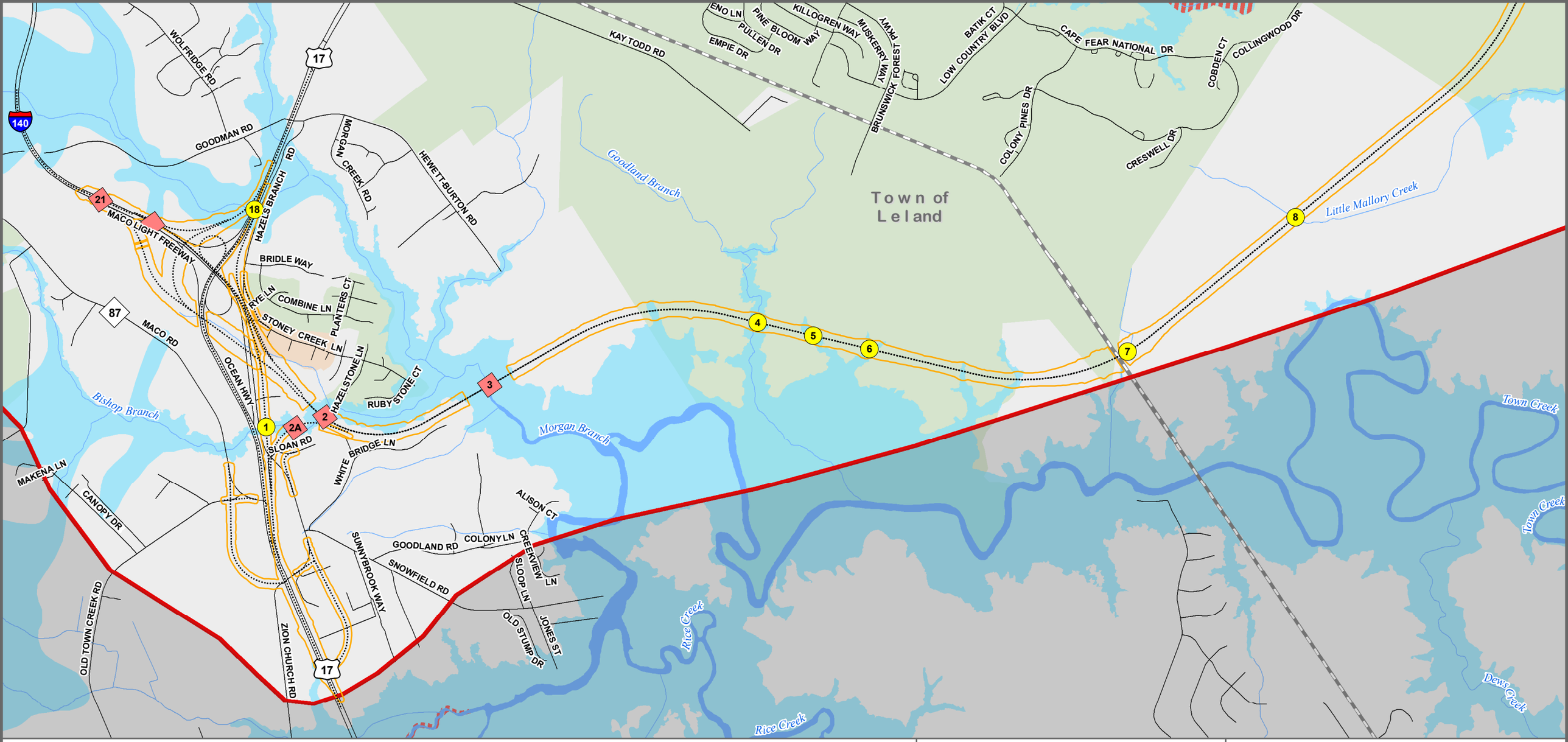
FIGURE 5b
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE B

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- Alternative M Avoidance Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

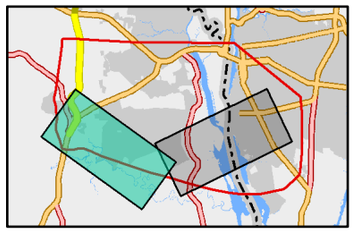


FIGURE 5c
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE M AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Legend

- Project Study Area
- Centerline
- Alternative M Avoidance Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

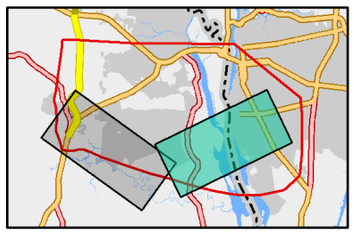


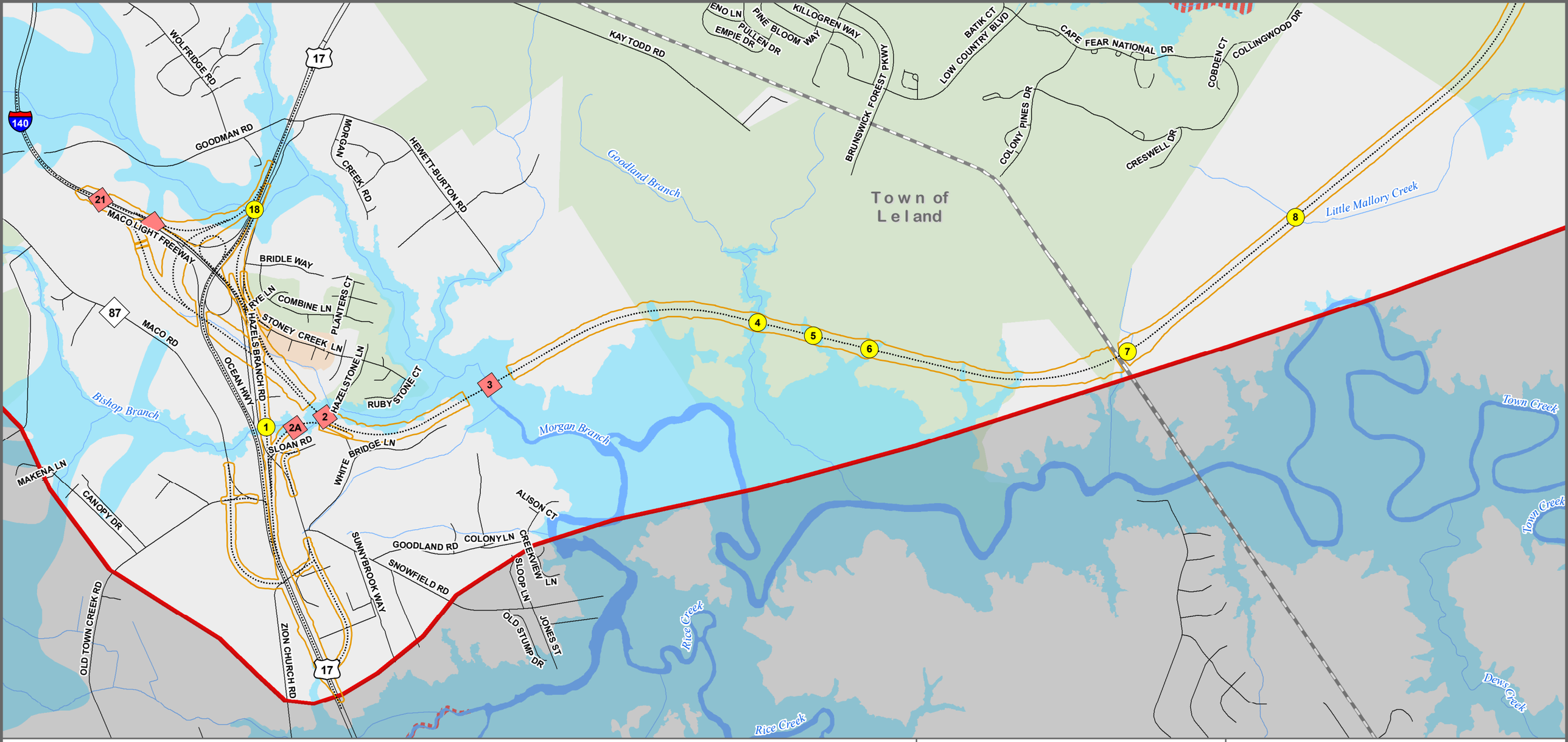
FIGURE 5d
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE M AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- Alternative NA Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

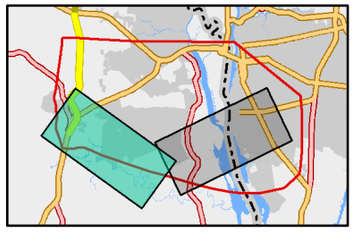


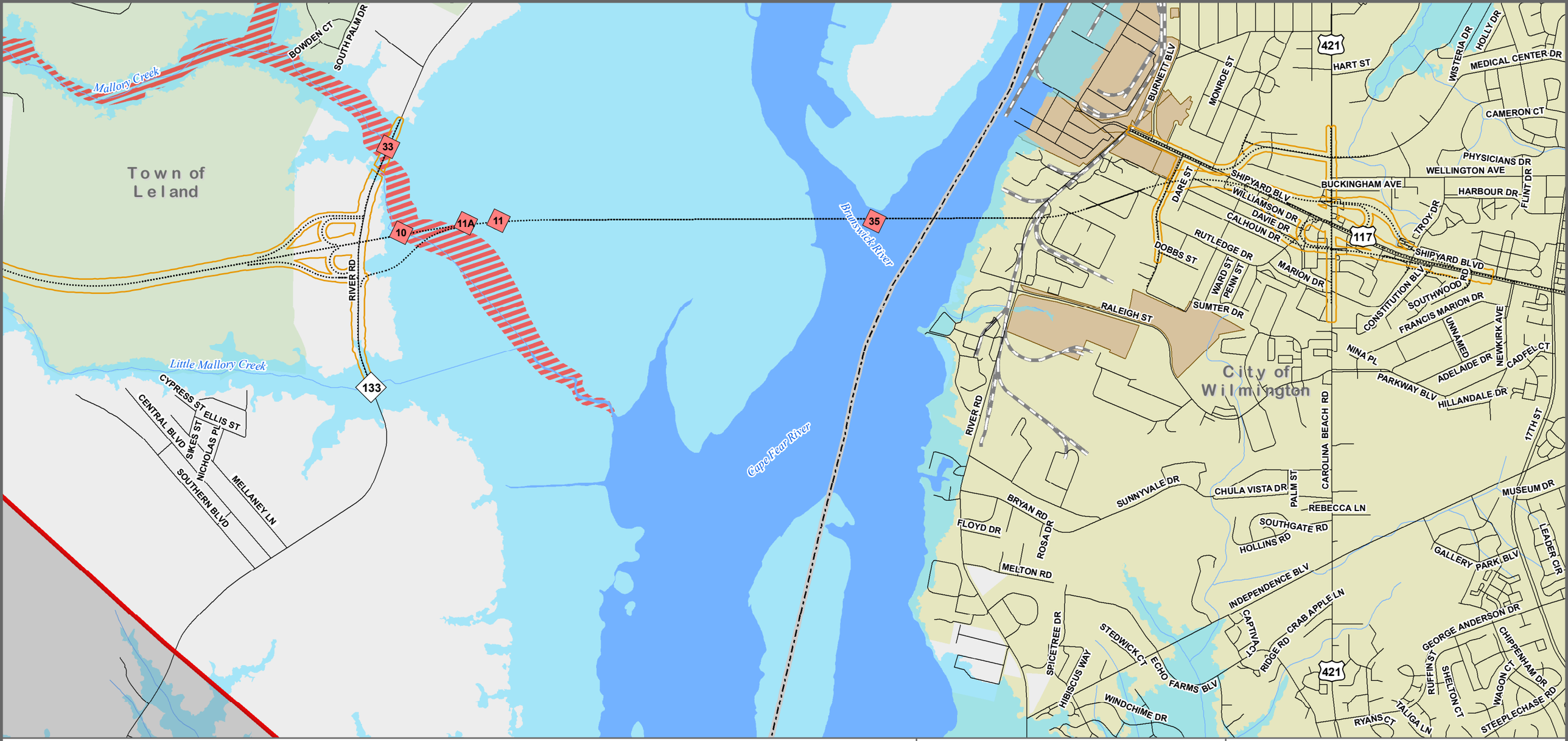
FIGURE 5e
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE N AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- Alternative NA Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

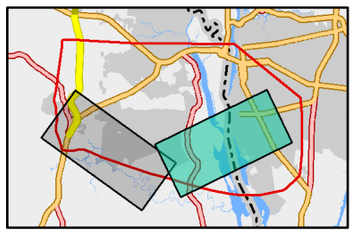


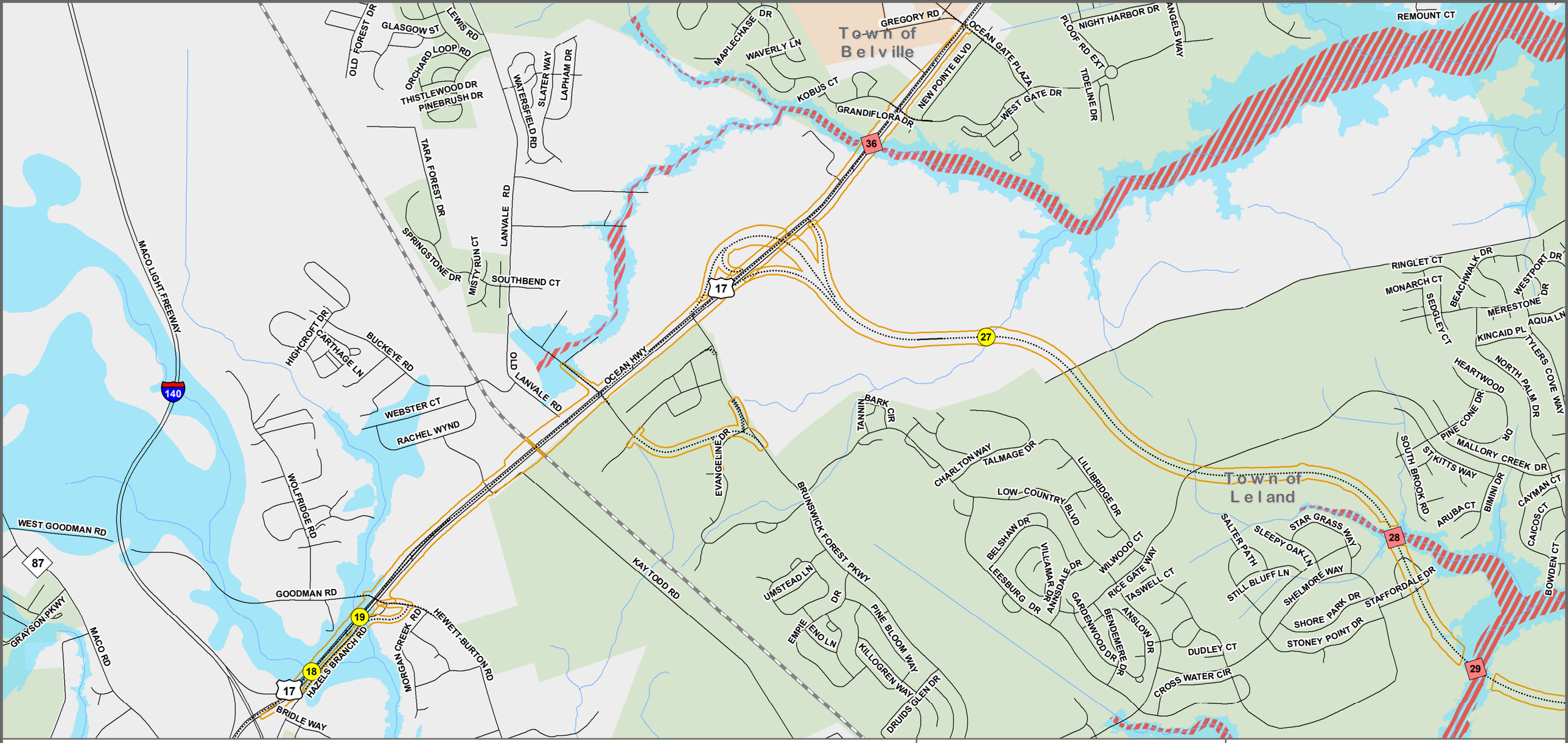
FIGURE 5f
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE N AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- Alternative Q Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

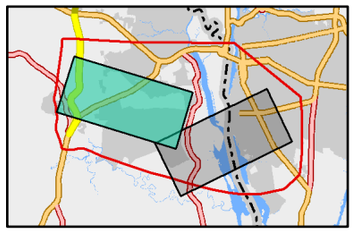


FIGURE 5g
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE Q

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Legend

- Project Study Area
- Centerline
- Alternative Q Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

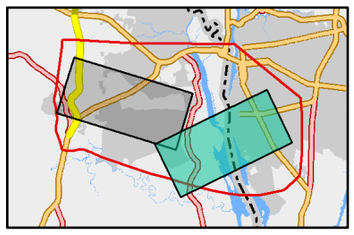


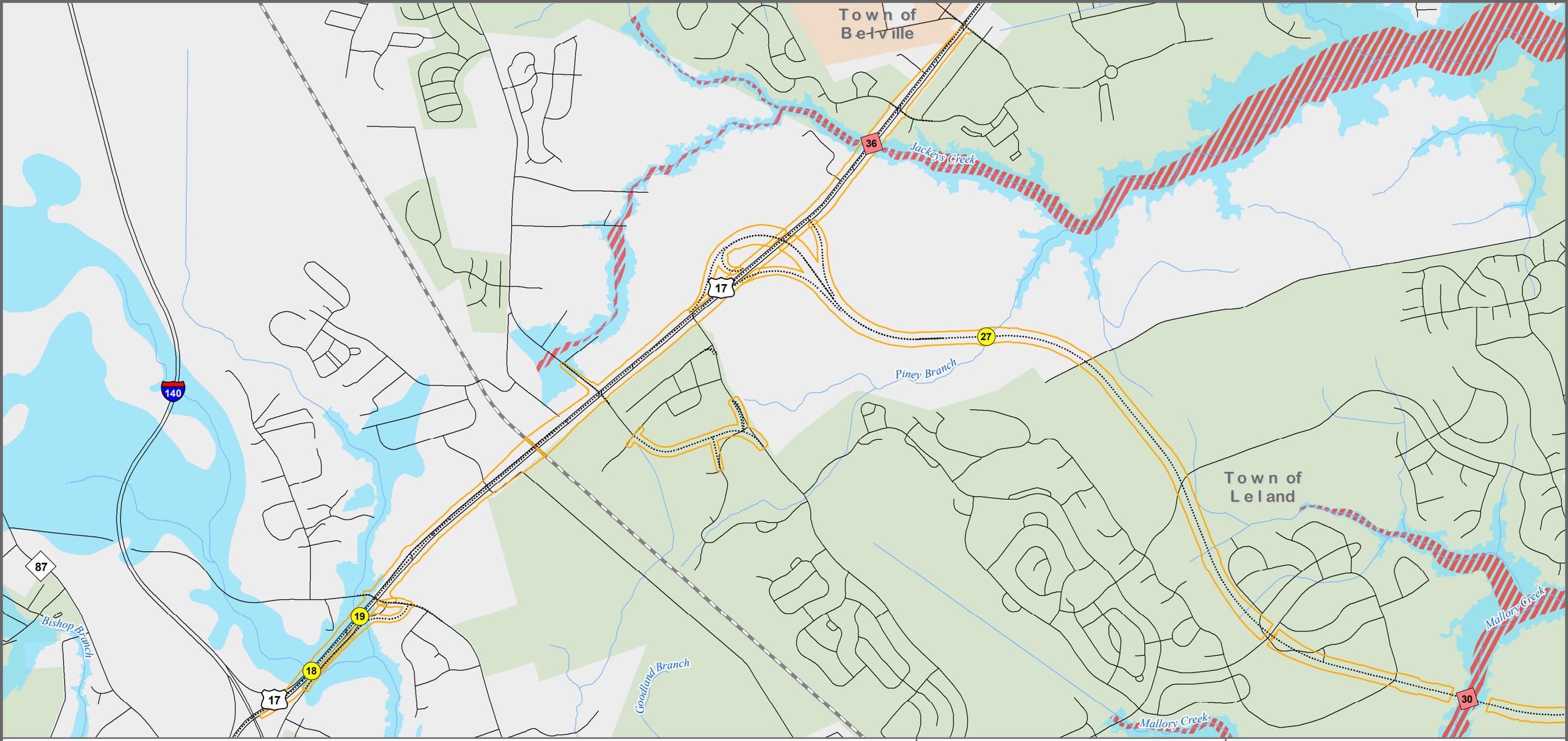
FIGURE 5h
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE Q

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- Alternative T Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

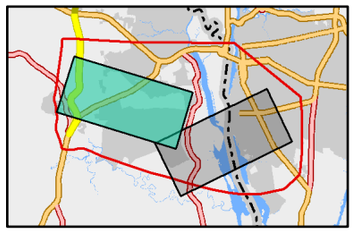


FIGURE 5i
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE T

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Mallory Creek

30

33

Town of Leland

34

10

11A

11

35

Brunswick River

421

117

City of Wilmington

Little Mallory Creek

133

Cape Fear River

421

Legend

- Project Study Area
- Centerline
- Alternative T Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

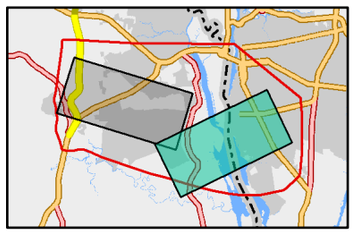


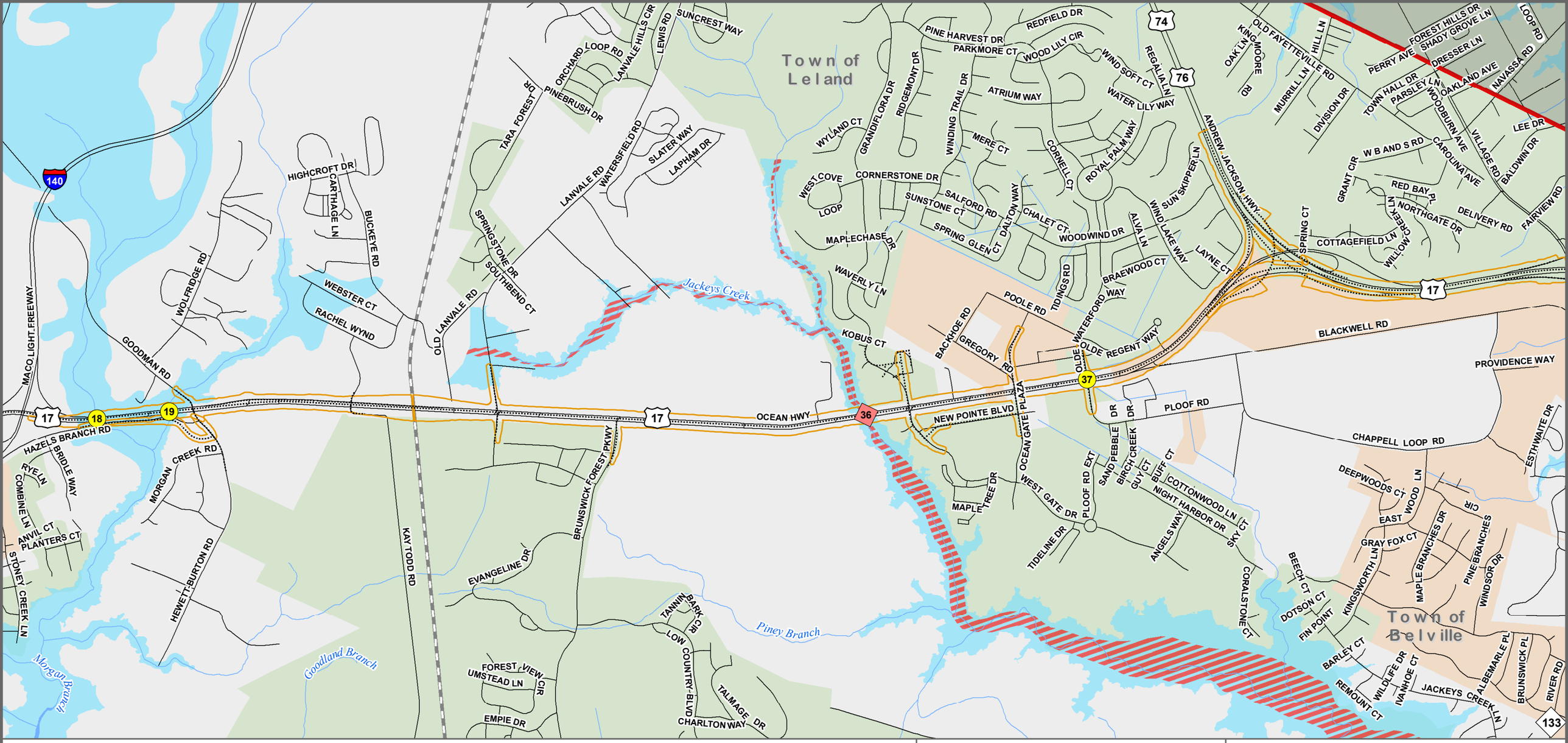
FIGURE 5j
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE T

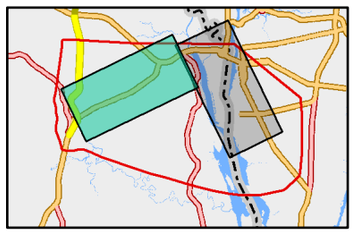
0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738





Legend

- Project Study Area
- Centerline
- Alternative V-AW Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

FIGURE 5k
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE V-AW

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Legend

- Project Study Area
- Centerline
- Alternative V-AW Slope Stakes Plus 40 Feet
- Bridge Crossing
- Culvert Crossing
- Regulatory Floodway
- 100-year Floodplain
- Port of Wilmington

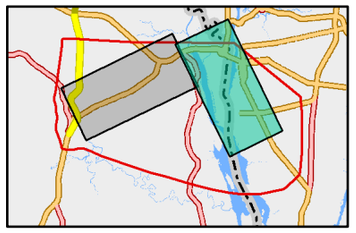


FIGURE 5I
FLOODPLAINS AND FLOODWAYS
ALTERNATIVE V-AW

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Town of Belville

Town of Leland

Jackeys Creek

Piney Branch

Bishop Branch

Goodland Branch

Mallory Creek

Mallory Creek

MACO LIGHT FREEWAY

OCEAN HWY

OLD LANVALE RD

LANVALE RD

MACO RD

HAZELS BRANCH RD

KAY TODD RD

BRUNSWICK FOREST PKWY

GRANDIFLORA DR

OCEAN GATE PLAZA

NEW POINTE BLVD

WEST GATE DR

GREGORY RD

NIGHT HARBOR DR

PLOOF RD EXT

TIDELINE DR

REMOUNT CT

MAPLECHASE DR

WAVERLY LN

KOBUS CT

OLD FOREST DR

GLASGOW ST

LEWIS RD

ORCHARD LOOP RD

THISTLEWOOD DR

PINEBRUSH DR

WATERSFIELD RD

SLATER WAY

LAPHAM DR

TARA FOREST DR

SPRINGSTONE DR

MISTY RUN CT

SOUTHBEND CT

HIGHCROFT DR

CARTHAGE LN

BUCKEYE RD

WEBSTER CT

RACHEL WYND

WOLFRIDGE RD

WEST GOODMAN RD

GOODMAN RD

GRAYSON PKWY

MORGAN CREEK RD

HEWETT-BURTON RD

BRIDLE WAY

EVANGELINE DR

UMSTEAD LN

DR

EMPIE

ENO LN

PINE BLOOM WAY

KILLOGREN WAY

DRUIDS GLEN DR

TANNIN

BARK CIR

CHARLTON WAY

TALMAGE DR

LILLIBRIDGE DR

LOW-COUNTRY BLVD

BELSHAW DR

LEESBURG DR

VILLAMAR DR

AMNSDALE DR

WILWOOD CT

RICE GATE WAY

TASWELL CT

GARDENWOOD DR

BENDEMERE DR

ANSLOW DR

DUDLEY CT

CROSS WATER CIR

SALTER PATH

STILL BLUFF LN

SLEEPY OAK LN

STAR GRASS WAY

SHELMORE WAY

SHORE PARK DR

STONEY POINT DR

STAFFORDALE DR

RINGLET CT

MONARCH CT

SEDGLEY CT

BEACHWALK DR

WESTPORT DR

MERESTONE DR

AQUA LN

KINCAID PL

TYLERS COVE WAY

HEARTWOOD

NORTH PALM DR

PINE CONE DR

MALLORY CREEK DR

ST KITTS WAY

SOUTH BROOK RD

BIMINI DR

ARUBA CT

CAYMAN CT

CAICOS CT

BOWDEN CT

140

17

17

87

Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative B Right-of-Way
- Port of Wilmington

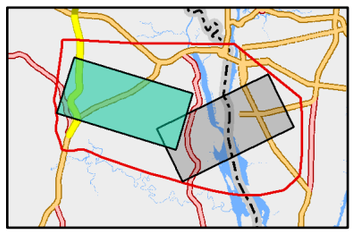


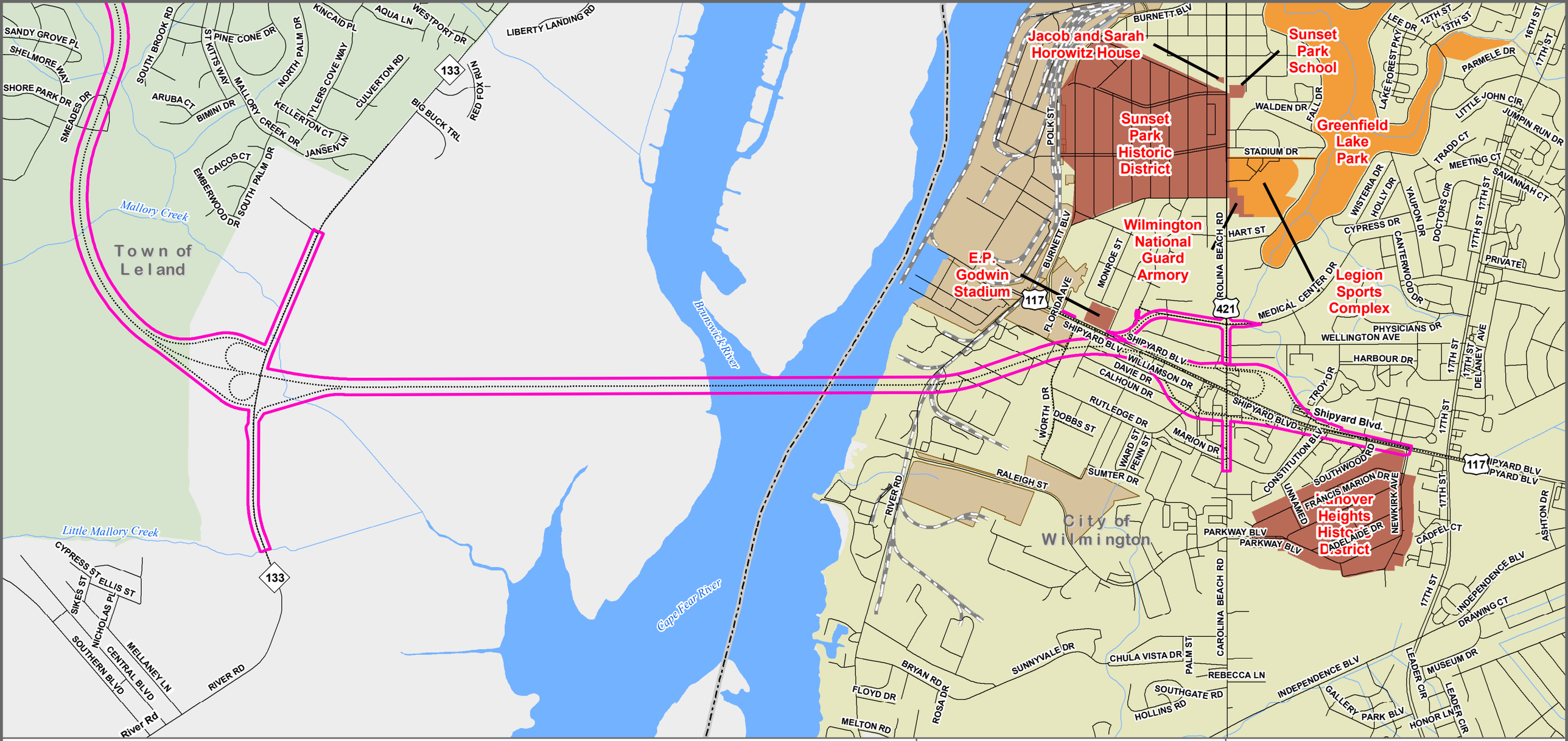
FIGURE 6a
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE B

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative B Right-of-Way
- Port of Wilmington

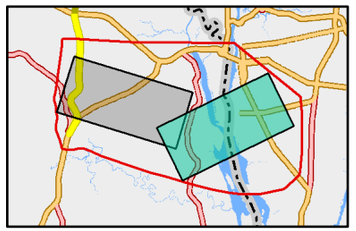


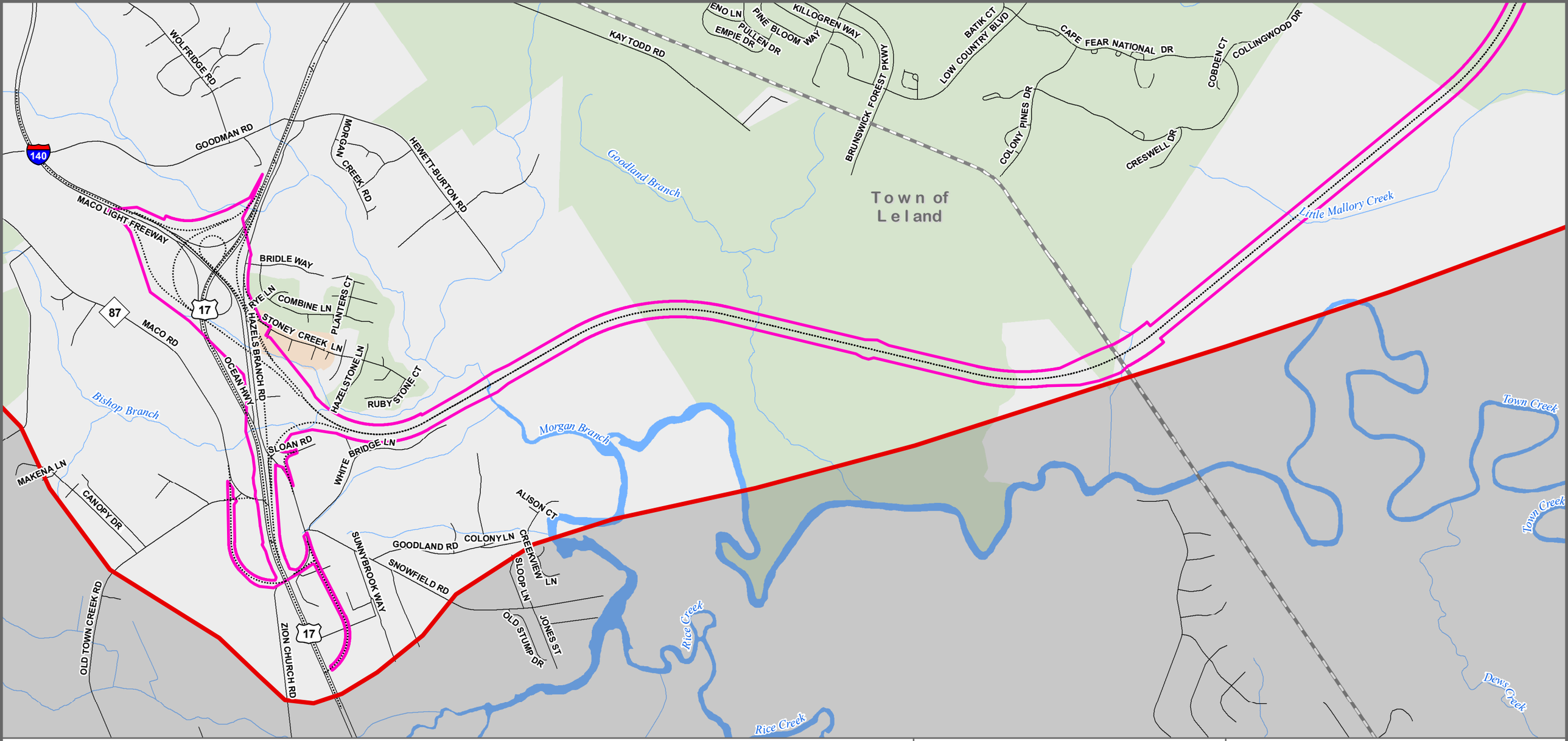
FIGURE 6b
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE B

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative M Avoidance Right-of-Way
- Port of Wilmington

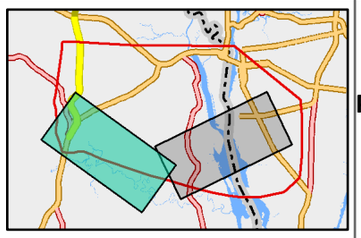


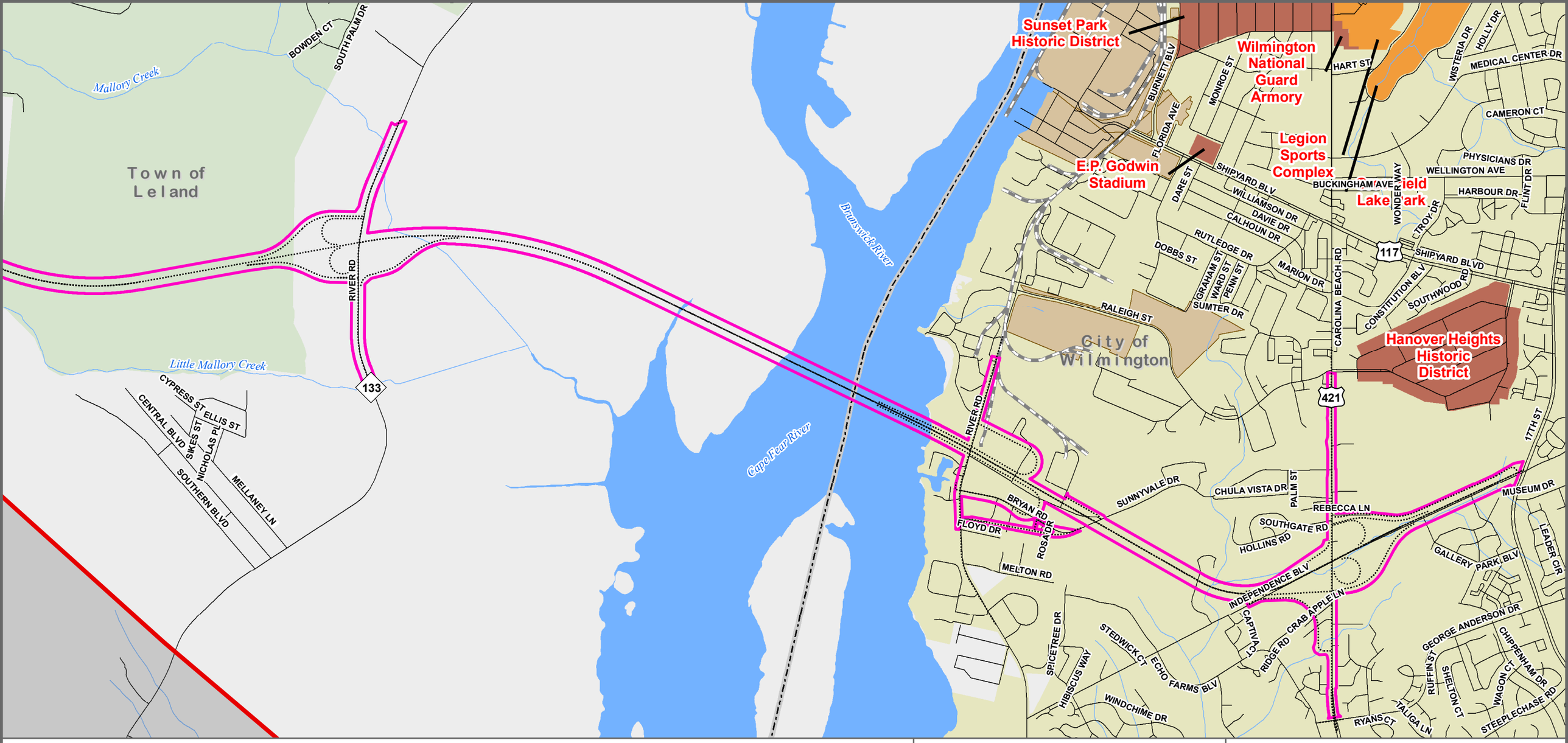
FIGURE 6c
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE M AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative M Avoidance Right-of-Way
- Port of Wilmington

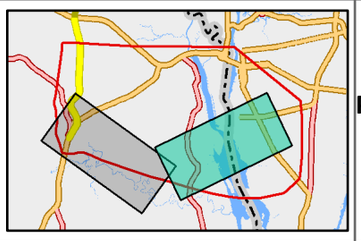


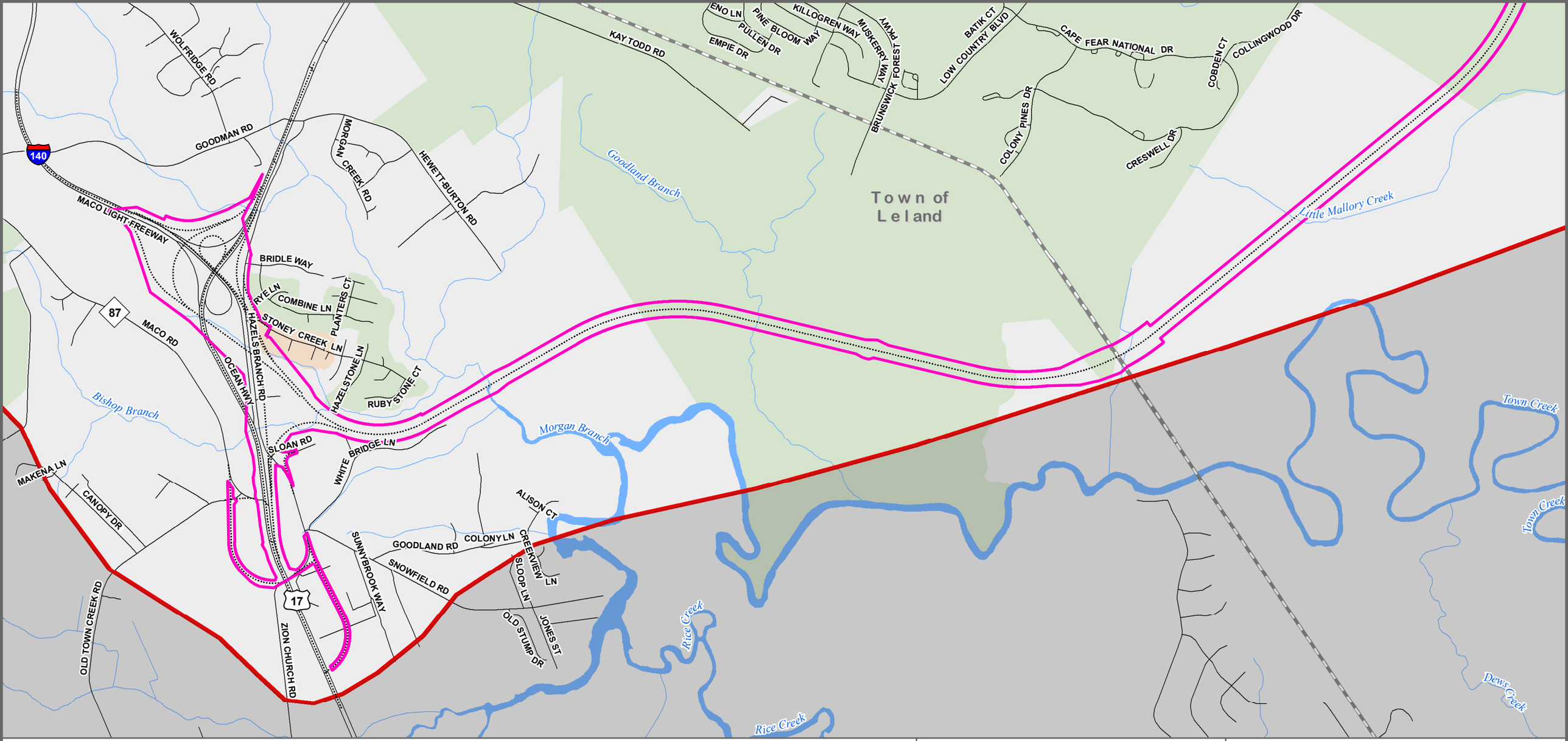
FIGURE 6d
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE M AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative N Avoidance Right-of-Way
- Port of Wilmington

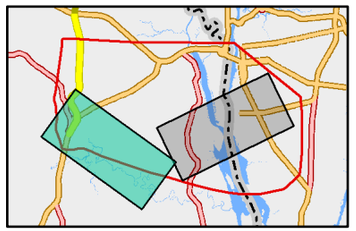


FIGURE 6e
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE N AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Jacob and Sarah Horowitz House
Sunset Park School
Sunset Park Historic District
Greenfield Lake Park
Wilmington National Guard Armory
E.P. Godwin Stadium
Legion Sports Complex
Hanover Heights Historic District
Town of Leland
City of Wilmington
Mallory Creek
Little Mallory Creek
Brunswick River
Cape Fear River
SANDY GROVE PL
SHELMORE WAY
SHORE PARK DR
SMEADES DR
SOUTH BROOK RD
ST KITTS WAY
PINE CONE DR
NORTH PALM DR
KINCAID PL
AQUA LN
WESTPORT DR
LIBERTY LANDING RD
ARUBA CT
BIMINI DR
MALLORY CREEK DR
TYLERS COVE WAY
CULVERTON RD
BIG BUCK TRL
RED FOX RUN
133
CAICOS CT
EMBERWOOD DR
SOUTH PALM DR
JANSEN LN
RIVER RD
CYPRESS ST
CENTRAL BLVD
NICHOLAS PL
MELLANEY LN
SOUTHERN BLVD
River Rd
POLK ST
BURNETT BLV
SHIPYARD BLV
WILLIAMSON DR
DAVIE DR
CALHOUN DR
RUTLEDGE DR
DOBBS ST
WORTH DR
WARD ST
PENN ST
MARION DR
SUMTER DR
RALEIGH ST
421
117
WALDEN DR
FALL DR
STADIUM DR
HART ST
LEE DR
12TH ST
13TH ST
16TH ST
17TH ST
LAKE FOREST PKY
PARMELE DR
LITTLE JOHN CIR
JUMPIN RUN DR
TRADD CT
MEETING CT
SAVANNAH CT
WISTERIA DR
HOLLY DR
CYPRESS DR
YAUPON DR
DOCTORS CIR
PRIVATE
PHYSICIANS DR
WELLINGTON AVE
BUCKINGHAM AVE
HARBOUR DR
FLINT DR
DELANEY AVE
TROY DR
Shipyard Blvd.
CONSTITUTION BLV
SOUTHWOOD DR
SHIPYARD BLV
CAROLINA BEACH RD
17TH ST
CADFEL CT
ASHTON DR
DRAWING CT
MUSEUM DR
INDEPENDENCE BLV
GALLERY
PARK BLV
HONOR LN
LEADER CIR
REBECCA LN
SOUTHGATE RD
HOLLINS RD
CHULA VISTA DR
PALM ST
SUNNYVALE DR
BRYAN RD
ROSA DR
FLOYD DR
MELTON RD

Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative N Avoidance Right-of-Way
- Port of Wilmington

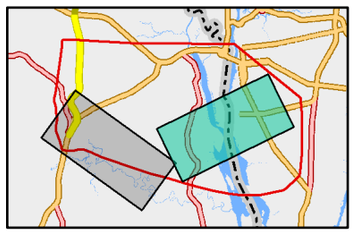


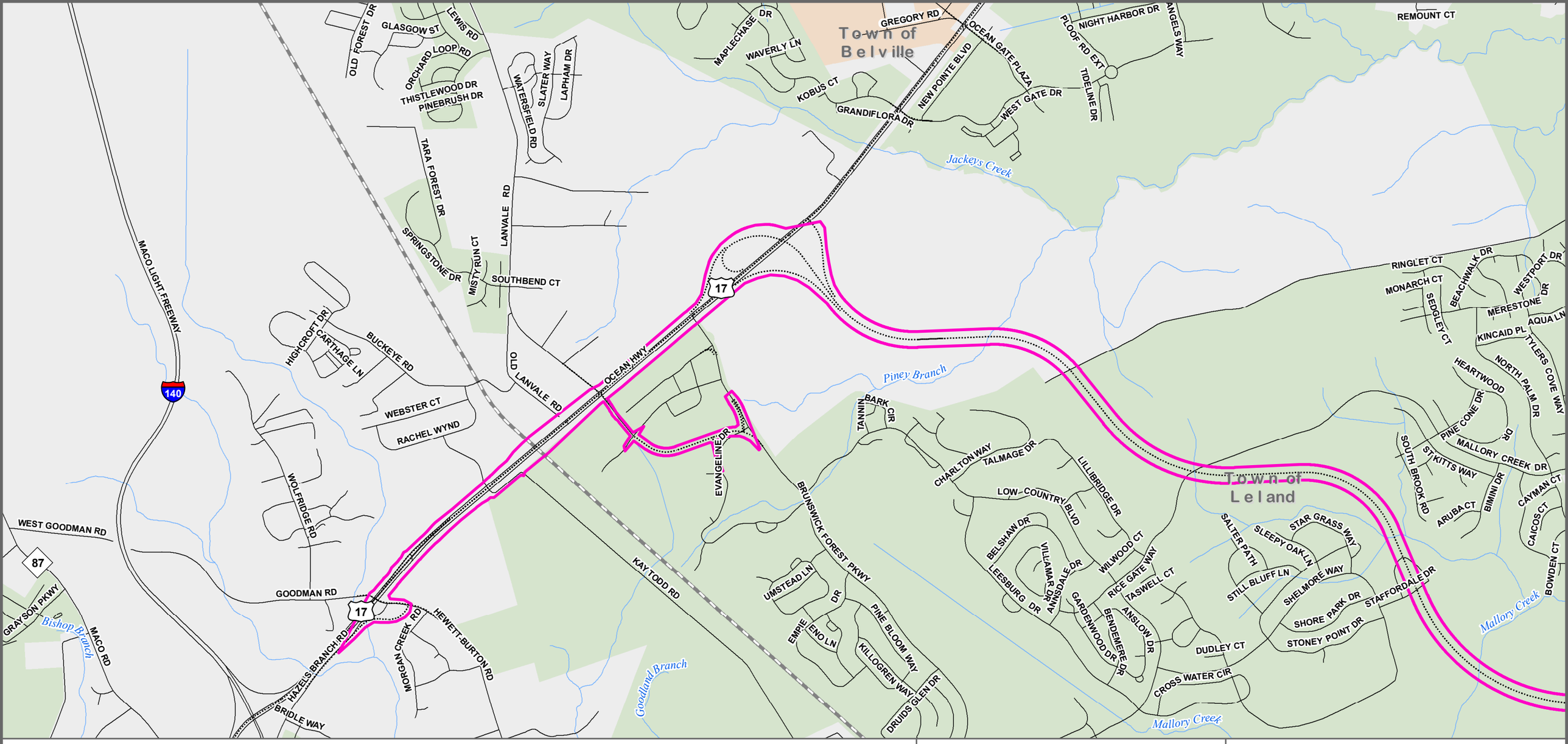
FIGURE 6f
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE N AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative Q Right-of-Way
- Port of Wilmington

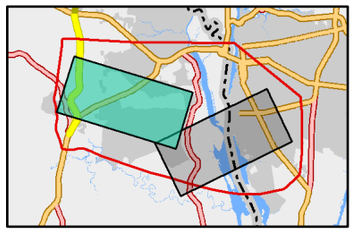


FIGURE 6g
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE Q

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Town of Leland

City of Wilmington

Mallory Creek

Little Mallory Creek

Brunswick River

Cape Fear River

Sunset Park Historic District

Wilmington National Guard Armory

E.P. Godwin Stadium

Legion Sports Compl

Lake Park

Hanover Heights Historic District

BOWDEN CT
SOUTH PALM DR
RIVER RD
133
CYPRESS ST
ELLIS ST
CENTRAL BLVD
SKES ST
NICHOLAS PL
SOUTHERN BLVD
MELLANEY LN
BURNETT BLV
FLORIDA AVE
MONROE ST
HART ST
CAROLINA BEACH RD
421
WISTERIA DR
HOLLY DR
MEDICAL CENTER DR
PHYSICIANS DR
WELLINGTON AVE
BUCKINGHAM AVE
WONDER WAY
HARBOUR DR
TROY DR
17TH ST
SHIPYARD BLV
DAVIE DR
CALHOUN DR
RUTLEDGE DR
DOBBS ST
GRAHAM ST
WARD ST
PENN ST
MARION DR
117
SHIPYARD BLVD
CONSTITUTION BLV
SOUTHWOOD RD
FRANCIS MARION DR
SUMTER DR
RALEIGH ST
UNNAMED
NEWKIRK AVE
ADELAIDE DR
CADFEL CT
PARKWAY BLV
SUNNYVALE DR
CHULA VISTA DR
PALM ST
REBECCA LN
SOUTHGATE RD
HOLLINS RD
MUSEUM DR
LEADER CIR
GALLERY PARK BLV
BRYAN RD
FLOYD DR
ROSA DR
MELTON RD
INDEPENDENCE BLV
CRAB APPLE LN
GEORGE ANDERSON DR
CHIPPENHAM DR
SHELTON CT
WAGON CT
STEEPLECHASE RD
RUFFIN ST
TALIGA LN
RYANS CT
SPICETREE DR
HIBISCUS WAY
STEDWICK CT
ECHO FARMS BLV
WINDCHIME DR
CAPTIVA CT
RIDGE RD

Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative Q Right-of-Way
- Port of Wilmington

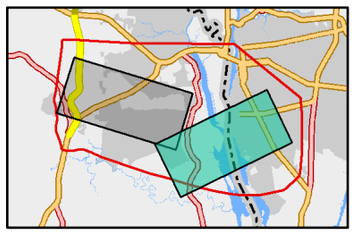


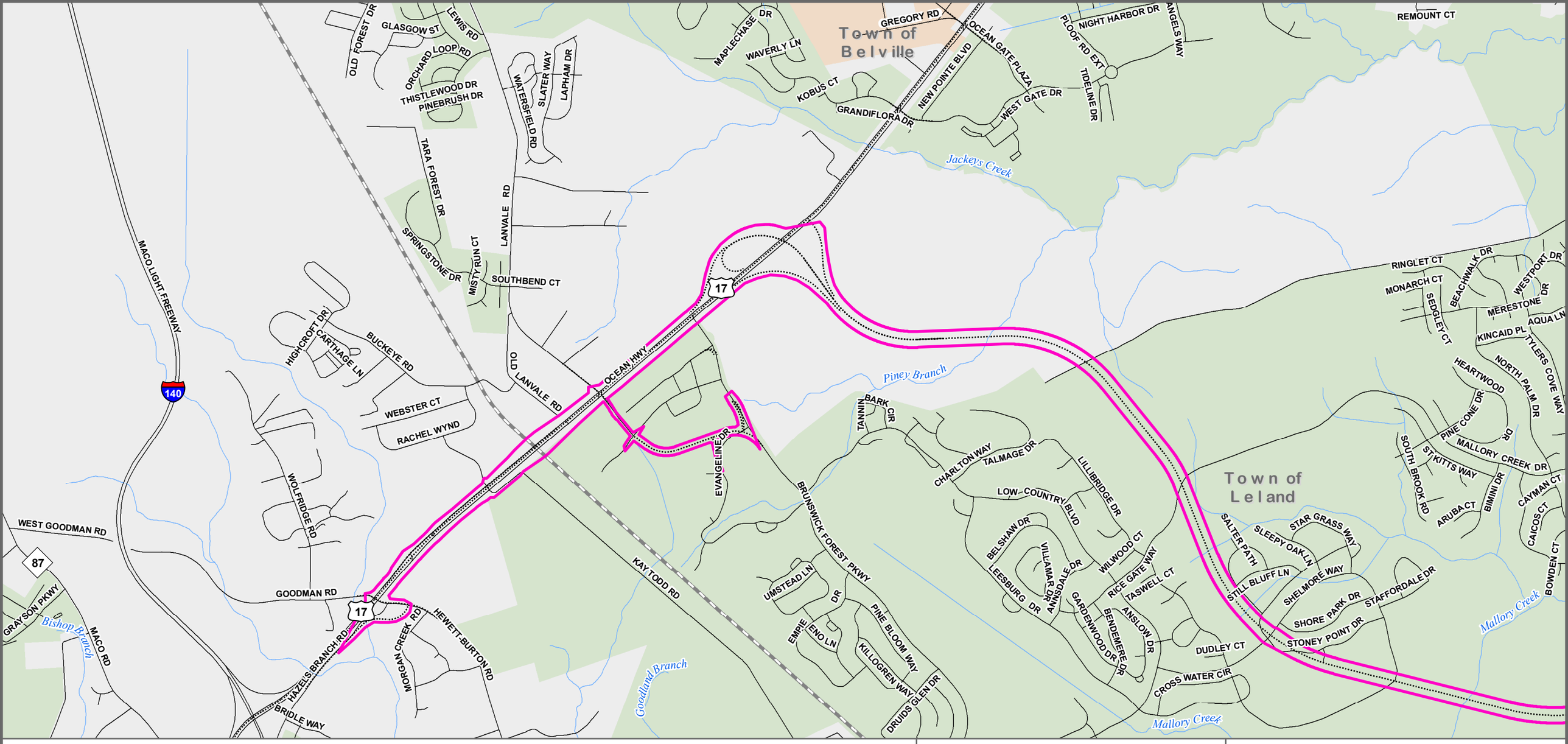
FIGURE 6h
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE Q

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative T Right-of-Way
- Port of Wilmington

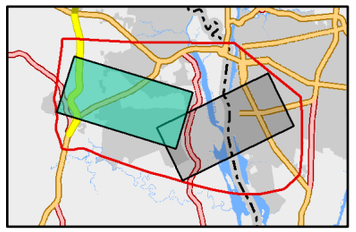


FIGURE 6i
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE T

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Jacob and Sarah Horowitz House
Sunset Park School
Sunset Park Historic District
Greenfield Lake Park
Wilmington National Guard Armory
Legion Sports Complex
E.P. Godwin Stadium
Hanover Heights Historic District
Town of Leland
City of Wilmington
Mallory Creek
Little Mallory Creek
Brunswick River
Cape Fear River
LIBERTY LANDING RD
SANDY GROVE PL
SHELMORE WAY
SHORE PARK DR
SMEADES DR
SOUTH BROOK RD
ST KITTS WAY
PINE CONE DR
NORTH PALM DR
KINCAID PL
AQUA LN
WESTPORT DR
ARUBA CT
BIMINI DR
MALLORY CREEK DR
TYLERS COVE WAY
CULVERTON RD
KELLERTON CT
JANSEN LN
BIG BUCK TRL
RED FOX RUN
133
CAICOS CT
EMBERWOOD DR
SOUTH PALM DR
RIVER RD
CYPRESS ST
ELLIS ST
SIKES ST
NICHOLAS PL
SOUTHERN BLVD
CENTRAL BLVD
MELLANEY LN
River Rd
POLK ST
WALDEN DR
FALL DR
STADIUM DR
LAKE FOREST PKY
LEE DR
12TH ST
13TH ST
16TH ST
17TH ST
PARMELE DR
LITTLE JOHN CIR
JUMPIN RUN DR
TRADD CT
MEETING CT
SAVANNAH CT
WISTERIA DR
HOLLY DR
CYPRESS DR
YAUPON DR
DOCTORS CIR
CANTERWOOD DR
MEDICAL CENTER DR
GLEN MEADE RD
PRIVATE
PHYSICIANS DR
WELLINGTON AVE
BUCKINGHAM AVE
HARBOUR DR
FLINT DR
DELANEY AVE
TROY DR
WILLIAMSON DR
DAVIE DR
SHIPYARD BLV
CALHOUN DR
RUTLEDGE DR
MARION DR
WORTH DR
DOBBS ST
WARD ST
PENN ST
SUMTER DR
421
117
Shipyard Blvd.
CONSTITUTION BLV
SHIPYARD BLVD
ASHTON DR
CADFEL CT
17TH ST
DRAWING CT
MUSEUM DR
INDEPENDENCE BLV
GALLERY
PARK BLV
HONOR LN
LEADER CIR
RALEIGH ST
RIVER RD
SUNNYVALE DR
CHULA VISTA DR
PALM ST
REBECCA LN
SOUTHGATE RD
HOLLINS RD
BRYAN RD
ROSA DR
FLOYD DR
MELTON RD

Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative T Right-of-Way
- Port of Wilmington

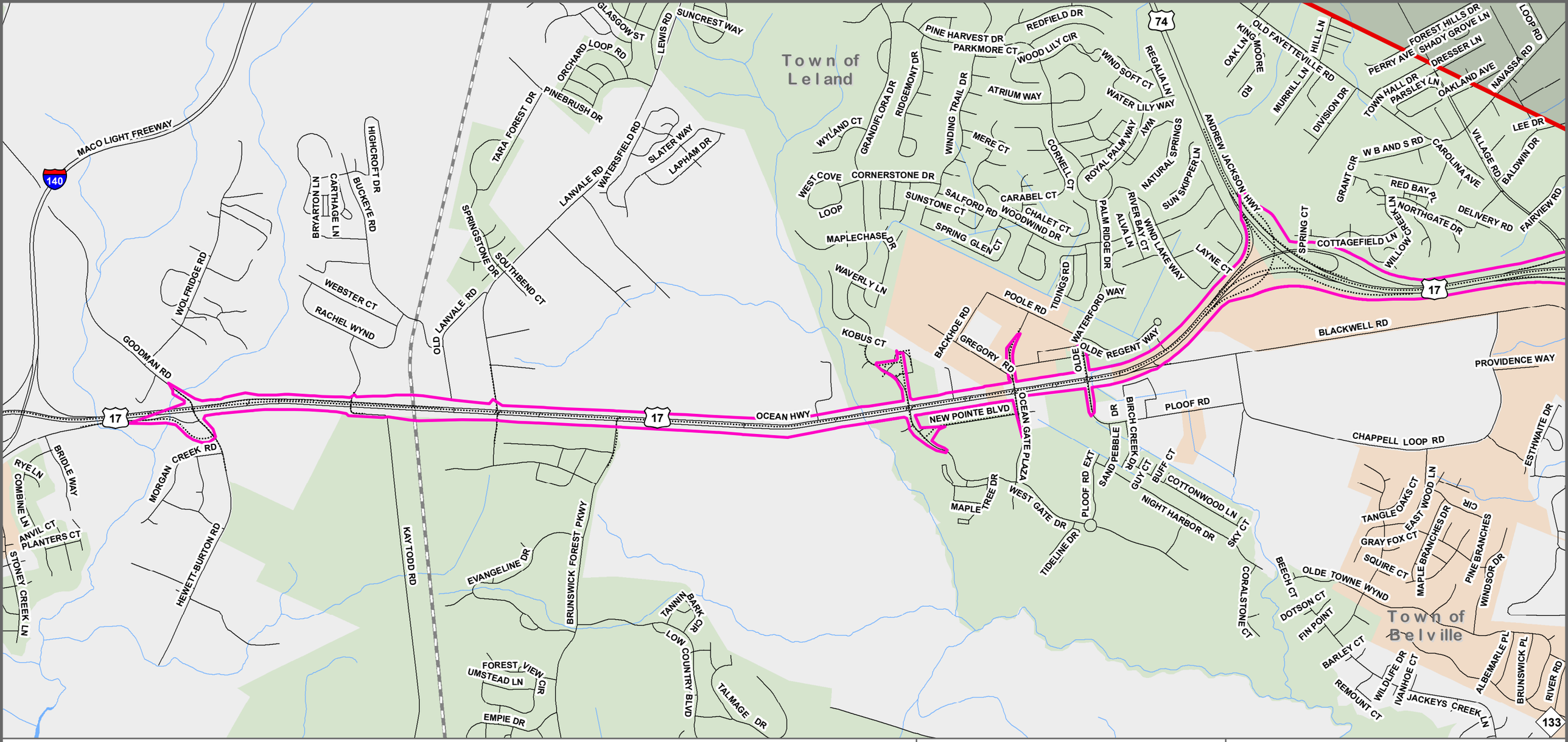
FIGURE 6j
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE T

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative V-AW Right-of-Way
- Port of Wilmington

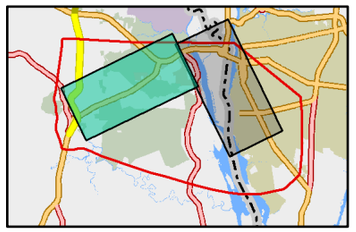


FIGURE 6k
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE V-AW

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Wilmington Historic District
Greenfield Lake Park
Sunset Park School
Legion Sports Complex
Wilmington National Guard Armory
Hanover Heights Historic District
Optimist Park
E.P. Godwin Stadium
Sunset Park Historic District
Jacob and Sarah Horowitz House
Town of Leland
Town of Belville
City of Wilmington
POINT HARBOR RD
HWY 421 THOMAS RHODES BRIDGE
USS NORTH CAROLINA RD
US HWY 421
421
76
17
133
117
BATTLESHIP RD
OCEAN HWY
US HWY 74/76
8TH ST
7TH ST
6TH ST
KIDDER ST
HOOPER ST
PINECREST PKY
LAKE FOREST PKY
YAUPON DR
CYPRESS DR
CANTERWOOD DR
WISTERIA DR
MEDICAL CENTER DR
WELLINGTON AVE
HARBOUR DR
TROY DR
CONSTITUTION BLVD
17TH ST
PARK BLVD
GALLERY
INDEPENDENCE BLVD
3RD ST
FRONT ST
BURNETT BLVD
CAROLINA BEACH RD
REBECCA LN
PALM ST
CHULA VISTA DR
SOUTHGATE RD
HOLLINS RD
SHIPYARD BLVD
RUTLEDGE
MARION DR
LANDMARK DR
DAVIE DR
CALHOUN DR
PENN ST
WARD ST
VANCE ST
SUMTER DR
MONROE ST
FLORIDA AVE
WORTH DR
DOBBS ST
POLK ST
RALEIGH ST
SUNNYVALE DR
ROSA DR
BRYAN RD
RIVER RD
FLOYD DR
BELVEDERE CT
HOLLY ST
RIVERVIEW DR
DIXIE DR
FAIRVIEW RD
VILLAGE RD
MAIN ST
BELVILLE RD
OLD RIVER RD
WYRE CT
HAWKESWATER BLVD
RIBBLE DR
MORECAMBLE BLVD
CLUB CT

Legend

- Project Study Area
- Centerline
- 4(F) Properties
- 4(F) and 6(F) Properties
- Alternative V-AW Right-of-Way
- Port of Wilmington

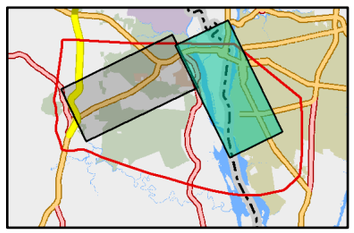


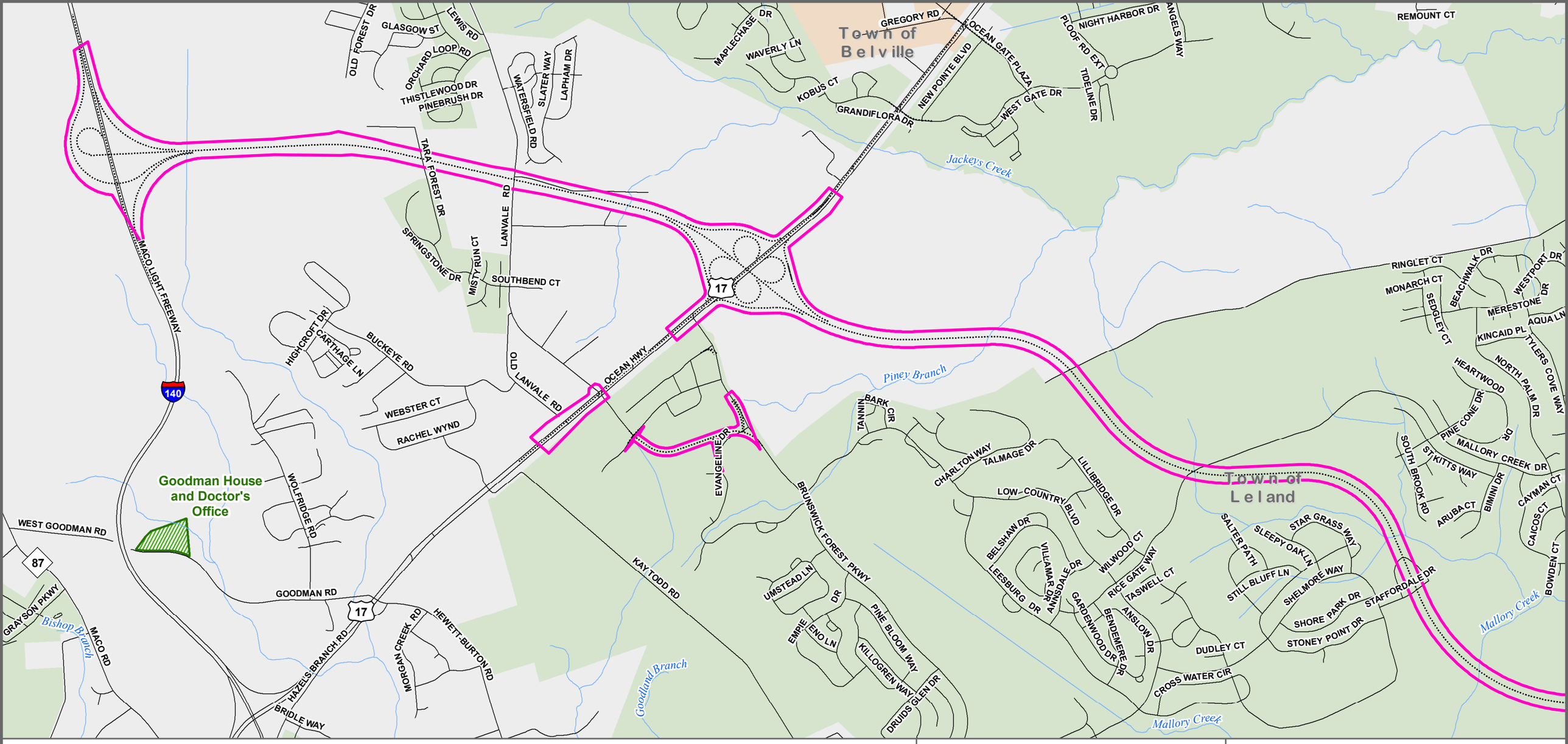
FIGURE 6I
SECTION 4(F) AND SECTION 6(F) PROPERTIES - ALTERNATIVE V-AW

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- Alternative B Right-of-Way
- National Register of Historic Places Eligible Properties
- Port of Wilmington

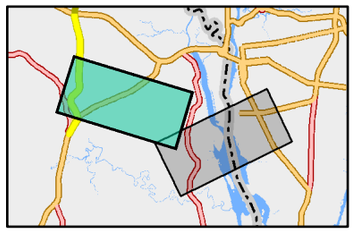


FIGURE 7a

HISTORIC ARCHITECTURAL RESOURCES ALTERNATIVE B

0 500 1,000 2,000

Feet

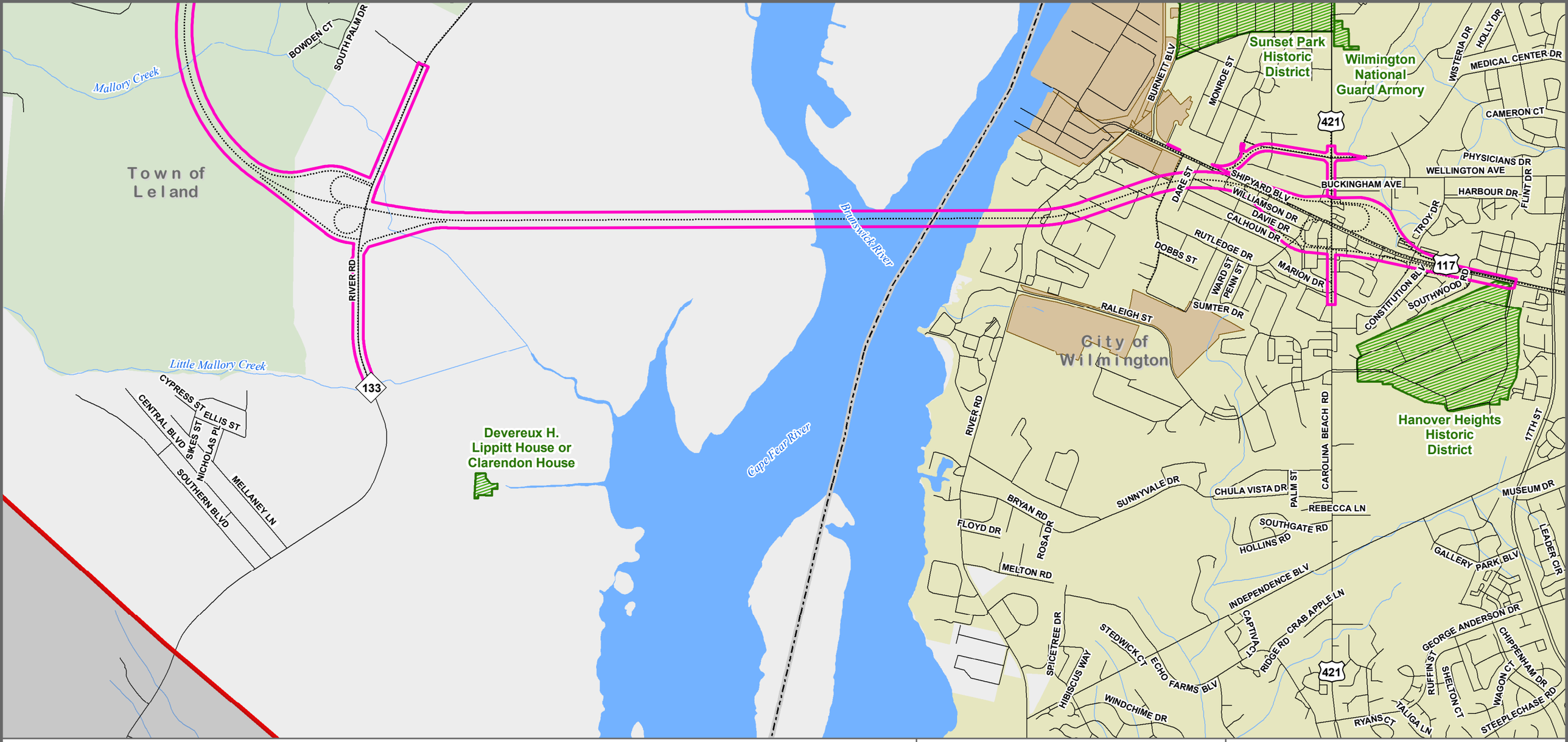
Date: February 2019

This map is for reference only.

Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study Area
- Centerline
- Alternative B Right-of-Way
- National Register of Historic Places Eligible Properties
- Port of Wilmington

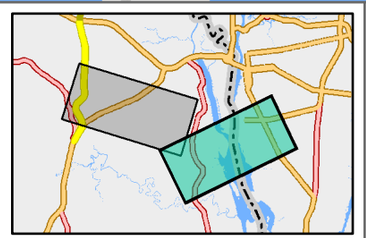


FIGURE 7b
HISTORIC ARCHITECTURAL RESOURCES
ALTERNATIVE B

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Goodman House and Doctor's Office
WOLFRIDGE RD
GOODMAN RD
MORGAN CREEK RD
HEWETT-BURTON RD
MACO LIGHT FREEWAY
BRIDLE WAY
RYE LN
COMBINE LN
PLANTERS CT
STONEY CREEK LN
HAZELSTONE LN
RUBY STONE CT
HAZELS BRANCH RD
OCEAN HWY
MACO RD
87
17
Bishop Branch
SLOAN RD
WHITE BRIDGE LN
MAKENA LN
CANOPY DR
OLD TOWN CREEK RD
ZION CHURCH RD
SUNNYBROOK WAY
GOODLAND RD
COLONY LN
SNOWFIELD RD
ALISON CT
CREEKVIEW LN
SLOOP LN
OLD STUMP DR
JONES ST
Morgan Branch
Rice Creek
Goodland Branch
KAY TODD RD
ENO LN
EMPIE DR
PULTEN DR
PINE BLOOM WAY
KILLOGREN WAY
BRUNSWICK FOREST PKWY
BATIK CT
LOW COUNTRY BLVD
COLONY PINES DR
CAPE FEAR NATIONAL DR
COBDEN CT
COLLINGWOOD DR
CRESWELL DR
Town of Leland
Little Mallory Creek
Town Creek
Dews Creek

Legend

- Project Study
- Centerline
- Alternative M Avoidance Right-of-Way
- National Register of Historic Places Eligible Properties
- Port of Wilmington

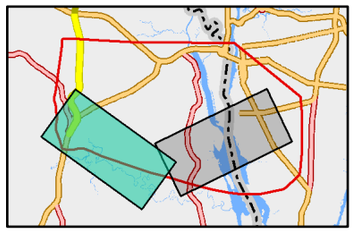


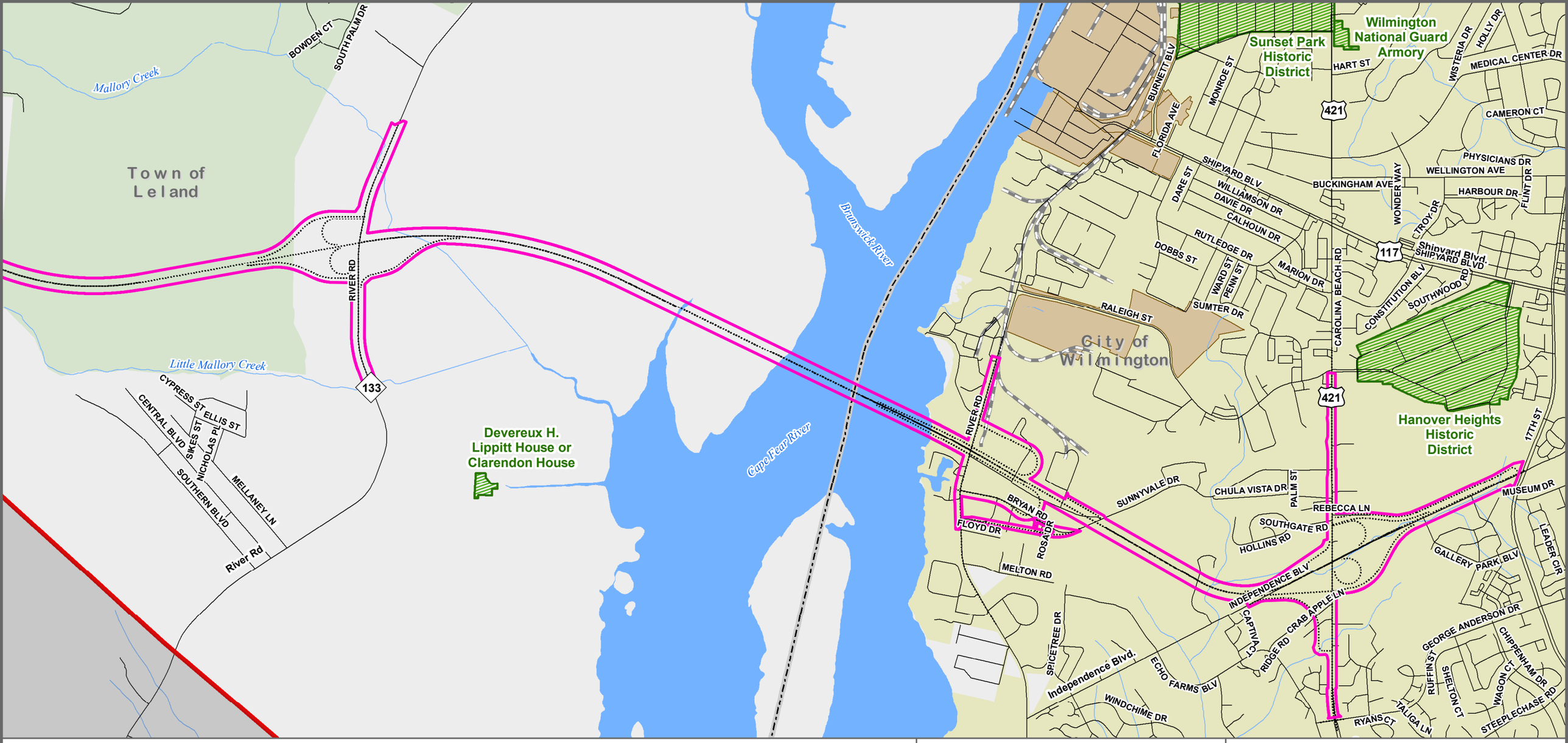
FIGURE 7c
HISTORIC ARCHITECTURAL RESOURCES
ALTERNATIVE M AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738



Legend

- Project Study
- Centerline
- Alternative M Avoidance Right-of-Way
- National Register of Historic Places Eligible Properties
- Port of Wilmington

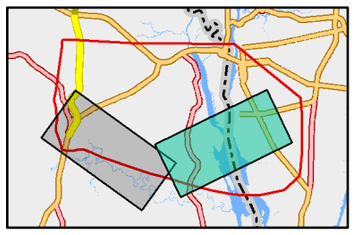


FIGURE 7d
HISTORIC ARCHITECTURAL RESOURCES ALTERNATIVE M AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Goodman House and Doctor's Office
WOLFRIDGE RD
GOODMAN RD
140
MACO LIGHT FREEWAY
MORGAN CREEK RD
HEWETT-BURTON RD
BRIDLE WAY
RYE LN
COMBINE LN
PLANTERS CT
DIAMOND CT
STONEY CREEK LN
RUBY STONE CT
87
MACO RD
OCEAN HWY
Bishop Branch
MAKENA LN
CANOPY DR
SLOAN RD
HAZELS BRANCH RD
WHITE BRIDGE LN
17
SUNNYBROOK WAY
GOODLAND RD
COLONY LN
CREEKVIEW LN
SLOOP LN
ALISON CT
SNOWFIELD RD
OLD STUMP DR
JONES ST
OLD TOWN CREEK RD
ZION CHURCH RD
17
KAY TODD RD
ENO LN
PULLEN DR
EMPIE DR
KILLOGREN WAY
MUSKERRY WAY
BRUNSWICK FOREST PKWY
BATIK CT
LOW COUNTRY BLVD
COKESBURY CT
COLONY PINES DR
CAPE FEAR
CRESWELL DR
NATIONAL DR
COBDEN CT
COLLINGWOOD DR
Town of Leland
Goodland Branch
Morgan Branch
Little Mallory Creek
Town Creek
Rice Creek
Rice Creek
Town Creek
Dews Creek

Legend

- Project Study Area
- Centerline
- Alternative N Avoidance Right-of-Way
- National Register of Historic Places Eligible Properties
- Port of Wilmington

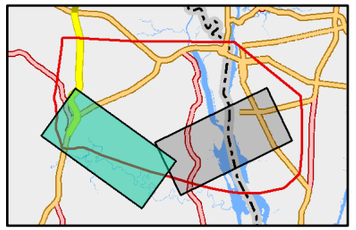


FIGURE 7e
HISTORIC ARCHITECTURAL RESOURCES
ALTERNATIVE N AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Town of Leland

Mallory Creek

Little Mallory Creek

Brunswick River

Cape Fear River

Devereux H. Lippitt House or Clarendon House

City of Wilmington

Sunset Park Historic District

Wilmington National Guard Armory

Hanover Heights Historic District

BOWDEN CT
SOUTH PALM DR
RIVER RD
CYPRESS ST
ELLIS ST
CENTRAL BLVD
NICHOLAS PL
SOUTHERN BLVD
MELLANEY LN
133
BURNETT BLV
FLORIDA AVE
MONROE ST
WISTERIA DR
HOLLY DR
YAUPON DR
CANTERWOOD DR
DOCTORS CIR
MEDICAL CENTER DR
PHYSICIANS DR
WELLINGTON AVE
HARBOUR DR
BUCKINGHAM AVE
DARE ST
SHIPYARD BLV
WILLIAMSON DR
DAVIE DR
CALHOUN DR
RUTLEDGE DR
DOBBS ST
MARION DR
WONDER WAY
TROY DR
117
SHIPYARD BLVD
CONSTITUTION BLV
SOUTHWOOD DR
WARD ST
PENN ST
SUMTER DR
RALEIGH ST
CAROLINA BEACH RD
421
17TH ST
SUNNYVALE DR
CHULA VISTA DR
PALM ST
REBECCA LN
SOUTHGATE RD
HOLLINS RD
BRYAN RD
FLOYD DR
ROSA DR
MELTON RD
MUSEUM DR
MOXIE WAY
LEADER CIR
GALLERY PARK BLV
INDEPENDENCE BLV
CAPTIVA CT
CRAB APPLE LN
RIDGE RD
GEORGE ANDERSON DR
CHIPPENHAM DR
RUFFIN ST
SHELTON CT
WAGON CT
STEEPLECHASE RD
SPICETREE DR
HIBISCUS WAY
STEDWICK CT
ECHO FARMS BLV
WINDCHIME DR
BREEZEWOOD DR
TALIGA LN

Legend

- Project Study Area
- Centerline
- Alternative N Avoidance Right-of-Way
- National Register of Historic Places Eligible Properties
- Port of Wilmington

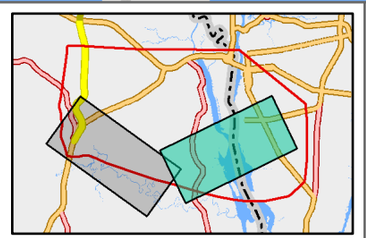


FIGURE 7f

HISTORIC ARCHITECTURAL RESOURCES ALTERNATIVE N AVOIDANCE

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Town of Belville

Town of Leland

Goodman House and Doctor's Office

MACO LIGHT FREEWAY
140
OLD FOREST DR
GLASGOW ST
LEWIS RD
ORCHARD LOOP RD
THISTLEWOOD DR
PINEBRUSH DR
WATERSFIELD RD
SLATER WAY
LAPHAM DR
MAPLECHASE DR
WAVERLY LN
KOBUS CT
GREGORY RD
OCEAN GATE PLAZA
NEW POINTE BLVD
GRANDIFLORA DR
WEST GATE DR
NIGHT HARBOR DR
PLOOF RD EXT
TIDELINE DR
ANGELS WAY
REMOUNT CT
TARA FOREST DR
SPRINGSTONE DR
MISTY RUN CT
LANVALE RD
SOUTHBEND CT
17
OCEAN HWY
OLD LANVALE RD
HIGHCROFT DR
CARTHAGE LN
BUCKEYE RD
WEBSTER CT
RACHEL WYND
WOLFRIDGE RD
EVANGELINE DR
TANNIN BARK CIR
CHARLTON WAY
TALMAGE DR
LOW-COUNTRY BLVD
LILLIBRIDGE DR
BRUNSWICK FOREST PKWY
UMSTEAD LN
DR
EMPIE
ENO LN
PINE BLOOM WAY
KILLOGREN WAY
DRUIDS GLEN DR
KAY TODD RD
BELSHAW DR
LEESBURG DR
VILLAMAR DR
ANNSDALE DR
GARDENWOOD DR
WILWOOD CT
RICE GATE WAY
TASWELL CT
BENDEMEER DR
ANSLOW DR
DUDLEY CT
CROSS WATER CIR
SALTER PATH
STILL BLUFF LN
SLEEPY OAK LN
STAR GRASS WAY
SHELMORE WAY
SHORE PARK DR
STAFFORDALE DR
STONEY POINT DR
RINGLET CT
MONARCH CT
SEDGLEY CT
BEACHWALK DR
WESTPORT DR
MERESTONE DR
AQUA LN
KINCAID PL
TYLERS COVE WAY
HEARTWOOD
NORTH PALM DR
PINE CONE DR
MALLORY CREEK DR
ST KITTS WAY
SOUTH BROOK RD
BIMINI DR
ARUBA CT
CAYMAN CT
CAICOS CT
BOWDEN CT
WEST GOODMAN RD
87
GRAYSON PKWY
GOODMAN RD
17
HAZELS BRANCH RD
MORGAN CREEK RD
HEWETT-BURTON RD
BRIDLE WAY
MACO RD
Bishop Branch
Goodland Branch
Mallory Creek
Jackeys Creek
Piney Branch

Legend

- Project Study Area
- Centerline
- Alternative Q Right-Of-Way
- National Register of Historic Places Eligible Properties
- Port of Wilmington

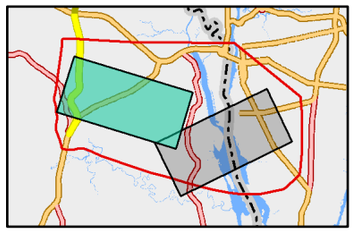


FIGURE 7g
HISTORIC ARCHITECTURAL RESOURCES
ALTERNATIVE Q

0 500 1,000 2,000
Feet

Date: February 2019
This map is for reference only.
Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Town of Leland

Mallory Creek

Little Mallory Creek

Brunswick River

Cape Fear River

BOWDEN CT

SOUTH PALM DR

RIVER RD

133

CYPRESS ST

ELLIS ST

CENTRAL BLVD

SIKES ST

NICHOLAS PL

SOUTHERN BLVD

MELLANEY LN

Devereux H. Lippitt House or Clarendon House

Sunset Park Historic District

Wilmington National Guard Armory

BURNETT BLV

MONROE ST

WISTERIA DR

HOLLY DR

MEDICAL CENTER DR

CAMERON CT

421

SHIPYARD BLV

WELLINGTON AVE

BUCKINGHAM AVE

HARBOUR DR

FLINT DR

WORTH DR

DARE ST

WILLIAMSON DR

DAVIE DR

CALHOUN DR

RUTLEDGE DR

DOBBS ST

MARION DR

WARD ST

PENN ST

SUMTER DR

RALEIGH ST

TROY DR

117

SOUTHWOOD RD

City of Wilmington

Hanover Heights Historic District

17TH ST

RIVER RD

CAROLINA BEACH RD

SUNNYVALE DR

CHULA VISTA DR

REBECCA LN

MUSEUM DR

BRYAN RD

FLOYD DR

HOLLINS RD

GALLERY PARK BLV

LEADER CIR

MELTON RD

INDEPENDENCE BLV

CRAB APPLE LN

SPICETREE DR

HIBISCUS WAY

STEDWICK CT

ECHO FARMS BLV

CAPTIVA CT

RIDGE RD

421

WINDCHIME DR

RYANS CT

TALIGA LN

RUFFIN ST

SHELTON CT

WAGON CT

CHIPPENHAM DR

STEEPLECHASE RD

Legend

- Project Study Area
- Centerline
- Alternative Q Right-Of-Way
- National Register of Historic Places Eligible Properties
- Port of Wilmington

FIGURE 7h

HISTORIC ARCHITECTURAL RESOURCES ALTERNATIVE Q

0 500 1,000 2,000

Feet

Date: February 2019

This map is for reference only.

Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Town of Belville

Town of Leland

Goodman House and Doctor's Office

MACO LIGHT FREEWAY
140
OLD FOREST DR
GLASGOW ST
LEWIS RD
ORCHARD LOOP RD
THISTLEWOOD DR
PINEBRUSH DR
WATERSFIELD RD
SLATER WAY
LAPHAM DR
MAPLECHASE DR
WAVERLY LN
KOBUS CT
GREGORY RD
OCEAN GATE PLAZA
NEW POINTE BLVD
GRANDIFLORA DR
WEST GATE DR
NIGHT HARBOR DR
PLOOF RD EXT
TIDELINE DR
ANGELS WAY
REMOUNT CT
Jackeys Creek
TARA FOREST DR
SPRINGSTONE DR
MISTY RUN CT
LANVALE RD
SOUTHBEND CT
17
OCEAN HWY
OLD LANVALE RD
HIGHCROFT DR
CARTHAGE LN
BUCKEYE RD
WEBSTER CT
RACHEL WYND
WOLFRIDGE RD
EVANGELINE DR
Piney Branch
TANNIN BARK CIR
CHARLTON WAY
TALMAGE DR
LOW-COUNTRY BLVD
LILLIBRIDGE DR
BRUNSWICK FOREST PKWY
UMSTEAD LN
DR
EMPIE
ENO LN
PINE BLOOM WAY
KILLOGREN WAY
DRUIDS GLEN DR
KAY TODD RD
BELSHAW DR
LEESBURG DR
VILLAMAR DR
ANNSDALE DR
GARDENWOOD DR
BENDEMERE DR
WILWOOD CT
RICE GATE WAY
TASWELL CT
ANSLOW DR
DUDLEY CT
CROSS WATER CIR
SALTER PATH
STILL BLUFF LN
SLEEPY OAK LN
STAR GRASS WAY
SHELMORE WAY
SHORE PARK DR
STAFFORDALE DR
STONEY POINT DR
Mallory Creek
RINGLET CT
MONARCH CT
SEDGLEY CT
BEACHWALK DR
WESTPORT DR
MERESTONE DR
AQUA LN
KINCAID PL
TYLERS COVE WAY
HEARTWOOD
NORTH PALM DR
PINE CONE DR
MALLORY CREEK DR
ST KITTS WAY
SOUTH BROOK RD
BIMINI DR
ARUBA CT
CAYMAN CT
CAICOS CT
BOWDEN CT
WEST GOODMAN RD
87
GRAYSON PKWY
Bishop Branch
MACO RD
GOODMAN RD
17
HAZELS BRANCH RD
MORGAN CREEK RD
HEWETT-BURTON RD
BRIDLE WAY
Goodland Branch
Mallory Creek

Legend

- Project Study Area
- Centerline
- Alternative T Right-of-Way
- National Register of Historic Places Eligible Properties
- Port of Wilmington

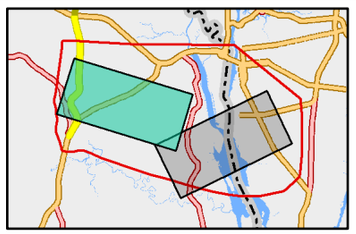


FIGURE 7i
HISTORIC ARCHITECTURAL RESOURCES
ALTERNATIVE T

0 500 1,000 2,000
Feet

Date: February 2019
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Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Town of Leland

City of Wilmington

Mallory Creek

Little Mallory Creek

Brunswick River

Cape Fear River

BOWDEN CT

SOUTH PALM DR

RIVER RD

133

CYPRESS ST

ELLIS ST

CENTRAL BLVD

SIKES ST

NICHOLAS PL

SOUTHERN BLVD

MELLANEY LN

Devereux H. Lippitt House or Clarendon House

Sunset Park Historic District

Wilmington National Guard Armory

BURNETT BLV

MONROE ST

WISTERIA DR

HOLLY DR

MEDICAL CENTER DR

CAMERON CT

421

PHYSICIANS DR

WELLINGTON AVE

BUCKINGHAM AVE

HARBOUR DR

FLINT DR

DARE ST

SHIPYARD BLV

WILLIAMSON DR

DAVIE DR

CALHOUN DR

RUTLEDGE DR

DOBBS ST

WARD ST

PENN ST

MARION DR

TROY DR

117

CONSTITUTION BLV

SOUTHWOOD RD

RALEIGH ST

SUMTER DR

Hanover Heights Historic District

17TH ST

RIVER RD

CAROLINA BEACH RD

SUNNYVALE DR

CHULA VISTA DR

PALM ST

REBECCA LN

BRYAN RD

FLOYD DR

ROSA DR

SOUTHGATE RD

HOLLINS RD

MUSEUM DR

LEADER CIR

GALLERY PARK BLV

MELTON RD

INDEPENDENCE BLV

CAPTIVA CT

CRAB APPLE LN

RIDGE RD

GEORGE ANDERSON DR

CHIPPENHAM DR

SPICETREE DR

STEDWICK CT

ECHO FARMS BLV

HIBISCUS WAY

WINDCHIME DR

RUFFIN ST

SHELTON CT

WAGON CT

STEEPLECHASE RD

RYANS CT

TALIGA LN

421

Legend

- Project Study Area
- Centerline
- Alternative T Right-of-Way
- National Register of Historic Places Eligible Properties
- Port of Wilmington

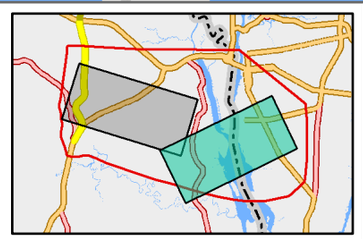

FIGURE 7j

HISTORIC ARCHITECTURAL RESOURCES ALTERNATIVE T

0 500 1,000 2,000

Feet

Date: February 2019

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Sources: ESRI Inc., CGIA, NCDOT, and AECOM.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Goodman House and Doctor's Office

Town of Leland

Town of Belville

Jackeys Creek

Piney Branch

Goodland Branch

Morgan Branch

MACO LIGHT FREEWAY

GOODMAN RD

HAZELS BRANCH RD

OCEAN HWY

NEW POINTE BLVD

OLDE REGENT WAY

BLACKWELL RD

PROVIDENCE WAY

CHAPPELL LOOP RD

PLOOF RD

COTTAGEFIELD LN

ANDREW JACKSON HWY

OLD FAYETTEVILLE RD

JACKEYS CREEK LN

CHARLTON WAY

LOW COUNTRY BLVD

KAY TODD RD

HEWETT BURTON RD

MORGAN CREEK RD

BRUNSWICK FOREST PKWY

OLD LANVALE RD

LANVALE RD

WATERSFIELD RD

SPRINGSTONE DR

SOUTHBEND CT

TARA FOREST DR

ORCHARD LOOP RD

PINEBRUSH DR

LANVALE HILLS CIR

LEWIS RD

SUNCREST WAY

SLATER WAY

LAPHAM DR

HIGHCROFT DR

CARTHAGE LN

BUCKEYE RD

WOLFRIDGE RD

WEBSTER CT

RACHEL WYND

EVANGELINE DR

FOREST VIEW CIR

UMSTEAD LN

EMPIE DR

TANNIN BARK CIR

TALMAGE DR

KOBUS CT

BACKHOE RD

GREGORY RD

POOLE RD

OCEAN GATE PLAZA

MAPLE TREE DR

WEST GATE DR

TIDELINE DR

SAND PEBBLE EXT

BIRCH CREEK DR

GUY CT

BLUFF CT

COTTONWOOD LN

NIGHT HARBOR DR

SKY CT

ANGELS WAY

CORALSTONE CT

WATERFORD WAY

BRAEWOOD CT

TIDINGS RD

WAVERLY LN

MAPLECHASE DR

SPRING GLEN CT

SUNSTONE CT

SALFORD RD

DALTON WAY

CHALET CT

WOODWIND DR

WEST COVE LOOP

CORNERSTONE DR

WYLAND CT

GRANDIFLORA DR

RIDGEMONT DR

WINDING TRAIL DR

MERE CT

CORNELL CT

ATRIUM WAY

PINE HARVEST DR

PARKMORE CT

REDFIELD DR

WOOD LILY CIR

WIND SOFT CT

WATER LILY WAY

ROYAL PALM WAY

REGALIA LN

ALVA LN

WIND LAKE WAY

LAYNE CT

SUN SKIPPER LN

OAK LN

KING MOORE DR

MURRILL LN

HILL LN

DIVISION DR

PERRY AVE

FOREST HILLS DR

SHADY GROVE LN

DRESSER LN

LOOP RD

NAVASSA RD

TOWN HALL DR

PARSLEY LN

OAKLAND AVE

WOODBURN AVE

VILLAGE RD

LEE DR

BALDWIN DR

GRANT CIR

W B AND S RD

CAROLINA AVE

RED BAY PL

NORTHGATE DR

DELIVERY RD

FAIRVIEW RD

WILLOW CREEK LN

SPRING CT

DEEPWOODS CT

EAST WOOD LN

GRAY FOX CT

MAPLE BRANCHES DR

PINE BRANCHES CIR

WINDSOR DR

KINGSWORTH LN

BEECH CT

DOTSON CT

FIN POINT

BARLEY CT

REMOUNT CT

WILDLIFE DR

IVANHOE CT

ALBEMARLE PL

BRUNSWICK PL

RIVER RD

STONEY CREEK LN

ANVIL CT

PLANTERS CT

COMBINE LN

RYE LN

BRIDLE WAY

140

17

74

133

Legend

- Project Study Area
- Centerline
- National Register of Historic Places Eligible Properties
- Alternative V-AW Right-of-Way
- Port of Wilmington

FIGURE 7k

HISTORIC ARCHITECTURAL RESOURCES
ALTERNATIVE V-AW

0 500 1,000 2,000

Feet

Date: February 2019

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738

Northeast Cape Fear River
Cape Fear River
Brunswick River
Greenfield Creek
Alligator Creek
Richmond Creek
Town of Leland
Town of Belville
City of Wilmington
USS North Carolina
Wilmington Historic District
Lake Forest Defense Housing Historic District
Sunset Park School
Wilmington National Guard Armory
Hanover Heights Historic District
Jacob and Sarah Horowitz House
Sunset Park Historic District
POINT HARBOR RD
HWY 421
THOMAS RHODES BRIDGE
USS NORTH CAROLINA RD
US HWY 421
421
76
US HWY 74/76
OCEAN HWY
17
133
BATTLESHIP RD
8TH ST
5TH AVE
HOOPER ST
MARTIN ST
MEARES ST
FRONT ST
3RD ST
CAROLINA BEACH RD
FALL DR
WALDEN DR
STADIUM DR
HART ST
WONDER WAY
MEDICAL CENTER DR
WELLINGTON AVE
HARBOUR DR
YAUPON DR
HOLLY DR
WISTERIA DR
CANTERWOOD DR
TROY DR
CONSTITUTION BLV
17TH ST
INDEPENDENCE BLV
GALLERY PARK BLV
BUCKINGHAM AVE
REBECCA LN
PALM ST
CHULA VISTA DR
HOLLINS RD
SOUTHGATE RD
LANDMARK DR
RUTLEDGE MARION DR
MORGAN ST
PENN ST
GRAHAM ST
VANCE ST
DARE ST
CHAPPELL AVE
WORTH DR
FLORIDA AVE
POLK ST
MONROE ST
SHIPYARD BLV
WILLIAMSON DR
DAVIE DR
CALHOUN DR
SUMTER DR
RALEIGH ST
WOODBINE ST
MYERS BLV
RIVER RD
SUNNYVALE DR
BRYAN RD
ROSA DR
FLOYD DR
BELVEDERE CT
HOLLY ST
RIVERVIEW DR
DIXIE DR
FAIRVIEW RD
VILLAGE RD
MAIN ST
BELVILLE RD
OLD RIVER RD
WYRE CT
HAWKESWATER BLVD
CAMBECK DR
RIBBLE DR
CLUB CT

Legend

- Project Study Area
- Centerline
- National Register of Historic Places Eligible Properties
- Alternative V-AW Right-of-Way
- Port of Wilmington

FIGURE 7I
HISTORIC ARCHITECTURAL RESOURCES
ALTERNATIVE V-AW

0 500 1,000 2,000
Feet

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPOSED CAPE FEAR CROSSING
BRUNSWICK AND NEW HANOVER COUNTIES
STIP PROJECT U-4738