NEPA/Section 404 Concurrence Point 4A: Avoidance and Minimization Kinston Bypass

CP 4A Meeting June 22, 2022

STIP Project No. R-2553
WBS No. 34460

North Carolina Department of Transportation
Division 2

Prepared By

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NEPA/Section 404
Concurrence Point 4A:
Avoidance and Minimization

CP 4A Meeting
June 22, 2022

Purpose of Meeting

The purpose of today's meeting is to achieve Merger Team concurrence on Concurrence Point (CP) 4A (Avoidance and Minimization) for the proposed Kinston Bypass Project (STIP No. R-2553).

A Draft Environmental Impact Statement (DEIS) for the project was published in June of 2019, and a Corridor Public Hearing was held on August 20, 2019. Based on the approved DEIS and comments received, Alternative 1SB was selected as the applicant's preferred alternative in February of 2020.

1.0 Project Description and Purpose and Need

The North Carolina Department of Transportation (NCDOT) proposes to construct an approximately 21-mile long project in Craven, Jones, and Lenoir Counties. The study area is shown on Figure 1. The project is included in the 2020-2029 State Transportation Improvement Program (STIP) as the proposed Kinston Bypass Project (STIP Project No. R-2553). Alternative 1SB would involve upgrading existing US 70 as well as constructing a portion of the roadway on new location.

The need for the Kinston Bypass Project is to address traffic congestion, capacity deficiencies, and through-traffic delays on US 70 between La Grange and Dover. The purpose of the project is to improve regional mobility, connectivity, and capacity for US 70 between La Grange and Dover in a manner that meets the intent of the North Carolina Strategic Transportation Corridors policy (previously the Strategic Highway Corridors policy).

KINSTON BYPASS
FEIS | R-2553

Figure 1:
Study Area

Legend

- Study Area
- Alternative 1 - Upgrade Existing with Shallow Southern Bypass
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Global TransPark (GTP)
- Municipal Boundary
- County Boundary

0 1.5 3 Miles

N

This map is for reference only.
Sources: AECOM, CGIA, City of Kinston, Craven County, ESRI, HPO, Jones County Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM, NCOnemap, NRCS, USFWS

WAYNE COUNTY
GREENE COUNTY
PITT COUNTY
LENOIR COUNTY
DUPLIN COUNTY
JONES COUNTY
CRAVEN COUNTY
Grifton
La Grange
Kinston
Dover
Cove City
GTP
Contentnea Creek
Swift Creek
Neuse River
Falling Creek
Bear Creek
Southwest Creek
Willie Measley Rd
Jim Sutton Rd
Albert Sugg Rd
Barwick Station Rd
Caswell Station Rd
Wyse Fork Rd
13
903
258
123
148
11
118
70 BYP
70
55
70 BUS
58
111
41

2.0 Proposed Improvements

The proposed Kinston Bypass, Alternative 1SB begins near the NC 903/US 70 interchange south of La Grange and would follow existing US 70 for approximately 7 miles to just east of NC 148 (C.F. Harvey Parkway). Interchanges would be located at Willie Measley Road/Jim Sutton Road, Albert Sugg Road/Barwick Station Road, and NC 148. A new interchange east of NC 148 would provide access to the shallow bypass section of Alternative 1SB, which would parallel existing US 70 to the south on new location for approximately 6.5 miles.

Interchanges along the new location section of Alternative 1SB would be located at NC 11/NC 55, US 258 (South Queen Street), and NC 58 (Trenton Highway). A new interchange east of Lenoir Community College would connect the shallow bypass back to existing US 70. Alternative 1SB would follow existing US 70 from this interchange east to the project terminus east of Dover and would upgrade US 70 to a full control of access highway with interchanges at Wyse Fork Road (SR 1002)/Caswell Station Road (SR 1309) and Old US 70 (West Kornegay Street).

3.0 Project Status and Next Steps

Since the last correspondence with the Merger Team at CP 3, held on February 19, 2020, the following major milestones have occurred:

- Delineation of Streams and Wetlands – October 2021
- Conducted Value Engineering Study – March 2021
- Developed and refined Preliminary Designs - September 2021 through February 2022
- Conducted initial Neuse River Waterdog Survey – April 2020
- Conducted Atlantic Pigtoe Survey – September 2021
- Conducted Carolina Madtom Survey – September 2021
- Updated Hydraulic Aspects Report – October 2021
- Developed Structure Type Study for Neuse River Crossing – May 2022
- Conducted Archaeological Survey & Evaluation – January 2022
- Section 106 Effects Meeting – March 2022
- Location & Surveys (on-the-ground surveys of 500 ft corridor) – May 2022
- Relocation Reports – May 2022
- Updated Traffic Noise Report – April 2022
- Conducted EJ and Business Outreach – November 2021
- Visualizations – Currently underway
- Updated NRTR Report – Currently underway
- HMGP Coordination with NCEM and FEMA – Currently underway
- Community Impact Assessment – Currently underway
- Economic Impact Assessment – Currently underway
- Land Use Scenario Assessment – Currently underway
- 2D Flood Analysis – Currently underway

Projected Next Steps

A portion of the project is funded for right-of-way acquisition and construction in the 2020-2029 STIP.

- Final Environmental Impact Statement released – Winter 2022
- Record of Decision issued – Summer 2023
- Right of way acquisition begins – 2026
- Construction begins – TBD

The project is listed in NCDOT's 2020-2029 State Transportation Improvement Program (STIP) as Project Number R-2553. The project is divided into 5 sections (A-E). Per the 2020-2029 STIP, the project funding is as follows:

Section (see map)	Right of Way	Construction
A (interchange at Willie Measely Road and Jim Sutton Road) (funded through the R-5813 project)	2026	2028
A (Jim Sutton Road to Albert Sugg Road)	Not Funded	Not Funded
B (Albert Sugg Road to NC 148 / Harvey Parkway)	2029	Not Funded
C (NC 148 / Harvey Parkway to East of NC 58)	2026	Not Funded
D (East of NC 58 to Wyse Fork Road)	Not Funded	Not Funded
E (Wyse Fork Road to near Dover)	Not Funded	Not Funded

The STIP is in the process of being updated, these updates could result in changes in the funding schedule for Kinston Bypass. The draft 2024-2033 STIP has been released and the final 2024-2033 STIP will be available in Summer 2023.

4.0 Agenda

This meeting is being held to:

- Review the proposed improvements for the Least Environmentally Damaging Practicable Alternative (LEDPA)/applicant's preferred alternative.
- Summarize the impacts as will be disclosed in the Final Environmental Impact Statement (FEIS).
- Discuss the proposed measures to avoid and minimize the impacts of the proposed action.
- Reach concurrence on avoidance and minimization measures for the project.

5.0 Summary of Merger Concurrence Points to Date

Concurrence Point 1 – The NEPA/Section 404 Merger Team defined the Purpose and Need and Study Area on September 14, 2010. The Purpose and Need Statement was defined as:

> The purpose of the Kinston Bypass project is to improve regional mobility, connectivity, and capacity for US 70 between La Grange and Dover in a manner that meets the intent of the North Carolina Strategic Transportation Corridors policy (previously the Strategic Highway Corridors policy).
>
> The need for the Kinston Bypass Project is to address traffic congestion, capacity deficiencies, and through-traffic delays on US 70 between La Grange and Dover.

Concurrence Point 2 – The NEPA/Section 404 Merger Team defined 12 Detailed Study Alternatives to carry forward on January 16, 2014. Prior to CP 2, shifts to the general alignment of several corridors were made to minimize impacts to jurisdictional streams and wetlands, residences, businesses, community resources, and cultural resources. Additionally, the set of alternatives known as the 'northern bypass alternatives' were removed from further consideration due to updated traffic forecasts (see DEIS Sections 2.3.2 – 2.3.4, https://xfer.services.ncdot.gov/PDEA/Web/R-2553/draft-eis/STIP_R-2553_DEIS_Part-I.pdf)

The Alternatives carried forward were:

- Alternative 1 Upgrade Existing (1UE)
- Alternative 1 Shallow Bypass (1SB)
- Alternative 11
- Alternative 12
- Alternative 31
- Alternative 32
- Alternative 35
- Alternative 36
- Alternative 51
- Alternative 52
- Alternative 63
- Alternative 65

Concurrence Point 2A – The NEPA/Section 404 Merger Team completed "Bridging Decisions and Alignment Review" on February 20, 2014.

Concurrence Point 3 – The NEPA/Section 404 Merger Team defined the Least Environmentally Damaging Practicable Alternative as Alternative 1SB on February 19, 2020.

Concurrence Point 2A, revisited – The NEPA/Section 404 Merger Team reviewed decisions made during the first CP2A meeting held on February 20, 2014. CP2A revisited was held on November 10, 2021. The purpose of the meeting was to review updates to the project since the first CP2A meeting. During the first CP2A meeting, an agreement was made that CP2A would be revisited following selection of a LEDPA. Two action items were identified during the meeting to provide additional information to agencies prior to CP4A and the previous concurrence was upheld. SHPO requested that an analysis of need for the Southwest Creek Service Road bridge be conducted. This analysis was completed and sent to the Merger Team on February 4, 2022. Gary Jordan (USFWS) requested that a discussion be held regarding bridging details for Falling Creek and Southwest Creek since Neuse River waterdog were found in both locations. Coordination with USFWS in ongoing.

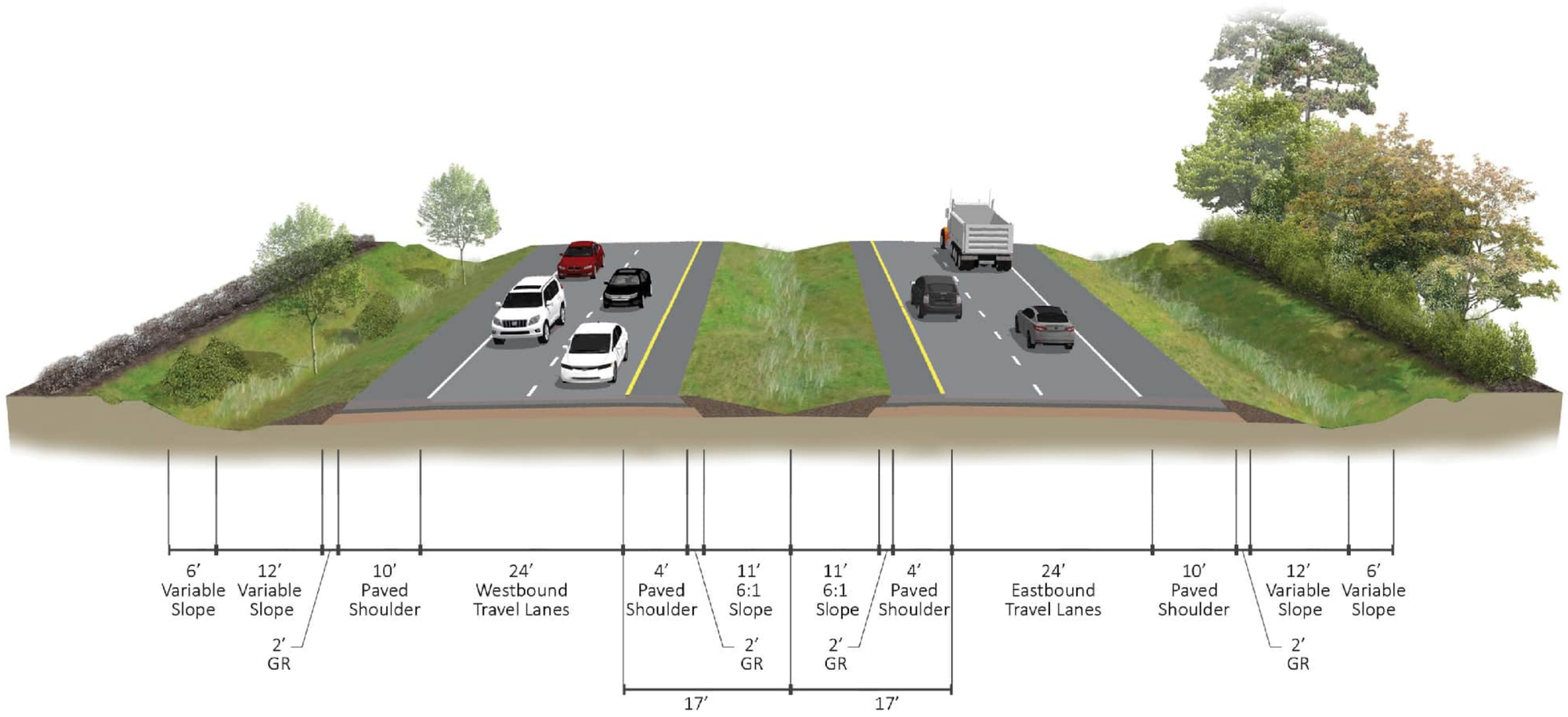
6.0 Typical Sections

The typical sections developed for the project were designed in order to avoid and minimize impacts. There are five proposed typical sections for Alternative 1SB:

- A typical section without service roads (Figure 2)
- A typical section with a service road on one side (Figure 3)
- A typical section with a service road on both sides (Figure 4)
- A typical section for the bridge over the Neuse River (Figure 5)
- A typical section with barrier separated service road(s) (Figure 6)

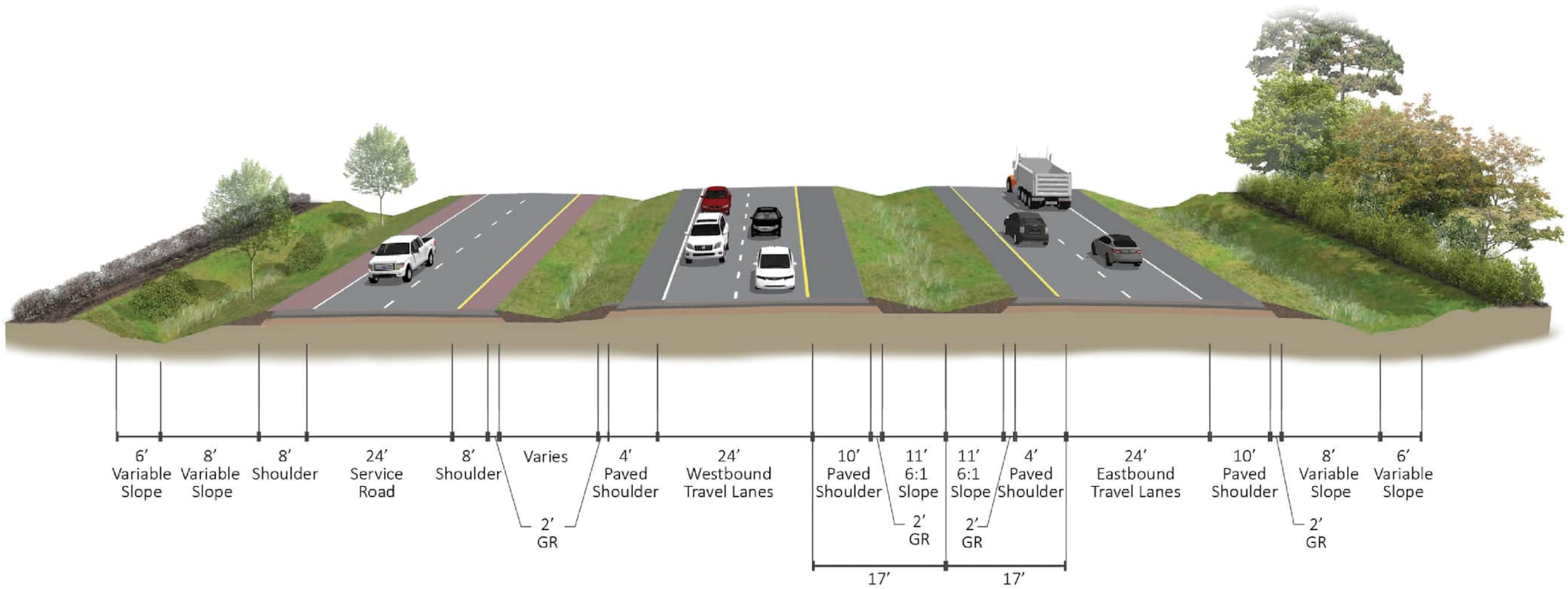
Source: AECOM

Figure 2:
Typical section without service road



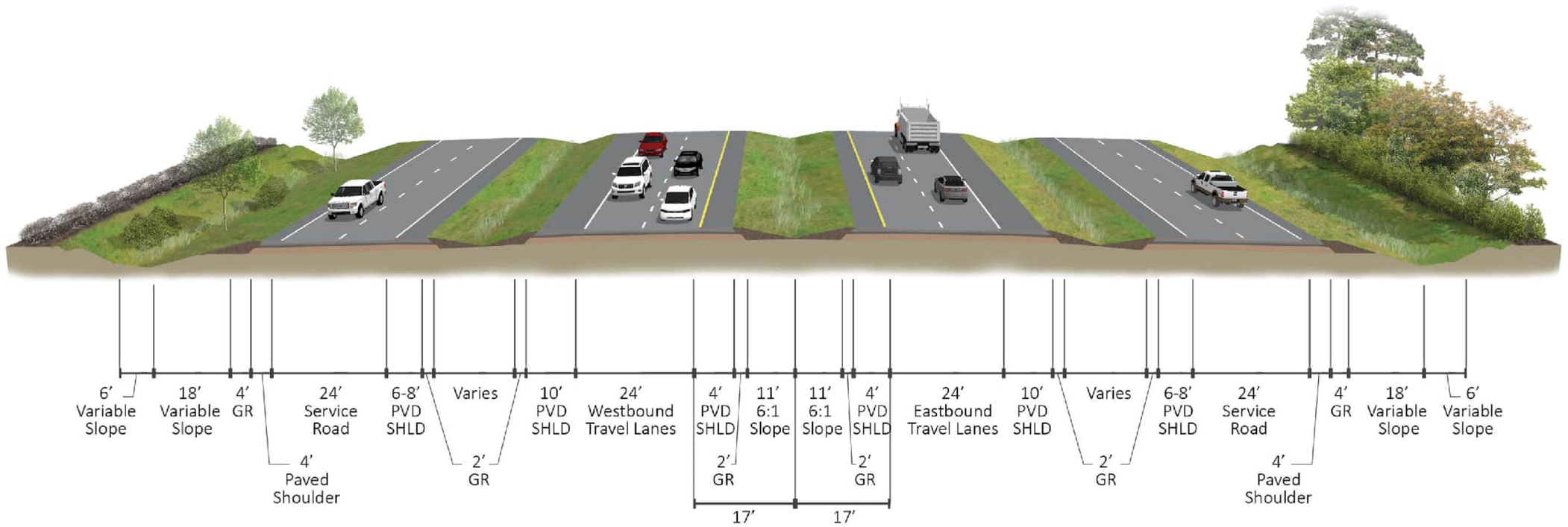
Source: AECOM

Figure 3:
Typical section with service road on one side



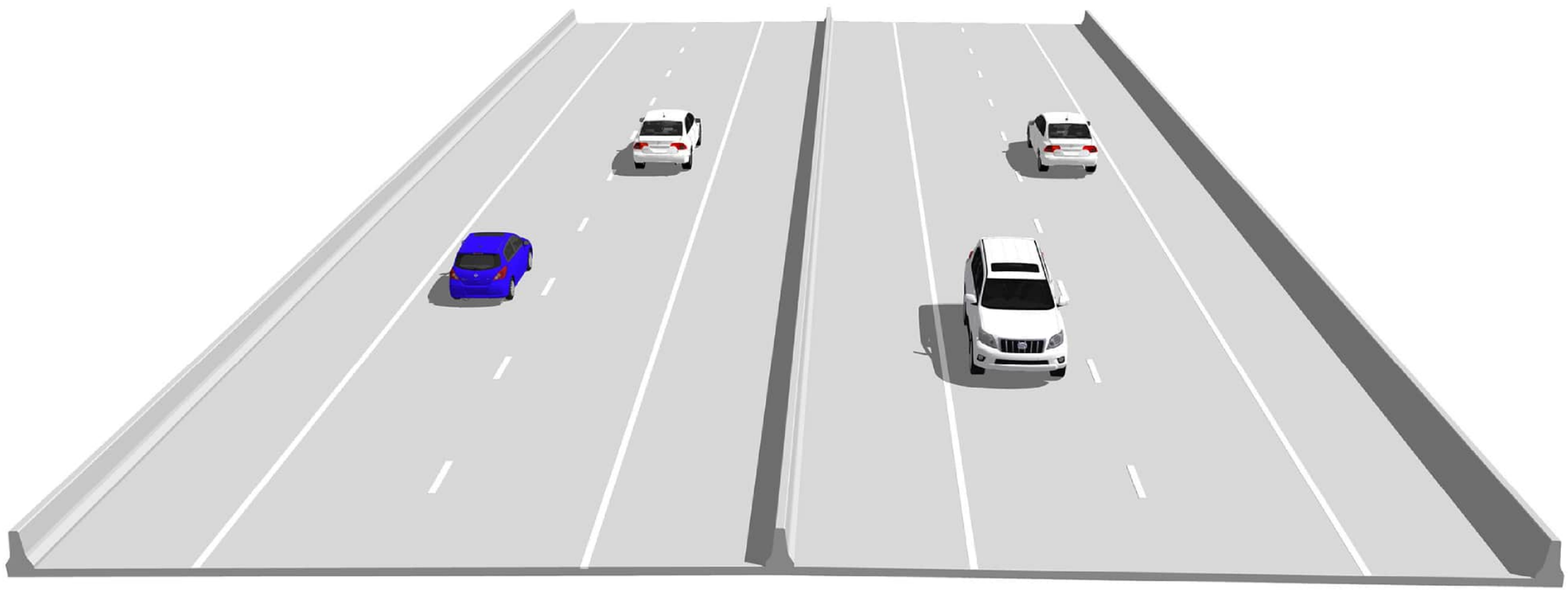
Source: AECOM

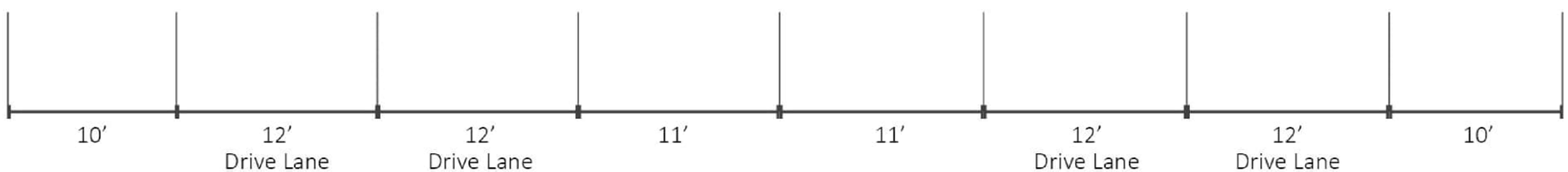
Figure 4:
Typical section with service road on both sides



Source: AECOM

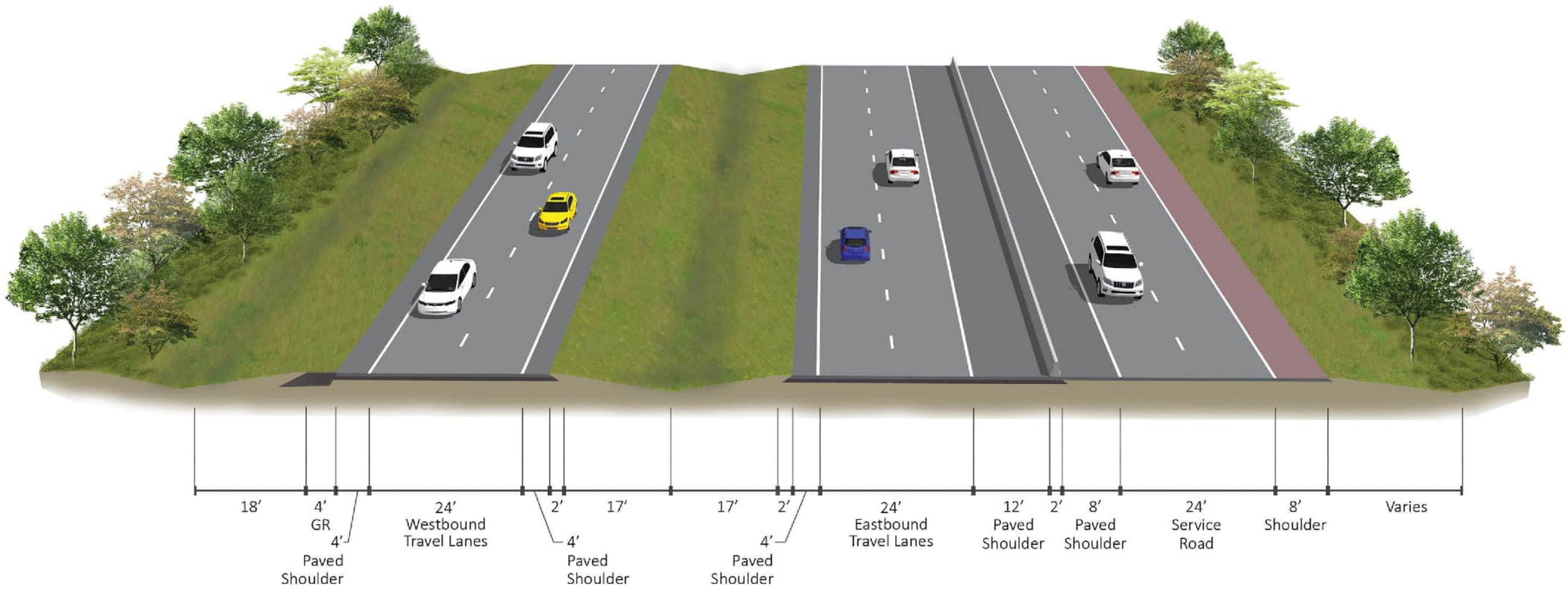
Figure 5:
Typical section for Neuse River bridge





Source: AECOM

Figure 6:
Typical section with barrier separated service road



7.0 Hydraulic Structures

Major hydraulic structures are those with a contributing drainage area requiring a conveyance greater than a 72-inch pipe. Twenty-three sites meeting that requirement were identified within the revised Hydraulics Analysis Report developed for the applicant's preferred alternative in October of 2021. Table 1 presents structures identified as potential major hydraulic structures and the recommended actions for the applicant's preferred alternative. The locations of these crossings are shown on Figures 7 and 8.

TABLE 1: PRELIMINARY HYDRAULIC RECOMMENDATIONS FOR MAJOR[1] CROSSINGS

DATE: 10/14/2021
PROJECT NUMBER: R-2553 Kinston Bypass
WBS ELEMENT #:
PROJECT DESCRIPTION:
NAME: Kinston Bypass

ALT ID [2]	ROUTE	STATION	LAT	LONG	STREAM/WETLAND ID	STREAM NAME	FEMA STUDY TYPE	DRAINAGE AREA (Mi^2)	EXISTING STRUCTURE	MINIMUM RECOMMENDED STRUCTURE	Notes
									Number, Size, Structure Type	Number, Size, Structure Type	
2	L	233+00	35.26694	-77.73161	Stream SA	Unnamed	None	1.72	6.5x4 box culvert	9'x8' RCBC with wingwalls	Replace existing, 1' to be buried.
4	L	320+75	35.260997	-77.692803	Falling Creek	Falling Creek	Detailed	46.5	2-3@40' bridges	retain existing, add 2 bridges 3@40'-4"	Retain existing bridges, add two for aux. lanes
505	L2	N/A	35.260788	-77.674406	Stream SJ	Unnamed	None	2.98	12'x6' RCBC	12'x8' RCBC	Replace existing, 1' to be buried.
12-4	L2 Ramp A	N/A	35.266537	-77.674177	Stream SJ	Unnamed	None	2.24	None	3@12'x11' RCBC	Minimum structure size by Q is 7.5'x7.5'; match up and downstream structure sizes. 1' to be buried.
509	Y3	68+00	35.260801	-77.651981	Stream SO	Unnamed	None	1.41	1@6'x4' RCBC	1@8'x8' RCBC	Replace existing, 1' to be buried
304	L	454+50	35.258242	-77.651854	Stream SO	Unnamed	None	1.69	None	1@9'x8' RCBC	New location, 1' to be buried.
307	L	607+00	35.240655	-77.606443	Stream SU	Unnamed	None	2.08	None	1@10' x 8' RCBC	New location, 1' to be buried.
308	L	620+50	35.238034	-77.603833	Stream SV	Unnamed	None	1.48	None	1@10'x7' RCBC	New location, 1' to be buried.
311	Y5	28+00	35.236385	-77.600422	Stream SV	Unnamed	None	1.43	1 24" RCP	1@8'x8' RCBC	Replace existing 24" pipe, 1' to be buried.
313-3	L	641+50	35.23453	-77.59836	Stream SX	Unnamed	None	1.09	None	1@8'x8' RCBC	New location, 1' to be buried.
312-1	A1C1Y5_RPA	26+50	35.236094	-77.598271	Stream SV	Unnamed	None	1.41	None	1@8'x8' RCBC	New location, 1' to be buried.
312-2	A1C1Y5_RPA	23+25	35.235373	-77.59791	Stream SV	Unnamed	None	1.41	None	1@8'x8' RCBC	New location, 1' to be buried.
110	L	818+50	35.229658	-77.543182	Southwest Creek	Southwest Creek	Detailed	56.1	2 bridges, Upstream bridge 1@56', 1@55', 1@56'; Downstream bridge 3@ 52'6"	retain existing, add 1 bridge, 1@56', 1@55', 1@56'	Retain existing, add additional bridge for service road
112	L	905+00	35.21913	-77.517401	Mill Branch	Mill Branch	None	2.3	2 barrel 7'x6' RCBC	retain and extend 2@7'x6'	Retain and extend existing (sized for 50 year currently)
48	L	1035+00	35.223119	-77.474747	Tracey Swamp	Tracey Swamp	Limited	5.02	3@7'x7' RCBC	retain and extend 3@7'x7' RCBC	Retain and extend existing (sized for 50 year currently)
516-2	L	1097+00	35.2187335	-77.454464	Stream SAN	Unnamed	None	0.79	1@5' RCP	Replace with 7'x7' RCBC	Replace existing pipe, 1' to be buried.
516-3	Y10 Ramp B	N/A	35.219674	-77.4538	Stream SAN	Unnamed	None	0.82	None	Install new 7'x7' RCBC	New location, 1' to be buried.
516-4	Y10	67+75	35.219246	-77.452178	Gum Swamp	Gum Swamp	None	2.37	CM Ellipse 12'x7'	1@11'x8' RCBC	Relace existing pipe, 1' to be buried.
516-5	Y10 Ramp A	N/A	35.218281	-77.451525	Gum Swamp	Gum Swamp	None	2.34	None	1@11'x8' RCBC	New location, 1' to be buried.
516-6	L	1111+50	35.216818	-77.450859	Gum Swamp	Gum Swamp	None	1.87	2@5'x7'	Retain as-is	Retain existing pipe. No need to extend.
516-8	Y10 Ramp D	N/A	35.215787	-77.449953	Gum Swamp	Gum Swamp	None	1.85	None	1@10'x8' RCBC	New location, 1' to be buried.
516-9	Y10 Ramp C	N/A	35.217319	-77.454361	Stream SAM	Unnamed	None	0.61	None	1@6'x7' RCBC	New location, 1' to be buried.
305	L	480+00	35.254052	-77.63601	Neuse River	Neuse River	Detailed	2700	None	7115' bridge	New Location

NOTES:
(1) Major Crossings - conveyance greater than 72" pipe (This table should be used for Merger CP2A concurrence.)
(2) Provided in planning document

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Figure 7: Culvert Locations

GREENE COUNTY
PITT COUNTY
LENOIR COUNTY
CRAVEN COUNTY
JONES COUNTY
GTP
Stonyton Creek
White Mash Run
Gum Swamp Creek
Briery Run
Jericho Run
Neuse River
Falling Creek
Whitelace Creek
Whitley's Creek
Southwest Creek
Mott's Swamp
Strawberry Branch
Mill Branch
Heath Branch
Gum Swamp
Alternative 1 SB
2
12
505
304
307
308
311
312
112
48
516
148
58
55
11
70BUS
70BYP
70

Legend

- Proposed Box Culvert Crossing
- Retain Existing Culvert (Extend as Needed)
- Study Area
- Alternative 1 SB
- Stream
- Railroad
- County
- US Highway
- NC Highway
- Secondary Road
- Waterbody
- Global TransPark (GTP)
- Floodplain
- Floodway
- Municipal Area

0 12,000 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDENR, NCFPM, Craven County, NCDCM, NCEM, Lenoir County, Pitt County, Kinston Planning Department, NCOneMap, NCWRC, NCSHPO,EPA, USFWS, USDA, NRCS, DWQ, ESRI and URS.

Virginia
Tennessee
North Carolina
South Carolina
Georgia

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Figure 8: Bridge Locations

Legend

- Proposed Bridge Crossing
- Maintain Existing Bridge (No Modification Anticipated)
- Maintain Existing Bridge (with Potential Widening and/or Proposed Ramp/Service Rd. Bridge)
- Study Area
- Alternative 1-SB
- Stream
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Global TransPark (GTP)
- County
- Waterbody
- Floodplain
- Floodway
- Municipal Area

0 12,000 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDENR, NCFPM Craven County, NCDCM, NCEM, Lenoir County, Pitt County, Kinston Planning Department, NCOneMap, NCWRC, NCSHPO,EPA, USFWS, USDA, NRCS, DWQ, ESRI and URS.

GREENE COUNTY
LENOIR COUNTY
CRAVEN COUNTY
JONES COUNTY
GTP
Alternative 1 SB
4
305
110
70BUS
70BYP
11
55
58
148
70
White Mash Run
Gum Swamp Creek
Falling Creek
Stonyton Creek
Briery Run
Jericho Run
Neuse River
Whitelace Creek
Rivermont Tributary
Whitley's Creek
Southwest Creek
Mott's Swamp
Strawberry Branch
Mill Branch
Heath Branch
Gum Swamp

8.0 Summary of Impacts from the DEIS

Table 2 includes a summary of the impacts for the applicant's preferred alternative as presented in the DEIS. Impacts were calculated using slope stakes plus 40 feet for natural systems.

Table 2. Summary of Impacts from the DEIS

Impact Type	Alternative 1SB
General	
Length (miles)	24.5
Intelligent transportation system cost ($)	$450,000
Utility cost ($)	$10,800,000
Right-of-way cost ($)	$123,710,000
Construction cost ($)	$292,800,000
Mitigation cost ($)	$12,250,000
Total cost ($)	$440,010,000
Socioeconomic Resources	
Residential (#)	162
Business (#)	67
Non-Profit (#)	0
Total (#)	**229**
Communities (#)	3
Environmental Justice residential areas (#)	6
Minority block groups (#)	0
Low Income block groups (#)	3
Schools (#)	1
Hospitals (#)	0
Churches (#)	6
Fire departments (#)	1
Emergency Medical Services stations (#)	0
Airports (#)	0
Parks and recreational areas (#)	0
Cemeteries (#)	1
VADs (#)	0
VADs (ac)	0.0
NCNHP managed areas (ac)	2.3
Prime farmland (ac)	302.3
Farmland of statewide importance (ac)	222.5
Farmland of unique importance (ac)	53.3
Economic Resources	
Annual total net benefits (quantified 2040)	$23.4 million

Impact Type	Alternative 1SB
Physical Resources	
Noise receptors impacted	56
Hazardous materials sites (#)	9
Cultural Resources	
Section 106 adverse effects	2
Archaeological sites - high probability (ac)	829.3
Archaeological sites - low probability (ac)	480.1
Natural Resources	
Maintained/Disturbed (ac)	516.6
Agriculture (ac)	507.9
Pine Plantation (ac)	148.5
Forested Upland (ac)	25.3
Palustrine Wetland (ac)	97.4
Open Water (ac)	13.7
Total biotic resources (ac)	1309.4
Stream crossings (#)	44
Stream length (ft)	33,112
100-year floodplain (ac)	147.7
500-year floodplain (ac)	130.8
Total floodplains (ac)	278.5
Floodway (ac)	0.6
Riparian wetland	41.2
Non-riparian wetland	24.2
Total wetland impacts (ac)	65.4

9.0 Avoidance and Minimization

Avoidance and minimization efforts have been applied throughout the project development and alternative analysis process including during the identification of preliminary alternatives and selection of the detailed study alternatives (CP 2 and CP 2a). In selecting their preferred alternative, NCDOT considered impacts calculated based on the proposed preliminary design as presented in the DEIS. However, it was recognized that the preliminary design would continue to be refined within the applicant's preferred alternative corridor through final design to address comments from environmental agencies and the public, and to further avoid and minimize impacts.

9.1 Design Refinements to the Applicant's Preferred Alternative

After selection of the applicant's preferred alternative, various design changes were made to the preliminary designs presented to the public in the DEIS and at the corridor public hearing in 2019. These changes were made in an effort to further reduce impacts, accommodate adjacent projects, and incorporate recommendations from the 2021 Value Engineering (VE) study to avoid and minimize impacts and reduce cost (the VE study is available for review upon request).

An overview of these changes is shown on Figures 9 and 10.

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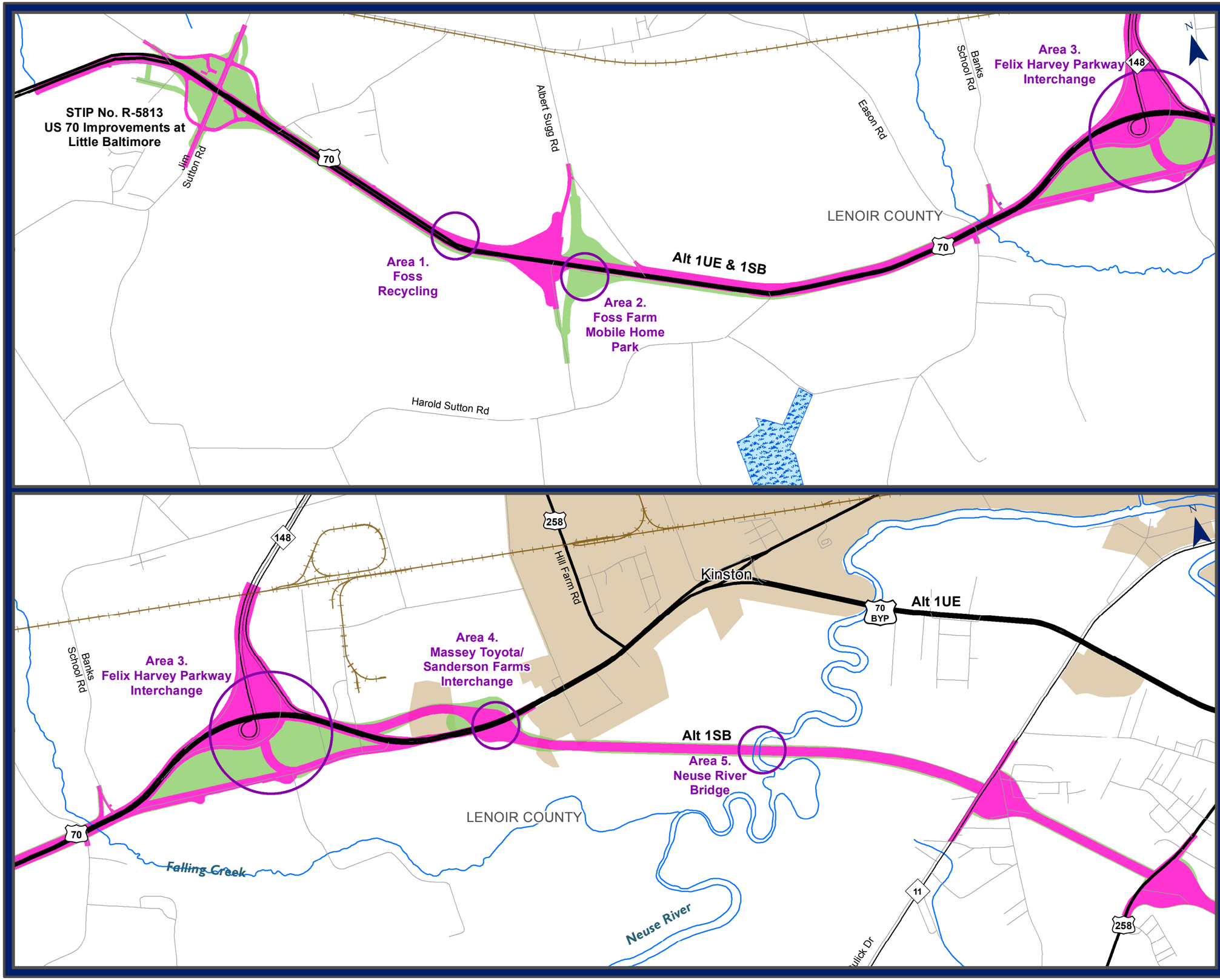
Figure 9:
FEIS alternative 1SB - A
(Applicants preferred alternative)



Legend

- Alt 1UESB - FEIS ROW
- Alt 1UESB - DEIS
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary

0 0.25 0.5 Miles

This map is for reference only.
Sources: AECOM, CGIA, City of Kinston, Craven County, ESRI, HPO, Jones County Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM, NCOnemap, NRCS, USFWS

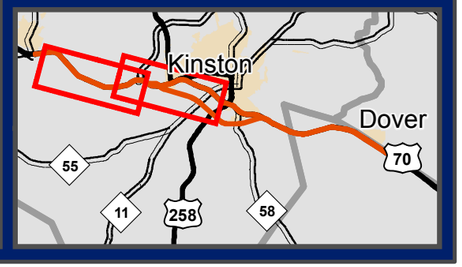


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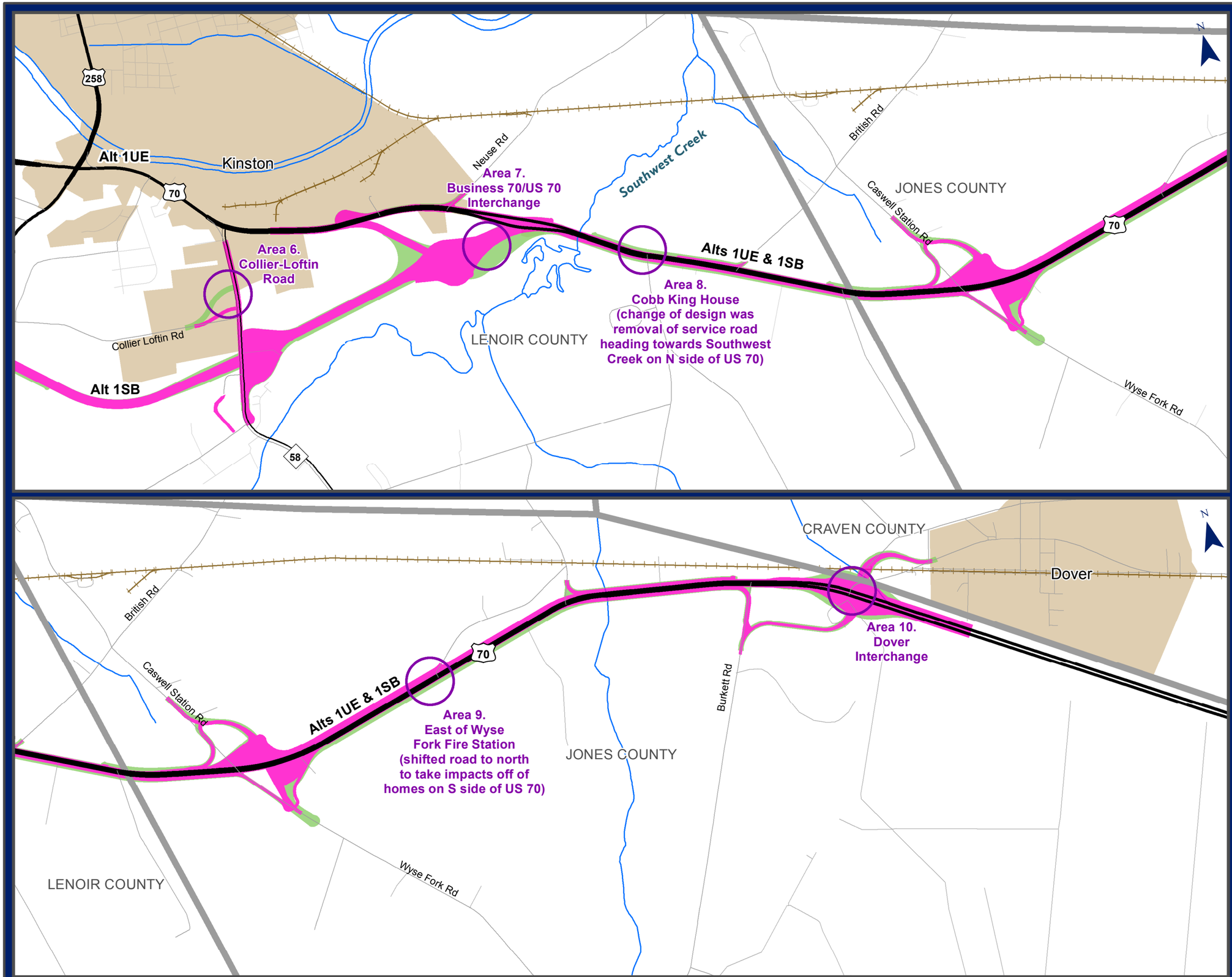
Figure 10:
FEIS alternative 1SB - B
(Applicant's preferred alternative)



Legend

- Alt 1UESB - FEIS ROW
- Alt 1UESB - DEIS
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary

0 0.25 0.5 Miles

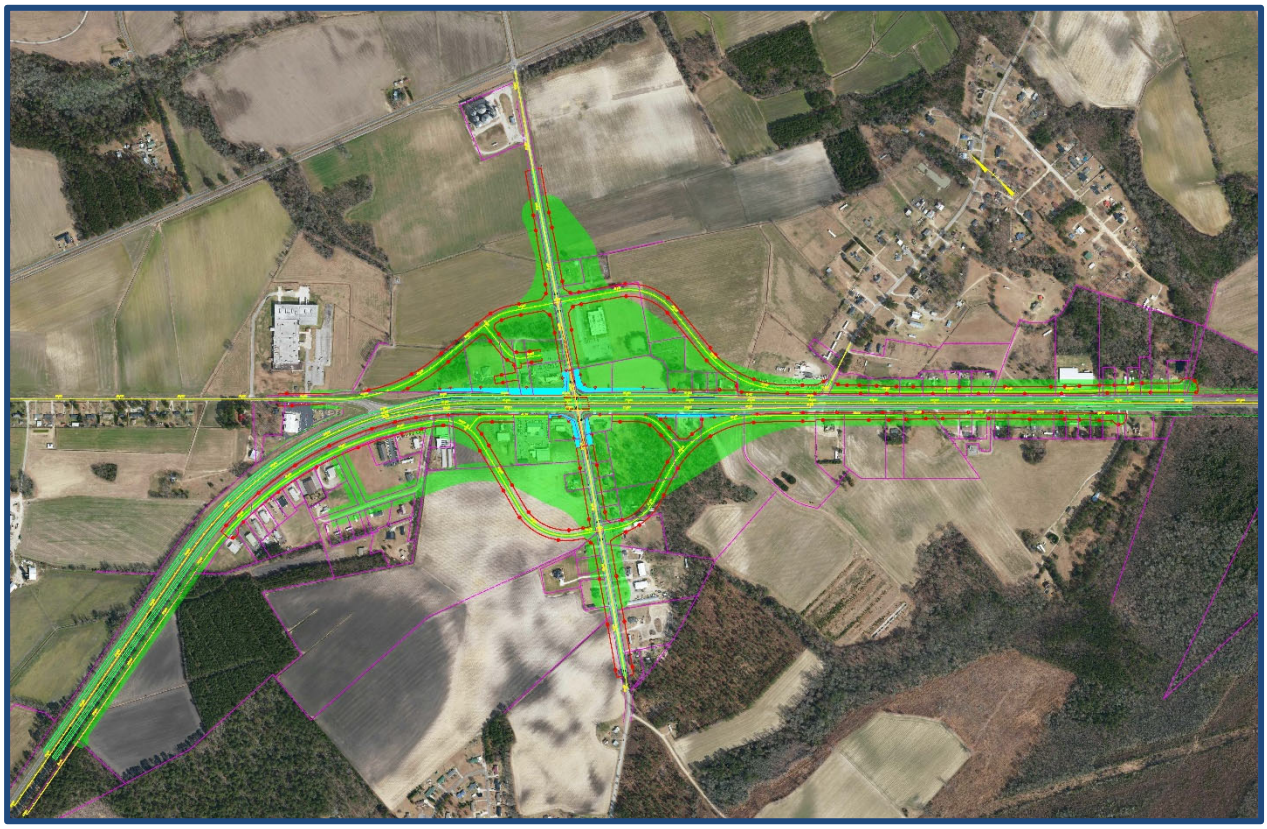
This map is for reference only.
Sources: AECOM, CGIA, City of Kinston,
Craven County, ESRI, HPO, Jones County
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,
NCOnemap, NRCS, USFWS

9.1.1 STIP No. R-5813 US 70 Improvements at Little Baltimore

NCDOT created a separate highway project, STIP No. R-5813 (US 70 Highway Improvements at Little Baltimore), at the western-most extent of the limits of the Kinston Bypass project. It consists of upgrading existing US 70 to full control of access from near NC 903 to east of Jim Sutton Road (SR 1227)/Willie Measley Road (SR 1252) which would be realigned and converted to an interchange with full control of access.

During environmental studies for the R-5813 project, three intersection configurations were considered: a partial cloverleaf, a tight urban diamond, and a full diamond. The full diamond interchange and partial cloverleaf configurations included accommodations inside the interchange for future loops. This would result in most of the homes and businesses within the interchange area being acquired as anything inside the interchange area would be converted to controlled access.

To minimize impacts to homes and businesses in the vicinity of the project, the tight urban diamond interchange alternative was selected as the recommended alternative. The tight urban diamond interchange would allow the service roads associated with the interchange to be relocated outside most of the existing homes and businesses adjacent to the interchange. A tight bridge design was incorporated that uses retaining walls to further minimize impacts. This resulted in reducing relocation impacts to businesses from 8 to 6, residential relocations from 19 to 6, and non-profit/church impacts from 2 to 0. The right-of-way reductions in this area were reduced from 70.3 acres in the DEIS to 41.0 acres.



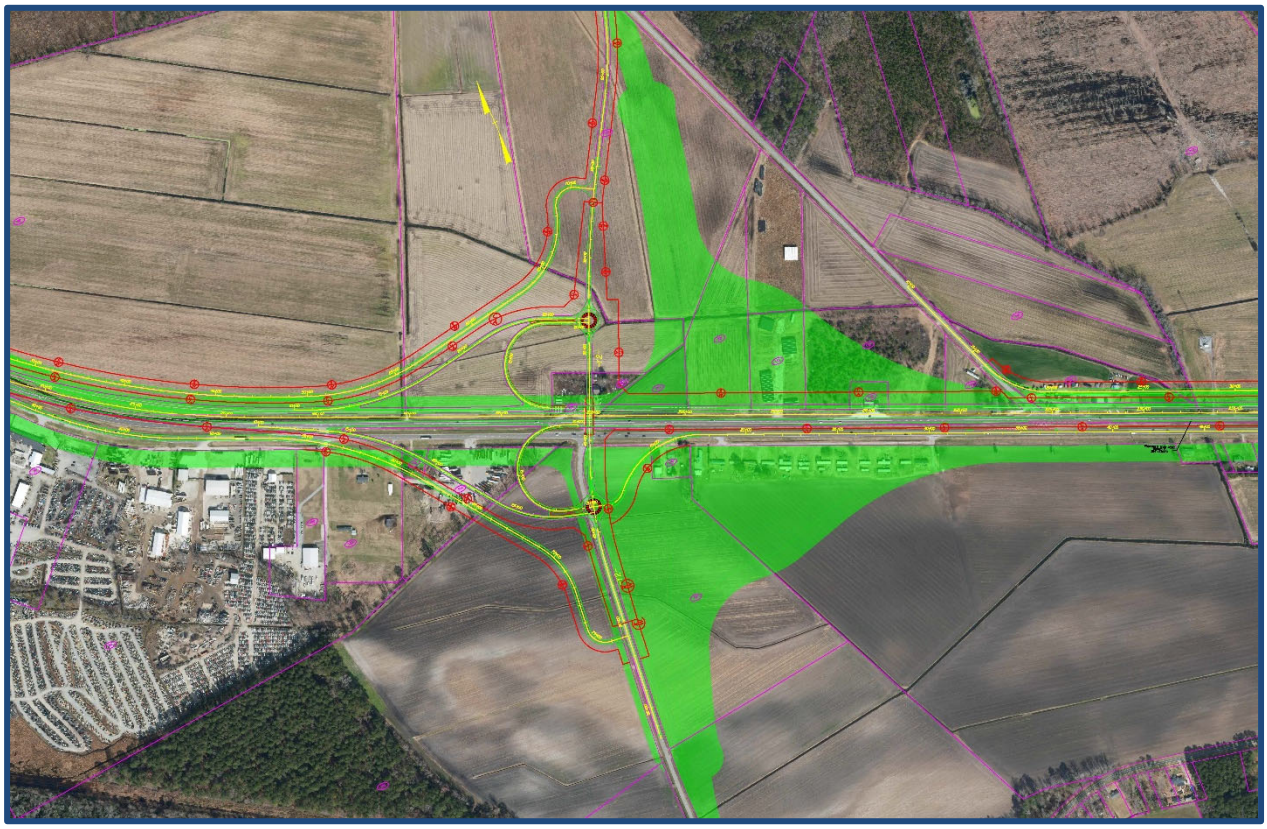
9.1.2 Foss Recycling

The original design for the project required the acquisition of right-of-way from the Foss Recycling property on the south side of existing US 70 to accommodate the service road running parallel to the project. At the request of the property owners, design changes were incorporated to minimize impacts to their property and business. The separation between the service road paralleling the project and the mainline facility was reduced by utilizing a barrier so it could be shifted closer to the new roadway. This shift reduced the amount of right-of-way required from Foss Recycling. The right-of-way reductions in this area were reduced from 6.9 acres in the DEIS to 5.2 acres.

9.1.3 Foss Farm Mobile Home Park

The original design for the project included a half clover interchange east of Barwick Station Road that would have impacts to the Foss Farm Mobile Home Park (Foss Farm) on Foss Farm Road, which was identified as an environmental justice community in the DEIS. Albert Sugg Road was being realigned to the west and Barwick Station Road was being realigned to the east so the two roads would meet just west of Foss Farm. Interchange loops and a service road would traverse the community and require the acquisition of all homes in the community.

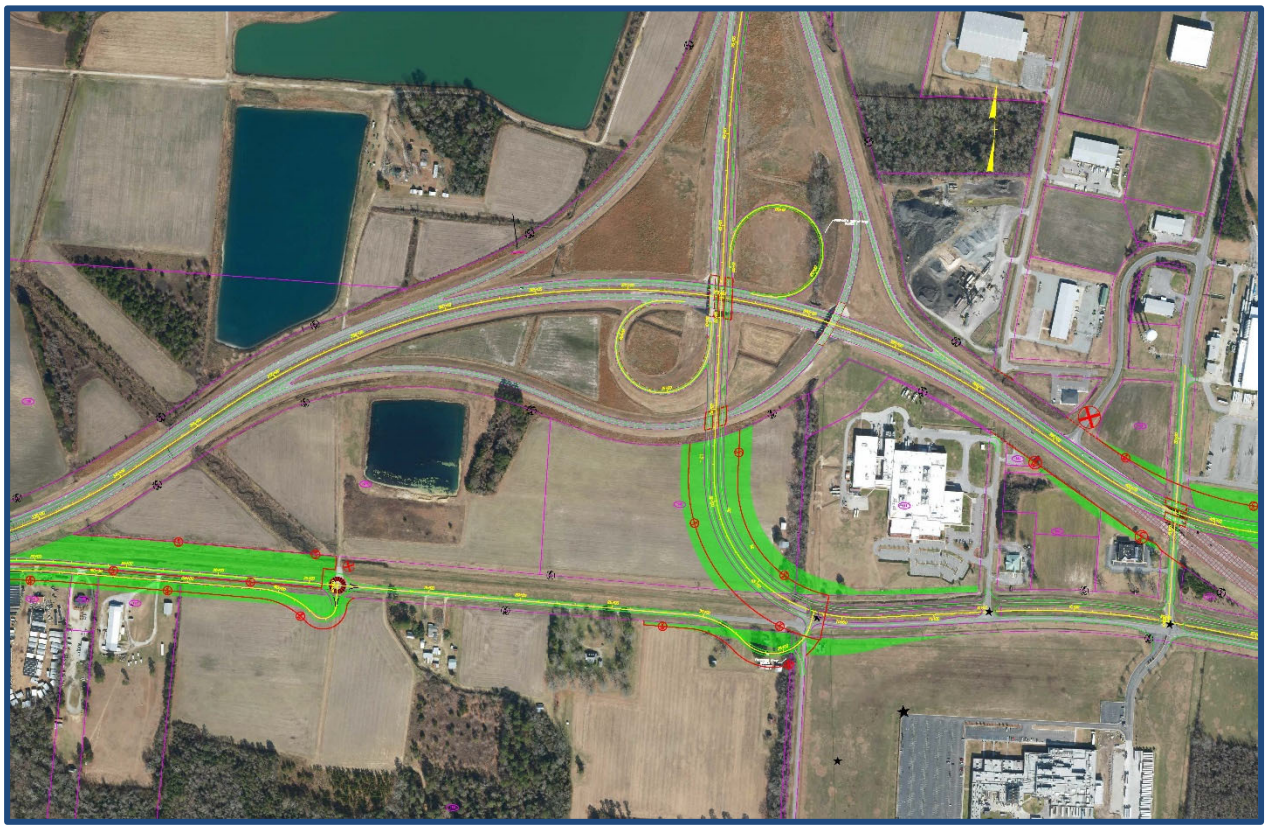
The VE Study suggested a single quad connector type interchange. An alternate design to the original half clover interchange was developed in place of designing a single quad connector interchange. The alternate design is a reconfigured half clover interchange that would avoid impacting Foss Farm. The revised design flips the interchange from the east side of Albert Sugg Road to the west side of Albert Sugg Road. In addition, roundabouts were added at the end of the ramps/loops in place of signalized intersections. Albert Sugg Road retains its current alignment and Barwick Station Road is realigned farther west to meet Albert Sugg Road. The eastbound lanes of existing US 70 would be converted to a service road and the new roadway would be shifted to the north to avoid Foss Farm. Foss Farm would have access to US 70 via the service road that intersects with Foss Farm Road. The use of existing eastbound US 70 for service roads transitions back to the construction of service roads on new location south of existing US 70 near Tidewater Transit, just east of Harold Sutton Road. As a result of this change, Foss Farm is allowed to remain in place, thus reducing relocation impacts to an environmental justice community.



9.1.4 Felix Harvey Parkway Interchange

The original design for the project included a signal at the intersection of Sanderson Way and the slip lane off the project for eastbound traffic, with Sanderson Way intersecting Felix Harvey Parkway with a free flow ramp.

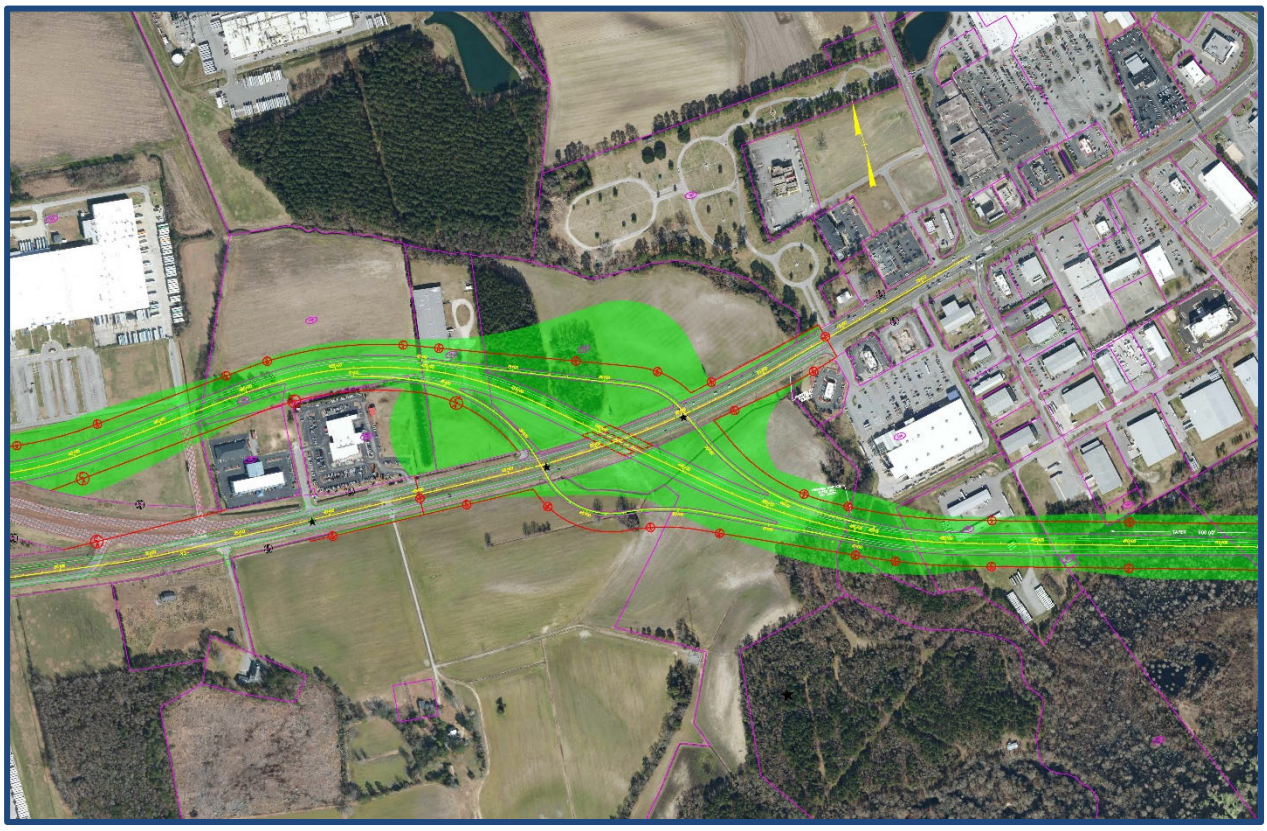
The VE Study suggested a roundabout be used at the intersection of Sanderson Way and the slip lane in place of a signalized intersection and to improve traffic operations and safety. The intersection of Sanderson Way with Felix Harvey Parkway was also reconfigured to come into the Felix Harvey Parkway ramp at a signalized intersection instead of the free-flow ramp for better traffic operations and safety. Once Felix Harvey Parkway intersects with Sanderson Way it would be transitioned to a more urban arterial roadway with potentially signalized intersections (to be determined later during final design). The design changes resulted in a reduction of direct impacts to the National Register listed Dr. James M. Parrot House property (LR-0703) from 0.2 acres (as shown in the DEIS) to zero.



9.1.5 Massey Toyota/Sanderson Farms Interchange

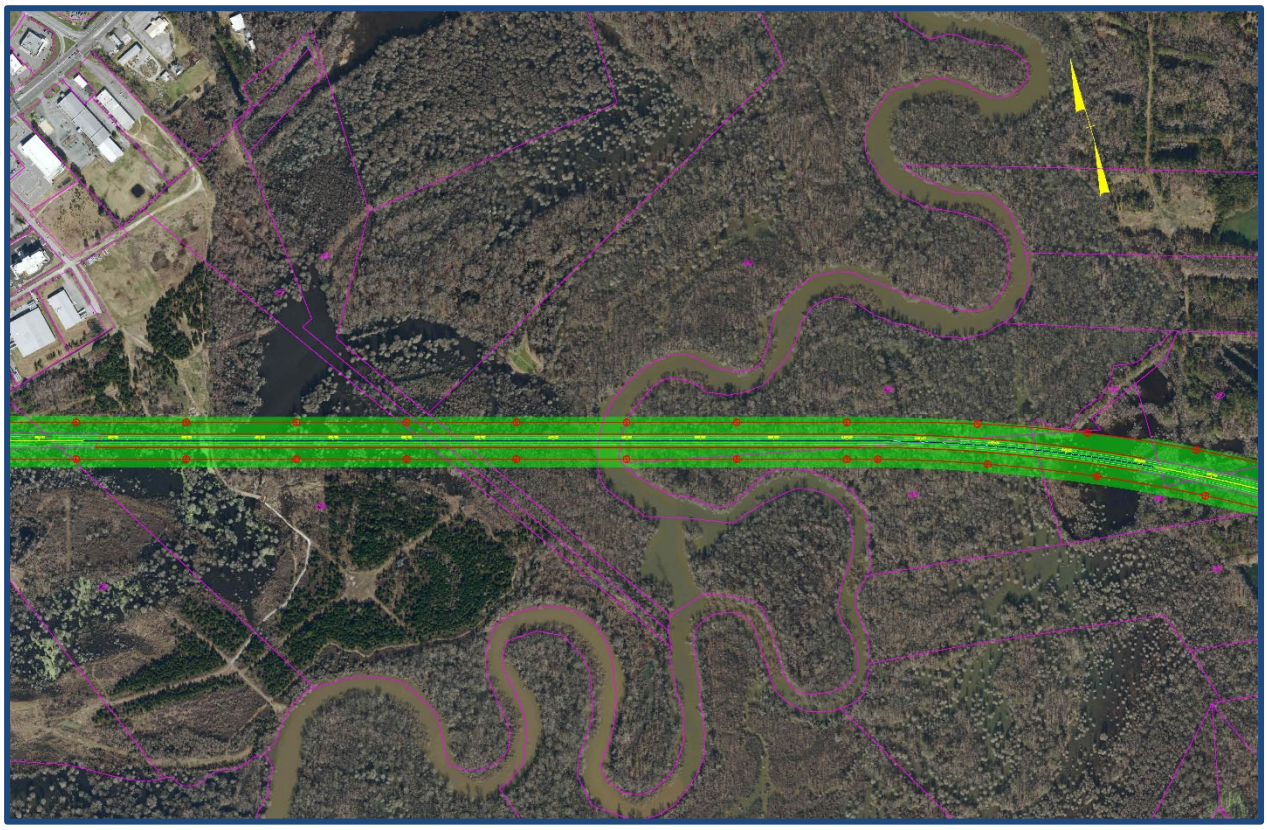
The original design for the project provided access to this area for eastbound traffic via Sanderson Way, with the next opportunity to turn around or turn back if the Sanderson Way exit was missed being after the crossing of the Neuse River. This design also limited opportunity to exit for travelers wishing to get to Business 70 and downtown Kinston.

The VE Study resulted in the interchange being converted from a system interchange to a diamond interchange, allowing improved access for people travelling eastbound to exit at Business 70. This configuration would allow people to exit the project at US 70/Business 70 and get to downtown Kinston, Lowes Home Improvement, and other surrounding businesses. It would also provide better access to businesses near Massey Toyota and the industrial park. The right-of-way reductions in this area were reduced from 8.7 acres in the DEIS to 0.6 acres.



9.1.6 Neuse River Bridge

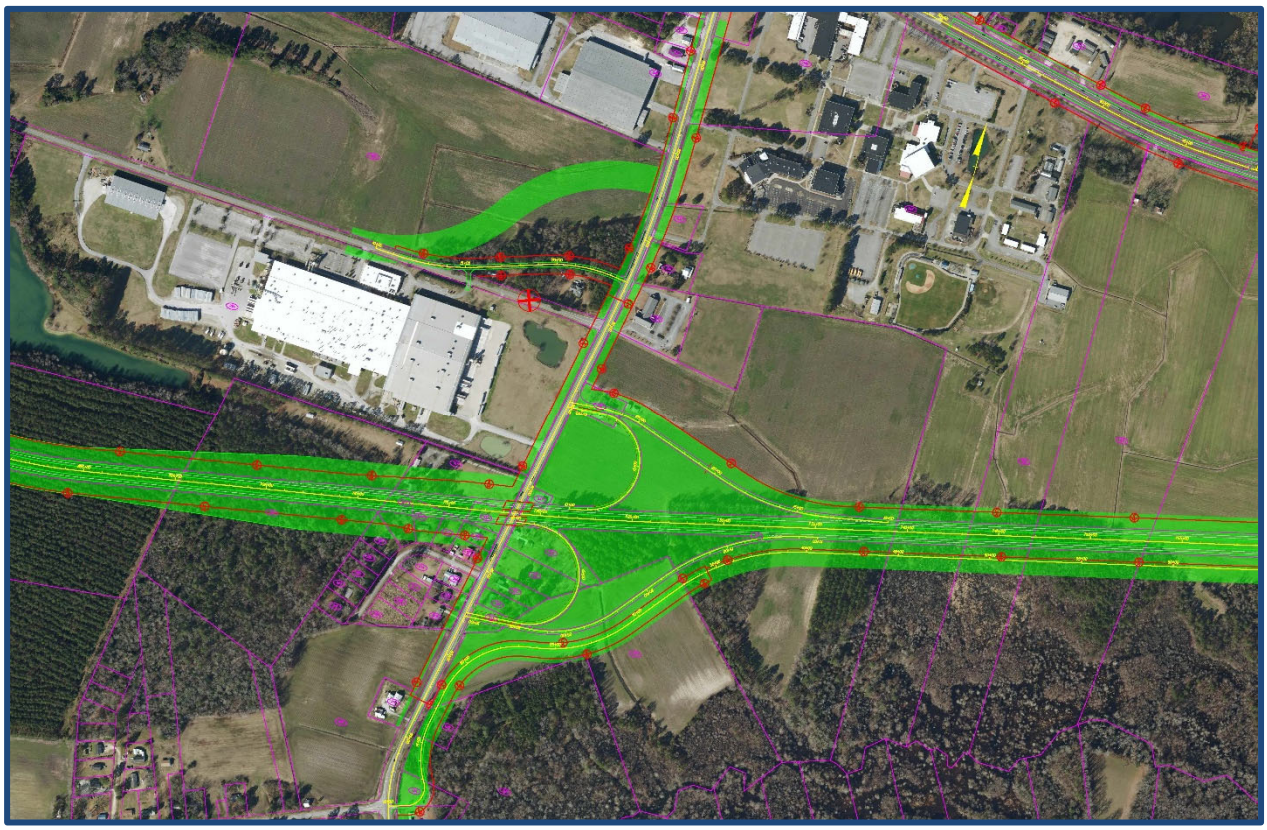
The original design for the crossing of the Neuse River consisted of dual bridges. This design was used in order to match the 46-foot median width proposed for the standard roadway new location typical section. During the VE Study, it was suggested that a single bridge structure be used to narrow the crossing and minimize impacts and cost. A bridge type study was completed for the bridge to evaluate the environmental and cost benefits of using a single bridge to reduce the overall construction footprint. A single bridge structure requires a narrower footprint than a dual structure which reduces shadowing beneath the bridge. Additionally, a single substructure requires less pilings, further reducing the overall environmental impacts of the bridge.



9.1.7 Collier-Loftin Road

The original design relocated the tie-in point for Collier-Loftin Road onto NC 58 further north to comply with interchange control of access requirements. Typically control of access limits are set near 1,000 feet from the ramp terminals of the interchange along the intersecting roadway. After discussions with affected property owners and nearby businesses and churches, the control of access limit was reduced to near 750 feet and the tie point for Collier-Loftin Road was moved further south along NC 58 to align with the entrance with Grace Baptist Church.

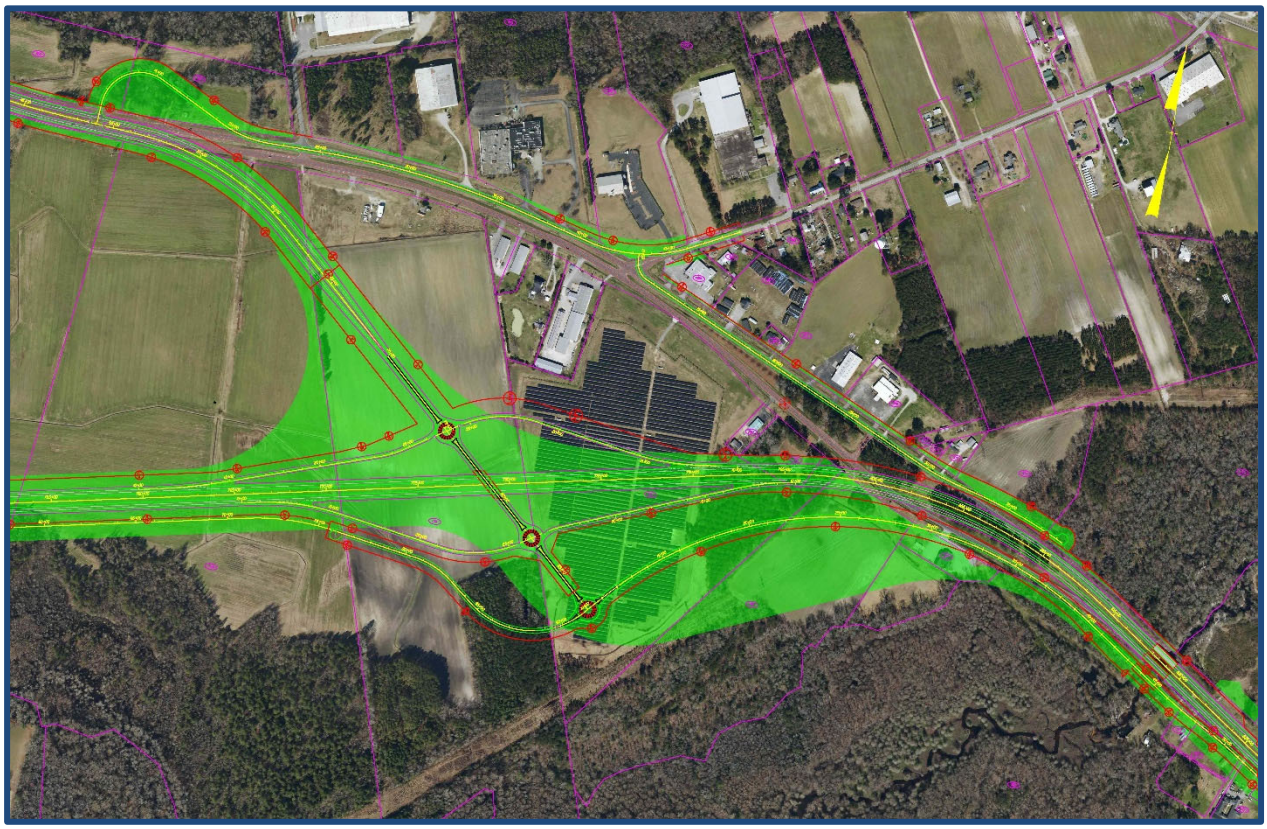
Furthermore, a section of the service road that is east of NC 58, near Southwest Creek, was eliminated. This resulted in a reduction of impacts to wetlands from 5.8 acres in the DEIS to 5.4 acres.



9.1.8 Business 70/US 70 Interchange

The original design for the Business 70/US 70 interchange consisted of a system interchange that provided only limited access, with the service roads separate from the interchange.

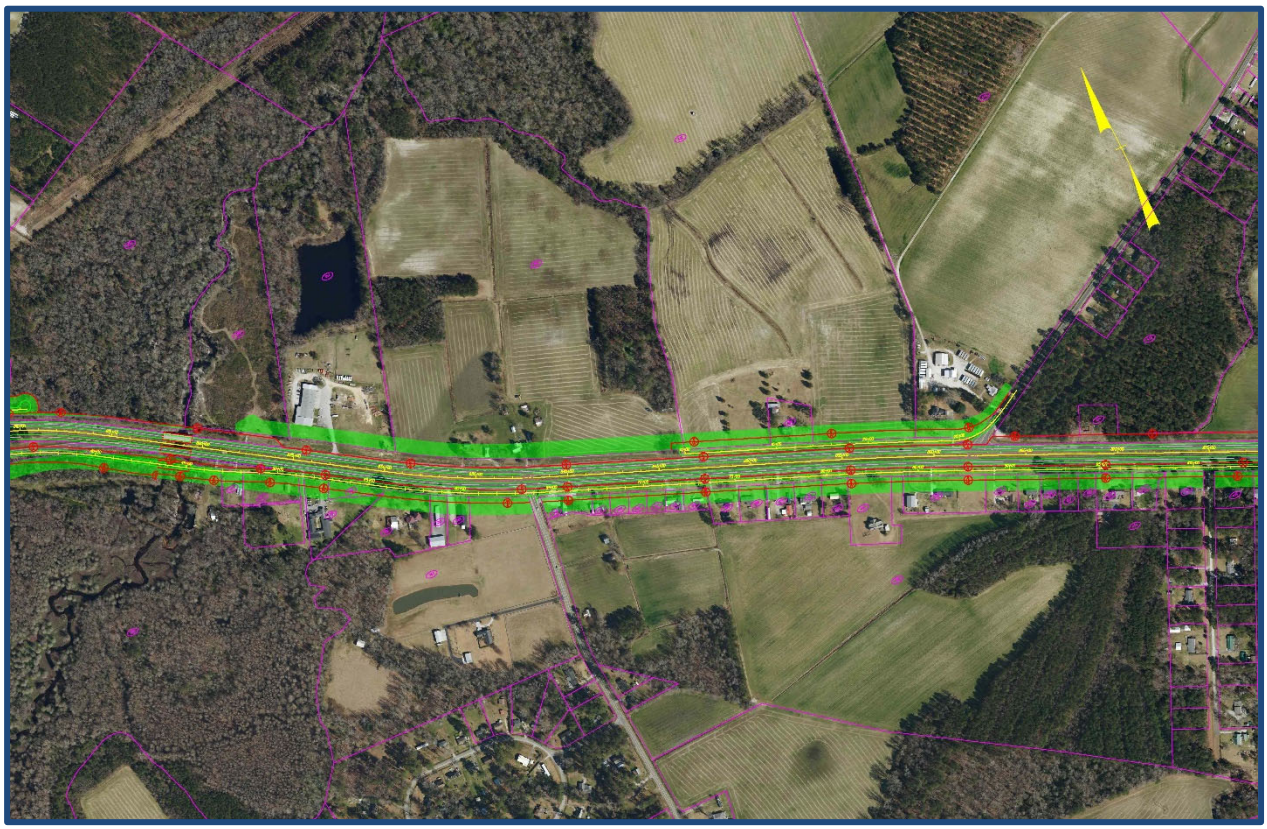
The VE Study resulted in changing the interchange from a system interchange to a traditional diamond interchange with roundabout terminals and a roundabout intersection that would allow the service roads access to the system and allow travelers to get back into downtown Kinston. The right-of-way reductions in this area were reduced from 189.7 acres in the DEIS to 113.6 acres.



9.1.9 Cobb King House

The original design in the area of the NRHP-listed Cobb King House included a service road that crossed across the front of the Cobb King House property, providing access to that parcel and the two parcels west of the Cobb King House. The service road was determined to cause an adverse effect to the historic property.

The VE Study resulted in a change to the service road to avoid directly impacting the historic structures. The service road was shortened to end in a cul-de-sac east of the Cobb King House property. A driveway could be used to provide access to the Cobb King House. The two parcels to the west of the Cobb King House would be land-locked and purchased as part of the right-of-way acquisition process for the project. The right-of-way reductions in this area were reduced from 4.9 acres in the DEIS to 1.9 acres.



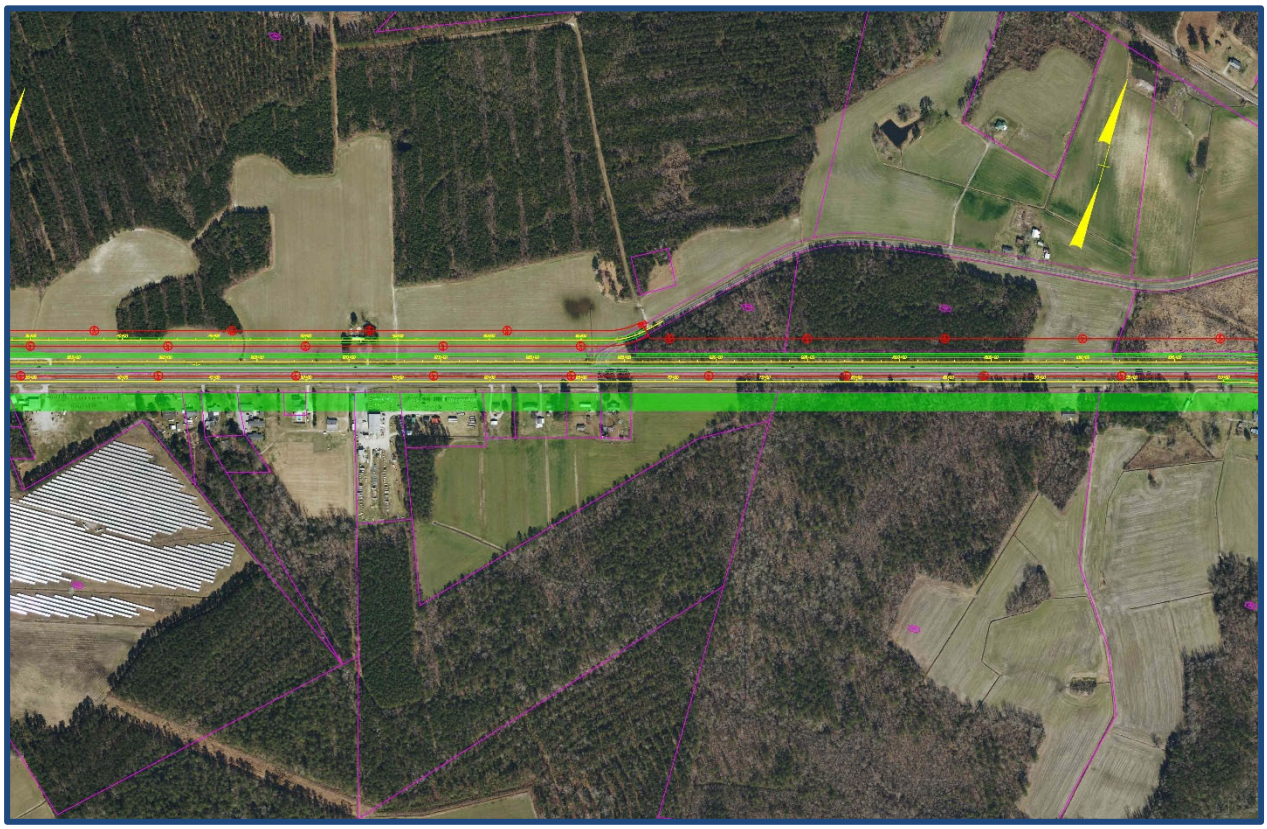
9.1.10 Wyse Fork Battlefield

In addition to the changes made at the Business 70/US 70 interchange and the Cobb King House, other minimization efforts were made to avoid areas of archaeological interest. This included reducing the width of the median by using a barrier-separated median and pulling in the service roads closer to the mainline. Overall reductions in right-of-way impacts to the Wyse Fork Battlefield went from 266.9 acres in the DEIS to 186.5 acres.

9.1.11 East of Wyse Fork Fire Station

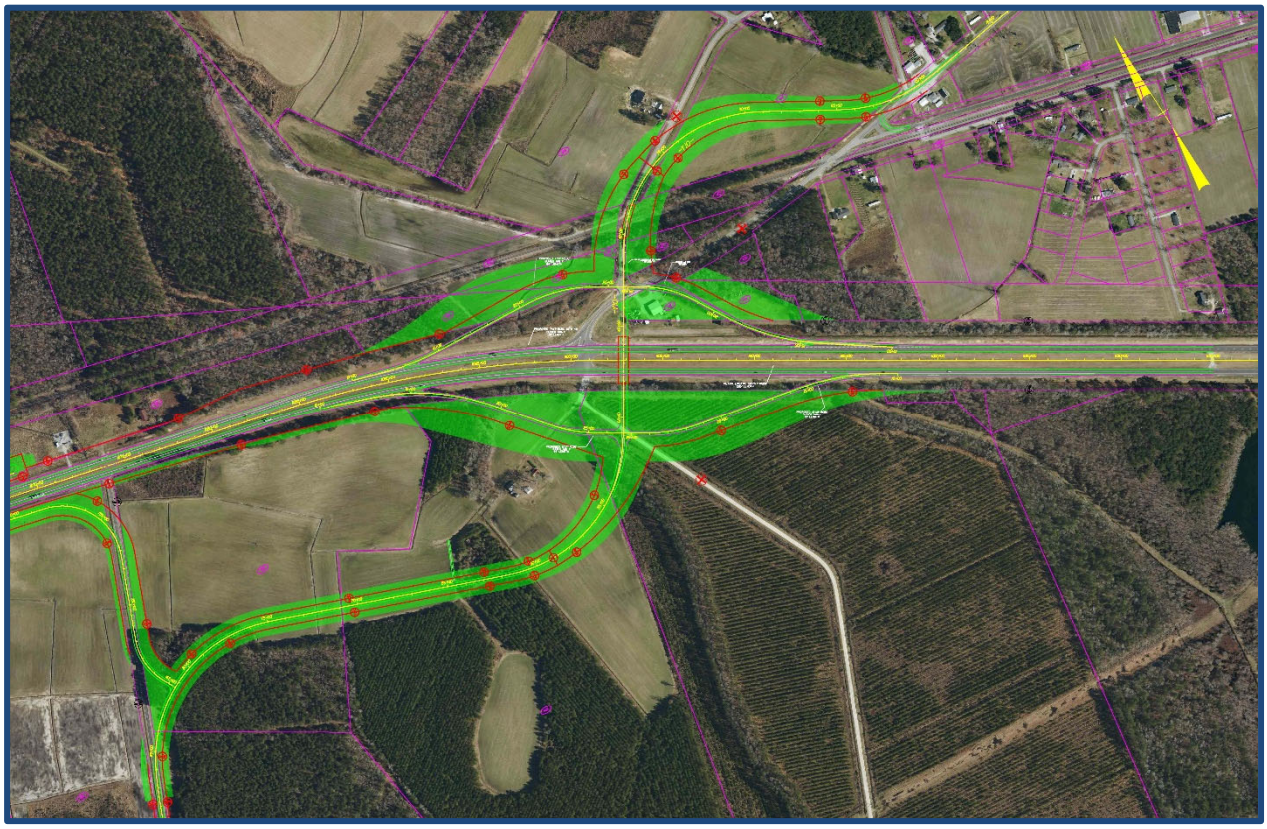
The original design in the area near the Wyse Fork Fire station included a service road running along the south side of existing US 70 which would require the relocation of several homes and businesses.

The VE Study suggested shifting the alignment of US 70 north and allowing the existing eastbound lanes to remain in place as the service road, allowing for the reduction in impacts to most of the homes and businesses on the south side of US 70. Since the north side of US 70 is largely unoccupied additional parcel impacts would be minimal.



9.1.12 Dover Interchange

Following the VE Study, the interchange at Dover was revised to reduce the length of ramps to lessen impacts and reduce the overall footprint of the interchange. This reduction in ramp lengths would allow for an additional reduction in cost without impacting traffic operations or increasing environmental impacts. The right-of-way reductions in this area were reduced from 153.3 acres in the DEIS to 89.0 acres.



9.2 Human Environment

The traffic noise report completed for the DEIS found that there were 56 noise receptors impacted. The updated traffic noise report completed for the FEIS found that there are now 84 noise receptors. This increase in noise receptors is due to the decrease in direct takes.

Impacts to residences and businesses were minimized to the greatest extent possible, while still allowing for traffic operations. Changes to relocation impacts are shown in Table 3.

Table 3. Relocation Impacts Comparison between DEIS and FEIS

Type of Relocation	DEIS Impacts	FEIS Impacts
Residential (#)	162	55
Business (#)	67	25
Non-Profit (#)	0	1
Total (#)	**229**	**81**

9.2.1 Cultural Resources

The DEIS reported that Alternative 1SB would require right of way from the following historic properties. Effect determinations are also listed for each of the properties below.

- Dr James M. Parrott House – no adverse effect
- Henry Loftin Herring Farm – no adverse effect
- Wyse Fork Battlefield – adverse effect
- Cobb-King-Humphrey House – adverse effect

Following revisions to designs, a second effects meeting was held on March 24, 2022. The effects calls listed above remain valid. Changes in impacts between the DEIS design and revised design are reflected in Table 4.

Additionally, NCDOT has committed to the following to further minimize impacts to cultural resources:

- Revise roadway designs to avoid areas of archaeological interest to the extent possible
- Include construction contract language to prevent ground disturbing activities (i.e. staging areas and borrow pits) within the Wyse Fork Battlefield
- Include contractual language the contractor must adhere to avoid archaeological sites and other sensitive areas
- Hold a burial treatment preconstruction meeting
- Monitor construction for cultural resources

Table 4. Property takings (acres) of Historic Architectural Resources by the Applicant's Preferred Alternative

HPO Site #	Resource Name	DEIS Alternative 1SB	FEIS Alternative 1SB
LR-0703	Dr James M. Parrott House	0.2	0.0
LR-0700	Henry Loftin Herring Farm	1.8	3.9[1]
JN-0603	Wyse Fork Battlefield	266.9	200.3
LR-1197	Cobb-King-Humphrey House	3.0	2.0

[1] Design changes made between the DEIS and FEIS to provide better access for travelers resulted in an overall increase in impacts to the property. The interchange changed to a tight urban diamond which increases the interchange area but does not bring the mainline of the project closer to the home. Access to the farm has not changed.

9.3 Natural Resources

The Kinston Bypass project was designated as a pilot project by the North Carolina Interagency Leadership Team, which included using GIS data as the basis for alternative development, alternative evaluation, and selection of the applicant's preferred alternative. In order to meet the intent of the pilot project process, two ArcGIS models were used to assess potential stream and wetland impacts and land cover data was used to assess terrestrial community impacts prior to the publication of the DEIS.

Impacts presented in the DEIS were estimated using corridor-level slope stake limits plus 40 feet. The corridor-level design at the time of the DEIS did not include interchange areas or y-lines.

Following distribution of the June 2019 DEIS and the August 2019 corridor public hearings, NCDOT selected Alternative 1SB as the applicant's preferred alternative for the project and streams and wetlands were field delineated for Alternative 1SB. Terrestrial communities were also field verified at that time. Therefore, the change in impacts between the DEIS and FEIS represents not only the change in design and addition of interchange areas, but also a change in the data being used for streams, wetlands, and terrestrial communities.

9.3.1 Terrestrial Communities

Areas mapped as forested upland and palustrine wetland are the only remaining natural areas present within the study area. Since a portion of this project would involve construction on new location, fragmentation of these forested natural communities would be expected. Impacts to forested uplands is showing an increase between the DEIS and FEIS. However, as mentioned above, the methodology used to distinguish community types between the DEIS and now has changed. The DEIS used land cover data to quantify terrestrial communities. The FEIS contains communities identified during field studies. Wetland impacts have decreased overall. (**Table 5**).

Table 5. Vegetative Community Impacts by the Applicant's Preferred Alternative

Vegetative Community	Coverage (acres)	
	DEIS Alternative 1SB	FEIS Alternative 1SB
Maintained/Disturbed	516.6	638.5
Agriculture	507.9	369.6
Pine Plantation	148.5	26.6
Forested Upland	25.3	146.1
Palustrine Wetland	97.4	42.6
Open Water	13.7	2.1
Total	**1,309.4**	**1,225.5**

9.3.2 Streams, Floodplains, and Wetlands

Impacts to streams, floodplains, and wetlands were calculated within the slope stakes of the current preliminary design plus 40 feet. The reduction in impacts from the DEIS to the FEIS are shown below. This is an overall reduction of 11,270 linear feet of stream impacts and reduction of 22.8 acres of wetlands (**Tables 6 and 7**). **Table 8** contains impacts by wetland type, as defined during field delineations. Floodplain impacts decreased for the 100-year and 500-year by 11.8 acres and 21.7 acres, respectively. Floodway impacts increased by 0.5 acre. Streams and wetlands are shown on **Figure 11** to **Figure 33.**

Table 6. Stream and Floodplain Impacts by the Applicant's Preferred Alternative

Impact Type	DEIS Alternative 1SB	FEIS Alternative 1SB
Stream crossings (#)	44	16
Stream length (ft)	33,112	21,842
100-year floodplain (ac)	147.7	135.9
500-year floodplain (ac)	130.8	109.1
Floodway (ac)	0.6	1.1
Total floodplains (ac)	**278.5**	**246.1**

Table 7. Wetland Impacts by the Applicant's Preferred Alternative

Impact Type	DEIS Alternative 1SB	FEIS Alternative 1SB
Riparian wetland (ac)	41.2	40.4
Non-riparian wetland (ac)	24.2	2.2
Total wetland impacts (ac)	65.4	42.6

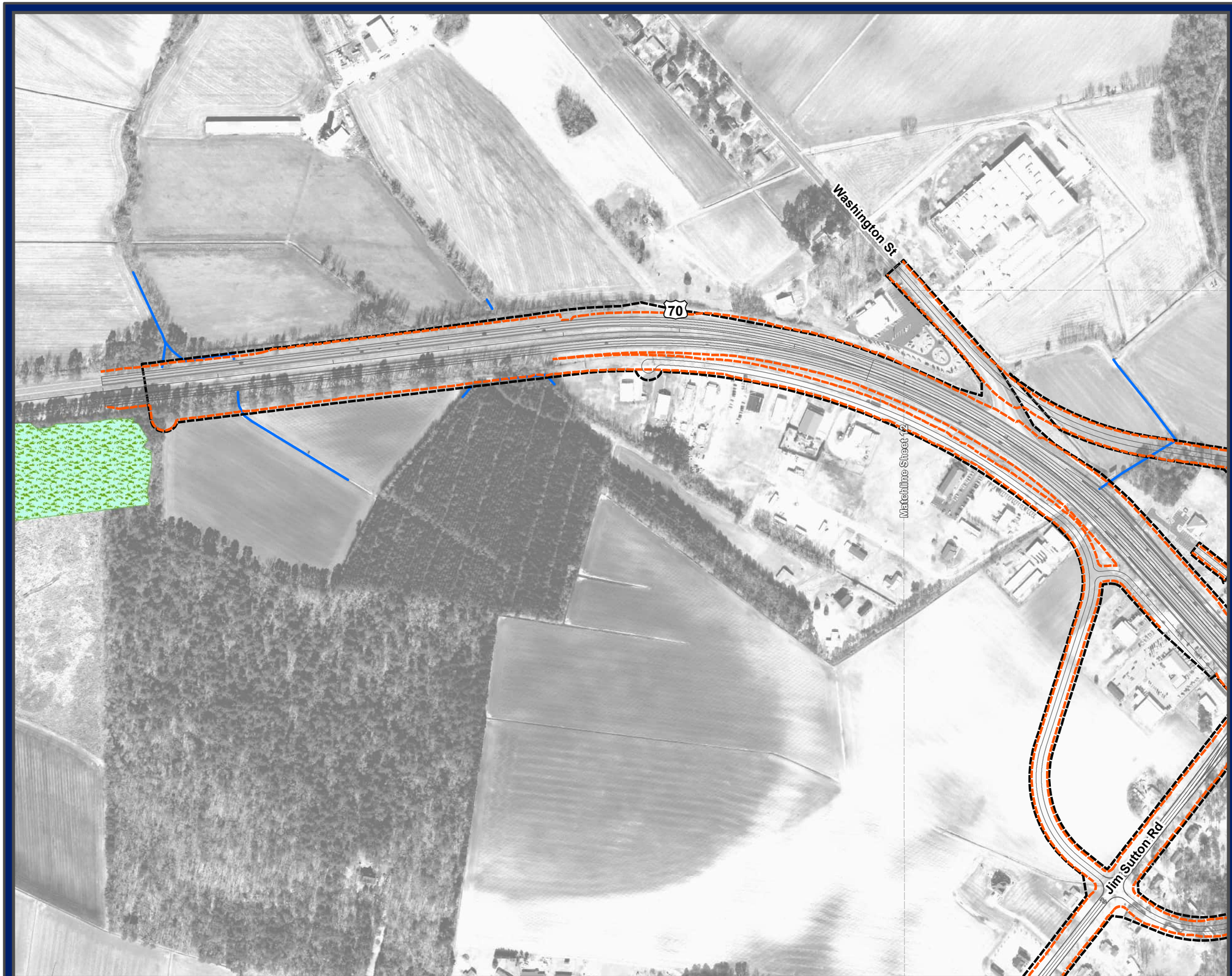
Table 8. Wetland Impacts by Type for the Applicant's Preferred Alternative

Impact Type	FEIS Alternative 1SB
Basin wetland (ac)	0.23
Bottomland hardwood forest (ac)	10.61
Floodplain pool (ac)	0.68
Headwater forest (ac)	9.97
Riverine swamp forest (ac)	19.07
Pine flat (ac)	1.99
Total wetland impacts (ac)	**42.55**

KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 11



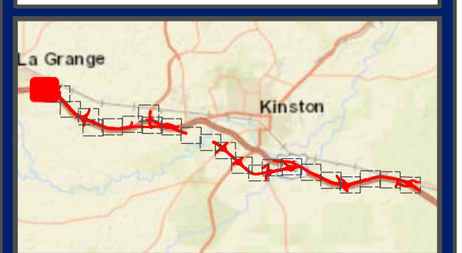
Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ,
Craven County, Lenoir County, Jones County,
Kinston Planning Department, NCOneMap,
NCSHPO, DWR, ESRI and AECOM.



KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 12

Legend

- Jurisdictional Streams
- Railroad
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

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Sources: CGIA, NCDOT, NCDEQ, Craven County, Lenoir County, Jones County, Kinston Planning Department, NCOneMap, NCSHPO, DWR, ESRI and AECOM.

Washington St
Fields Station Rd
Willie Measley Rd
Matchline Sheet 11
70
Jim Sutton Rd
Norbert Hill Rd
Matchline Sheet 13

KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 13

Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

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KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 14

Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

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Matchline Sheet 16

Albert Sugg Rd

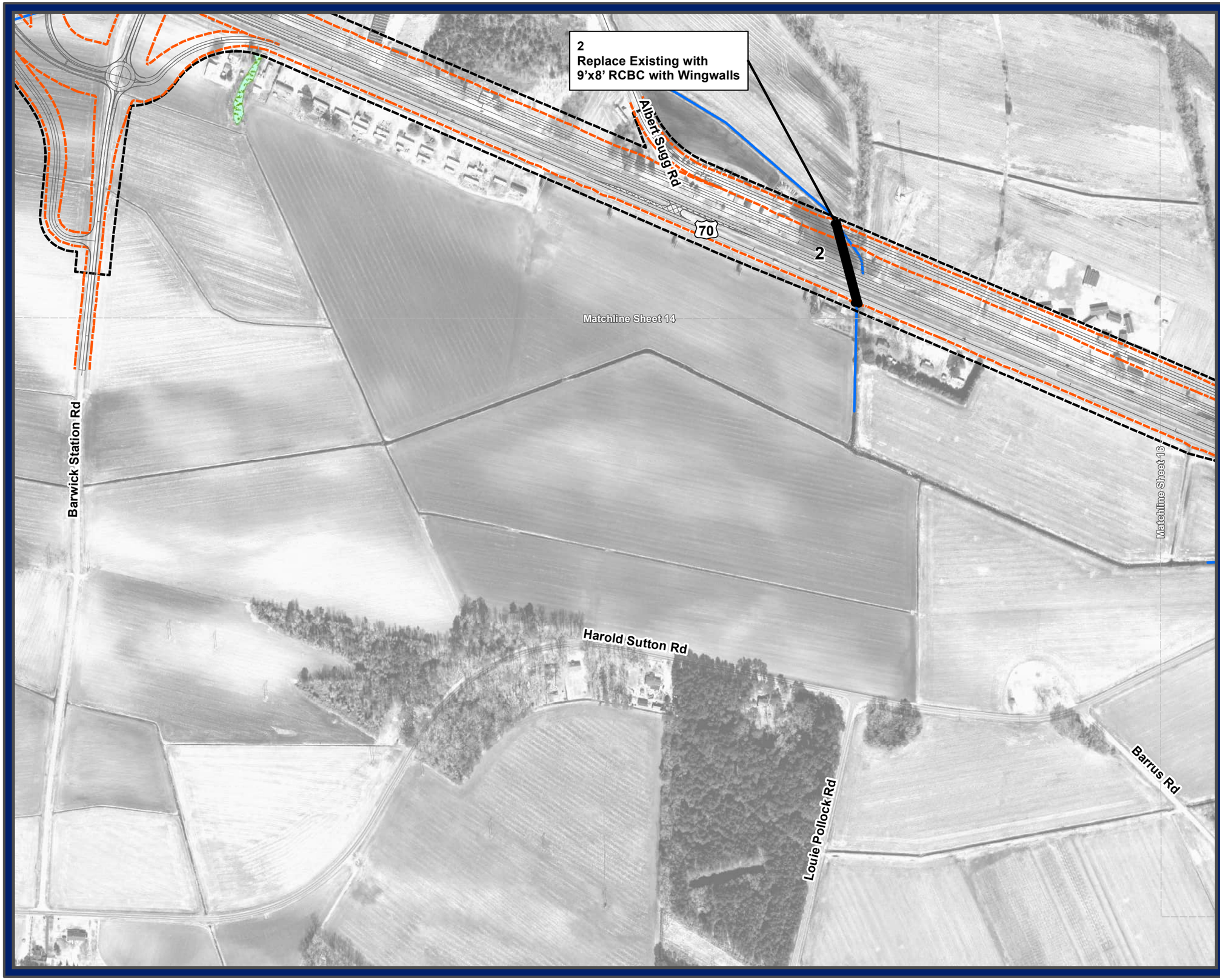
Matchline Sheet 15

70

Barwick Station Rd

2

2
Replace Existing with
9'x8' RCBC with Wingwalls



KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 15

Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

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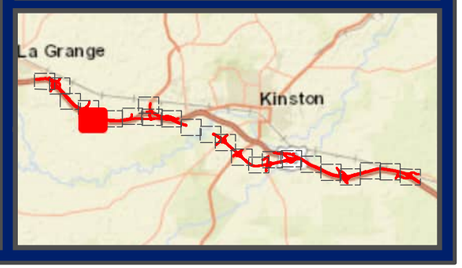

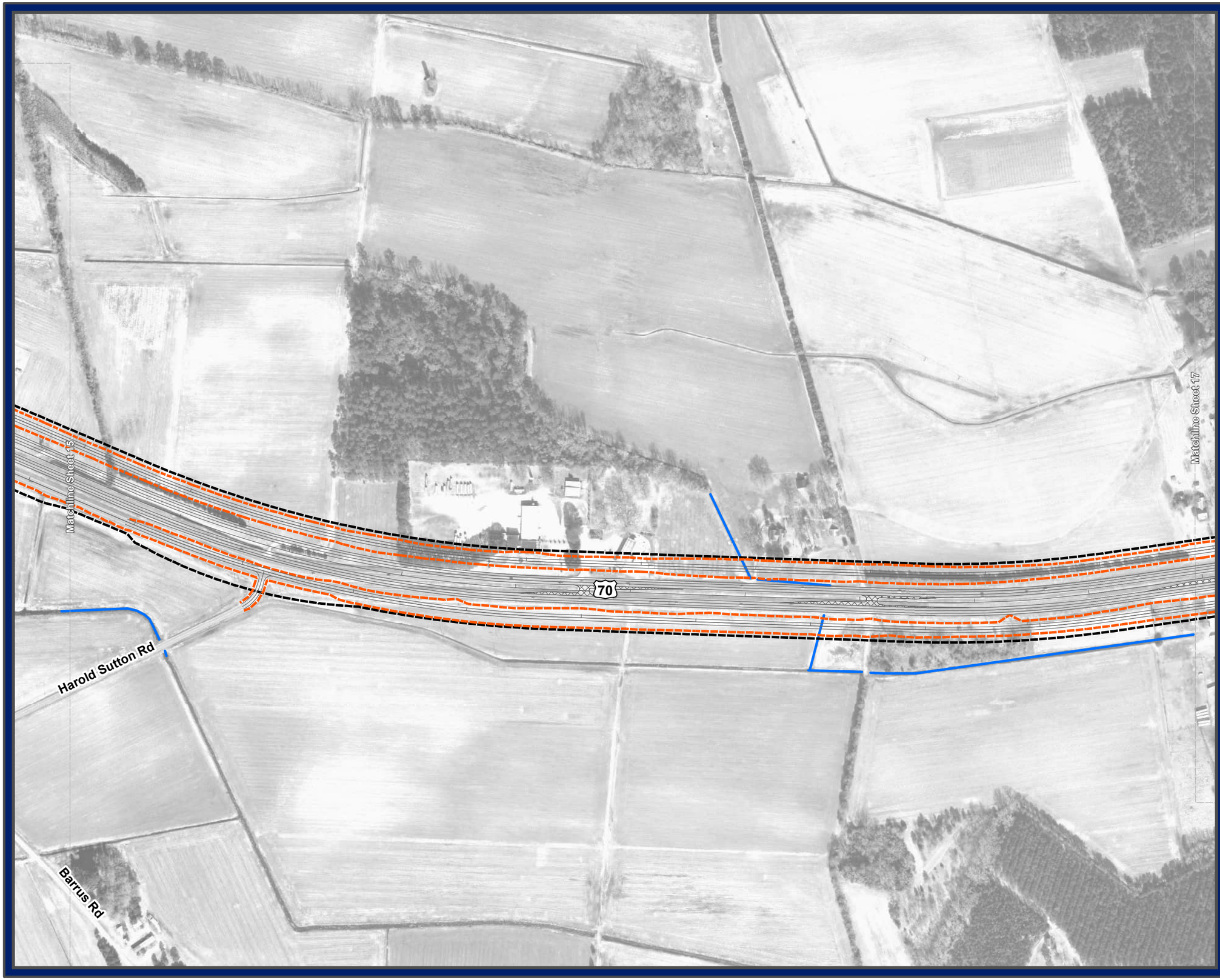

KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 16

Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

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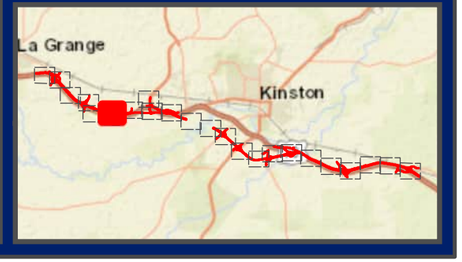

KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 17

Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

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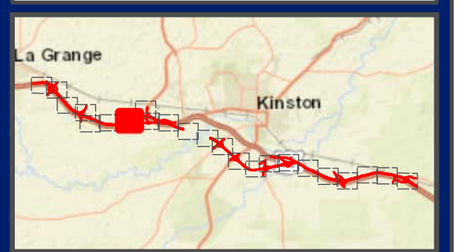

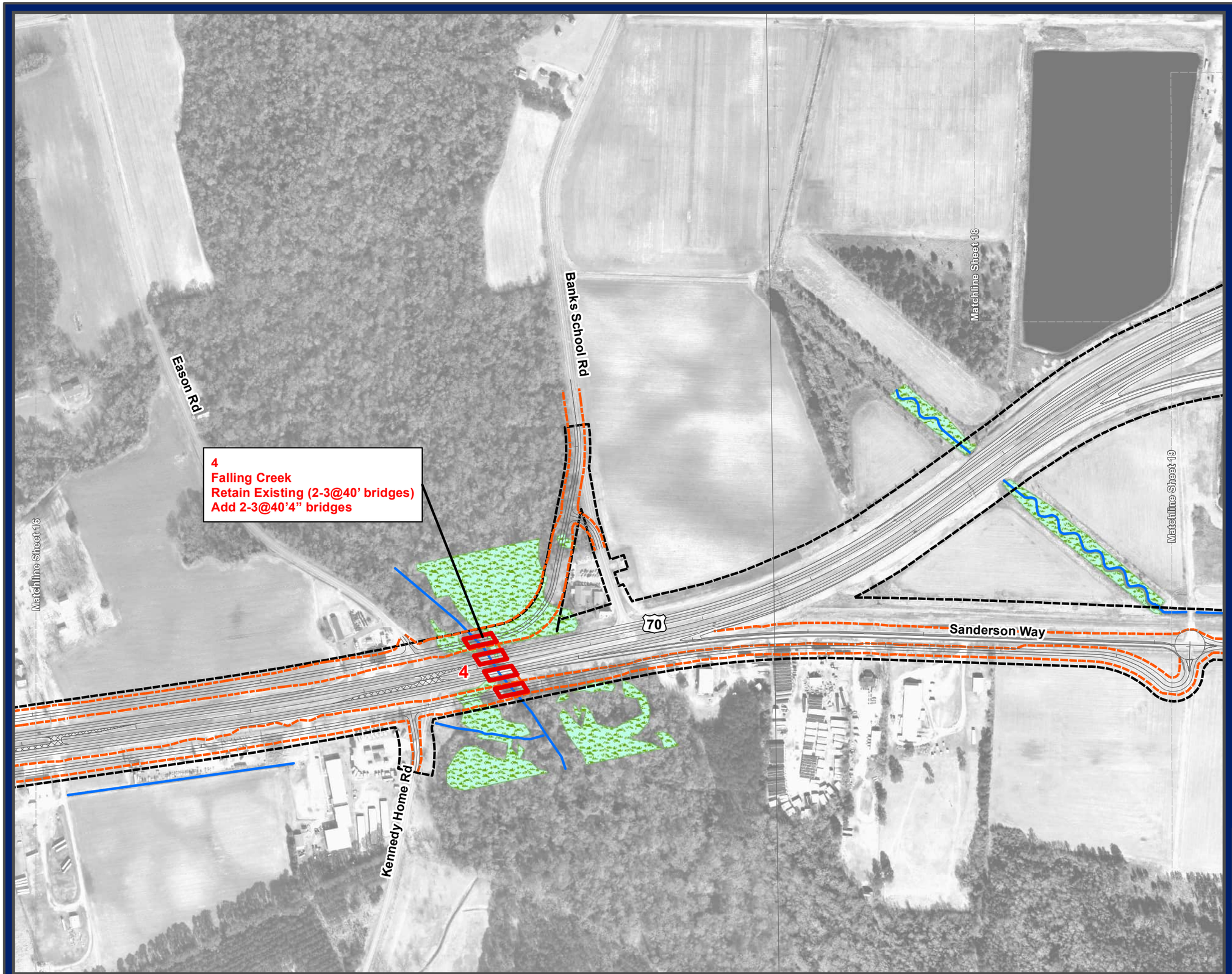

KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 18

Legend

- Jurisdictional Streams
- Railroad
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

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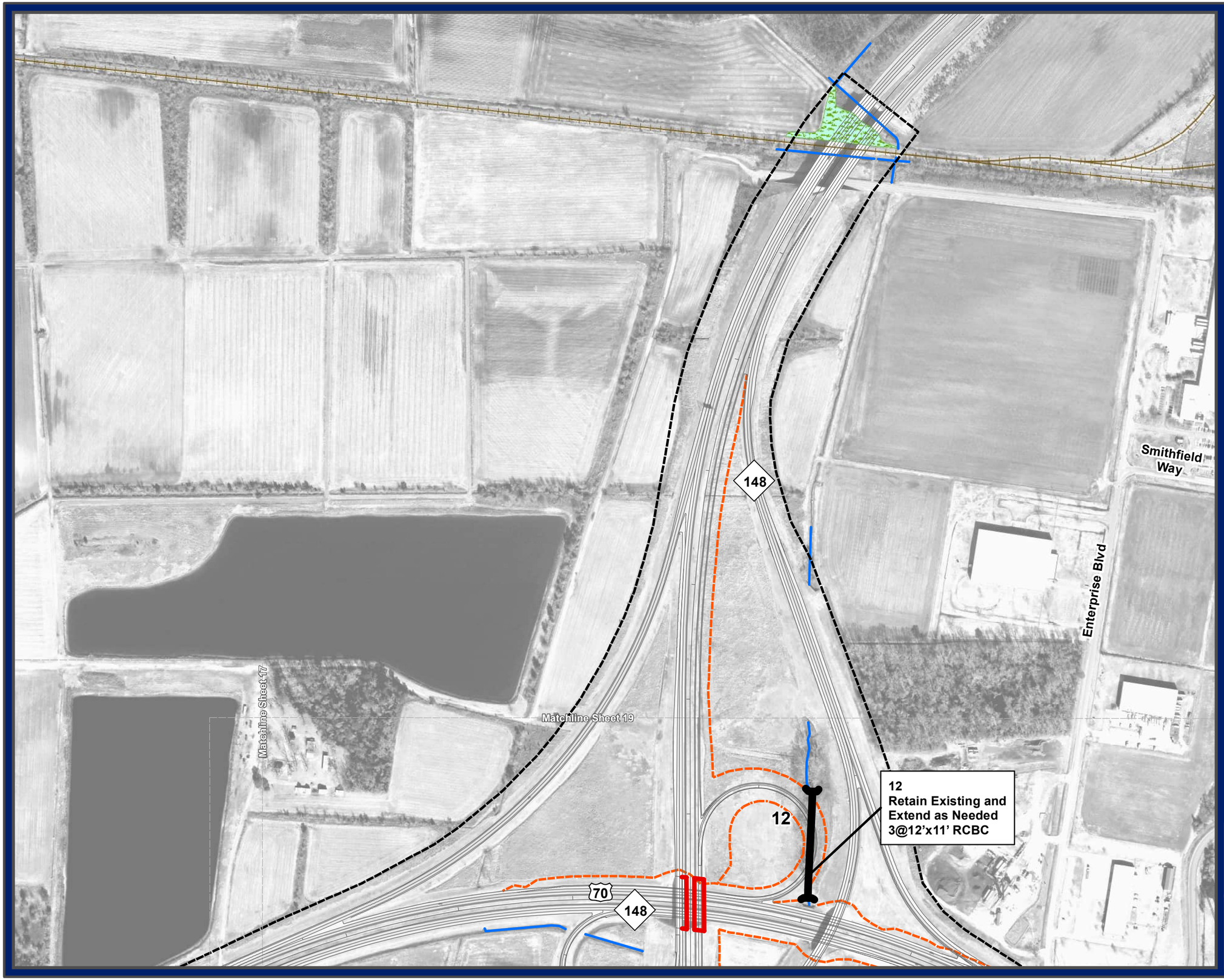
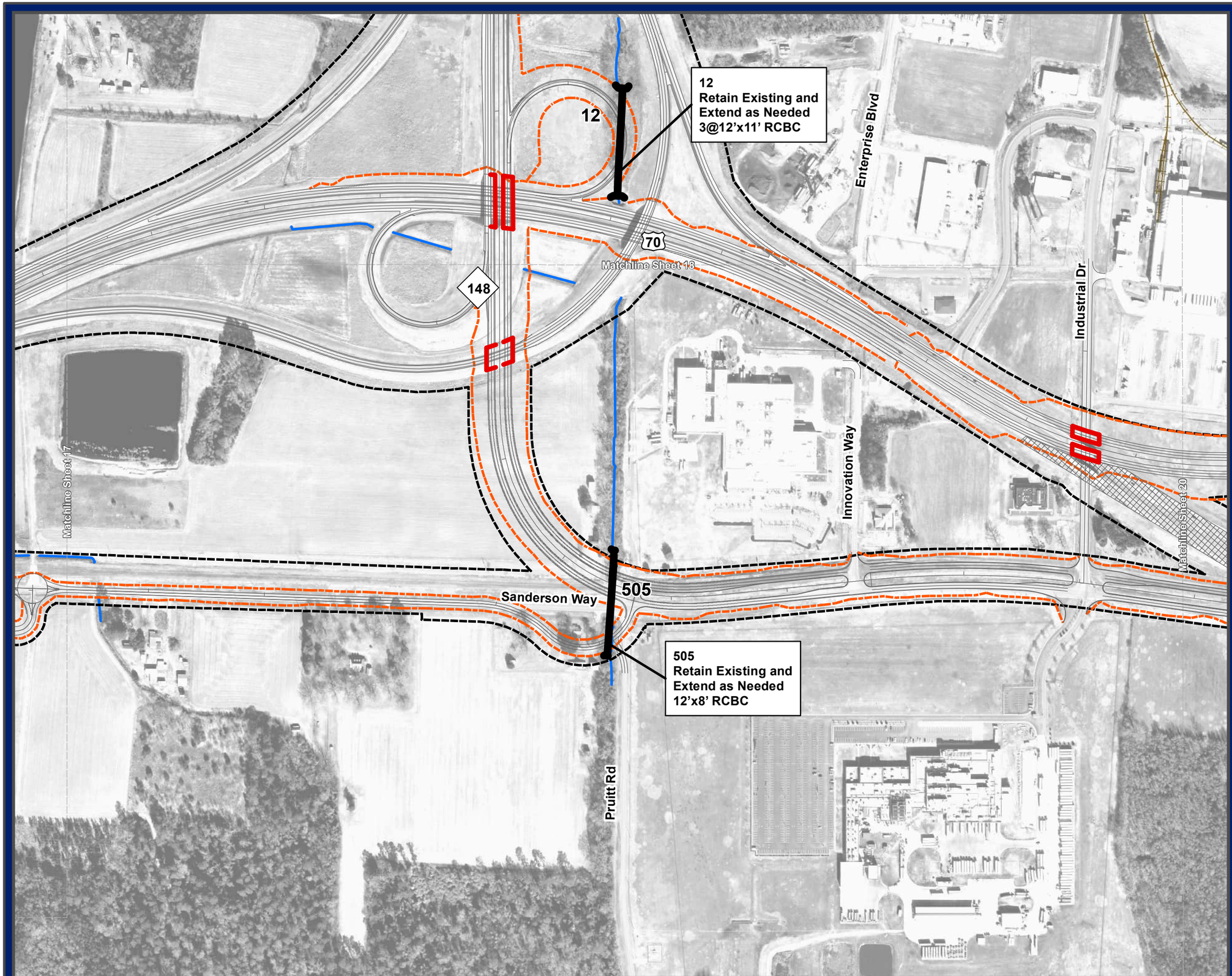


KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 19



Legend

- Jurisdictional Streams
- Railroad
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

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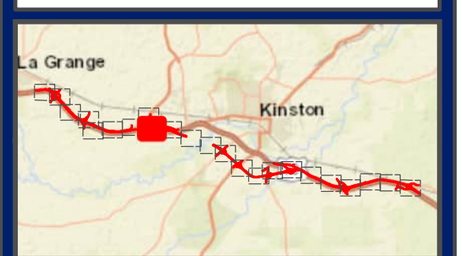


KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 20

Legend

- Jurisdictional Streams
- Railroad
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

Hill Farm Rd

Matchline Sheet 19

Sanderson Way

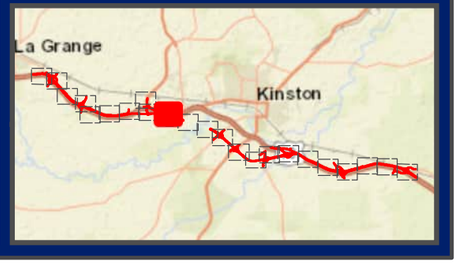
70

304

304
New Location
1@9'x8' RCBC

Matchline Sheet 21

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ, Craven County, Lenoir County, Jones County, Kinston Planning Department, NCOneMap, NCSHPO, DWR, ESRI and AECOM.



KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 21

Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

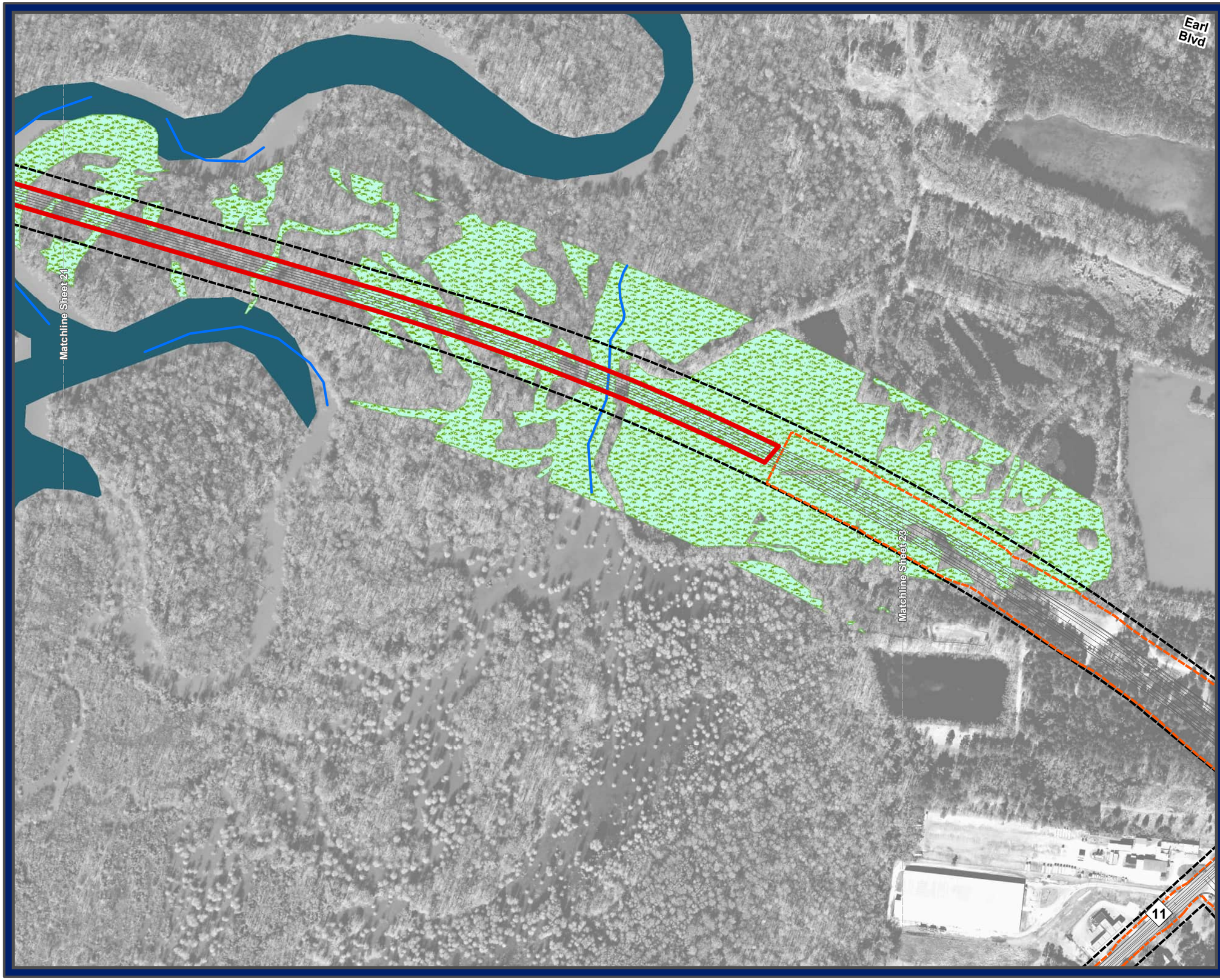
Matchline Sheet 20

305

305
Neuse River
New Location
Single Bridge 7,115'

Matchline Sheet 22

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ, Craven County, Lenoir County, Jones County, Kinston Planning Department, NCOneMap, NCSHPO, DWR, ESRI and AECOM.



KINSTON BYPASS
70 FEIS | R-2553

Jurisdictional Features Alternative 1 SB

Figure 22

Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ, Craven County, Lenoir County, Jones County, Kinston Planning Department, NCOneMap, NCSHPO, DWR, ESRI and AECOM.

KINSTON BYPASS
70 FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 23

Legend

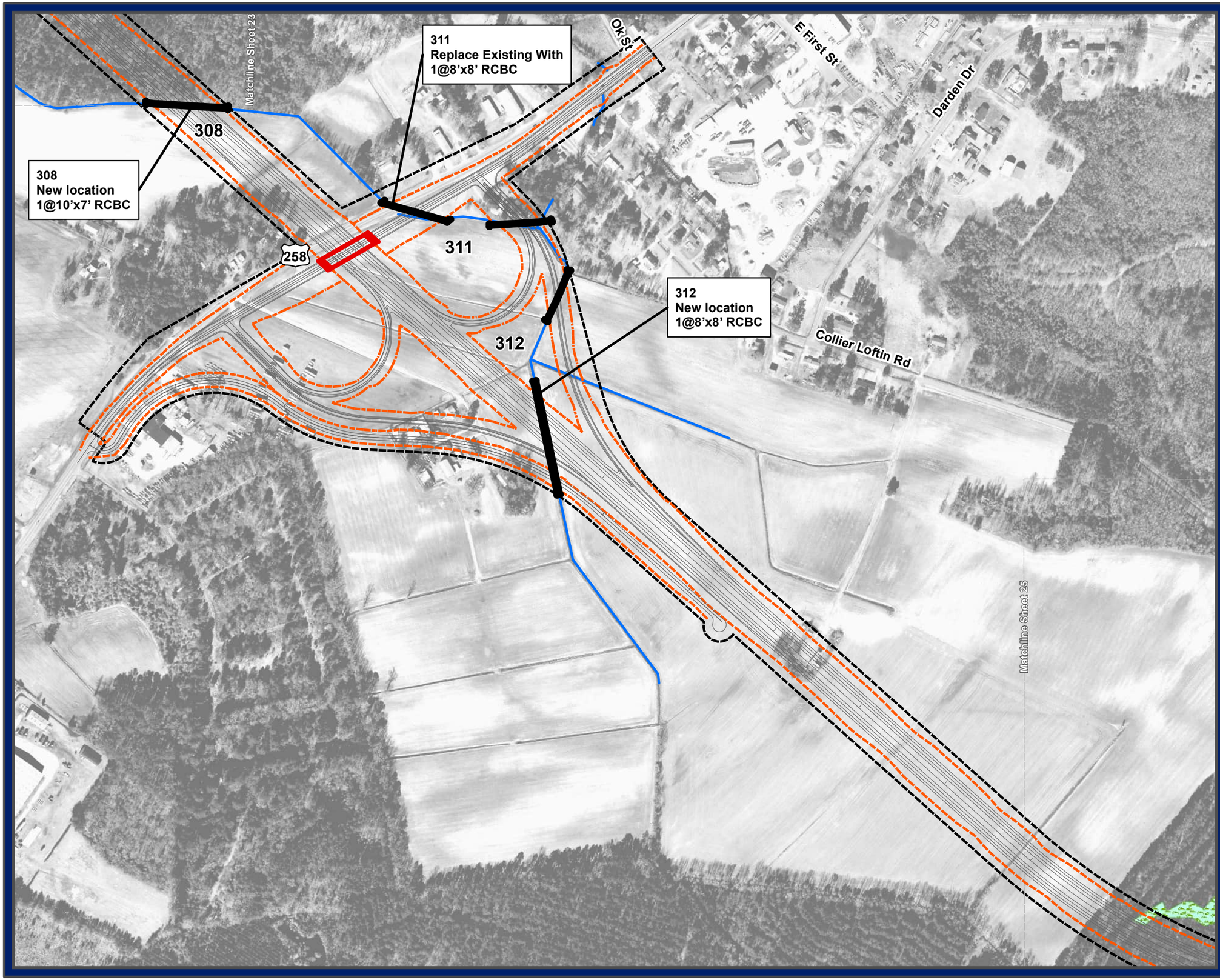
- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

307
New location
1@10'x8' RCBC

Old Asphalt Rd
Bobbie Dr
Baker St
Whitfield Dr
Baker Bradley St
Fourth St
Brooks Blvd
Ok St
11
Matchline Sheet 23
Edgewood Dr
Magnolia Dr
Goodman Rd
Miriam St
Mary Beth Rd
Bell Rd
Fairgrounds Rd
Matchline Sheet 24



KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features Alternative 1 SB

Figure 24

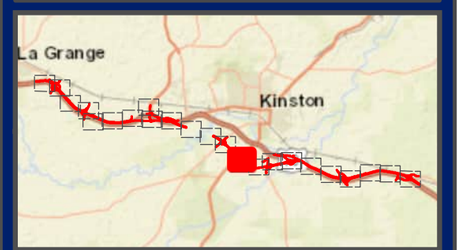
Legend

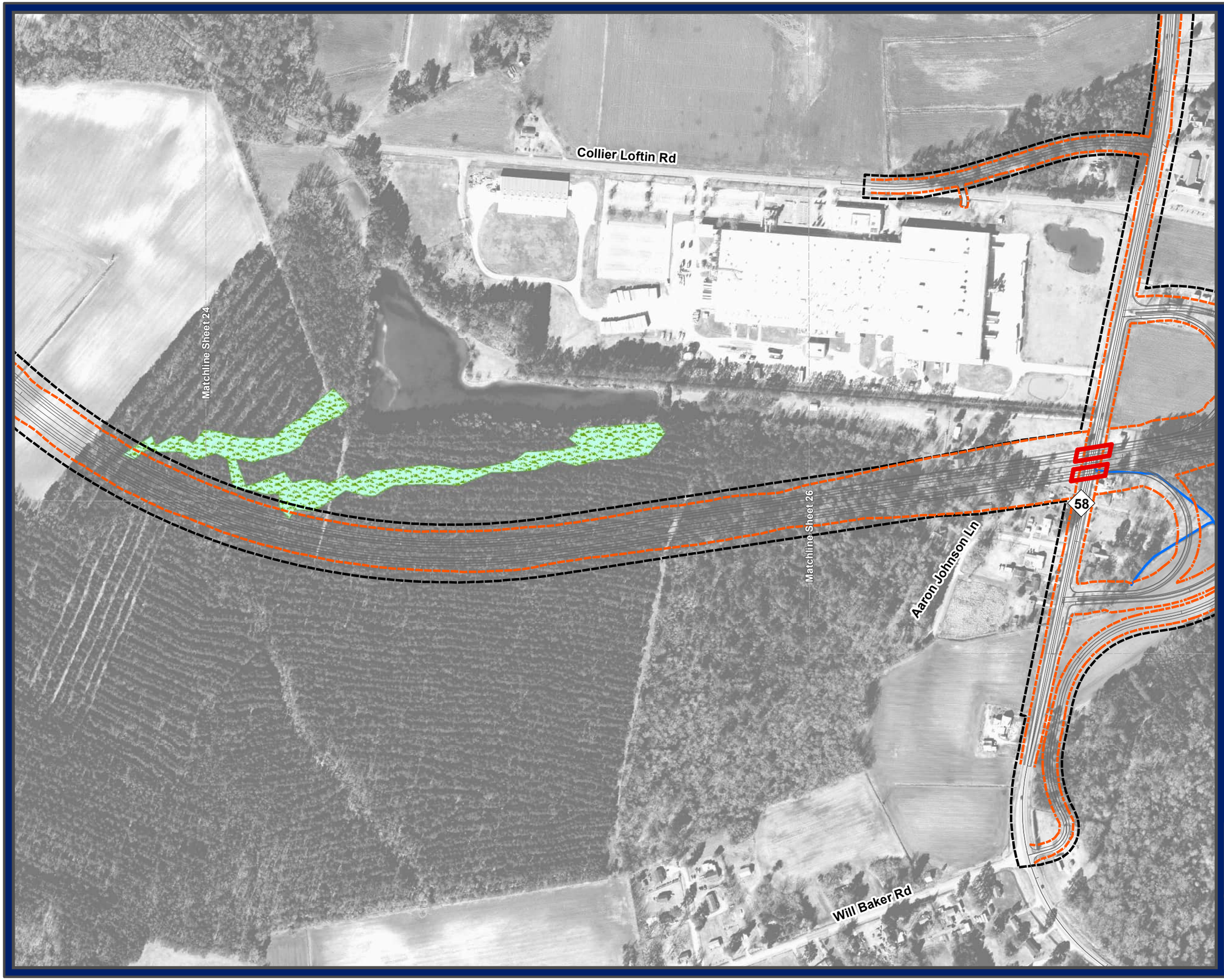
- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ, Craven County, Lenoir County, Jones County, Kinston Planning Department, NCOneMap, NCSHPO, DWR, ESRI and AECOM.





70 KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 25

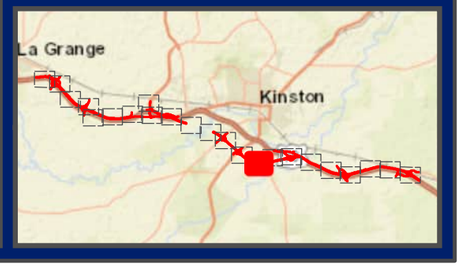
Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ, Craven County, Lenoir County, Jones County, Kinston Planning Department, NCOneMap, NCSHPO, DWR, ESRI and AECOM.



KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 26

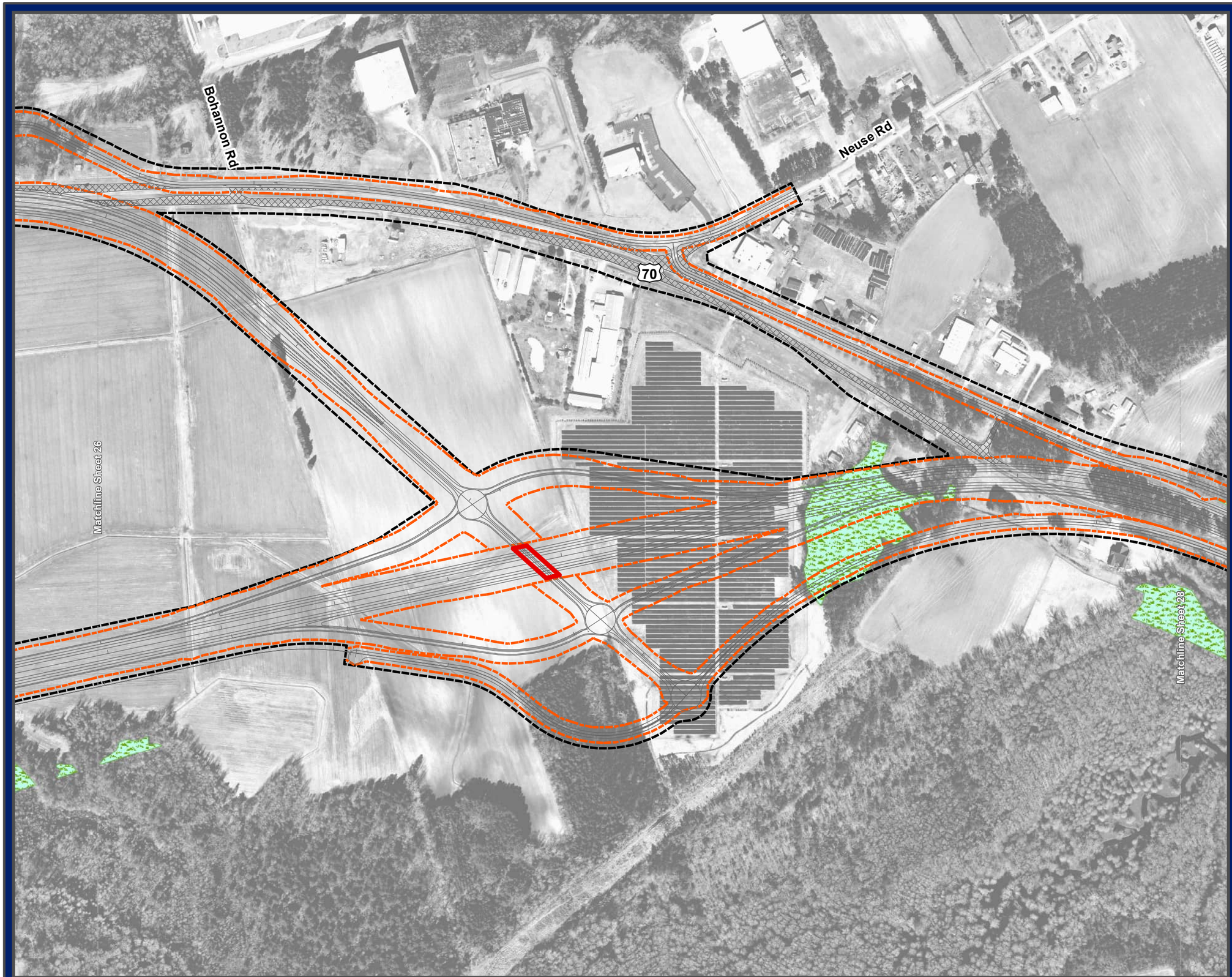
Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ,
Craven County, Lenoir County, Jones County,
Kinston Planning Department, NCOneMap,
NCSHPO, DWR, ESRI and AECOM.



70 KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 27

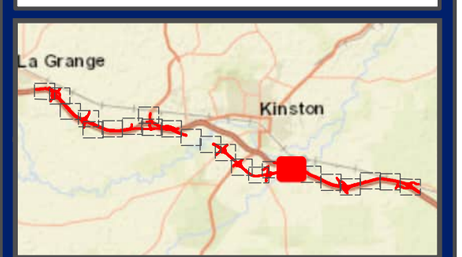
Legend

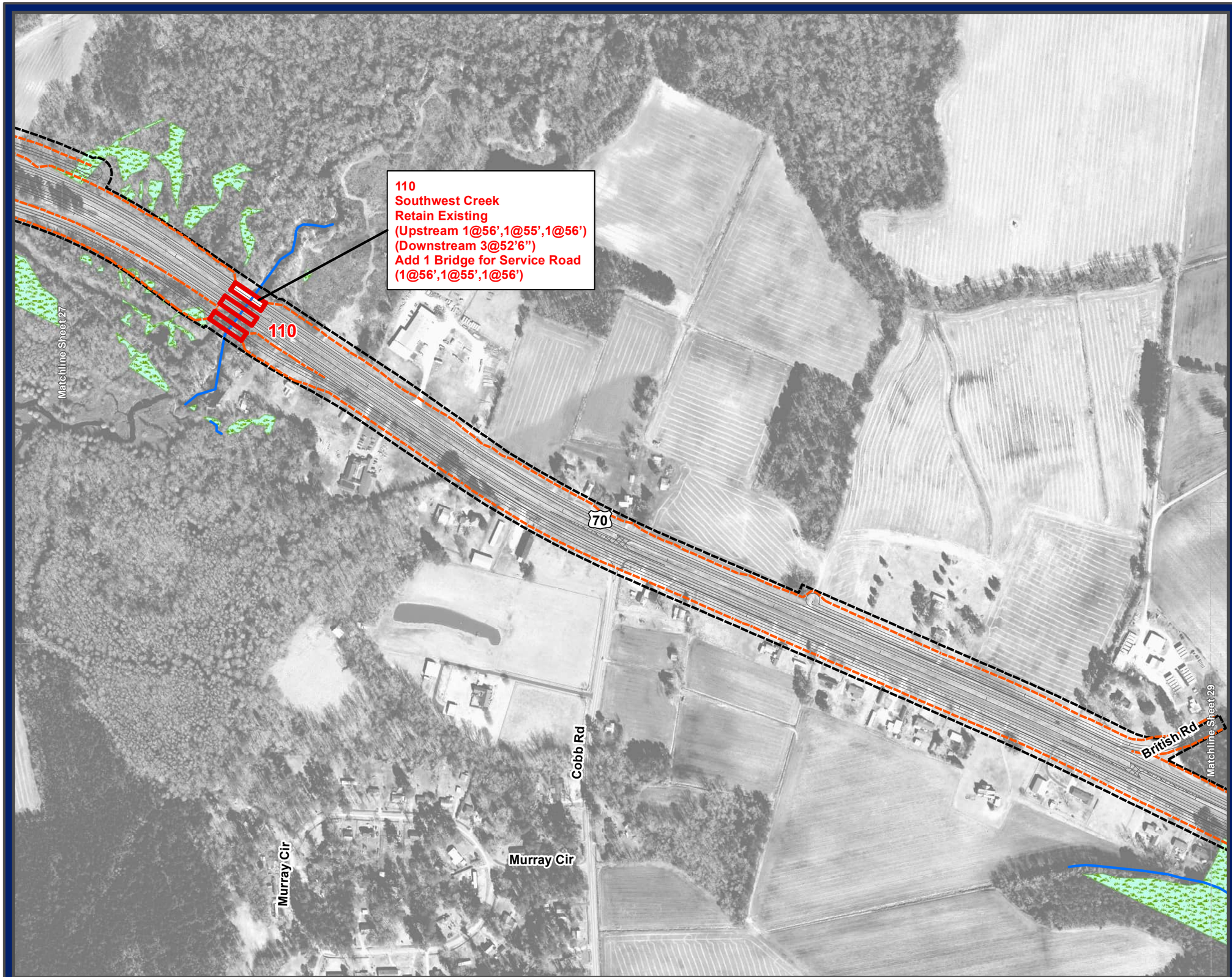
- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ,
Craven County, Lenoir County, Jones County,
Kinston Planning Department, NCOneMap,
NCSHPO, DWR, ESRI and AECOM.





KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 28

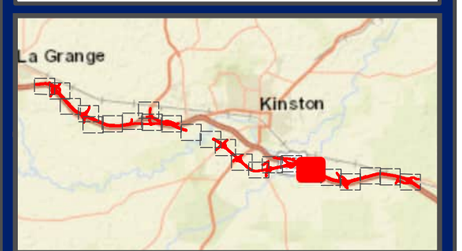
Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ,
Craven County, Lenoir County, Jones County,
Kinston Planning Department, NCOneMap,
NCSHPO, DWR, ESRI and AECOM.



KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 29

British Rd

Matchline Sheet 28

Caswell Station Rd

70

112

Bill Smith Rd

Matchline Sheet 30

112
Retain Existing and
Extend as Needed
2@ 7'x6' RCBC

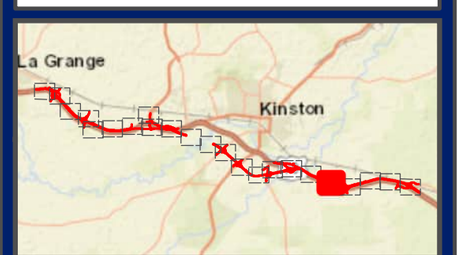
Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ,
Craven County, Lenoir County, Jones County,
Kinston Planning Department, NCOneMap,
NCSHPO, DWR, ESRI and AECOM.



KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 30

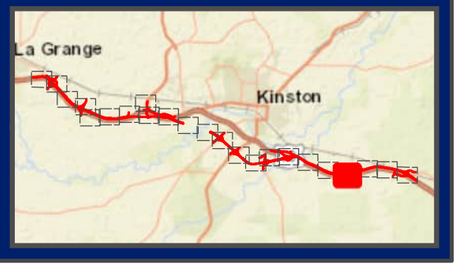
Legend

- Jurisdictional Streams
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ,
Craven County, Lenoir County, Jones County,
Kinston Planning Department, NCOneMap,
NCSHPO, DWR, ESRI and AECOM.



KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 31

Legend

- Jurisdictional Streams
- Railroad
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

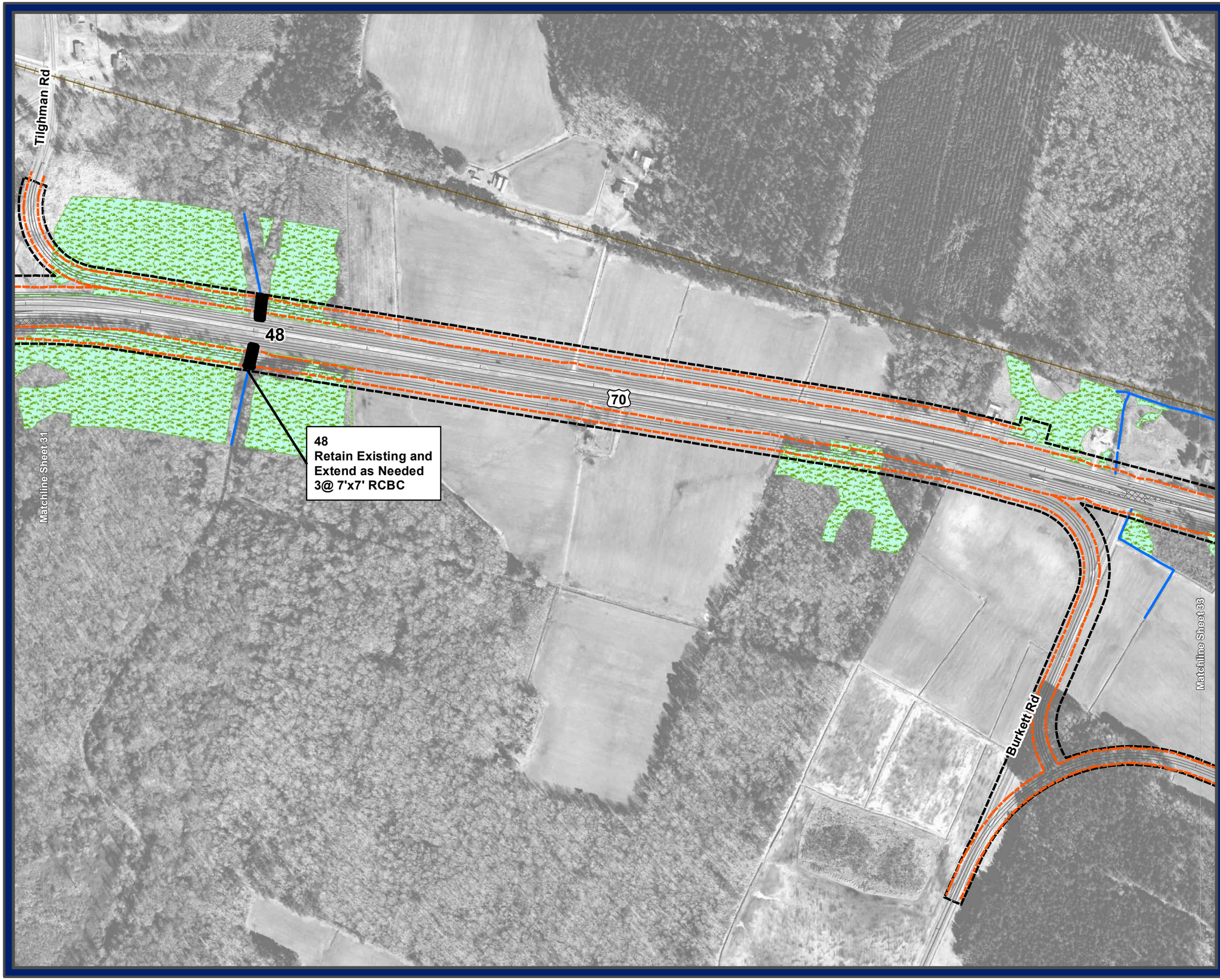
This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ, Craven County, Lenoir County, Jones County, Kinston Planning Department, NCOneMap, NCSHPO, DWR, ESRI and AECOM.

Roy White Rd
Tilghman Rd
70
Matchline Sheet 31
Matchline Sheet 32

KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

Figure 32



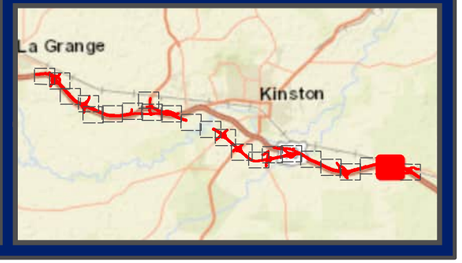
Legend

- Jurisdictional Streams
- Railroad
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N

This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ,
Craven County, Lenoir County, Jones County,
Kinston Planning Department, NCOneMap,
NCSHPO, DWR, ESRI and AECOM.



KINSTON BYPASS
FEIS | R-2553

Jurisdictional Features
Alternative 1 SB

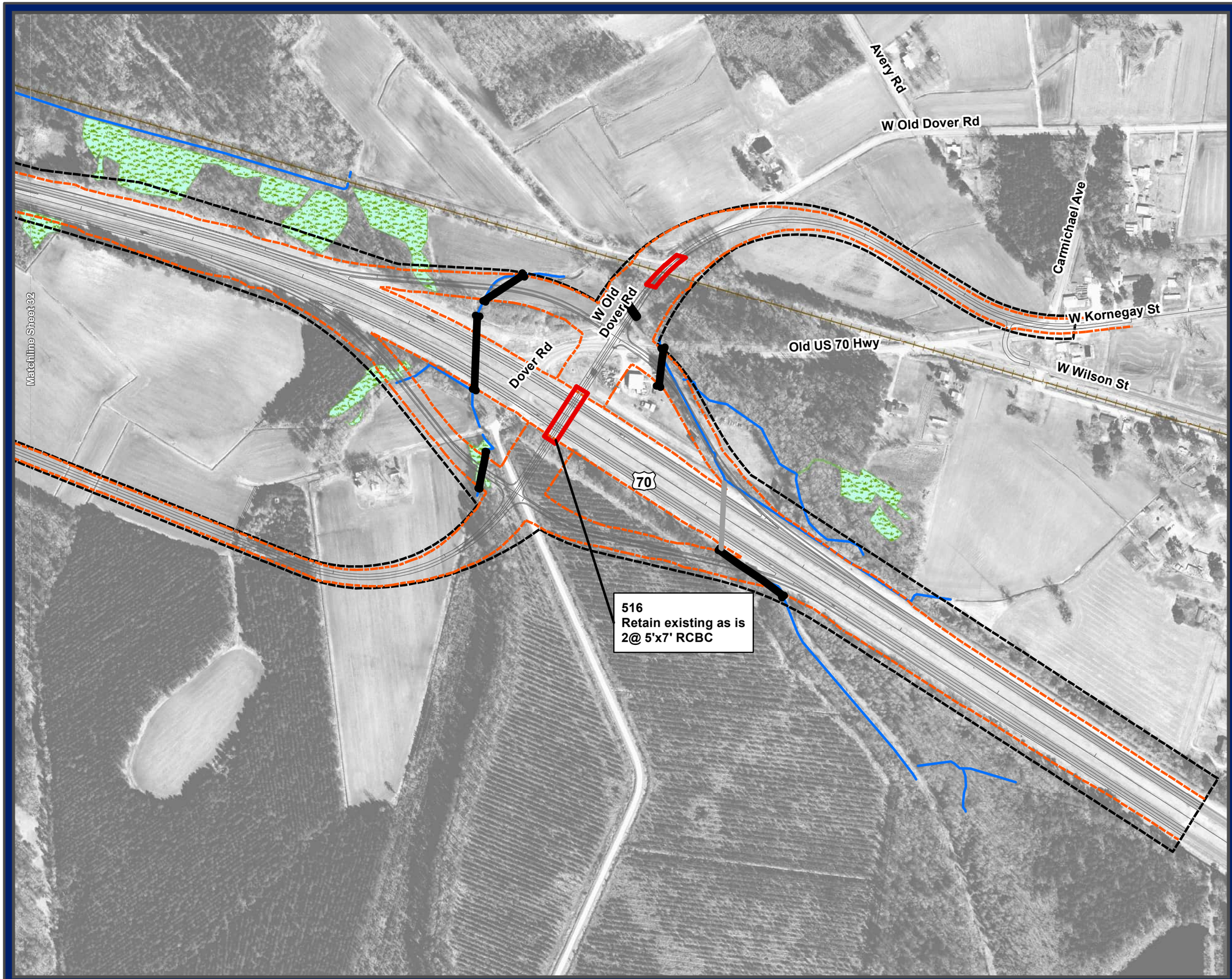
Figure 33

Legend

- Jurisdictional Streams
- Railroad
- Existing Drainage Structure
- Proposed Drainage Structure
- Jurisdictional Wetlands
- Slope Stakes FEIS
- ROW FEIS
- Proposed Bridge
- Matchline

0 250 500 Feet

N



This map is for reference only.
Sources: CGIA, NCDOT, NCDEQ, Craven County, Lenoir County, Jones County, Kinston Planning Department, NCOneMap, NCSHPO, DWR, ESRI and AECOM.

9.3.3 Protected Species

The proposed project crosses multiple stream systems in the Neuse River Basin, including the mainstem of the Neuse River. The Neuse River Waterdog (*Necturus lewisi,* NRWD) and Carolina Madtom (*Noturus furiosus,* CMT) are known to occur in Jones and Lenoir Counties, and the Atlantic Pigtoe (*Fusconaia masoni,* AP) is known to occur in Lenoir County. As part of the federal permitting process that requires an evaluation of potential project-related impacts to federally protected species, Three Oaks Engineering (Three Oaks) was contracted by NCDOT to conduct surveys targeting NRWD, CMT, and AP.

Initial surveys were conducted in water bodies identified to contain potential habitat for target species within the proposed alignment in the appropriate seasons in 2020. Survey methods included a five-day trapping protocol targeting NRWD in winter, visual and electrofishing surveys for CMT and NRWD, and visual and tactile surveys for mussels. From west to east, waterbodies surveyed in 2020 included Falling Creek, the Neuse River, Southwest Creek, Mill Creek, Tracy Swamp, Gum Swamp, and Core Creek. The NRWD was the only targeted federally protected species located during these efforts being found in both Falling Creek and Southwest Creek in the survey reaches for the project crossings in the vicinity of US 70. A total of 9 NRWD (4 in Falling Creek and 5 in Southwest Creek) were located during the 2020 efforts. The Falling Creek captures were the first known occurrence documented. Mussels were found in Falling Creek, Neuse River, Southwest Creek, Mill Creek, and Tracey Swamp and while appropriate habitats were present, the AP was not found. Two NC Threatened species were found during the efforts, with the Eastern Lampmussel (*Lampsilis radiata*) being observed in the Neuse River and Southwest Creek and the Triangle Floater (*Alasmidonta undulata*) being found in the Neuse River and Falling Creek. Typical fish assemblages for the available habitat were documented in surveyed water bodies; however, the CMT was not located.

To bolster survey presence/absence data and aid in the development of a population estimate for NRWD, repeat surveys were requested by NCDOT in 2021/2022. Additional mussel and fish surveys were conducted in Falling Creek, Southwest Creek, and the Neuse River with similar results to the 2020 surveys.

Over four full trapping weeks during winter 2021/2022, 30 NRWD were captured and marked in Falling Creek and 18 were captured and marked in Southwest Creek. Of these marked individuals, seven individuals were recaptured once (six in Falling Creek and one in Southwest Creek), and one individual was recaptured twice in Falling Creek. To date, the cumulative total number of NRWD captured is 57 (34 in Falling Creek and 23 in Southwest Creek).

Based on these survey efforts and results, NCDOT is recommending a Biological Conclusion of May Affect-Not Likely to Adversely Affect for AP and CMT, and a Biological Conclusion of May Affect-Likely to Adversely Affect for the NRWD.

The likely effects to the NRWD will be assessed and fully disclosed in the Biological Assessment currently being prepared for the project to initiate Formal Consultation under Section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 et seq.), with the US Fish and Wildlife Service.

In addition, the proposed new alignment crossing of the Neuse River, as well as the existing crossing, occur within designated Critical Habitat for the Atlantic Sturgeon (*Acipenser oxyrhinchus*). This species is under the jurisdiction of the National Marine Fisheries Service. As such, the potential effects to the Atlantic Sturgeon and Critical Habitat have been assessed in a separate Expedited Section 7 Consultation Memorandum submitted on May 24, 2022.

Surveys for terrestrial plants and animals that could occur in the study area are scheduled to begin in the summer of 2022. Surveys will be done for red-cockaded woodpecker (*Picoides borealis*), rough-leaved loosestrife (*Lysimachia asperulaefolia*), and sensitive joint-vetch (*Aeschynomene virginiana*).

10.0 Summary of Bridge Type Study

A Bridge Project Questionnaire for the new location bridge over the Neuse River was submitted by NCDOT to the US Coast Guard on November 3, 2021. A bridge permit exemption was received for the project on February 8, 2022.

A Structure Type Study was completed in April 2022 for the Neuse River crossing along Alternative 1SB. The purpose of the study was to evaluate different construction methodologies and associated permanent and temporary environmental impacts as they relate to construction of the bridge superstructure and substructure. The alternatives considered were influenced by three key construction methodologies and the option for a single bridge structure or dual bridges to cross the Neuse River.

Three distinct construction methodologies were evaluated for construction of a single bridge carrying directional traffic separated by a double-faced median barrier or dual bridges having completely independent structures. The bridge superstructure for each of these options was evaluated as a formed reinforced concrete deck supported on prestressed concrete I-girders with an option for using deck overhangs with overhang falsework and an option without deck overhangs, thus eliminating the need for overhang falsework. Each superstructure alternative was also evaluated for two girder types, modified bulb-tee girder and Florida I-beam. Only Florida I-beams were considered for a conventional top-down construction method. All substructure options assumed the use of standard end bents founded on steel piles or prestressed concrete piles and interior pile bents founded on prestressed concrete piles. All bents were assumed to be aligned normal to the bridge (i.e., 90-degree skew).
The construction methodologies evaluated were:

1. Conventional Bridge Construction (C1) using temporary work bridge methods. For this method, a temporary work bridge to support construction equipment would be built adjacent to the location of the proposed permanent structure. The work bridge would have “fingers” extending adjacent to each proposed bent as required to construct the bents. Upon completion of the permanent structure, the work bridge would be removed. The environmental impacts associated with this construction method are restricted to the location of temporary piles. This option was evaluated for two different span arrangements for each girder option.
2. Conventional Top-Down Construction (C2) with a crawler crane supported on the superstructure. For this method, bents, girders, and deck would be constructed using equipment placed on the previously completed spans. This construction method would avoid or greatly limit the need for temporary causeways, work bridges, or other temporary structures. Span length would be controlled by the reach of a crawler crane capable of driving piles and setting girders.
3. Top-Down Construction (C3) using a gantry system. A gantry system would be capable of providing pile driving operations, setting girders, and screeding the concrete bridge deck. Similar to the C2, this construction method would avoid or greatly limit the need for temporary causeways, work bridges, or other temporary structures.

The advantages and disadvantages of the three construction methods are listed in **Table 9** and bridge span information for each method are listed in **Table 10**.

Table 9. Advantages and Disadvantages of Bridge Construction Methods

Construction Method	Advantages	Disadvantages
C1 – conventional bridge using a work bridge	- Longest span length - Lowest permanent impacts	- Requires work bridge - Large amount of temporary impacts - Only method with temporary impacts to river and wetlands - Both span arrangements place one bent in the river and one in the bank
C2 – conventional top-down construction with crawler crane	- No temporary impacts to river or wetlands	- Shortest span lengths - Largest permanent impacts - Three bents in the river and two in the bank - Highest cost
C3 – top-down using a gantry system	- No temporary impacts to river or wetlands - Lowest cost - Requires a lot of time pre-construction and/or a specialized project delivery system like design-build - With a launching gantry system, all of construction can be done from the top of the bridge	- Larger permanent construction footprint than conventional construction - A double-girder gantry could have temporary impacts to the river and wetlands

Table 10. Bridge Span Arrangement Comparison

Construction Method	C1		C2	C3	
Girder Type	72” modified bulb-tee	72” Florida I beam	36” Florida I beam	72” modified bulb-tee	72” Florida I beam
Max Span Length (ft)	130	145	60	120	130
Total No. of Spans	57	50	120	61	57
No. Spans in Tangent Alignment	42	37	89	45	42
No. Spans in Curved Alignment	15	13	31	16	15

Other construction methodologies commonly used that were not considered in the study included the use of temporary haul road/causeway methods and the use of modified top-down construction. The environmental impacts associated with building a haul road/causeway across this length of wetlands would be substantial and not practical. Modified top-down construction may be used to increase span lengths by constructing temporary foundations at intermediate locations allowing construction equipment a greater reach to construct the permanent bents spaced farther apart. However, this method is considered very expensive and time-consuming in addition to having greater environmental impacts.

Although, no geotechnical information was available at the time the study was conducted, the project location tends to have soils classified as sandy soil (getting denser the deeper it goes). Due to the expected site conditions, prestressed concrete piles are the most cost-effective deep foundation solution and are ideal for this location. Prestressed concrete piles are displacement-based piles which are better suited for use in weak clays, gravels, and loose to medium density sands. Static or dynamic testing is used to confirm load carrying capacities and proper hammer performance of the piles installed. The reduction in time, labor, and materials to construct prestressed concrete pile foundations would provide for a substantial cost savings over other foundation types.

For the end bents it is ideal to use steel H-piles since they are generally more affordable and easier to install. For estimating purposes, it is assumed Alternative C1 would use two rows of steel H-piles while Alternative C2 would use a single row of steel H-piles. For Alternative C3, Top-Down with gantry, the end bent design is controlled by the construction loading and a single row of piles is not sufficient. For estimating purposes, it is assumed Alternative C3 uses a single row of prestressed concrete piles at end bents, although final decisions will be made during the design phase.

The prestressed concrete piles would be driven in place. Driven piles provide a less intrusive foundation and can be done with either conventional or top-down construction. Footings were disregarded as an option due to the prohibitive cost of constructing and dewatering cofferdams in the wetlands and river, necessary to construct footings. Similarly drilled pier foundations would also require dewatering cofferdams and more specialized equipment that would be difficult with top-down construction. Drilled pier foundations are also not ideal for wetland construction and would result in a much more expensive foundation when compared to driven piles. Furthermore, footings and shafts have a substantially larger environmental impact than pile bents. If rock or a limestone layer are encountered within the site, prestressed concrete piles cannot penetrate the limestone layer. In this circumstance, 36-inch open pipe piles should be used instead of the prestressed concrete piles. Steel pipe piles are on average 37 percent more expensive than prestressed concrete piles. Therefore, prestressed concrete piles were considered at interior bents for all alternatives.

During construction all alternatives will use a pile template to hold and lead the piles in place while installed. The pile template is a pile guidance frame that is typically built as a steel trestle with an opening at each pile location.

Environmental impacts have been quantified for temporary and permanent conditions in **Table 11**. Impacts quantified do not include shadow effects from the bridge superstructure since it does not require compensatory mitigation. The causeway at both approaches and end bent fill are not considered as part of the bridge, and as such they were not investigated in the report. Impacts and costs associated with causeway fill required for the roadway would be the same regardless of the bridge alternative. The permanent bridge bent footprint plus an assumed cleared area was applied to each bent to calculate the permanent environmental impacts. The area of permanent impacts per bent is larger for Alternative C3 since it was assumed that gantry bents would be larger to accommodate the gantry loads. The construction footprint would be equal to the sum of all the temporary approaches and permanent environmental impacts of the bridge. To minimize impacts, the bridge would have a closed drainage system over the river, meaning no stormwater from the bridge would impact the river. Having all bents founded on precast concrete or steel piles, eliminates impacts associated with the possibility of any concrete contaminating the river or wetlands.

Table 11. Summary of Environmental Impacts

Design Options				Single Bridges (X1)				Dual Bridges (X2)			
				River		Buffer		River		Buffer	
Line No.	No. Spans	Span Length Ft.	Girder Type	Temp Impacts Sq. Ft.	Perm Impacts Sq. Ft.	Temp Impacts Sq. Ft.	Perm Impacts Sq. Ft.	Temp Impacts Sq. Ft.	Perm Impacts Sq. Ft.	Temp Impacts Sq. Ft.	Perm Impacts Sq. Ft.
C1.a.i.	57	130	MBT 72	8,100	5,700	476,658	153,900	8,100	6,400	522,400	172,800
C1.a.ii.	50	145	FIB 72	8,100	5,700	457,075	133,950	8,100	6,400	444,400	150,400
C1.b.i.	57	130	MBT 72	8,100	5,700	476,658	153,900	8,100	6,400	522,400	172,800
C1.b.ii.	50	145	FIB 72	8,100	5,700	457,075	133,950	8,100	6,400	497,200	150,400
C2.a.iii.	120	60	FIB 36	0	8,550	0	330,600	0	9,600	0	371,200
C2.b.iii.	120	60	FIB 36	0	8,550	0	330,600	0	9,600	0	371,200
C3.a.i.	61	120	MBT 72	0	6,960	0	201,840	0	8,120	0	235,480
C3.a.ii.	61	120	FIB 72	0	6,960	0	201,840	0	8,120	0	235,480
C3.b.i.	61	120	MBT 72	0	6,960	0	205,320	0	8,120	0	235,480
C3.b.ii.	61	120	FIB 72	0	6,960	0	205,320	0	8,120	0	235,480

** Impacts do not include shadow effects from bridge superstructure (663,940 sq. ft. for single bridges and 615,880 sq. ft. for dual bridges). Impacts do not include causeway at beginning and end of bridge and both end bents.*

Legend:

C1 - Conventional Bridge Construction
C2 - Conventional Top-Down Construction
C3 - Top-Down Construction Utilizing a Gantry System

a. - Overhang with Falsework
b. - Bridge Overhang Without Falsework

i. - MBT 72
ii. - FIB 72
iii. - FIB 36

11.0 Summary DEIS Impacts versus FEIS Impacts

Impacts calculated for the DEIS compared to the current designs for the applicant's preferred alternative to be presented in the FEIS are shown in **Table 12**.

Table 12. Summary of DEIS Impacts versus FEIS Impacts

Impact Type	DEIS Alternative 1SB	FEIS Alternative 1SB
General		
Length (miles)	21.2	21.1
Intelligent transportation system cost ($)	$450,000	$2,600,000
Utility cost ($)	$10,800,000	$17,090,000
Right-of-way cost ($)	$123,710,000	$86,830,000
Construction cost ($)	$292,800,000	$582,600,000
Mitigation cost ($)	$12,250,000	$27,050,000
Total cost ($)	$440,010,000	$716,170,000
Socioeconomic Resources		
Residential (#)	162	55[1]
Business (#)	67	25[1]
Non-Profit (#)	0	1[1]
Total (#)	**229**	81[1]
Communities (#)	3	7[2]
Environmental Justice residential areas (#)	6	8[3]
Minority block groups (#)	0	0
Low Income block groups (#)	3	8[3]
Schools (#)	1	1
Hospitals (#)	0	0
Churches (#)	6	6
Fire departments (#)	1	0
Emergency Medical Services stations (#)	0	0
Airports (#)	0	0
Parks and recreational areas (#)	0	0
Cemeteries (#)	1	2[4]
VADs (#)	0	0
VADs (ac)	0.0	0.0
NCNHP managed areas (ac)	2.3	31.9[5]
Prime farmland (ac)	302.3	328.0[6]
Farmland of statewide importance (ac)	222.5	231.4[6]
Farmland of unique importance (ac)	53.3	39.9
Economic Resources		
Annual total net benefits (quantified 2040)	$23,400,000	$37,200,000

Impact Type	DEIS Alternative 1SB	FEIS Alternative 1SB
Physical Resources		
Noise receptors impacted	56	63[7]
Hazardous materials sites (#)	9	19
Cultural Resources		
Section 106 adverse effects	2	2
Archaeological sites - high probability (ac)	829.3	834.9
Archaeological sites - low probability (ac)	480.1	1,267.6
Natural Resources[8]		
Maintained/Disturbed (ac)	516.6	638.5
Agriculture (ac)	507.9	369.6
Pine Plantation (ac)	148.5	26.6
Forested Upland (ac)	25.3	146.1
Palustrine Wetland (ac)	97.4	42.6
Open Water (ac)	13.7	2.1
Total biotic resources (ac)	1309.4	1225.5
Stream crossings (#)	44	16
Stream length (ft)	33,112	21,842
100-year floodplain (ac)	147.7	135.9
500-year floodplain (ac)	130.8	109.1
Floodway (ac)	0.6	1.1
Total floodplains (ac)	278.5	246.1
Riparian wetland	41.2	40.4
Non-riparian wetland	24.2	2.2
Total wetland impacts (ac)	65.4	42.6

[1] Relocation numbers are preliminary and subject to change

[2] GIS data was used to determine DEIS impact numbers. Ground-truthing and community outreach resulted in the identification of additional communities.

[3] Updated 2020 Census data resulted in changes to minority and low-income communities.

[4] Field reconnaissance identified an additional cemetery.

[5] Updates to the NCNHP managed areas data now include HMGP properties.

[6] Soil data layers were updated.

[7] Avoidance and minimization efforts resulted in the taking of less properties and an increase in noise receptors.

[8] DEIS was an estimate based on GIS/model using corridor-level design slope stakes plus 40 feet (which did not include interchange areas or y-lines). FEIS are calculated based on actual field surveys for 1,000 foot corridor and encompasses all potential ROW, interchanges, and y-lines.

12.0 Summary of Recent Public and Agency Involvement

NCDOT published the DEIS in June of 2019 and held a Corridor Public Hearing in August of 2019. Since that time, NCDOT and the project team have held small group meetings with businesses and EJ communities with potential to be affected by the project. Meetings held since August 2019 are summarized in **Table 13**.

Table 13. Summary of Small Group Meetings

Date	Description
10/12/2021	Small Group Meeting with owners of Foss Farm Mobile Home Park
11/13/2021	Small Group Meeting with residents of Foss Farm Mobile Home Park
11/09/2021 11/15/2021	Business Community Virtual & Open House Meetings (Microsoft Teams and NCDOT Division 2 Office)
11/17/2021	Small Group Meeting - EJ and Affected Community at Southwood Memorial Church
12/2/2021	Small Group Meeting - EJ and Affected Community at Kinston Community Center
2/14/2022	Business Meeting with Electrolux
3/17	Small Group Meeting with God's House for All People
4/19	Business Meeting with West Pharmaceutical
4/19	Business Meeting with MasterBrand
5/10	Small Group Meeting with God's House for All People

The Section 106 Effects meeting was held in March of 2022. A meeting with Consulting Parties and other interested stakeholders will be held on June 15, 2022.

13.0 Schedule

Early 2023:	Final EIS
Spring 2023:	Hold Local Officials Meeting, Pre-Hearing Open Houses, and Design Public Hearing
Late 2023:	Record of Decision
2026:	Right-of-Way for Section C and R-5813
2028:	Construction for R-5813
2029:	Right-of-Way for Section B
Future Years:	Construction for Sections B and C and Right-of-Way and Construction for Sections A, D, and E are currently unfunded