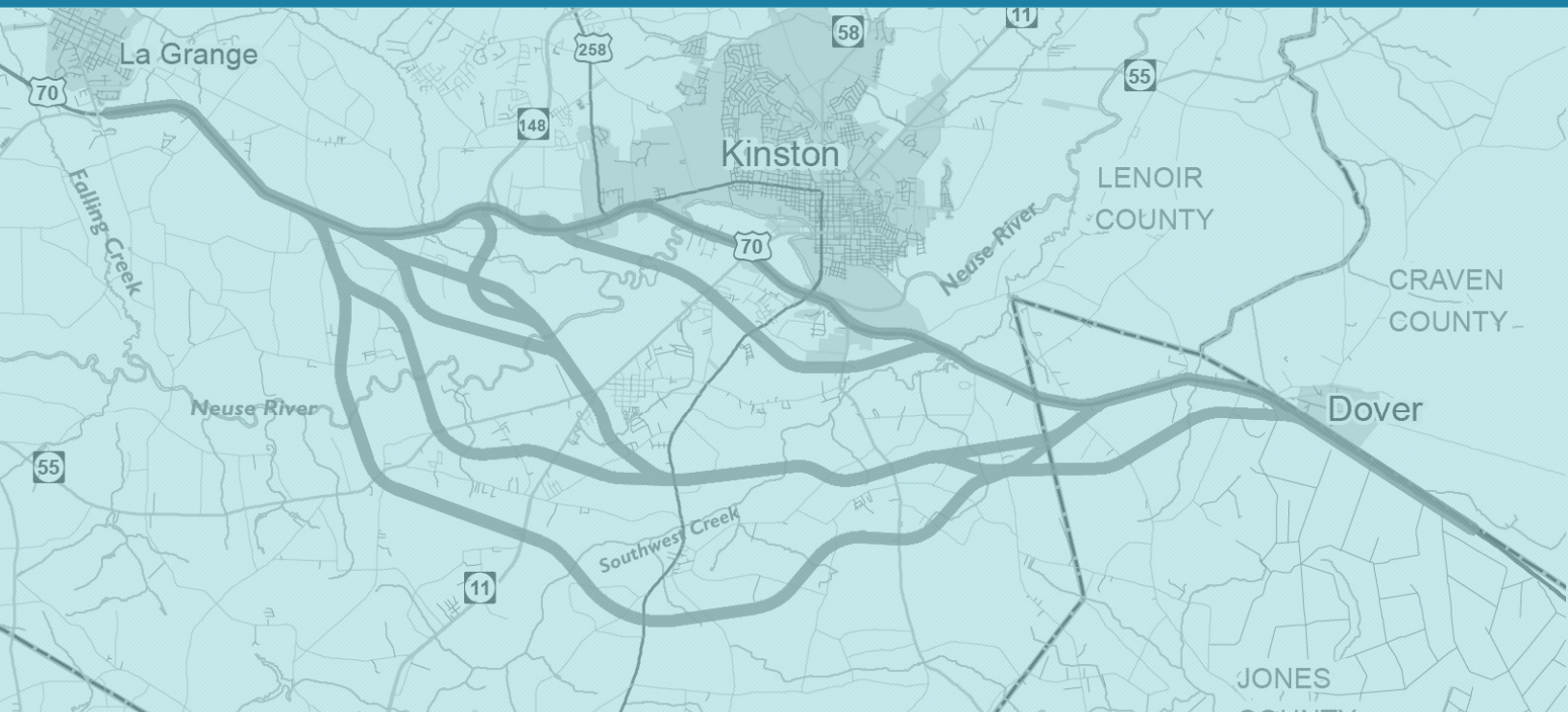


KINSTON BYPASS



STIP Project Number R—2553

Draft Environmental Impact Statement



North Carolina Department of Transportation

June 2019






**PROPOSED KINSTON BYPASS
U.S. 70 FROM LA GRANGE TO DOVER
CRAVEN, JONES, AND LENOIR COUNTIES
WBS NUMBER 34460
STIP PROJECT NUMBER R-2553
USACE AID# SAW-2009-01603**

**ADMINISTRATIVE ACTION
DRAFT ENVIRONMENTAL IMPACT STATEMENT**


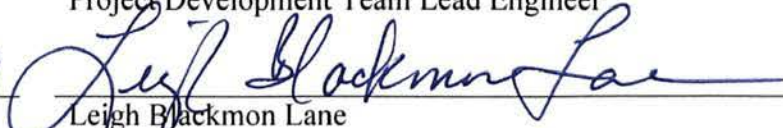
June 2019

Documentation Prepared by
AECOM Technical Services of North Carolina, Inc.

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For the:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

<u>6/19/19</u> Date	 Heather Lane, P.E. North Carolina Department of Transportation Division 2 Project Development Team Lead Engineer
<u>6/19/19</u> Date	 Leigh Blackmon Lane E.L. Robinson Engineering Agent of North Carolina Department of Transportation Project Manager

KINSTON BYPASS Project Fact Sheet

PROJECT LOCATION

Project is located in North Carolina near Kinston, Lenoir County; western part of Craven County; and northern part of Jones County, North Carolina.

ABSTRACT

The North Carolina Department of Transportation (NCDOT) is proposing a four-lane, median divided freeway with full control of access in Lenoir, Jones and Craven Counties in North Carolina. The project extends from US 70, a designated principal arterial, near La Grange (in Lenoir County) to US 70 near Dover (on the Jones and Craven County line), a distance of approximately 22 miles. The proposed action is listed in the State Transportation Improvement Program (STIP) as Project Number R-2553. 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 (STC) policy (previously the Strategic Highway Corridors policy). The project has a design speed of 70 miles per hour (mph), and would serve as a bypass of Kinston from La Grange to Dover. The Draft Environmental Impact Statement (DEIS) was prepared to consider the effects the proposed project would have on the human and natural environment.

PROJECT SPONSOR

NCDOT

FEDERAL LEAD AGENCY

United States Army Corps of Engineers (USACE)

NEPA RESPONSIBLE OFFICIAL

Thomas A. Steffens - USACE

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DATE OF ISSUE

July 22, 2019

Authors & Principal Contributors

NCDOT | AECOM

DOCUMENT AVAILABILITY

This DEIS is available online at the following link: <https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

Copies of the DEIS are also available for viewing at the following locations:

NCDOT Division 2*

2815 Rouse Road Extension, Kinston, NC 28504

NCDOT Kinston District Office*

1629 U.S. 258 South, Kinston, NC 28504

Kinston-Lenoir County Public Library

510 N. Queen Street, Kinston, NC 28501

Cove City-Craven Library

102 N Main St, Cove City, NC 28523

La Grange Public Library

119 E Washington St, La Grange, NC 28551

* Indicates locations where copies of the Public Hearing Maps are also available for viewing.

COMMENTS

Comments on this DEIS can be made in writing by sending a letter to Ms. Heather Lane of the NCDOT at the address listed (see Contact Persons).

Written comments are due by the close of business on September 6, 2019.

Project Commitments

The project commitments listed below are preliminary in nature and will be further evaluated upon selection of the applicant's preferred alternative and the development of more detailed designs and environmental impact analysis that is part of the Final Environmental Impact Statement (FEIS). The FEIS will include a more definitive list of project commitments that includes those listed below, as applicable, as well as other needs that come to light during the public and agency review process, as well as during the development of the FEIS.

- Once the applicant's preferred alternative is selected, consultation will be undertaken to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize, or mitigate adverse effects on historic architectural resources (36 CFR 800.6).
- Full and fair access to meaningful involvement by low-income and minority populations in project planning and development is an important aspect of environmental justice. Ensuring full and fair access means actively seeking the input and participation from those typically under-represented groups throughout all the project stages. Residents can provide important information on community concerns, special sites, and unusual traffic, pedestrian, or employment patterns. This information can be used in the design and evaluation of alternatives, to avoid negative impacts to valued sites, and to support the development of safe, practical, and attractive designs of the detailed study alternatives (DSA) that are responsive to the concerns of environmental justice communities.
- An erosion and sedimentation control plan will be developed for the applicant's preferred alternative prior to construction.
- Impacts to Hazard Mitigation Grant Program properties will be avoided and minimized to the extent practicable during final project design. North Carolina Department of Transportation's (NCDOT) coordination with the Federal Emergency Management Agency (FEMA) and North Carolina Division of Emergency Management will ensure that any impacts will be mitigated to the fullest extent practicable.
- Field investigations, as appropriate and impacts for all federally protected species will be evaluated once the applicant's preferred alternative is selected.
- Identification of essential fish habitat will be coordinated with National Oceanic and Atmospheric Administration, National Marine Fisheries, and NCDOT's Biological Surveys Group once the applicant's preferred alternative is selected.
- During construction, the moratorium on in-water work during spawning periods within the designated anadromous fish spawning areas along the Neuse River will be observed (February 15 through June 30).
- Coastal Area Management Act areas of environmental concern determinations and potential impacts will be established once the applicant's preferred alternative is selected and formal consultation with North Carolina Division of Coastal Management has been completed.
- Impacts to the navigable waters in the form of bridge piers will be determined once the applicant's preferred alternative is selected and bridge designs have been completed.



- Potential impacts to protected stream buffers will be determined once the applicant's preferred alternative is selected and formal stream delineations have been conducted.
- For all new location crossings on FEMA-regulated streams, a Conditional Letter of Map Revision and Letter of Map Revision will be prepared and submitted to the North Carolina Floodplain Mapping Program for approval.
- If one of the new location DSAs is chosen to be the applicant's preferred alternative, the vertical alignment of the mainline will be revised during final design revisions so that the sag locations show a minimum of a 1.5-foot freeboard at the proposed shoulder point during a 1 percent annual chance flooding event.
- Additional testing at hazardous material sites will be completed once the applicant's preferred alternative is selected, and a work plan will be developed based on the final design to address any contaminated material that may be encountered during construction.
- NCDOT will ensure that access is maintained during construction for farm equipment and impacts to agricultural operations are minimized during construction.
- If right-of-way is acquired from the Voluntary Agricultural District (VAD) property through eminent domain, the Lenoir County VAD Ordinance requires that the Agricultural Advisory Board hold a public hearing on the proposed condemnation before condemnation may be initiated. Any VAD lands converted to non-agricultural use as part of a temporary construction easement must be returned to farmable condition by the project's completion.
- The highway will be landscaped to improve the aesthetic quality of the view shed.
- A Design Noise Report will be completed on the applicant's preferred alternative to determine more specific details regarding the noise abatement measures.



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Acronyms and Abbreviations

#	number
1SB	Upgrade Existing US 70 with Shallow Bypass
1UE	Upgrade Existing US 70
AADT	average annual daily traffic
AASHTO	American Association of State Highway and Transportation Officials
ac	acre
ACS	American Community Survey
AEC	area of environmental concern
AFSA	anadromous fish spawning area
APE	area of potential effects
BG	block group
C	Class C Waters
CAMA	Coastal Area Management Act
CARTS	Craven Area Rural Transit System
C-CAP	Coastal Change Analysis Program
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGIA	Center for Geographic Information and Analysis
CIA	Community Impact Assessment
CP	concurrence point
CSX	CSX Transportation
CT	census tract
CTP	Comprehensive Transportation Plan
dB	decibel
DCIA	direct community impact area
DEIS	Draft Environmental Impact Statement
DOE	Department of Energy
DSA	detailed study alternative
DWR	Division of Water Resources
EIA	Economic Impact Assessment
EJ	environmental justice
EMS	emergency medical services
EPA	Environmental Protection Agency
ETJ	extraterritorial jurisdiction
FAST	Fixing America's Surface Transportation
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FLUSA	future land use study area
ft	foot/feet
GIS	geographic information system
GNIS	Geographic Names Information System
GS	General Statute
GTP	Global TransPark



HMGP	Hazard Mitigation Grant Program
HPO	Historic Preservation Office
IPNA	inland primary nursery area
LCT	Lenoir County Transit
LEP	limited English proficiency
LOS	level of service
LUSA	Land Use Scenario Assessment
MALAA	May affect, likely to adversely affect
MOA	Memorandum of Agreement
mph	miles per hour
MSAT	mobile source air toxics
MWh	megawatt hours
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NC	North Carolina
NCAC	North Carolina Administrative Code
NCDA&CS	North Carolina Department of Agriculture and Consumer Services
NCDCM	North Carolina Division of Coastal Management
NCDEM	North Carolina Division of Emergency Management
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality
NCDMS	North Carolina Division of Mitigation Services
NCDOT	North Carolina Department of Transportation
NCDWR	North Carolina Division of Water Resources
NCEM	North Carolina Emergency Management
NC-HPO	North Carolina Historic Preservation Office
NCNHP	North Carolina Natural Heritage Program
NCRR	North Carolina Railroad
NCSHPO	North Carolina State Historic Preservation Office
NCTN	North Carolina Transportation Network
NCWRC	North Carolina Wildlife Resources Commission
NEPA	National Environmental Policy Act of 1969
NHS	National Highway System
NLEB	northern long-eared bat
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NRTR	Natural Resources Technical Report
NS	Norfolk Southern
NSA	noise study area
NSW	nutrient sensitive waters
PBO	programmatic biological opinion
PDA	probable development area
RCW	red-cockaded woodpecker



ROW	right-of-way
SB	shallow bypass
SQG	small quantity generator
SR	State Route
STC	strategic transportation corridors
STI	strategic transportation investments
STIP	State Transportation Improvement Program
STRAHNET	strategic highway network
Sw	swamp waters
TDM	transportation demand management
TRB	Transportation Research Board
TSM	transportation system management
U.S.C.	United States Code
UE	Upgrade Existing
US	United States
USACE	US Army Corps of Engineers
USCG	US Coast Guard
USDA	US Department of Agriculture
USDOJ	US Department of Justice
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
UST	underground storage tank
UT	unnamed tributary
VAD	voluntary agricultural district
VMT	vehicle miles traveled
WBS	work breakdown structure
WS	water supply



EXECUTIVE SUMMARY





EXECUTIVE SUMMARY

TYPE OF ACTION

Administrative Action Environmental Impact Statement

Draft

Final

CONTACTS

The United States (US) Army Corps of Engineers (USACE) is serving in the role of Lead Federal Agency on this project.

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PROPOSED ACTION

Description of Proposed Action

The NCDOT is proposing the Kinston Bypass, a projected four-lane, median-divided freeway with full control of access in Lenoir, Jones, and Craven counties in North Carolina. The project extends from US 70 near La Grange (in Lenoir County) to US 70 near Dover (at the Jones and Craven county line). The project study area is located mostly in Lenoir County in eastern North Carolina, with the eastern part of the project study area in Craven and Jones counties. For the purposes of this DEIS the term “upgrade” is defined as a widening of the existing roadway to include adequate capacity to handle the forecasted traffic and provide for full control of access.

The proposed action is listed in NCDOT’s State Transportation Improvement Program (STIP) as Project Number R-2553 (NCDOT 2017h). The project is funded in the 2018-2027 STIP for construction to start in state fiscal year 2024.



Purpose of the Proposed Action

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 (STC) policy (previously the Strategic Highway Corridors policy) (NCDOT 2015c).

Need for the Proposed Action

The Kinston Bypass project is needed to address traffic congestion, capacity deficiencies, and through-traffic delays on US 70 between La Grange and Dover.

ALTERNATIVES

The National Environmental Policy Act (NEPA) requires that a full range of alternatives be considered for this project. Five general types of alternatives were considered and were evaluated to determine whether they could meet the stated purpose and need. The No-Build Alternative, the Transportation System Management Alternative, the Travel Demand Management Alternative, the Mass Transit Alternative, and the build alternatives.

Following the evaluation of the preliminary alternatives, the No-Build, Transportation System Management, Travel Demand Management, and Mass Transit alternatives were determined to not be reasonable because they would not meet the purpose of and need for the project. The No-Build Alternative must be carried forward under NEPA to allow for a basis of comparison of the detailed study alternatives (DSA). Therefore, the only type of alternative that would meet the purpose and need would be the construction of a build alternative. Numerous build alternatives were evaluated and several eliminated from further consideration due to either not meeting the purpose of and need for the project or not being practicable from an engineering or environmental standpoint.

Following the evaluation of the preliminary alternatives, 12 build alternatives were selected as DSAs for the Kinston Bypass project. The following is a brief description of each of the alternatives carried forward. Refer to section 2.4.1 for more detailed descriptions and figures of the alternatives.

Alternatives 1UE (Upgrade Existing US 70) and 1SB (Shallow Bypass): Alternatives 1UE and 1SB begin at the western terminus of the project at the North Carolina (NC) 903/US 70 interchange south of La Grange. Alternative 1UE would follow existing US 70 for approximately 21 miles from the NC 903/US 70 interchange south of La Grange to the project terminus east of Dover and would upgrade the existing US 70 to a full control of access highway. Alternative 1SB would also begin at the NC 903/US 70 interchange in La Grange and would follow existing US 70 for approximately 7 miles to just east of NC 148 (C.F. Harvey Parkway). 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. A new interchange east of Lenoir Community College would connect Alternative 1SB 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 (State Route [SR] 1002)/Caswell Station Road (SR 1309) and Old US 70 (West Kornegay Street).



Alternatives 11 and 12: Alternatives 11 and 12 begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange and follow existing US 70 for approximately 7 miles to the NC 148/US 70 interchange. At NC 148, both alternatives turn south and then east on new location for approximately 9.5 miles with interchanges at NC 11/NC 55, US 258, and NC 58. The alternatives cross NC 58 just south of Southwood Elementary School before diverging east of NC 58. Alternative 11 continues eastward on new location before interchanging with existing US 70 near Old US 70 just west of Dover. Alternative 12 would turn back to the north to interchange with existing US 70 just east of the Lenoir/Jones county line and would upgrade existing US 70 to the project terminus east of Dover.

Alternatives 31 and 32: Alternatives 31 and 32 begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange and follow existing US 70 for approximately 4.5 miles and would then travel southeast on new location. A new connector approximately 1.5 miles long would connect north to the US 70/NC 148 interchange. From the Neuse River crossing to US 58, Alternatives 31 and 32 are the same as Alternatives 11 and 12.

Alternatives 35 and 36: Alternatives 35 and 36 begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange and follow existing US 70 for approximately 2.25 miles. A new interchange here would allow both alternatives to diverge onto new location and travel to the south. The alternatives swing back to the north before diverging at Cobb Road. East of Cobb Road, Alternative 36 is the same as Alternatives 11, 31, 65, and 51. Alternative 35 continues northeast on new location, and from Wyse Fork Road eastward is the same as Alternatives 12, 32, 63, and 52.

Alternatives 51 and 52: Alternatives 51 and 52 begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange and follow existing US 70 for approximately 2.25 miles. A new interchange here would allow both alternatives to diverge onto new location and travel to the south. East of US 258, Alternative 51 is the same as Alternatives 11, 31, and 65, and Alternative 52 is the same as Alternatives 12, 32, and 63.

Alternatives 63 and 65: Alternatives 63 and 65 begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange and follow existing US 70 for approximately 4.5 miles and would then travel south and then east on new location. A new connector approximately 2 miles long would connect north to the US 70/NC 148 interchange. From east of the Neuse River crossing, Alternative 63 is the same as Alternatives 12 and 32, and Alternative 65 is the same as Alternatives 11 and 31.

SUMMARY OF IMPACTS

A comparison of the DSAs is shown in Table S-1.

Table S-1: Alternatives comparison matrix

	Alternative 1UE	Alternative 1SB	Alternative 11	Alternative 12	Alternative 31	Alternative 32	Alternative 35	Alternative 36	Alternative 51	Alternative 52	Alternative 63	Alternative 65
General												
Length (miles)	24.5	24.5	26.5	26.7	25.3	25.5	28.6	28.3	25.9	26.1	25.6	25.4
Intelligent transportation system cost (\$)	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000
Utility cost (\$)	\$12,830,000	\$10,800,000	\$9,130,000	\$9,430,000	\$7,840,000	\$8,080,000	\$8,620,000	\$7,980,000	\$7,930,000	\$9,880,000	\$7,880,000	\$7,630,000
Right-of-way cost (\$)	\$183,070,000	\$123,710,000	\$78,330,000	\$85,050,000	\$63,340,000	\$66,990,000	\$65,490,000	\$64,200,000	\$54,560,000	\$57,380,000	\$64,010,000	\$61,180,000
Construction cost (\$)	\$245,900,000	\$292,800,000	\$284,100,000	\$299,000,000	\$284,200,000	\$288,900,000	\$290,400,000	\$297,800,000	\$296,200,000	\$275,800,000	\$355,900,000	\$358,900,000
Mitigation cost (\$)	\$12,940,000	\$12,250,000	\$12,130,000	\$13,390,000	\$12,290,000	\$13,550,000	\$13,940,000	\$12,810,000	\$11,720,000	\$12,980,000	\$13,440,000	\$12,180,000
Total cost (\$)	\$455,190,000	\$440,010,000	\$384,140,000	\$407,320,000	\$368,120,000	\$377,970,000	\$378,900,000	\$383,240,000	\$370,860,000	\$356,490,000	\$441,680,000	\$440,340,000
Socioeconomic Resources												
Residential (#)	125	162	95	101	76	92	130	113	97	113	98	80
Business (#)	137	67	35	40	30	37	32	27	26	32	36	30
Non-Profit (#)	0	0	0	0	0	0	0	0	0	0	0	0
Total (#)	262	229	130	141	106	129	162	140	123	145	134	110
Communities (#)	3	3	2	3	3	3	5	5	3	3	3	3
Environmental Justice residential areas (#)	4	6	2	3	2	3	5	4	4	5	4	3
Minority block groups (#)	2	0	0	0	0	0	0	0	0	0	0	0
Low income block groups (#)	6	3	3	3	3	3	3	3	3	3	3	3
Schools (#)	1	1	0	0	0	0	0	0	0	0	0	0
Hospitals (#)	0	0	0	0	0	0	0	0	0	0	0	0
Churches (#)	9	6	1	1	1	1	1	1	0	0	1	1
Fire departments (#)	1	1	1	2	1	2	1	0	1	2	2	1
Emergency Medical Services stations (#)	0	0	0	0	0	0	0	0	0	0	0	0
Airports (#)	0	0	0	0	0	0	0	0	0	0	0	0
Parks and recreational areas (#)	1	0	0	0	0	0	0	0	0	0	0	0
Cemeteries (#)	2	1	1	0	1	0	2	2	1	0	0	1
VADs (#)	0	0	0	0	0	0	1	1	0	0	0	0
VADs (ac)	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.6	0.0	0.0	0.0	0.0
NCNHP managed areas (ac)	6.0	2.3	0.0	0.0	6.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0
Prime farmland (ac)	282.2	302.3	392.5	422.4	404.3	434.0	432.4	415.2	410.3	440.1	420.5	390.6
Farmland of statewide importance (ac)	172.2	222.5	236.8	210.2	263.7	236.6	203.4	225.6	224.4	198.3	218.2	243.7
Farmland of unique importance (ac)	53.3	53.3	56.8	56.8	51.7	51.7	47.3	47.3	48.8	48.8	51.7	51.7
Economic Resources												
Annual total net benefits (quantified 2040)	\$22.5 million	\$23.4 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million
Physical Resources												
Noise receptors impacted	38	56	34	37	41	44	23	21	24	27	41	38
Hazardous materials sites (#)	18	9	9	10	7	8	6	5	5	6	8	7
Cultural Resources												
Section 106 adverse effects	2	2	3	4	6	7	2	1	1	2	6	5
Archaeological sites - high probability (ac)*	649.8	829.3	628.9	753.6	590.3	714.3	626.1	526.3	516.8	641.8	668.4	542.8
Archaeological sites - low probability (ac)*	570.6	480.1	684.37	583.9	688.0	588.4	816.9	883.1	756.4	657.2	664.7	763.9

	Alternative 1UE	Alternative 1SB	Alternative 11	Alternative 12	Alternative 31	Alternative 32	Alternative 35	Alternative 36	Alternative 51	Alternative 52	Alternative 63	Alternative 65
Natural Resources												
Maintained/Disturbed (ac)	706.2	516.6	264.2	346.3	242.3	324.3	312.7	230.1	214.9	297.6	315.5	232.8
Agriculture (ac)	317.9	507.9	672.2	689.6	664.6	682.3	714.1	699.9	637.3	655.6	667.8	648.9
Pine Plantation (ac)	73.0	148.5	246.7	193.0	242.6	188.7	265.3	305.1	266.1	212.4	211.3	265.1
Forested Upland (ac)	21.5	25.3	28.0	19.9	27.9	19.7	29.7	38.0	34.2	26.0	19.4	27.6
Palustrine Wetland (ac)	98.3	97.4	98.2	86.6	97.0	85.4	117.3	130.7	115.1	103.5	114.8	126.3
Open Water (ac)	3.5	13.7	3.9	2.3	3.9	2.3	4.0	5.6	5.6	4.0	4.3	5.9
Total biotic resources (ac)	1220.4	1309.4	1313.2	1337.7	1278.3	1302.7	1443.1	1409.4	1273.2	1299.1	1333.1	1306.6
Stream crossings (#) ^a	43	44	45	50	41	45	42	40	38	42	45	41
Stream length (ft) ^a	32,057	33,112	26,771	33,864	26,620	33,699	31,295	24,888	23,638	30,717	31,368	24,289
100-year floodplain (ac) ^b	358.6	147.7	95.2	83.9	109.0	97.7	52.1	62.3	73.4	62.1	139.1	150.4
500-year floodplain (ac) ^c	75.0	130.8	23.9	23.9	21.7	21.7	40.2	40.2	46.2	46.2	29.2	29.2
Total floodplains (ac)^d	433.6	278.5	119.1	107.8	130.7	119.4	92.3	102.5	119.6	108.3	168.3	179.6
Floodway (ac) ^e	35.6	0.6	1.8	1.9	1.1	1.1	0.1	0.1	1.1	1.1	1.2	1.2
Riparian wetland ^a	74.1	41.2	68.5	55.1	66.5	53.2	41.6	55.4	60.4	47.1	74.5	87.9
Non-riparian wetland ^a	11.8	24.2	49.4	37.4	60.1	48.1	107.4	116.4	81.8	69.8	37.7	49.7
Total wetland impacts (ac)^a	85.9	65.	117.9	92.5	126.6	101.3	149	171.8	142.2	116.9	112.2	137.6

^a Archaeological sites, stream, and wetland impacts were calculated using GIS predictive modelling. Methodologies are described in sections 3.4.2 and 3.6.7, respectively.

^b The 100-year floodplain is a flood that has a 1 percent chance of being equaled or exceeded in any given year.

^c The 500-year floodplain is a flood that has a 0.2 percent chance of being equaled or exceeded in a given year.

^d Total floodplains is the total acreage of 100- and 500-year floodplains within each alternative corridor.

^e Floodways are FEMA regulated areas that include the channel of a river or watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.



UNRESOLVED ISSUES

The selection of an applicant's preferred alternative is necessary before moving forward with the following required actions:

- **Historic architecture studies:** Additional coordination, investigation, and documentation relating to historic architecture resources will be conducted for the applicant's preferred alternative. If affected, consultation with the North Carolina State Historic Preservation Office will be needed to develop appropriate mitigation plans. In addition, a memorandum of agreement (MOA) regarding project effects and mitigation measures will be prepared.
- **Archaeological survey:** A comprehensive archaeological survey of the applicant's preferred alternative will be conducted to identify potentially affected archaeological sites. If affected, consultation with the North Carolina State Historic Preservation Office will be needed to develop appropriate mitigation plans. In addition, an MOA will include archaeology.
- **Hazardous materials investigations:** Supplemental investigations will be conducted for the applicant's preferred alternative.
- **Threatened and endangered species investigations:** A request for concurrence with the biological conclusion will be submitted to the United States Fish and Wildlife Service (USFWS) after selection of the applicant's preferred alternative.
- **Wetland, stream, and riparian buffer investigations:** Two ArcGIS models were used in order to assess potential stream and wetland impacts for the project. A jurisdictional stream model was created by the North Carolina Division of Water Resources (NCDWR) and a jurisdictional wetland model was created by NCDOT. Supplemental investigations will be conducted for the applicant's preferred alternative.
- **Environmental justice:** Coordination with affected populations/communities will continue throughout the project development process.

ACTIONS REQUIRED BY OTHER STATE AND FEDERAL AGENCIES

Through agency coordination in the NCDOT Merger Process, the following permits have been identified as necessary for this project:

- Section 401 Certification from the NCDWR
- Section 404 Permit from the USACE
- Section 10 Permit from the USACE
- Section 9 Permit from the United States Coast Guard
- Section 7 Consultation by the USFWS
- Consultation with NOAA Fisheries

Stormwater discharge with the potential to impair water quality will be under the jurisdiction of the NCDOT National Pollutant Discharge Elimination System stormwater permit.



CHAPTER I

PROJECT PURPOSE AND NEED





I. PURPOSE OF AND NEED FOR PROJECT

A Draft Environmental Impact Statement (DEIS) has been prepared for the proposed Kinston Bypass project, in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code [U.S.C.] 4321-4327) as codified in Title 40 of the Code of Federal Regulations (CFR) Parts 1500-1508, and the North Carolina (or State) Environmental Policy Act of 1971, as amended (North Carolina General Statutes [GS] Article 1 Chapter 113A), as codified in the North Carolina Administrative Code (NCAC), Title 1, Chapter 25. The DEIS is intended for use as an informational document by the decision-makers and the public. As such, it represents a disclosure of relevant environmental information concerning the proposed action.

The content of this DEIS conforms to the Council on Environmental Quality (CEQ) guidelines (CEQ 2005), which provide direction regarding implementation of the procedural provisions of NEPA, and the United States (US) Army Corps of Engineers (USACE) Public Interest review.

I.1 PROPOSED ACTION

The North Carolina Department of Transportation (NCDOT) is proposing the Kinston Bypass, by upgrading US 70 from the existing freeway near La Grange, in Lenoir County, to the existing freeway near Dover in Jones County. The proposed improvements include a four-lane, median-divided freeway with full control of access in Lenoir, Jones, and Craven counties in North Carolina. The proposed action is listed in NCDOT's State Transportation Improvement Program (STIP) as Project Number R-2553 (NCDOT 2017h). Figure 1-1 shows the project vicinity and study area of the proposed action.

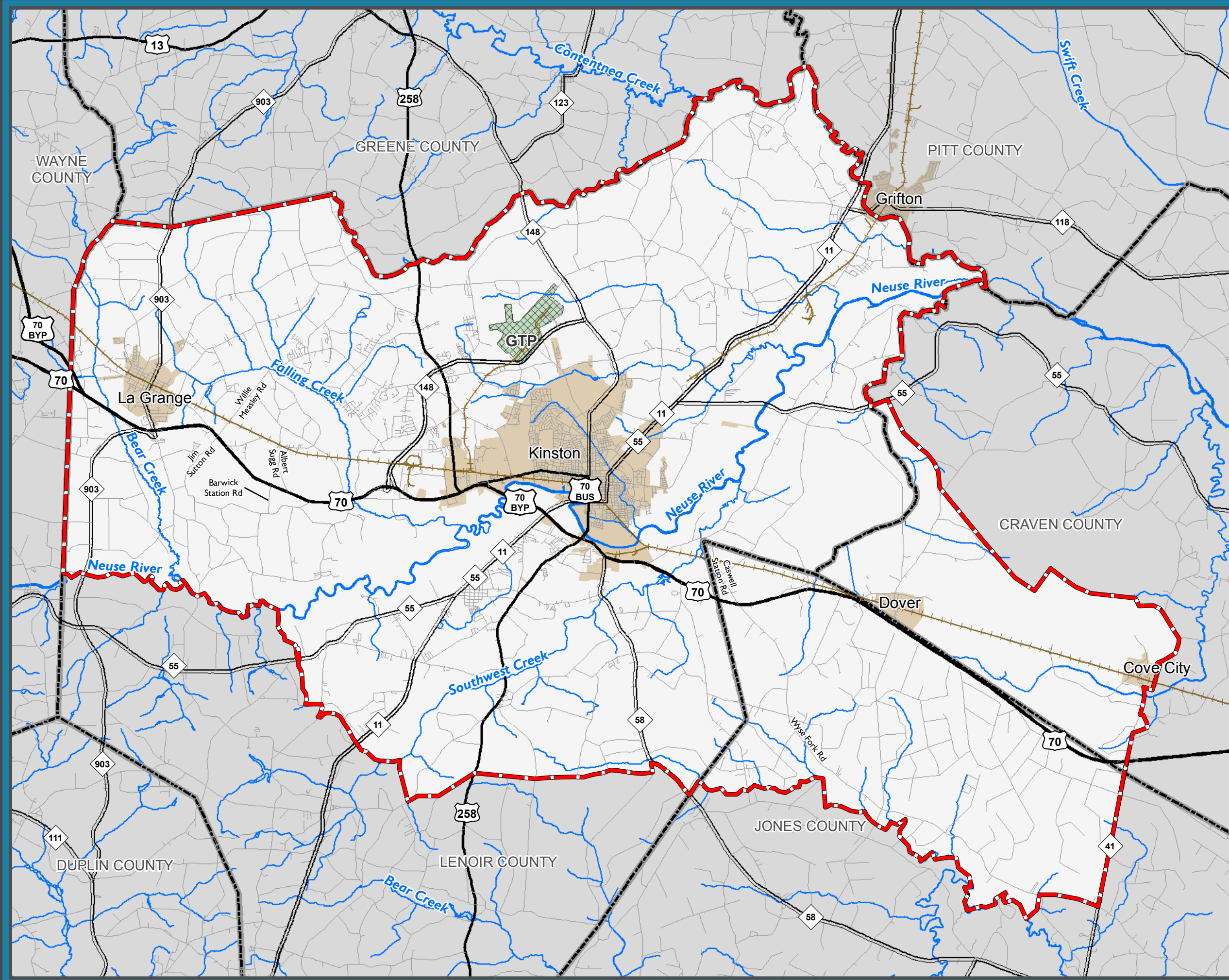
I.2 PROJECT SETTING

I.2.1 Description of Project Area

Lenoir County lies in the Coastal Plain physiographic province of North Carolina. The topography of Lenoir County is characterized as mostly level, with gently rolling areas along interstream divides. Topography within the project study area is relatively flat with elevations ranging from 14 to 30 feet (4.3 to 9.1 meters) above mean sea level. The dominant natural features in the Kinston urban area are the Neuse River and its associated floodplains and wetland systems. Tributaries to the Neuse River within the study area include Bear Creek, Falling Creek, Briery Run, Stonyton Creek, Mosley Creek, and Southwest Creek.

Kinston, the county seat, is the largest city in Lenoir County with a population of close to 21,000 (US Census Bureau 2016). The Neuse River flows west-to-east through Kinston, dividing Lenoir County in half. Kinston is located within 30 miles of Goldsboro to the west and Greenville to the north. North Carolina's state capital, Raleigh, is located approximately 80 miles to the northwest of Kinston. Morehead City is located approximately 70 miles to the southeast of Kinston and Wilmington is located approximately 90 miles to the south.

Figure 1-1:
Project study area



- Legend**
- Project Study Area
 - Railroad
 - US Highway
 - NC Highway
 - Secondary Road
 - Global TransPark (GTP)
 - Municipal Boundary
 - County Boundary



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





Kinston has a mix of urban land uses that includes a central business district, office/institutional properties, residential neighborhoods, and commercial development. The most prominent land use throughout Lenoir County, excluding the urbanized area of Kinston, is agriculture. Other land uses are undeveloped land including pasture, forest, and wetlands. There are clusters of residential development in and around the municipal areas and large-lot residential development spread throughout the rural areas. Commercial and industrial development areas exist as well, particularly around the area of the Global TransPark (GTP) and US 70 west of Kinston.

The project study area, shown on Figure 1-1, is located mostly in Lenoir County in eastern North Carolina, with the eastern part of the project study area in Craven and Jones counties. Lenoir County borders Greene County to the north, Pitt County to the northeast, Craven County to the east, Jones County to the southeast, Duplin County to the southwest, and Wayne County to the west.

The western boundary of the project study area follows the Lenoir/Wayne county boundary, where access of US 70 is fully controlled. The southern boundary cuts through Lenoir County south of Kinston following the Neuse River for approximately 5 miles, then continues southeast crossing NC 55, NC 11 (south of Deep Run), US 258, and US 58 in southern Lenoir County. The eastern edge of the project study area is about 16 miles east of Kinston near the Town of Cove City in Craven County, where US 70 includes full control of access. The northern boundary is common with the county boundary between Greene and Lenoir counties. The boundary follows Beaver Creek as it crosses into Jones County all the way to NC 41 (north of Trenton).

The boundaries of the project study area were chosen to ensure that alternatives evaluated will connect to logical termini, as well as have independent utility, and provide adequate coverage to identify a full range of alternatives.

1.2.2 Existing Transportation Facilities

US 70 is a primary east-west corridor. Within the nearby region of the project, US 70 provides connections between Raleigh, Goldsboro, and points west, and New Bern, Havelock, and points east. In the project vicinity, US 70 may be split into three regions:

- From the western terminus of the project to the interchange with NC 148 (C.F. Harvey Parkway), US 70 is a four-lane divided rural expressway. In this section, US 70 carries 16,600 annual average daily traffic (AADT) west of NC 903, increasing to 21,200 AADT west of NC 148 (C.F. Harvey Parkway). The speed limit in this area varies between 55 miles per hour (mph) and 70 mph, and approximately 12 percent to 15 percent of the traffic is heavy vehicles.
- From NC 148 (C.F. Harvey Parkway) to NC 58/Trenton Highway, US 70 operates as a four-lane divided urban corridor. In this section, US 70 carries 19,800 AADT east of NC 148 (C.F. Harvey Parkway), rising to 40,000 AADT west of US 70 Business, and dropping to 25,600 AADT west of NC 58/Trenton Highway. The speed limit in this area varies between 45 mph and 55 mph, and approximately 9 percent to 14 percent of the traffic is heavy vehicles.
- From NC 58/Trenton Highway to the eastern terminus of the project, US 70 reverts to a four-lane divided rural expressway. In this section, US 70 carries 16,400 AADT east of NC 58/Trenton Highway, decreasing to 11,100 AADT east of State Route (SR) 1005



(Kornegay Street). The speed limit in this area varies between 45 mph and 55 mph, and approximately 15 percent to 21 percent of the traffic is heavy vehicles.

NC 903 is a two-lane undivided north-south roadway providing connections to La Grange and residential areas. It carries 4,000 AADT north of US 70, and 1,800 AADT south of SR 1002. The speed limit is 55 mph and approximately 7 percent to 9 percent of the traffic is heavy vehicles.

NC 148 (C.F. Harvey Parkway) is a four-lane divided north-south freeway providing access to residential communities. It carries 2,800 AADT north of US 70. The speed limit is 70 mph and approximately 14 percent of the traffic is heavy vehicles.

US 258 is a primary north-south corridor providing connections to businesses and residential communities—US 258 connects with NC 148 (C.F. Harvey Parkway) to the north of US 70, co-routes with US 70 for approximately 3.7 miles, and then departs to the south:

- North of US 70, US 258 is a five-lane undivided urban roadway. In this section, US 258 carries 11,800 AADT north of US 70, increasing to 14,000 AADT north of SR 1546 (Banks School Road). The speed limit in this area is 45 mph and approximately 7 percent to 11 percent of the traffic is heavy vehicles.
- South of US 70, US 258 is a two-lane undivided rural roadway. In this section, US 258 carries 10,600 AADT south of US 70, decreasing to 5,000 AADT south of SR 1139 (Clarence Potter Road). The speed limit in this area varies between 45 mph and 55 mph and approximately 9 percent to 13 percent of the traffic is heavy vehicles.

US 70 Business is a five-lane undivided east-west corridor providing access to Kinston. It carries 19,800 AADT at the western interchange with US 70, and 15,000 AADT at the eastern intersection with US 70 and US 258. Near US 70, the speed limit is 45 mph and approximately 5 percent to 7 percent of the traffic is heavy vehicles.

NC 11/NC 55 is a five-lane undivided north-south roadway providing access to businesses and residential communities. NC 11/NC 55 carries 13,000 AADT north of US 70, and 17,000 AADT south of US 70, decreasing to 12,600 AADT north of the NC 11/NC 55 split. West of NC 11, NC 55 carries 4,800 AADT, while NC 11 carries 10,400 AADT. The speed limit varies between 45 mph and 55 mph and approximately 8 percent to 16 percent of the traffic is heavy vehicles.

NC 58/Trenton Highway is a two-lane north-south corridor providing access to residential communities. Trenton Highway carries 3,400 AADT north of US 70, while NC 58 carries 11,400 AADT south of US 70, dropping to 4,900 AADT south of SR 1913 (Elijah Loftin Road). The speed limit varies between 25 mph and 55 mph and approximately 6 percent to 12 percent of the traffic is heavy vehicles.

Numerous other secondary routes access US 70 throughout the study corridor, mainly to provide connectivity to residential and rural areas of Lenoir, Craven, and Jones counties. Multiple businesses and private driveways also intersect US 70. In total, the study area spans 21 miles through Lenoir and Jones counties.

I.2.3 Project History

NCDOT initiated environmental and engineering studies for the Kinston Bypass project in the late 1990s; however, the project was placed on hold several times due to other local and NCDOT



Division 2 (Jones, Lenoir, Greene, Pitt, Beaufort, Craven, Pamlico, and Carteret counties) funding priorities. NCDOT placed the project on hold most recently in 2014 and reinitiated the environmental and engineering studies for the Kinston Bypass project in 2016 when it was funded in NCDOT's current 2018-2027 STIP (NCDOT 2017h).

The Kinston Bypass is identified in the *City of Kinston Comprehensive Transportation Plan Highway Map* adopted by the City of Kinston on August 20, 2007, and by NCDOT on February 6, 2008, and endorsed by the Eastern Carolina Rural Planning Organization on August 27, 2007 (NCDOT 2007b).

1.3 PURPOSE OF PROPOSED ACTION

The purpose of the proposed action 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 (STC) policy (previously the Strategic Highway Corridors policy) (NCDOT 2015c). The intent of the STC policy is to provide North Carolina with a network of high-priority, multi-modal transportation corridors and facilities that will connect statewide plus regional activity centers to enhance economic development, promote highly-reliable, efficient mobility and connectivity, and support good decision-making.

The proposed action would improve regional mobility and capacity by providing a highway that would consist of a median-divided multilane roadway, would limit access to major crossroads by way of interchanges, and would connect to the sections of US 70 that have full control of access near La Grange and Dover.

1.4 NEED FOR PROPOSED ACTION

The proposed action is needed to address traffic congestion, capacity deficiencies, and through-traffic delays on US 70 between La Grange and Dover. Supporting technical data for existing and forecasted conditions are included below.

Information that further supports the need for the project is discussed in sections 1.4.1, 1.4.2, and 1.4.3. These sections describe the traffic forecast and operational analysis for the US 70 corridor, as well as the project's relationship to other transportation systems and transportation plans.

- **Through-traffic delays:** Currently there is no control of access along US 70 and the existing US 70 Bypass between La Grange and Dover. Numerous street and driveway connections to adjacent development substantially reduce the mobility of this corridor. Mobility is considered the ability to move unimpeded, safely, and efficiently using a reliable transportation system. Currently there are 60 intersections along the US 70 corridor within the project study area. Seven of these intersections are controlled by traffic signals that prohibit uninterrupted traffic flow.
- **Travel time deficiencies:** A travel time analysis (NCDOT 2012d) was completed to assess the travel speeds of US 70 between La Grange and Dover. The section of US 70 studied from NC 903 (NC 903) to SR 1313 (Tucker Town Road), a total distance of 20.16 miles, was broken down into 10 smaller segments of varying lengths to better detail the route and to show where signal delays typically occur. The segments were selected based on existing signals and major crossing roadways. The study revealed that 4 of the 10 segments in the

eastbound direction are operating at speeds lower than the recommended minimum 45 mph in the a.m. and/or p.m. peak periods. Five of the 10 segments in the westbound direction are operating at speeds lower than the recommended minimum 45 mph in the a.m. and/or p.m. peak periods. As a result approximately half of the segments along existing US 70 in the study area do not meet the mobility and capacity requirements for the recommended speed in the study area.

- **Existing and future roadway capacity deficiencies:** US 70 and the existing US 70 Bypass within the project study area are classified as principal arterials, consisting of four- to seven-lane roadways. US 70 and the existing US 70 Bypass include signalized intersections, unsignalized intersections, and numerous commercial and residential driveway connections. In 2015, 59 out of the 63 intersections analyzed along the project corridor performed at level of service (LOS) D or better in both peak hours. Four intersections exhibited poor LOS (LOS E or F) in at least one peak hour. These intersections are all unsignalized and the delay stems from the minor side street movements. In the 2040 No-Build Alternative, 47 out of the 63 intersections are predicted to perform at LOS D or better in both peak hours. Sixteen intersections exhibit poor LOS (LOS E or F) in at least one peak hour, which translates into a 300 percent increase in intersections that perform at poor LOS from 2015, including one signalized intersection

I.4.1 Traffic Forecasts and Operations Analysis

The geometric design and operational characteristics, including number and type of vehicles traveling on it, determines how well the highway will perform. A traffic operations analysis is performed to evaluate the existing and future travel conditions and to determine the effectiveness of the proposed action to improve the regional mobility, connectivity, and capacity for US 70 within the project study area.

The *Traffic Forecast Technical Memorandum, Kinston Bypass Alternatives Study, TIP Project R-2553, Lenoir, Jones & Craven Counties*, which was prepared using output from the Kinston Travel Demand Model, used the base year 2015 and the horizon year 2040 (NCDOT 2012a, 2016b). The Kinston Travel Demand Model forecasts growth using various socioeconomic data to predict future demands on a transportation network. Projected traffic in a horizon year is determined using regional growth expectations and assumptions about future development activity, and changes in distribution of population and employment in the forecasted study area are embedded in the model.

A capacity analysis performed for this project is based on methodologies from the *Highway Capacity Manual* (Transportation Research Board [TRB] 2010) and is summarized in the *Traffic Capacity Analysis Report* (NCDOT 2017i). The capacity analysis used the a.m. and p.m. peak hour traffic volumes from the traffic forecast prepared for this project (NCDOT 2016b). The results of the traffic capacity analysis are presented in terms of LOS, which is a qualitative measure that describes the operational conditions within a traffic stream and the perception of the traffic service by the driving public.



What is Level of Service (LOS)?

The traffic carrying ability of a roadway is defined by a LOS letter grade A through F that indicates the ability for a highway to carry traffic. LOS A indicates free-flow conditions and LOS F indicates extreme delay. The maximum capacity of a roadway is defined by LOS E.

The Kinston Bypass has been considered by NCDOT in previous forecasts and studies for projects in and around the City of Kinston. The following forecasting projects were reviewed as part of the current forecasting efforts:

- North Carolina Global TransPark (GTP) Study – May 1996
- R-2719A C.F. Harvey Parkway (formerly Crescent Road) – June 2004
- Kinston Eastern Loop/NC 11 Relocation (FS-0802) – May 2008
- US 70 Strategic Highway Corridor Study (including US 70 at NC 11/NC 55 Feasibility Study)
- US 70 Kinston Bypass (R-2553) – July 2009
- R-2554 Goldsboro Bypass (Public Hearing Map) – project completed May 2016
- US 70 Kinston Bypass (R-2553) – July 2012

In addition, the *Kinston Comprehensive Transportation Plan (CTP)*, adopted in February 2008, provides future regional forecasts assuming multiple transportation projects identified for the area. Many of these projects are not included in the financially feasible network identified for the current Kinston Bypass forecast. A review of these forecasts was conducted and compared with model runs of the latest Kinston area regional demand model using TransCAD software. This demand model was initially developed by NCDOT in April 2012 and has been used as part of the latest forecast.

1.4.1.1 Forecasted Traffic Volumes for 2015 and 2040 No-Build Conditions

Without the project, traffic volumes are forecasted to increase along the entirety of the project corridor by 2040. The largest increases will be seen at the two terminuses of the project, with the western terminus seeing an increase of 113 percent and the eastern terminus seeing an increase of 116 percent. In general, the western portion of the project corridor, from west of NC 903 to C.F. Harvey Parkway, is forecasted to experience the highest overall increases with all volumes ranging between 84 percent and 113 percent. Moderate increases ranging from 24 percent to 66 percent are forecasted between C.F. Harvey Parkway and NC 58. From NC 58 to the eastern terminus of the project, volumes will steadily increase from 40 percent to 116 percent along the corridor. More detailed information on the forecasted traffic volumes for 2015 and 2040 No-Build conditions for US 70 and the existing US 70 Bypass within the project study area are provided in Appendix A (NCDOT 2016b).



I.4.1.2 Capacity Analysis for 2015 and 2040 No-Build Conditions

Sixty-three intersections were analyzed for the 2015 and 2040 No-Build conditions to evaluate the current and future traffic operations of US 70 and the existing US 70 Bypass corridor within the project study area.

In the 2015 No-Build Alternative, 59 out of the 63 intersections analyzed perform at LOS D or better in both peak hours. Four intersections exhibited poor LOS (LOS E or F) in at least one peak hour: Kennedy Home Road/Eason Road at US 70, Shopping Center Drive/Pinelawn Cemetery Drive at US 70, NC 11 at Edgewood Drive/Mary Beth Road, and Hillcrest Road at US 70. These intersections are all unsignalized and the delay stems from the minor side street movements.

In the 2040 No-Build Alternative, 47 out of the 63 intersections analyzed perform at LOS D or better in both peak hours, down from 59 in the 2015 No-Build Alternative. 16 intersections exhibit poor LOS (LOS E or F) in at least one peak hour, which translates into a 300 percent increase in intersections that perform at poor LOS from the 2015 No-Build Alternative, including one signalized intersection: NC 11 at US 70. The remaining failing intersections are unsignalized and the delay stems from the minor side street movements, with one exception: the westbound US 70 left turn at Ruby Tuesday operates at LOS E in the p.m. peak hour.

I.4.2 Transportation Systems

The US 70 corridor is one of the primary east-west corridors across eastern North Carolina and is a major connection between Raleigh, Goldsboro, Kinston, Havelock, and the Port of Morehead City. The US 70 corridor is just a few miles south of the North Carolina GTP and is heavily used for moving freight. It also provides important connections to two military bases serviced by US 70, Seymour Johnson Air Force Base in Goldsboro and the Marine Corps Air Station in Cherry Point.

I.4.2.1 Relationship to the Interstate System

There are currently no interstate routes in Lenoir, Craven, or Jones counties; however, US 70 between Raleigh and Morehead City intersects three interstate highways. I-40, approximately 55 miles west of the project study area, is an east-west interstate highway that spans the US from Wilmington, North Carolina to Barstow, California. I-95, approximately 35 miles west of the project study area, is a north-south interstate highway that spans from Miami, Florida to Houlton, Maine. I-795, approximately 15 miles west of the project study area, is a spur route to I-95 and runs from west of Goldsboro to I-95 near Wilson, North Carolina.

The US 70 Corridor between I-40 and Morehead City is included as Corridor 82 in Fixing America's Surface Transportation Act (FAST Act) signed into Public Law on December 4, 2015 (FAST Act 2015). In 2016, North Carolina received approval from the American Association of State Highway and Transportation Officials (AASHTO) for the US 70 Corridor, between I-40 and Morehead City, to be labeled as Future I-42 (AASHTO 2016).

1.4.2.2 North Carolina Transportation Network and Strategic Transportation Corridors

NCDOT started updating its STC policy in 2013, which 10 years earlier had identified 55 highway corridors across the state deemed to be of high priority in achieving state development goals (NCDOT 2015c). The result is the North Carolina Transportation Network (NCTN), and the STC policy and corridor network (NCDOT 2015d). The NCTN and STC network relate to long-range transportation planning across North Carolina in the following ways:

- The NCTN identifies the most significant multi-modal transportation assets of the state arrayed into three levels: statewide, regional, and local.
- The STC network is a subset of the NCTN statewide level highways and rail lines and is comprised of corridors of greatest importance in supporting statewide connectivity, mobility, and economic prosperity.

The purpose of the STC policy is to identify, from existing highways, a network of multi-modal, high priority, strategic transportation corridors to form a core network of highly performing highways for movement of high volumes of people and freight within North Carolina. The STC has identified 25 transportation corridors that move most of the freight and people in the state, link critical centers of economic activity to international air and sea ports, and support interstate commerce. The STC map shown on Figure 1-2 designates US 70 and the North Carolina Railroad (NCRR) as STC “P” from I-40 near Raleigh to Morehead City.

1.4.2.3 National Highway System and STRAHNET

In addition to its designation as an STC in North Carolina, US 70 is designated at the federal level as part of the National Highway System (NHS) and as part of the strategic highway network (STRAHNET), which itself is part of the NHS. The federal-aid highway system, which includes the interstate system and the NHS, is defined in 23 CFR 470.107. The NHS includes approximately 160,000 miles of roadway that are important to the nation’s economy, defense, and mobility (Federal Highway Administration [FHWA] 2016b).

The STRAHNET is a 62,791-mile system of roads deemed necessary for emergency mobilization and is critical to the Department of Defense’s domestic operations. It is also used during peacetime for the movement of heavy armor, fuel, ammunition, repair parts, food, and other commodities to support US military operations (FHWA 2014). US 70 between I-40 (near Raleigh) and Morehead City is designated as a STRAHNET non-interstate route (see Figure 1-3). The proposed action has the potential to improve the mobility of armed forces located at Seymour Johnson Air Force Base and Marine Corps Air Station Cherry Point.

1.4.2.4 Emergency Evacuation Routes

The North Carolina Division of Emergency Management (NCDEM) has identified the US 70 corridor as a major hurricane evacuation route. The proposed action has the potential to reduce hurricane evacuation clearance time for residents and visitors who use the US 70 corridor during evacuation (NCDOT 2013)

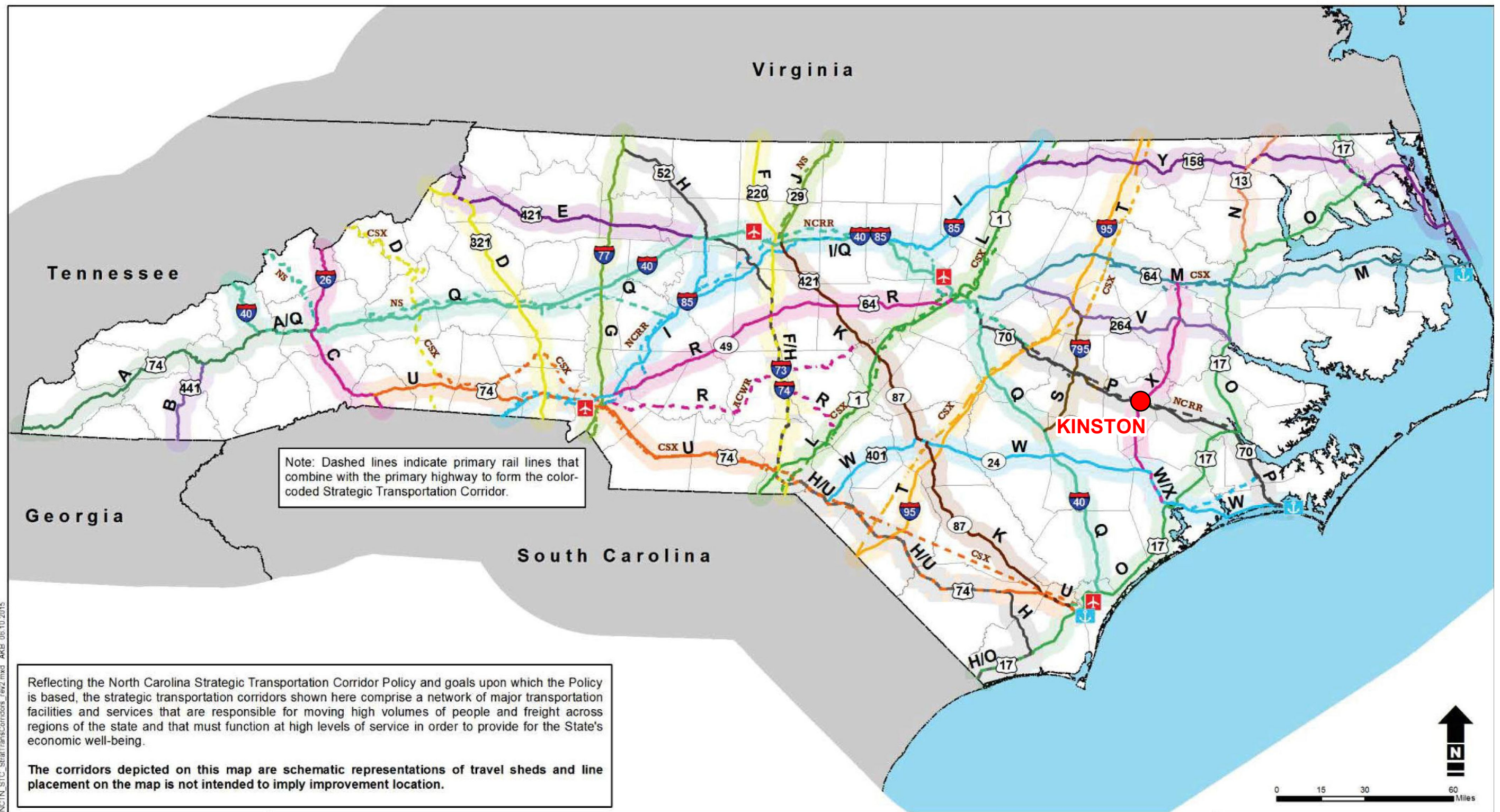


Source: NCDOT 2015c

Figure 1-2:
North Carolina strategic transportation corridors



KINSTON BYPASS
DEIS | R-2553



Reflecting the North Carolina Strategic Transportation Corridor Policy and goals upon which the Policy is based, the strategic transportation corridors shown here comprise a network of major transportation facilities and services that are responsible for moving high volumes of people and freight across regions of the state and that must function at high levels of service in order to provide for the State's economic well-being.

The corridors depicted on this map are schematic representations of travel sheds and line placement on the map is not intended to imply improvement location.

NCTN_STC_StratTransCorridors_rev2.mxd AKB 06.10.2015



NORTH CAROLINA TRANSPORTATION NETWORK

MARCH 2015

Source: NCOneMap, NCDOT GIS, ESRI

Strategic Transportation Corridors (solid = highway; dashed = rail)					
A (US74W)	F (I73/Future I73)	K (US421/NC87)	P (US70E/NCRR)	U (US74W/US74E)	NC Seaports NC Int'l or Major Freight Airports
B (US441)	G (I77)	L (US1)	Q (I40)	V (US264E)	
C (I26/US23)	H (I74/Future I74)	M (I495/US64E)	R (US64W/NC49)	W (US401/NC24/US258)	
D (US321/CSX)	I (I85)	N (US13)	S (I795/US117)	X (US258/NC11/US13)	
E (US421W)	J (US29N/NS)	O (US17)	T (I95/CSX)	Y (US158)	

NORTH CAROLINA STRATEGIC TRANSPORTATION CORRIDORS NETWORK



I.4.2.5 Relationships to other Modes of Transportation

I.4.2.5.1 Railroads

The NCR Company/Norfolk Southern (NS) and CSX Transportation (CSX) own and/or operate railroads in Lenoir County (NCDOT 2008). The NCR/NS railroad EC branch, a statewide tier, is a single track mainline that runs from Raleigh to Morehead City. It runs east-west through the project study area near La Grange to south of Dover and Cove City. The NCR/NS EC branch carries one train per day at speeds ranging from 20 to 40 mph (NCDOT 2015a). The CSX railroad is a regional tier that runs from north of Kinston to Greenville, the AA branch (NCDOT 2015a). CSX has abandoned a portion of the railroad from the NCR/NS in Kinston to near the NC 11 intersection with SR 1735 (Ferrell Road). The CSX freight line AA branch carries one train per day at a speed of 10 to 25 mph (FRA 2017).

A new single-track railroad (NCDOT STIP Project U-2928B) was constructed in 2012 to provide access from the GTP to the NCR/NS. The new segment of railroad is approximately 5.7 miles long and was planned to carry freight into, and out of, the GTP for a variety of manufacturing and industrial facilities. The initial rail traffic was supposed to consist of large aircraft components moving at a relatively low frequency running from the Spirit AeroSystems site, within the GTP; however, Spirit AeroSystems has elected to use other shipping methods at lower costs.

No passenger rail service is operated or planned for the NCR/NS or CSX, with the nearest passenger rail service available to the project study area provided by Amtrak in downtown Wilson, approximately 40 miles from the project. The Amtrak North Carolina Thruway bus service runs through Kinston and provides transportation to and from the Amtrak station in Wilson. The pick-up/drop-off point is at the Kinston Visitor's Center on US 70 (Amtrak 2018).

I.4.2.5.2 Airports

Built alongside the North Carolina GTP, the Kinston Regional Jetport is a public airport located 3 miles north of downtown Kinston. In 1999, ownership of the jetport was transferred to the GTP. The Kinston Regional Jetport has a lighted asphalt runway 11,500 feet in length and 150 feet in width and provides services as an air carrier charter, air transit charter, military operations, general aviation, cargo operations, and flight school training (North Carolina GTP 2018).

NC 148 (C.F. Harvey Parkway) provides direct access between US 70 and the Kinston Regional Jetport. Direct access from US 70 to this airport provides an opportunity for moving goods to and from the port at Morehead City using ground and air transportation options.

I.4.2.5.3 Public Transportation

Lenoir County Transit (LCT) provides transportation options to Lenoir County residents with support of the LCT Advisory Board, Lenoir County Board of Commissioners, and NCDOT Public Transportation Division (Lenoir County 2018). LCT provides general public and human services transportation using demand response and subscription scheduling. LCT is the primary provider of transportation services for Lenoir County Department of Social Services, Lenoir County Health Department, vocational rehabilitation, Council of Aging, and Eastpointe Mental



Health. LCT also provides transportation to and from work, Lenoir Community College, shopping trips, non-emergency medical transportation, and Woodmen Community Center, Neuseway Nature Center, and other points of interest.

Craven Area Rural Transit System (CARTS) provides public transportation services to human service agencies and the general public through fixed-route, subscription, demand response, and Americans with Disabilities Act of 1990 complementary paratransit service in Craven, Jones, and Pamlico counties.

Greyhound offers intercity bus transportation throughout the state and nationwide. The Lunch Box Bus Station on Martin Luther King Street in downtown Kinston serves Greyhound, which offers daily routes to major cities in North Carolina, including Goldsboro, Raleigh, New Bern, Fayetteville, Charlotte, Winston Salem, and Asheville (Greyhound Lines, Inc. 2018).

Other than the fixed-route intercity bus transportation services provided by Greyhound, no other bus service is provided along the existing US 70 corridor within the project study area that connects to the local transit services.

I.4.2.5.4 Pedestrian and Bicycle

The City of Kinston completed a *Comprehensive Pedestrian Plan* in February 2008 (City of Kinston 2008), and updated section 9 of this report, recommendations for priority pedestrian projects, programs, and policies in 2012 (City of Kinston 2012). Through a survey that was conducted as part of the pedestrian plan, citizens identified several factors that make walking in Kinston difficult or unpleasant. Factors identified included a lack of sidewalks, poor lighting, and hazardous conditions. The pedestrian plan identified and prioritized 66 projects that would help alleviate these obstacles to pedestrian movement. The most notable projects included a pedestrian bridge over the Neuse River, implementing pedestrian safety measures throughout the community, creating a greenway master plan, and developing a safe route to school program.

The Bicycling Lenoir Style Map (NCDOT n.d.) and the Kinston CTP Bicycle Map (NCDOT 2007a) show several NCDOT designated bicycle routes along the more lightly traveled and scenic roads in central Lenoir County and Kinston. The routes are marked by numbered bike route signs, and “Share the Road” signs are posted where traffic is heavier and more caution should be taken. None of the bike routes have designated bicycle lanes.

The Mountains-to-Sea Trail, which is part of the North Carolina State Trails Program, is a planned trail that runs through North Carolina from Clingmans Dome in the Great Smoky Mountains to Jockey’s Ridge State Park in the Outer Banks. Close to 700 miles of the planned 1,200-mile route are completed (Friends of Mountains-to-Sea Trail 2017). Within Lenoir County, the Mountains-to-Sea Trail is planned as a greenway trail along the Neuse River. Currently, only a small segment in downtown Kinston has been constructed.

I.4.3 Local Area Transportation Plans

The Lenoir County CTP was developed by Lenoir County, Kinston, La Grange, Pink Hill, the Eastern Carolina Rural Planning Organization, and NCDOT in September 2018 (NCDOT 2018a). The CTP is a long range multi-modal transportation plan that covers the needs of Lenoir County through 2045. The plan addresses highway, rail, bicycle, and pedestrian improvements, as well as public transportation. The plan references the Kinston Bypass.



CHAPTER 2

DESCRIPTION OF ALTERNATIVES CONSIDERED



2. DESCRIPTION OF ALTERNATIVES CONSIDERED

A discussion of the alternatives considered for the proposed action, the process of elimination of those alternatives not determined reasonable and feasible, and the basis for the selection of the alternatives carried forward for detailed study are provided in this chapter.

2.1 ALTERNATIVES STUDY PROCESS

The process of developing and evaluating alternatives for the Kinston Bypass project included formal coordination and consultation between NCDOT and the NEPA/Section 404 Merger Team. Information on what environmental and regulatory resource agencies are part of the Merger Team, as well as public involvement that has assisted in selecting alternatives, is in chapter 5.

Alternative concepts were evaluated for the proposed action to determine their reasonableness and feasibility and included the No-Build Alternative, the transportation demand management (TDM) alternative, the transportation system management (TSM) alternative, the mass transit/multi-modal alternative(s), and preliminary build alternatives.

Each alternative concept was first screened for its ability to meet the purpose of and need for the project. The development of the build alternatives that met the purpose of and need for the project was an iterative process that began with 95 preliminary alternatives and was eventually narrowed down to 12 detailed study alternatives (DSA). The evaluation criteria and steps taken to refine the alternatives are described in section 2.3.

2.2 ALTERNATIVE CONCEPTS

2.2.1 No-Build Alternative Concept

The No-Build Alternative normally includes short-term, minor restoration types of activities (safety and maintenance improvements, etc.) that maintain continuing operation of the existing roadway. The No-Build Alternative assumes the current transportation system evolves as planned in the Kinston CTP (NCDOT 2011b) and the 2018-2027 STIP (NCDOT 2017h) without implementation of the proposed action. With the exception of routine maintenance, no changes will take place along the existing corridor within the project study area. The No-Build Alternative also serves as the baseline comparative alternative for the design year (2040).

The No-Build Alternative would not improve regional mobility, connectivity, and capacity; therefore, it would not meet the primary need of the project. However, in accordance with NEPA (40 CFR 1502.14(d)) and FHWA guidance (FHWA 1987), the No-Build Alternative is given full consideration in the DEIS to provide a baseline for comparison with the DSAs.

Consistent with Appendix B of the USACE regulations at 33 CFR 325, USACE considers the No-Build Alternative to be the alternative that results in no construction requiring a USACE permit. This may be brought by either the applicant electing to modify the proposal to eliminate work under the jurisdiction of the USACE or by the denial of the permit. Based on the information available concerning the location and extent of the streams and wetlands in the project area, to construct the proposed action while completely avoiding impacts to jurisdictional



waters and wetlands and thus preclude the need for a USACE permit would not be reasonable and thus does not satisfy the applicant’s purpose of and need for the project.

2.2.2 Transportation Demand Management Alternative Concept

The TDM alternative includes measures to improve the efficiency of the existing transportation system by changing traveler behavior. This alternative does not involve major capital improvements. The TDM alternative would include demand management strategies currently implemented in Lenoir County, such as staggered work hours, flex-time (employer focused), and ridesharing.

Ridesharing, such as carpools and vanpools, is generally viewed as more convenient than bus transit with regard to access, door-to-door travel times, and comfort. However, the ability of these voluntary programs to reduce traffic volumes on particular roadways is minimal.

The TDM measures would provide increased transportation choices in the area, but only for a small percentage of travelers that would take advantage of them. The TDM alternative would not improve regional mobility, connectivity, and capacity; therefore, it would not meet the need for the project. The TDM alternative does not meet the purpose of and need for the project and has been eliminated from further consideration.

2.2.3 Transportation System Management Alternative Concept

The TSM alternative concept includes low-cost, minor transportation improvements that maximize the efficiency of the existing system. There are two main types of TSM improvements – operational and physical.

Operational TSM improvements include traffic law enforcement, access control, signal coordination, turn prohibitions, speed restrictions, and signal phasing or timing changes. Operational TSM improvements would improve traffic flow along US 70. However, it is expected that US 70 would not show an appreciable increase in capacity in design year 2040 with operational improvements.

Physical TSM improvements include turn lanes, intersection realignment, improved warning and information signs, new signals or stop signs, and intersection geometric and signalization improvements. Physical TSM improvements are most effective in addressing site-specific capacity and safety issues. It is expected that TSM physical improvements would improve traffic flow in some areas along US 70 and would be able to provide a median-divided, multi-lane roadway. However, TSM improvements could not provide a full control of access facility that would be able to improve regional mobility, allow for high-speed travel, limit access to major crossroads by way of interchanges, or result in an appreciable increase in capacity.

Therefore, regional mobility, connectivity, and the traffic carrying capacity of US 70 would not improve. As a result, the TSM alternative does not meet the purpose of and need for the project and has been eliminated from further consideration.

2.2.4 Mass Transit/Multi-Modal Alternative Concept

The mass transit alternative concept would include bus or rail passenger service. A major advantage of mass transit is that it can provide high-capacity, energy-efficient movement in



densely traveled corridors. It also serves high-density areas by offering an option for automobile owners who do not wish to drive and those without access to an automobile. The multi-modal alternative concept would combine mass transit with roadway improvements.

LCT provides transit services to the general public using a van service. These services provide a demand response system service, picking passengers up at their homes, including paratransit options, and transporting them to a desired location from 6:00 a.m. to 6:00 p.m., Monday through Saturday (Lenoir County 2018). In addition to local transit service, Greyhound offers intercity bus transportation throughout the state and nationwide. The Union Bus Station on East Blount Street in downtown Kinston serves Greyhound. Greyhound offers one or two daily routes to all major cities in North Carolina (Greyhound Lines, Inc. 2018). During site visits to Kinston, neither the LCT van service nor Greyhound bus service was observed.

The Craven Area Rural Transit System (CARTS) provides public transportation services to human service agencies and the general public through subscription, demand response, and Americans with Disabilities Act of 1990 complementary paratransit service in Craven and Jones counties (Craven County 2019).

The Amtrak North Carolina Thruway bus service runs through Kinston and provides transportation to and from the Amtrak station in Wilson. The pick-up/drop-off point is at the Kinston Visitor's Center on US 70 (Amtrak 2018). This does not, however, connect to any of the local transit services previously described.

Other than the fixed-route intercity bus transportation services provided by Greyhound, there is no other bus service provided along the existing US 70 corridor within the project study area that connects to the local transit services.

This alternative concept (either new rapid transit or expanded bus service) would not divert enough vehicular traffic to improve traffic flow to any substantial degree on US 70, nor improve transportation within the project study area or the regional transportation system as a whole.

The mass transit/multi-modal alternative is typically considered for all major highway projects in urbanized areas with a population exceeding 200,000 people and when mass transit is referenced in regional plans. Based on the population of the demographic study area and municipalities located within the demographic study area (discussed in section 3.1.1), the inclusion of a mass transit/multi-modal alternative to alleviate traffic along the project corridor is not a viable option. The primary purpose of the proposed action is to improve regional mobility, connectivity, and capacity. Based on the low population density and lack of clustering of businesses, employment centers, and other destinations, transit is not a practicable option for improved regional connectivity. Combining a mass transit alternative with other modes also would not be practical. The mass transit element would add substantial costs to any alternative that includes road improvements, but would do very little to improve traffic flow and freight movement. Therefore, the mass transit/multi-modal alternative does not meet the purpose of and need for the project and has been eliminated from further consideration.

2.2.5 Build or Construction Alternatives Concept

The build or construction alternatives concept includes both improvement of existing roadways and alternatives on new location. This initial screening considers the overall concept of constructing a roadway and does not differentiate between alternative corridor locations.



The build or construction alternatives concept would improve regional mobility, connectivity, and capacity for US 70 between La Grange and Dover in a manner that meets the intent of the STC by providing a highway that would allow for high-speed travel, would consist of a median-divided multilane roadway, would limit access to major crossroads by way of interchanges, and would connect to the existing sections of US 70 that have full control of access near La Grange and Dover. In addition, this concept has the potential to reduce hurricane evacuation clearance time for residents and visitors who use the US 70 corridor during evacuation and has the potential to improve the mobility of armed forces located at Seymour Johnson Air Force Base and Marine Corps Air Station Cherry Point as a STRAHNET corridor.

This alternative concept meets the purpose of and need for this project; therefore, it was carried forward for further study.

2.3 PRELIMINARY ALTERNATIVE EVALUATION AND ANALYSIS

Preliminary alternative segments were developed using geographic information system (GIS) constraints mapping to avoid and minimize impacts to environmental features. The preliminary alternative segments were developed using standard avoidance and minimization measures to include avoidance and minimization of perennial streams, wetlands, cultural resources, and community resources. This process was begun by collecting the most recent GIS data from state and local agencies. A data dictionary was created and is included in Appendix B that lists the name of the layer, abstract, name located on AECOM’s Kinston file geodatabase, geometry, coverage, and sources. The dictionary also includes whether each feature class was modified by AECOM, notes, modification dates, and modification descriptions.

The following sections describe the evaluation and refinement process for the preliminary alternatives and the DSAs.

2.3.1 Evaluation and Refinement of Preliminary Alternatives

Combining the preliminary alternative segments resulted in over 3,000 preliminary alternatives. In order to reduce the number of possible alternatives to a more manageable number, similar adjacent segments were consolidated. The consolidation of adjacent segments resulted in approximately 300 best fit segments. The best fit segments were then reviewed and modified to prohibit any non-allowable combinations (i.e., segments were not allowed to double back, go backwards, or make 90-degree turns). These modifications resulted in 89 segments, which were combined to create 95 preliminary alternatives. Impacts to environmental features were then calculated in GIS.

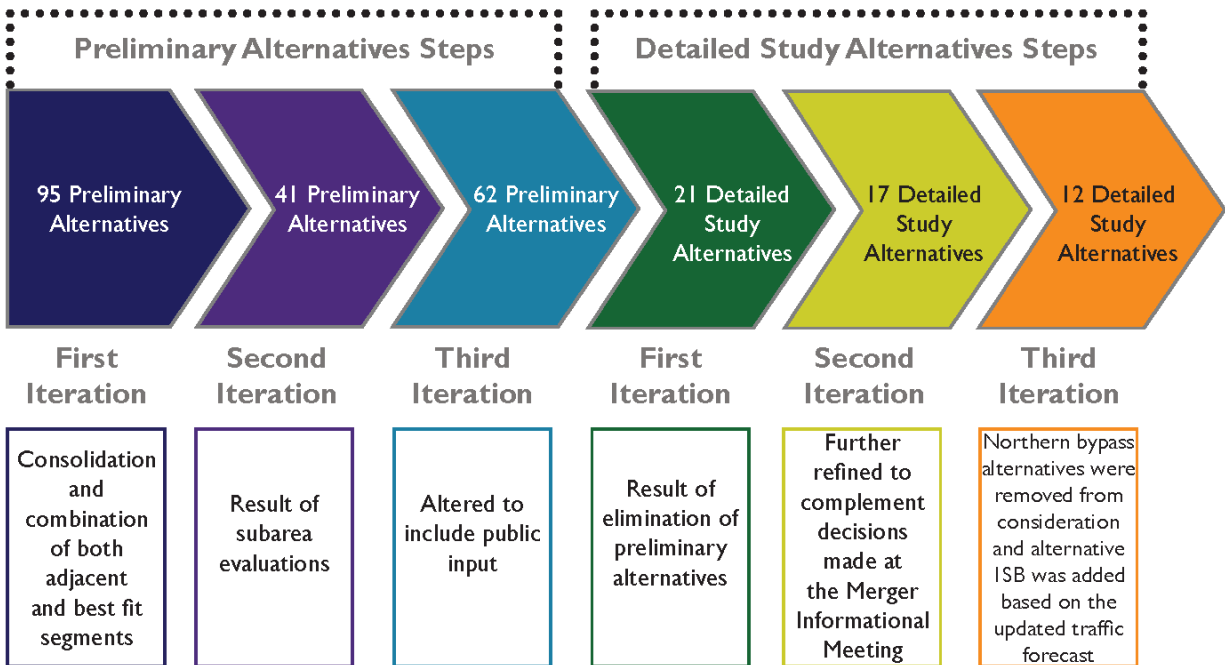
What is “Best Fit”?

A “best fit” segment or alignment is typically one that balances and minimizes overall environmental impacts to the extent practicable including impacts to residences and businesses, historic structures, and natural features such as wetlands, streams, and protected species habitat.

Segments with similar beginning and end points were compared to one another to identify segments with the least impacts. Impacts were calculated for GIS-based features. Since many of the screening features resulted in no impacts, major screening categories such as building impacts, floodplains, number of stream crossings, wetland impacts, and Hazard Mitigation Grant

Program (HMGP) properties were often used or relied on for comparison. Similar adjacent segments were consolidated, resulting in a best fit segment. Figure 2-1 shows an overview of the process.

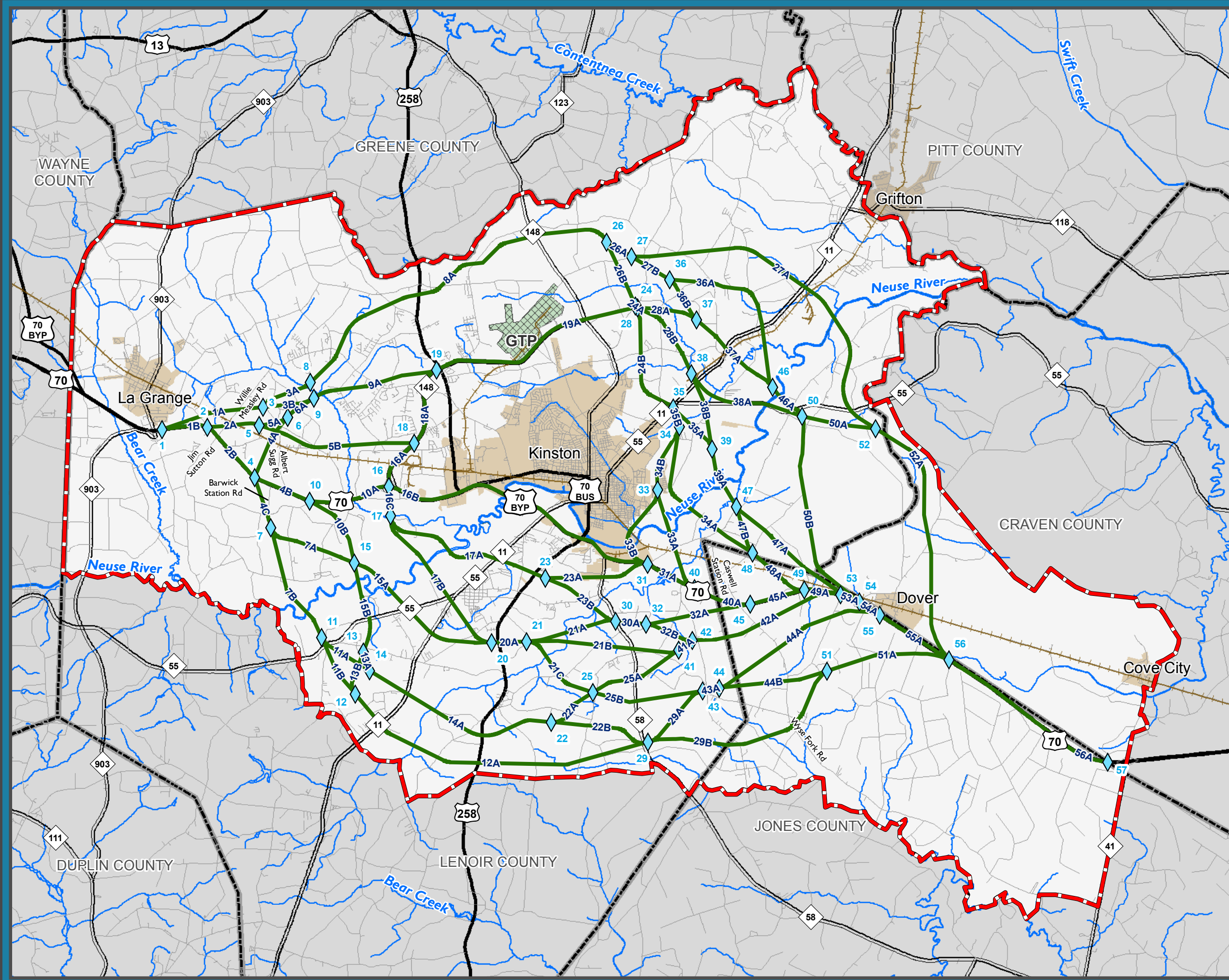
Figure 2-1: Preliminary alternatives and detailed study alternatives evaluation and refinement process



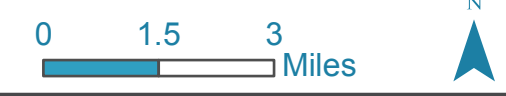
Per request from the NEPA/Section 404 Merger Team, corridor widths were reduced from 1,000 feet to 500 feet for impact calculations. Merger Team members requested this change in order to avoid gross over-calculation of impacts associated with preliminary alternatives. All impacts were re-calculated based upon 500-foot corridors, even though there are common segments for many of the alternatives including upgrade to US 70 and some corridors contain portions of C.F. Harvey Parkway. The first iteration of preliminary alternatives segment combinations (95) is shown on Figure 2-2.

Using the results of the GIS-based impact analysis, subarea evaluations were performed to further eliminate segments. The subarea evaluations consisted of the examination of similar segments in small subsections of the project. Where segments had similar endpoints, a comparison was made to determine the segment with the least potential impact. The segment with the least impact remained, and all other segments were eliminated. In cases where impacts within a subarea would be similar or where competing resources were present, all segments remained.

Figure 2-2:
Preliminary alternatives
(first iteration)



- Legend**
- Project Study Area
 - Alternative Segment
 - Segment Breakpoint
 - Railroad
 - US Highway
 - NC Highway
 - Secondary Road
 - Global TransPark (GTP)
 - Municipal Boundary
 - County Boundary



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





Upon the completion of the subarea evaluations, the second iteration of preliminary alternatives resulted in 41 preliminary alternatives. The 41 preliminary alternatives consisted of 1 Upgrade Existing US 70 Alternative, 10 northern bypass preliminary alternatives, and 30 southern bypass preliminary alternatives. The northern bypass and southern bypass designations refer to the preliminary alternatives' location in relation to existing US 70. Graphics displaying the remaining segments and corresponding 41 preliminary alternatives were presented to local officials in July 2011 and at the second round of public meetings (known at the time as Citizens' Informational Workshop #2) held for public comment in September 2011. The second iteration of preliminary alternatives segment combinations (41) is shown on Figure 2-3.

2.3.1.1 Input from the Public

Upon receiving public input at Citizens' Informational Workshop #2, minor modifications were made to segment 26A to further minimize impacts. Four new segments – 5C, 27B, 39A, and 40A - were added for consideration, resulting in 62 preliminary alternatives. Updated impact calculations were performed for the additional 21 preliminary alternatives, as well as for the alternatives containing the modified segment, and presented to the Merger Team at the concurrence point (CP) 2 meeting on November 17, 2011. Concurrence Point 2 is the point at which DSAs to be carried forward are presented and agreed upon by the consulting agencies. The third iteration of preliminary alternative segment combinations (62) and the corresponding impact summary are included in Appendix C and are shown on Figure 2-4.


2.3.1.2 Preliminary Alternatives Eliminated

At CP2, the Merger Team performed another subarea analysis of the segments and agreed to eliminate the following segments or segment combinations from further consideration:

- Segment 29B due to high wetland impacts.
- Segment Combination 25B-28A-29A due to higher wetland impacts than Segment Combination 25A-27A. This also resulted in the elimination of Segment 24B.
- Segment Combination 23B-25A due to higher wetland impacts than Segment Combination 23A-26B.
- Segment 9A due to high wetland impacts. This also resulted in the elimination of Segments 5A and 8A.
- Segment 8B due to other similar options having less impacts to the Neuse River crossing and corresponding floodplains. This also resulted in the elimination of Segment 7B; however, the Merger Team requested a new segment be added named Segment 7C to be located south and parallel to Segment 7A. The intent of adding Segment 7C was to provide a segment farther away from the Kennedy Memorial Home Historic District campus core while trying to minimize the impacts to the multiple conservation easements south and east of Segment 7A.
- Segment 19A due to other similar options that have a more narrow and perpendicular crossing of the Neuse River crossing and corresponding floodplains. This also resulted in the elimination of Segments 18A and 39B.
- Segment 15A due to other more direct options that have fewer impacts to the Stonyton Creek natural system.

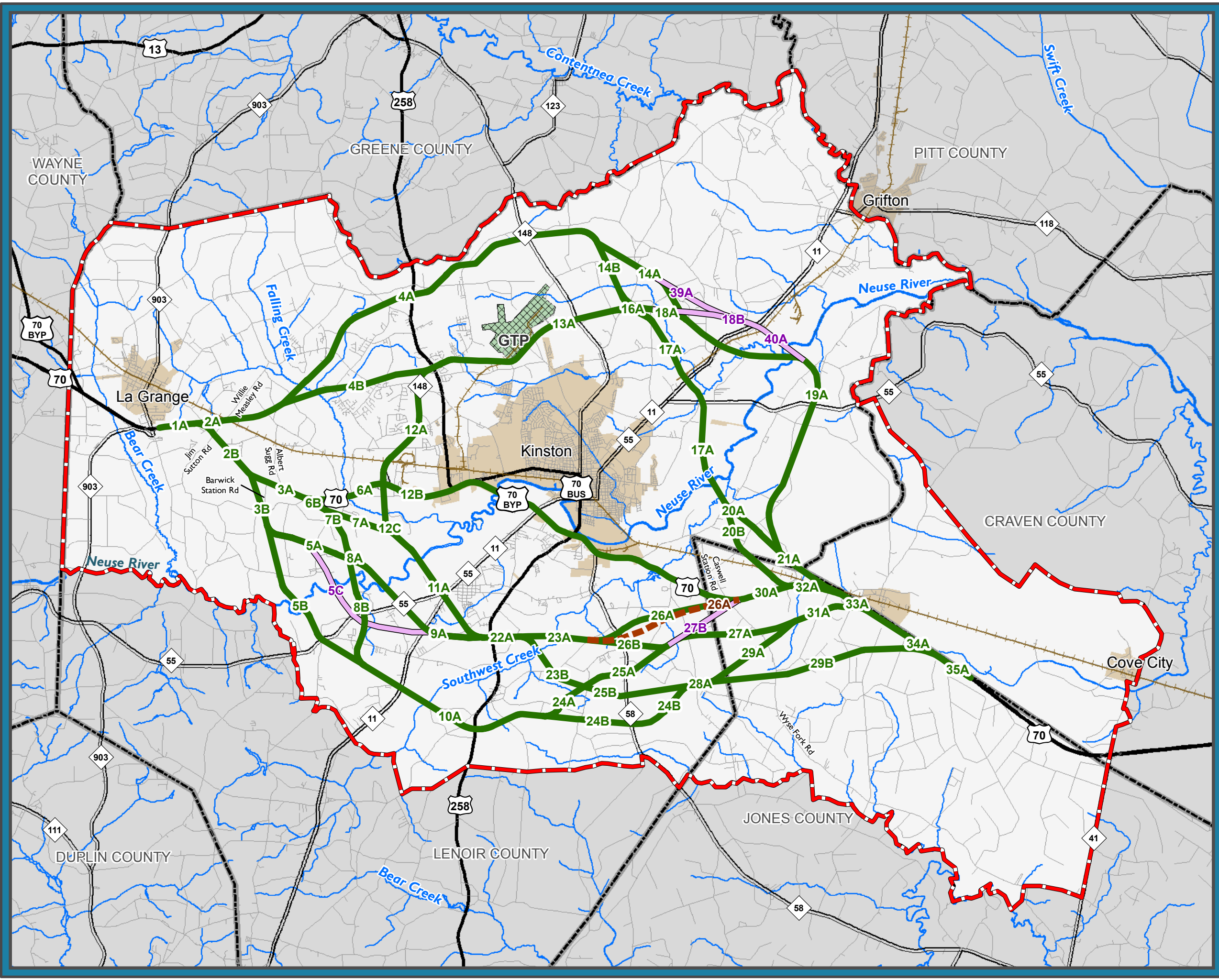
Figure 2-4:
Preliminary alternatives
(third iteration)

Legend

-  Project Study Area
-  Draft Preliminary Segments
-  New Draft Route Option Segment
-  Edited Draft Route Option Segment
-  Railroad
-  US Highway
-  NC Highway
-  Secondary Road
-  Global TransPark (GTP)
-  Municipal Boundary
-  County Boundary



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



Upon elimination of the above segments, the following 41 preliminary alternatives were eliminated from further study:

- Southern Bypass Corridors
 - 6, 13, 17, 19, 26, 33, 37, 39, 46 (due to elimination of Segment 29B)
 - 7, 14, 20, 27, 34, 40, 47 (due to elimination of Segment 25B-28A-29A)
 - 8, 9, 21, 22, 28, 29, 38, 41, 42, 48, 49 (due to elimination of Segment 23B-25A)
 - 23, 24, 25, 43, 44, 45 (due to elimination of Segments 5A, 8A, and 9A)
 - 15, 16, 18 (due to elimination of Segments 7B and 8B)
- Northern Bypass Corridors
 - 4, 55, 58, 59 (due to elimination of Segments 18A, 19A, and 39B)
 - 60 (due to elimination of Segment 15A)

2.3.1.3 Preliminary Alternatives Carried Forward

Upon elimination of the above preliminary alternatives, the following 21 preliminary alternatives were carried forward for further study as DSAs:

- Upgrade Existing US 70 Corridor
- Northern Bypass Corridors
 - 5, 56, 57
 - 2 (combined Corridors 2 and 3 as a result of creating bulged area for Segment Combinations 20A-21A and Segment 20B)
 - 53 (combined Corridors 53 and 54 as a result of creating bulged area for Segment Combinations 20A-21A and Segment 20B)
 - 61 (combined Corridors 61 and 62 as a result of creating bulged area for Segment Combinations 20A-21A and Segment 20B)
- Southern Bypass Corridors
 - 10, 11, 12, 30, 31, 32, 35, 36, 50, 51, 52
 - 63, 64, and 65 (new corridors created as a result of adding Segment 7C)










The first iteration of the DSAs is shown on Figure 2-5.

2.3.2 Reevaluation of Detailed Study Alternatives after CP2

Following CP2, the 21 DSAs selected for further evaluation were refined as the project transitioned from ArcMap/GIS software to computer aided design software. This allowed project engineers to look at specific interchange locations along secondary roadways and refine locations and alignments to further minimize impacts to personal property and natural resources.

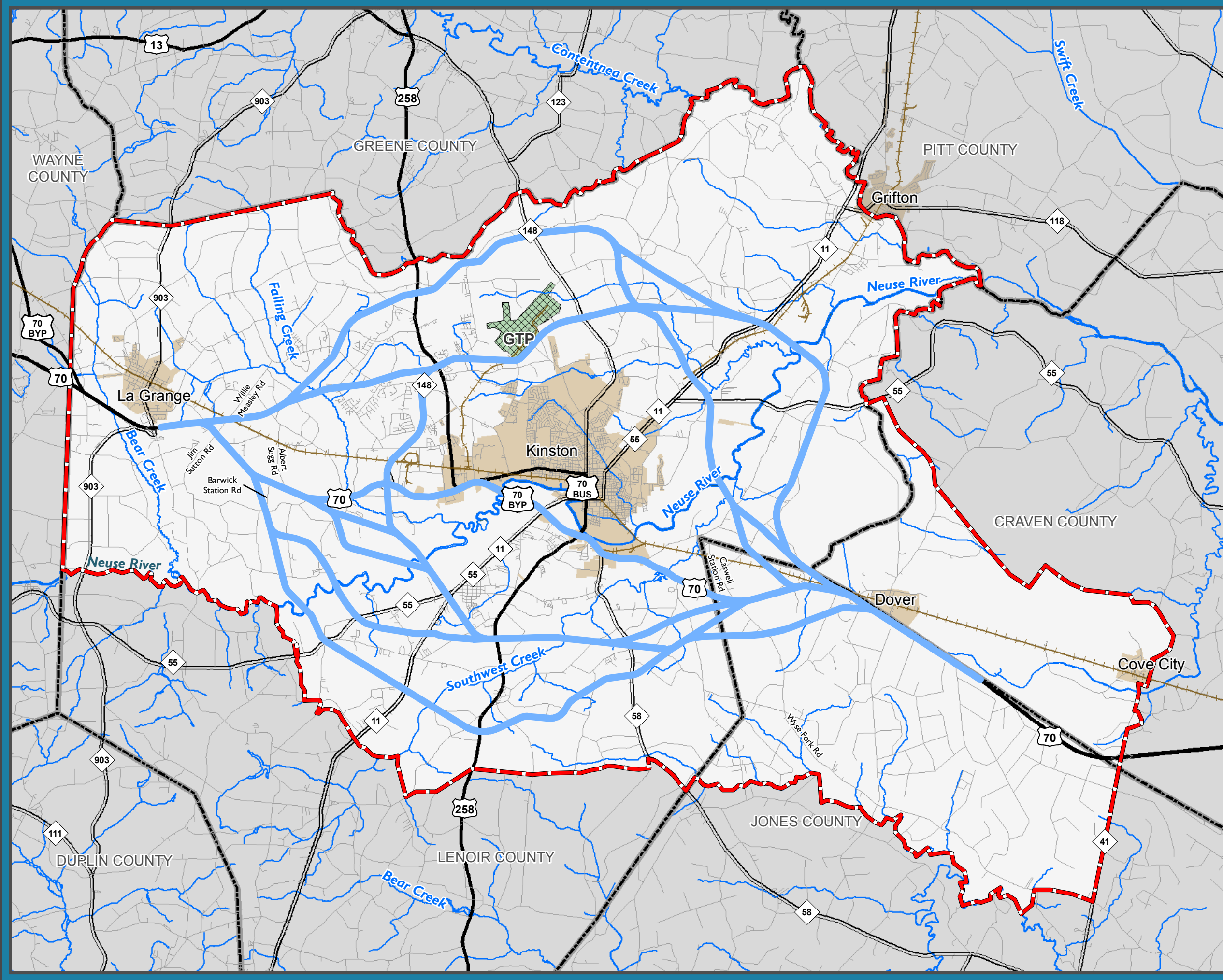
Figure 2-5:
Detailed study alternatives
(first iteration)

Legend

-  Project Study Area
-  Detailed Study Alternatives Per Nov. 17, 2011 CP 2 Meeting
-  Railroad
-  US Highway
-  NC Highway
-  Secondary Road
-  Global TransPark (GTP)
-  Municipal Boundary
-  County Boundary



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Lenoir County, NCDOT, NCEM,
NCONemap, NRCS, USFWS












The following is a brief description of shifts and changes to the DSA alignments that were approved at the Merger Informational Meeting held on March 14, 2012. The area numbers below correspond to numbers on Figure 2-6.

- **Area 1:** It is recommended a general area rather than a specific location be considered to allow for a best fit alignment to connect with US 70 in this area. Alignment was shifted to better accommodate proposed interchange with US 70 and existing railroad, while maintaining existing Willie Measley Road/Fields Station Road intersection.
- **Area 2:** Alignment was shifted to generally reduce impacts to residents and streams.
- **Area 3:** Alignment was shifted to improve spacing between proposed US 258 interchange and existing US 258/Institute Road intersection, improve the proposed crossing of Institute Road, reduce wetland impacts, and improve spacing between proposed NC 58 interchange and existing NC 58/Dawson Station Road intersection.
- **Area 4:** Alignment was shifted to reduce impacts to multiple farming operations along Airy Grove Church Road.
- **Area 5:** Alignment was shifted to improve proposed crossing of Airy Grove Church Road, provide more of a perpendicular crossing of Hugo Road (potential proposed interchange location), reduce residential impacts along Ferrell Road, reduce wetland impacts, and provide more of a perpendicular crossing of NC 11 (for proposed interchange) and existing railroad.
- **Area 6:** Alignment was shifted to improve spacing between proposed NC 55 interchange and existing NC 55/British Road intersection, reduce potential impact to a historic resource, and improve proposed grade-separated crossings at British Road and Tilghman Road.
- **Area 7:** Merger Team recommendations from CP2 meeting included creating a general area to allow for a best fit alignment for all northern bypass alternatives connecting to US 70 in this area. The northern bypass connection back to US 70 was slightly shifted to the west to increase distance between existing US 70 and the existing railroad to accommodate the proposed northern bypass interchange with US 70. This shift will reduce impacts to streams and wetlands, avoid multiple crossings of Tilghman Road, and increase spacing between the proposed northern bypass/US 70 interchange and the potential proposed interchange with US 70 at Dover. Generally, by increasing the interchange spacing, better traffic operations should result, thus maintaining the integrity of the proposed improvements.
- **Area 8:** Minor shifts were made to the alignment to improve road geometry while improving stream and wetland crossings.
- **Area 9:** Alignment was shifted to reduce stream impacts and wetland impacts, and minimize residential and farming operation impacts along Hugo Road and Wallace Family Road.
- **Area 10:** Alignment was shifted to eliminate crossing with North Dickerson Road, and minimize residential and farming operations impacts along Hugo Road and Wallace Family Road. The shift should also further minimize impacts to streams and wetlands.
- **Area 11:** Alignment was shifted to minimize residential impacts along Tilghman Mill Road, and to minimize stream, wetland, and business impacts near NC 11 (proposed interchange location).

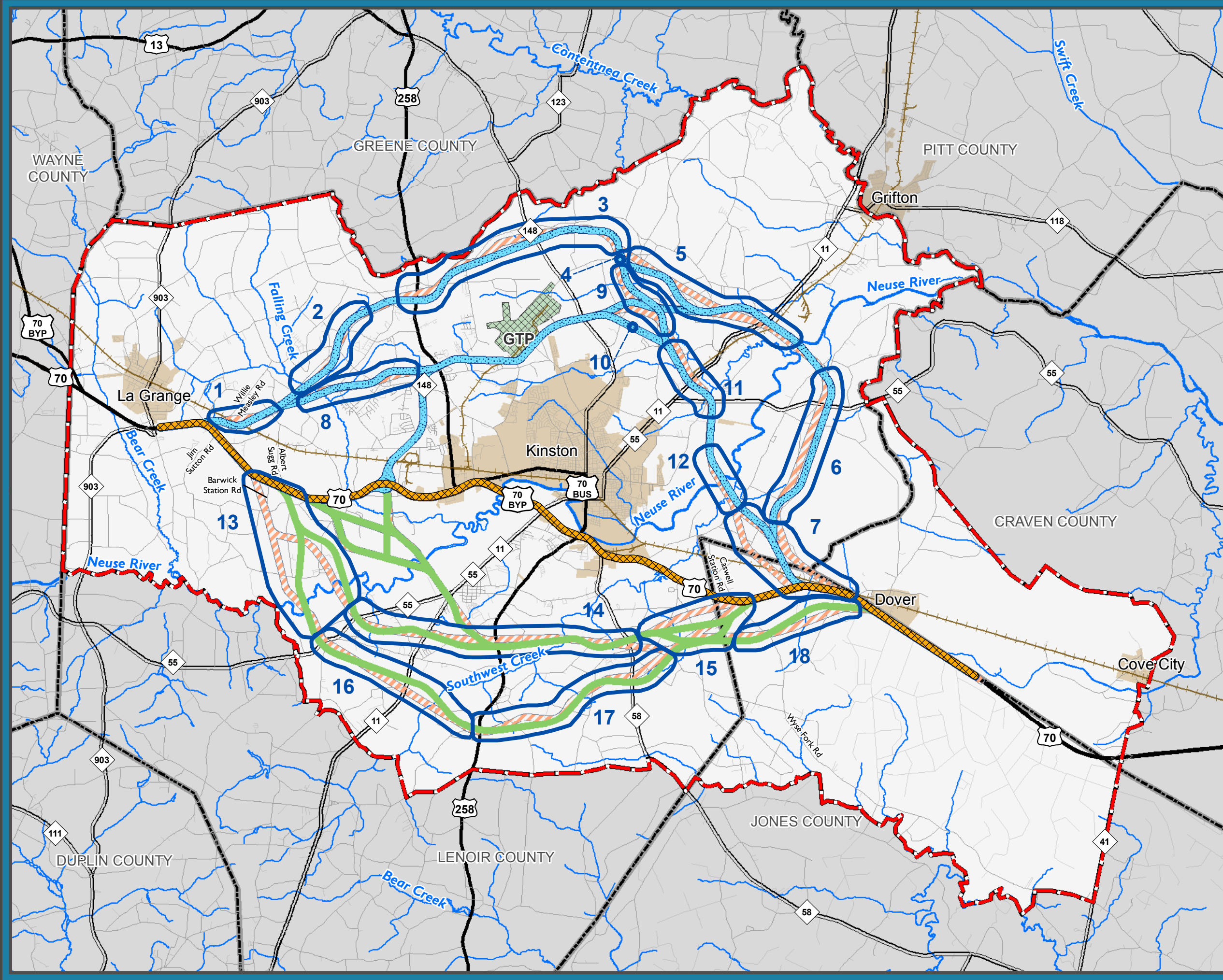
Figure 2-6:
Alignment discussion
diagram

Legend

-  Detailed Study Alternative Refinement Area
-  Project Study Area
-  Southern Detailed Study Alternatives
-  Northern Detailed Study Alternatives
-  Upgrade Existing Detailed Study Alternative
-  Detailed Study Alternatives Per Nov. 17, 2011 CP 2 Meeting
-  Railroad
-  US Highway
-  NC Highway
-  Secondary Road
-  Global TransPark (GTP)
-  Municipal Boundary
-  County Boundary



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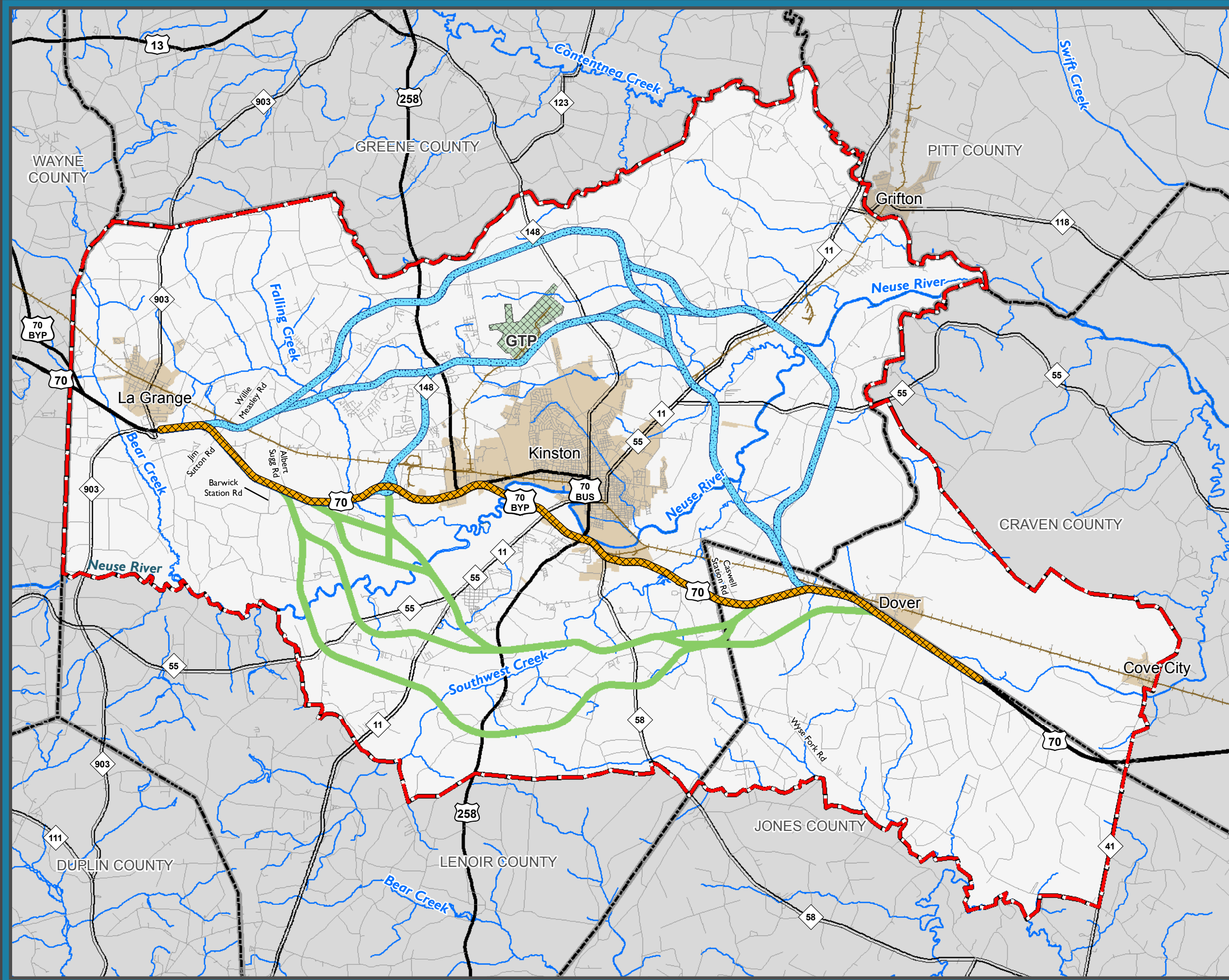




- **Area 12:** Alignment was shifted to minimize historic resource impacts and residential impacts along Neuse Road.
- **Area 13:** It is recommended a general area rather than a specific location be considered to allow for a best fit alignment to connect with US 70 in this area. Alignment was shifted to better accommodate proposed interchange with US 70, allowing for avoidance of the existing salvage yard and wetland system southwest of US 70. Shift will also allow for further minimization of stream, wetland, historic resource, and residential impacts near Bucklesberry and Pot Neck. In addition, the alignment shift will allow for a narrower crossing of the Neuse River natural system.
- **Area 14:** Alignment was shifted to provide more desirable crossings of secondary roadways such as NC 55, Jesse T. Bryan Road, NC 11, Joe Nunn Road, US 258, Patterson Road, and Woodington Road. As a result, continued efforts were made to further avoid and minimize impacts to streams, wetlands, and residents.
- **Area 15:** It is recommended a general area rather than a specific location be considered to allow for a best fit alignment to connect with US 70 in this area. Alignments were shifted to better accommodate the proposed interchange with US 70 and existing Wyse Fork Road/US 70 intersection. Shifting the proposed interchange location farther to the east along US 70 may allow the existing Wyse Fork Road/US 70 intersection to remain, which could avoid impacts and additional cost associated with reconnecting Wyse Fork Road, provide a benefit for emergency responders using Wyse Fork Road, and shift potential impacts to the proposed Wyse Fork Battlefield District towards the outer boundaries of the district.
- **Area 16:** Minor shifts were made to the alignment to improve road geometry while improving stream and wetland crossings. The shifts also provided an opportunity to improve spacing from the proposed NC 55 interchange to the existing NC 55/Albrittons Road intersection and from the proposed NC 11 interchange to the existing NC 11/Leslie Stroud Road intersection (and the associated community).
- **Area 17:** Minor shifts were made to the alignment to improve road geometry. The shifts provided an opportunity to further avoid historic resource impacts; improve spacing from the proposed NC 58 interchange to the existing NC 58/Southwood Road intersection; and include continued efforts to avoid/minimize impacts to streams, wetlands, residential pockets, and farming operations along the secondary roads (including a nursing home along NC 58).
- **Area 18:** Minor shifts were made to the alignment to improve road geometry, which provided an opportunity to reduce residential impacts along Burkett Road and to further minimize impacts to streams and wetlands.

As a result of the described changes to the alternatives that the Merger Team agreed to, the following pairs of alternatives were merged together: 10 with 11, 30 with 31, 50 with 51, and 63 with 64. The end result of this refinement process was the elimination of 4 DSAs, with 17 DSAs remaining. This second iteration of DSAs was presented to the public at a public meeting (known at the time as Citizens' Informational Workshop #3, held in May 2012) (Figure 2-7).

Figure 2-7:
Detailed study alternatives
(second iteration)



Legend

- Project Study Area
- Southern Detailed Study Alternatives
- Northern Detailed Study Alternatives
- Upgrade Existing Detailed Study Alternative
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Global TransPark (GTP)
- Municipal Boundary
- County Boundary



This map is for reference only.
Sources: AECOM, CGIA, City of Kinston,
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Lenoir County, NCDOT, NCEM, NCEM,
NCONemap, NRCS, USFWS





2.3.3 New Alternative Identified

A new alternative, known as Alternative 1SB (Upgrade Existing US 70 with Shallow Bypass), was developed following the development of the functional designs. During the design process, it was apparent that Alternative 1UE (Upgrade Existing US 70) would impact businesses along existing US 70, as well as impact the floodway associated with the Neuse River. The intent of adding Alternative 1SB as a DSA was to provide an alternative that would still stay on the existing US 70 corridor through a majority of the study area, but avoid the segments of existing US 70 that would have the highest number of relocated businesses and residences.

2.3.4 Refinement of Detailed Study Alternatives

The first CP2 meeting held in November 2011 included concurrence from the Merger Team on the alternatives to be carried forward for detailed study that satisfied the purpose of and need for the project. Due to the development of Alternative 1SB, a CP2 Revisited Merger Team meeting was held on January 16, 2014. The purpose of the meeting was to present information on the recently developed Alternative 1SB and to recommend the removal of the six remaining northern bypass alternatives.

Based on updated traffic forecasting performed in 2012 and 2013, the northern bypass alternatives would not draw as much traffic from existing US 70 as the southern bypass alternatives, and construction of a northern bypass alternative would result in the continued pressure to widen existing US 70 even after construction. Forecasts show that the southern bypass alternatives would draw more than twice the traffic of the northern bypass alternatives and existing US 70 would remain sustainable as a four-lane highway. A short, shallow southern bypass would be expected to draw the most traffic onto the Kinston Bypass from existing US 70, while still maintaining sustainable traffic volumes on upgraded sections of US 70.

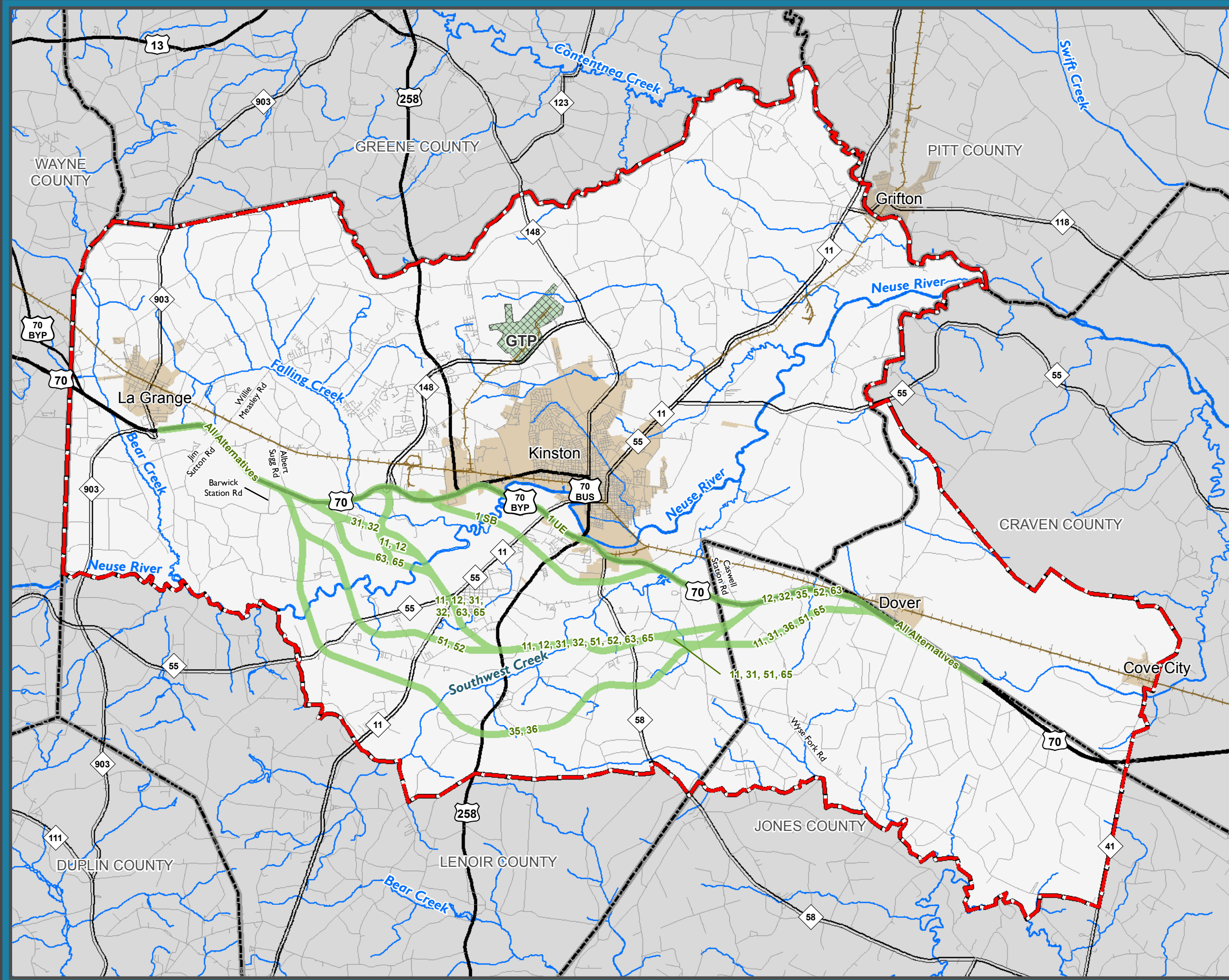
A representative from the Eastern Carolina Rural Planning Organization was present at the meeting and reported that Alternative 1SB has the support of the local community. The Merger Team reached an agreement to add Alternative 1SB and eliminate the six northern bypass alternatives from further consideration.

Based on the changes agreed to by the Merger Team, the third iteration of the DSAs included 12 DSAs that would move forward for evaluation in the DEIS (Figure 2-8).

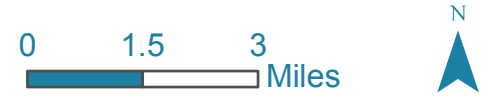
2.4 DETAILED STUDY ALTERNATIVES

Designs for the 12 DSAs were developed based upon the *Traffic Forecast Technical Memorandum, Kinston Bypass Alternatives Study, TIP Project R-2553, Lenoir, Jones & Craven Counties* and the *Traffic Capacity Analysis Report* (NCDOT 2016b, 2017i). Refer to section 1.4.1 for details on the history and comparison of traffic studies for the project. The level of design used to develop the DSAs included interchanges, obvious service roads, and areas where full control of access is being proposed. These designs have been used to evaluate impacts to the human and natural environments for each of the DSAs and are reported in detail in chapter 4. Information presented in this DEIS will be used, along with resource agency and public input, to assist in the selection of the applicant's preferred alternative.

Figure 2-8:
Detailed study alternatives
(third iteration)



- Legend**
- Project Study Area
 - Detailed Study
 - Railroad
 - US Highway
 - NC Highway
 - Secondary Road
 - Global TransPark (GTP)
 - Municipal Boundary
 - County Boundary



This map is for reference only.
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Lenoir County, NCDOT, NCEM, NCEM,
NCEM, NRCS, USFWS



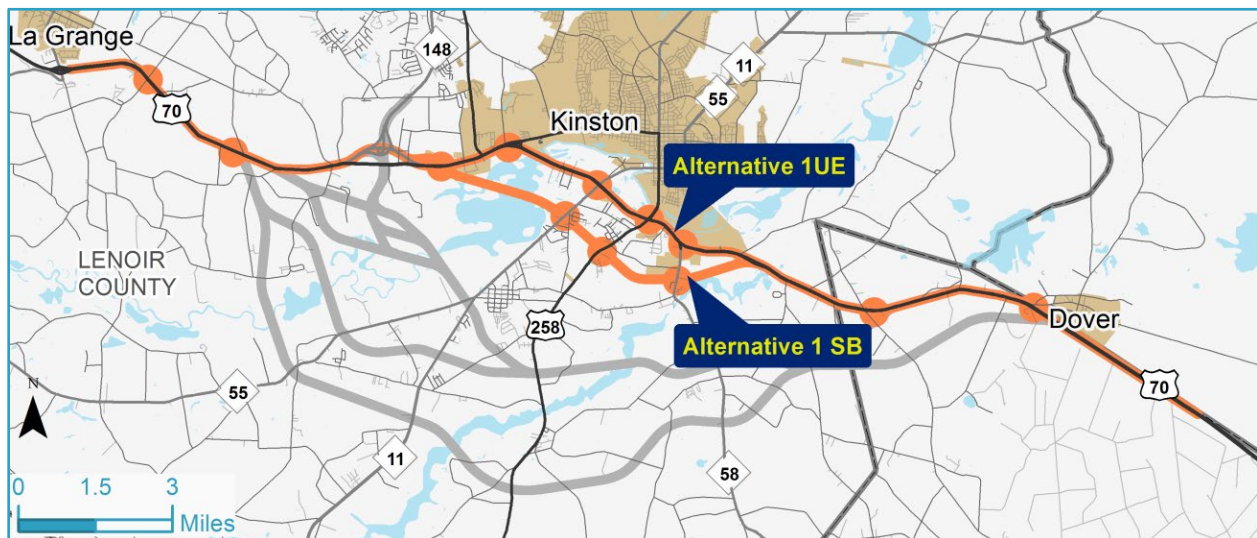
2.4.1 Descriptions of Detailed Study Alternatives

2.4.1.1 Alternatives 1UE and 1SB

Alternatives 1UE and 1SB begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange (Figure 2-9). Alternative 1UE follows existing US 70 for approximately 21 miles from the NC 903/US 70 interchange south of La Grange to the project terminus east of Dover and would upgrade the existing US 70 to a full control of access highway. The definition of upgrading an existing facility refers to a widening of the roadway to include adequate capacity to handle the forecasted traffic and provide for full control of access. Interchanges would provide access to other major roads and would be located at the following points:

- Willie Measley Road/Jim Sutton Road
- Albert Sugg Road/Barwick Station Road
- NC 148 (C.F. Harvey Parkway)
- US 258
- US 258/US 70 Business (West Vernon Avenue)
- NC 11/NC 55
- US 258 (South Queen Street)
- NC 58 (Trenton Highway)
- Wyse Fork Road (SR 1002)/Caswell Station Road (SR 1309)
- Old US 70 (West Kornegay Street)

Figure 2-9: Alternatives 1UE and 1SB



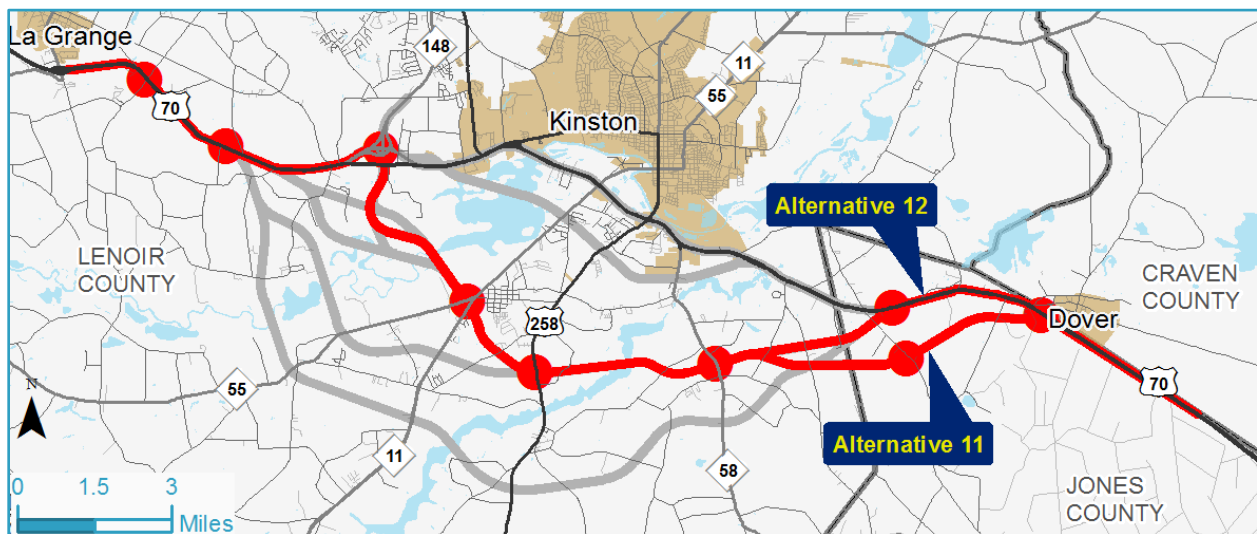
Alternative 1SB also begins at the NC 903/US 70 interchange in La Grange and would follow existing US 70 for approximately 7 miles to just east of NC 148 (C.F. Harvey Parkway). Interchanges would be located at Willie Measley Road/Jim Sutton Road, Albert Sugg Road/Barwick Station Road, and NC 148. A new 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 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). Alternative 1SB is 21.1 miles in length.

2.4.1.2 Alternatives 11 and 12

Alternatives 11 and 12 begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange and follow existing US 70 for approximately 7 miles to the NC 148/US 70 interchange (Figure 2-10). Interchanges would be located at Willie Measley Road/Jim Sutton Road, Albert Sugg Road/Barwick Station Road, and NC 148. At NC 148, both alternatives turn south and then east on new location for approximately 9.5 miles with interchanges at NC 11/NC 55, US 258, and NC 58. The alternatives cross NC 58 just south of Southwood Elementary School before diverging east of NC 58.

Figure 2-10: Alternatives 11 and 12



Alternative 11 continues eastward on new location with an interchange at Wyse Fork Road (SR 1002), approximately 1.25 miles south of existing US 70, before interchanging with existing US 70 near Old US 70 just west of Dover. Alternative 11 would include upgrades to existing US 70 between this interchange and the project terminus east of Dover. Alternative 11 is 23.2 miles in length.

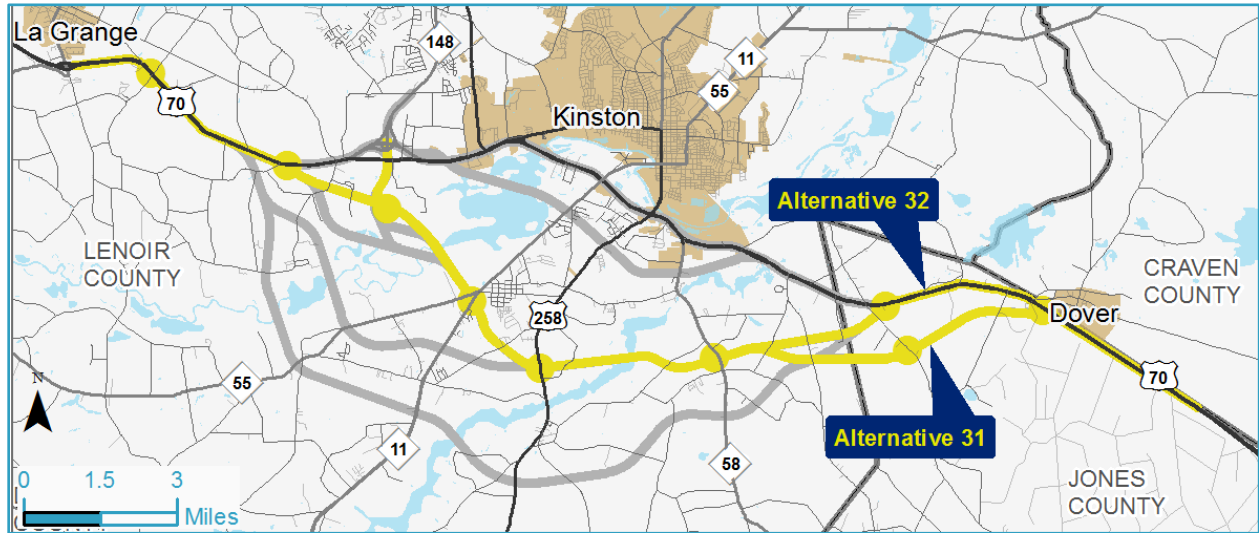
Alternative 12 would turn back to the north to interchange with existing US 70 just east of the Lenoir/Jones county line at Wyse Fork Road (SR 1002) and would upgrade existing US 70 to the project terminus east of Dover with an interchange at Old US 70 (West Kornegay Street). Alternative 12 is 23.4 miles in length.

2.4.1.3 Alternatives 31 and 32

Alternatives 31 and 32 begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange and follow existing US 70 for approximately 4.5 miles, with an interchange at Willie Measley Road/Jim Sutton Road, to near where Harold Sutton Road intersects with existing US 70 (Figure 2-11). At this point, a new interchange would provide access to the new location alternatives, which would travel southeast on new location. A new

connector approximately 1.5 miles long would connect north to the US 70/NC 148 interchange. From the Neuse River crossing to US 58, Alternatives 31 and 32 are the same as Alternatives 11 and 12, including interchanges at NC 11/NC 55, US 258, and NC 58. East of NC 58, Alternative 31 is the same as Alternative 11, and Alternative 32 is the same as Alternative 12. Alternative 31 is 22 miles in length. Alternative 32 is 22.1 miles in length.

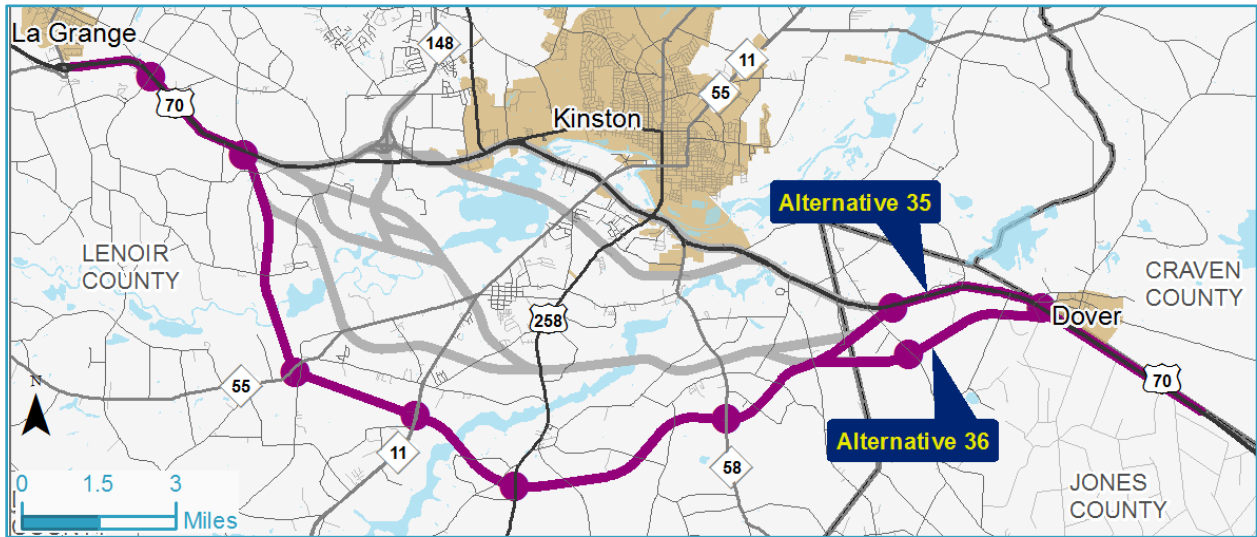
Figure 2-1 I: Alternatives 31 and 32



2.4.1.4 Alternatives 35 and 36

Alternatives 35 and 36 begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange and follow existing US 70 for approximately 2.25 miles, with an interchange at Willie Measley Road/Jim Sutton Road, to Albert Sugg Road (Figure 2-12). A new interchange here would allow both alternatives to diverge onto new location and travel to the south. Interchanges would be located at NC 55 (about 4 miles west of the split with NC 11), NC 11 (about 2.75 miles south of the split with NC 55), US 258 (just north of Woodington Middle School), and NC 58 (just south of Southwood Road). The alternatives swing back to the north before diverging at Cobb Road. East of Cobb Road, Alternative 36 is the same as Alternatives 11, 31, 65, and 51. Alternative 36 is 25.0 miles in length. Alternative 35 continues northeast on new location, and from Wyse Fork Road eastward is the same as Alternatives 12, 32, 63, and 52. Alternative 35 is 25.3 miles in length.

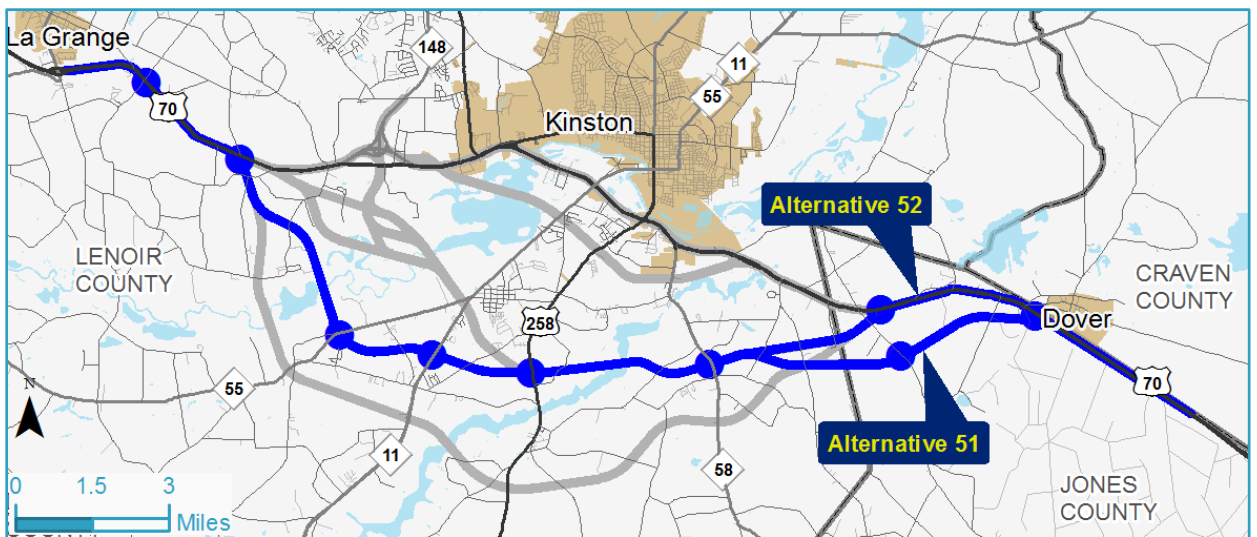
Figure 2-12: Alternatives 35 and 36



2.4.1.5 Alternatives 51 and 52

Alternatives 51 and 52 begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange and follow existing US 70 for approximately 2.25 miles, with an interchange at Willie Measley Road/Jim Sutton Road, to Albert Sugg Road (Figure 2-13). A new interchange here would allow both alternatives to diverge onto new location and travel to the south. Interchanges would be located at NC 55 (about 2.75 miles west of the split with NC 11), NC 11 (about 1.5 miles south of the split with NC 55), and US 258. East of US 258, Alternative 51 is the same as Alternatives 11, 31, and 65, and Alternative 52 is the same as Alternatives 12, 32, and 63. Alternative 51 is 22.6 miles in length. Alternative 52 is 22.7 miles in length.

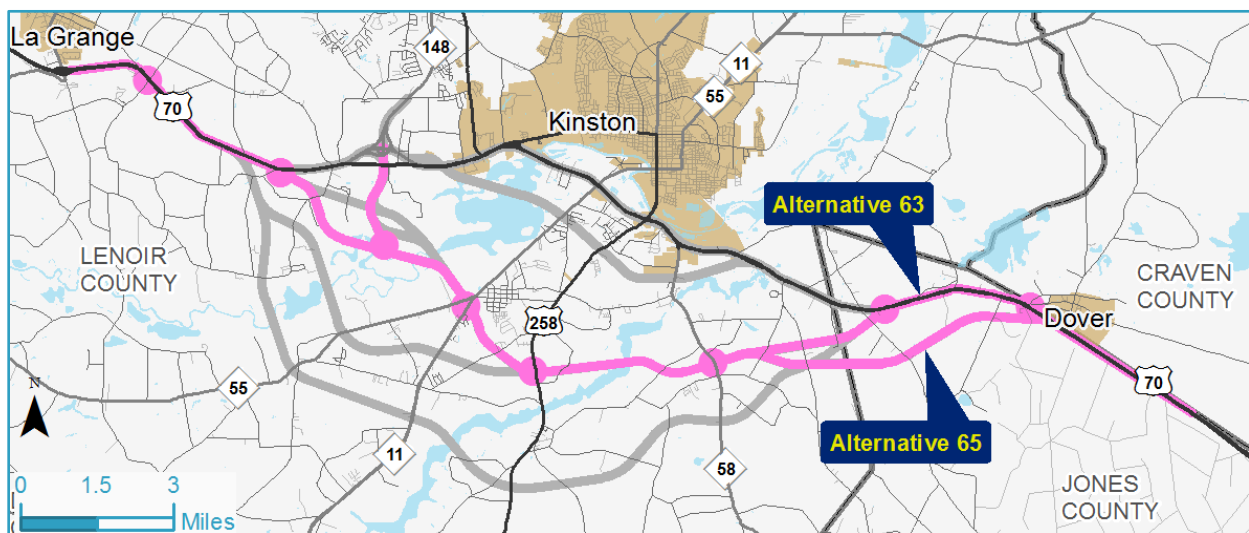
Figure 2-13: Alternatives 51 and 52



2.4.1.6 Alternatives 63 and 65

Alternatives 63 and 65 begin at the western terminus of the project at the NC 903/US 70 interchange south of La Grange and follow existing US 70 for approximately 4.5 miles, with an interchange at Willie Measley Road/Jim Sutton Road, to near where Harold Sutton Road intersects with existing US 70 (Figure 2-14). At this point, a new interchange would provide access to the new location alternatives, which would travel south and then east on new location. A new connector approximately 2 miles long would connect north to the US 70/NC 148 interchange. From east of the Neuse River crossing, Alternative 63 is the same as Alternatives 12 and 32, and Alternative 65 is the same as Alternatives 11 and 31. Alternative 63 is 22.2 miles in length. Alternative 65 is 22.1 miles in length.

Figure 2-14: Alternatives 63 and 65



2.4.2 Design Features for Detailed Study Alternatives

The following sections present the design level of service, design criteria, typical sections, and access control established for the development of the build alternatives.

2.4.2.1 Selection of Design Level of Service

The engineering profession generally accepts LOS D as a minimally acceptable operating condition. A minimum of LOS D is being used for design purposes for the project, but will not be used to screen or select alternatives. The determination of the number of lanes for the proposed action is based on the traffic volume that can be accommodated on the facility such that it meets LOS D or better in design year 2040. The traffic volume used in the analysis of traffic operations is the peak hour traffic volume for the roadway. The peak hour volume is adjusted to a flow rate based on terrain, heavy vehicle percentage, driver familiarity, and roadway characteristics. The flow rate is then used to calculate the density and LOS for the roadway.

2.4.2.2 Design Criteria

Design criteria for the DSAs are shown in Table 2-1.

**Table 2-1: Design criteria**

Route	US 70 Bypass	Alternative 1UE
Line	-Y14-	-Y15-
Traffic data		
Average daily traffic let year = 2020	21,800	42,800
Average daily traffic design year = 2040	27,600	47,000
Tractor trailer semi-truck	4	5
Duals	6	5
Design hourly volume	2,484	4,700
Directional	60	55
Classification	Freeway	Freeway
Terrain type	Level	Level
Design speed; mph	70	70/60
Posted speed; mph	65	65/55
Proposed right-of-way width	Minimum 235 feet	Minimum 185 feet
Control of access	Full	Full
Rumble strips (y/n)	N	N
Typical section type	4-lane divided	4-lane divided
Lane width	12 feet	12 feet
Sidewalks (y/n)	N	N
Bicycle lanes (y/n)	N	N
Median width	46 feet	Varies 23 feet to 46 feet
Median protected (guardrail/barrier)	N/A	N/A
Median shoulder width (total)	6 feet	Varies 6 feet to 11.5 feet
Median width	46 feet	46 feet
Outside without guard rail	12 feet	12 feet
Outside with guard rail	15 feet	15 feet
Outside paved shoulder width	10 feet	10 feet
Outside total/full depth paved shoulder	12 feet/10 feet	12 feet/10 feet

Note: Design assumptions compiled using NCDOT *Design Manual for Roadway Design* (NCDOT 2018i) and AASHTO 2011.

2.4.2.3 Typical Sections

Four proposed typical sections were developed for the DSAs and include the following options: a typical section without service roads (Figure 2-15), a typical section with a service road on one side (Figure 2-16), a typical section with a service road on both sides (Figure 2-17), and a typical section with a narrow median and a service road on both sides (Figure 2-18). The typical section with a narrow median and a service road on both sides is only used on Alternative 1UE to reduce property impacts in densely developed areas.

2.4.2.4 Structures

Each of the DSAs will include structures, often referred to as bridges, over hydraulic crossings. Major hydraulic crossings are those with a contributing drainage area requiring conveyance greater than a 72-inch pipe. Hydraulic crossings requiring less than or equal to the conveyance of a 72-inch pipe are considered minor crossings and are not included in the list of structures. For drainage areas requiring a triple box culvert, estimated bridge lengths were calculated for structure size comparison.

The NEPA/Section 404 Merger Team concurred on the size and location of the major hydraulic structures on April 17, 2014. A list and description of the proposed major hydraulic structures for the DSAs is provided in Appendix C. The locations of the proposed major hydraulic structures are shown on Figure 2-19 and Figure 2-20. More information can also be found in the *Hydraulic Analysis Report Addendum* (NCDOT 2017e).

2.4.2.5 Access Control

The required access control for interstates is specified as follows in *A Policy on Design Standards – Interstate System* (AASHTO 2011).

“Access to the interstate system shall be fully controlled. The interstate highway shall be grade separated at all railroad crossings and select public crossroads. At grade intersections shall not be allowed. To accomplish this, the intersecting roads are to be grade separated, terminated, rerouted, and/or intercepted by frontage roads. Access is to be achieved by interchanges at select public roads.

Access control shall extend the full length of ramps and terminals on the crossroad. Such control shall either be acquired outright prior to construction or by the construction of service roads or by a combination of both.”

Access beyond the ramp terminals should be controlled by purchasing access rights, providing frontage roads, controlling added corner right-of-way areas, or prohibiting driveways. Such control should extend beyond the ramp terminal at least 30 meters (100 feet) in urban areas and 90 meters (300 feet) in rural areas. However, in areas of high traffic volume, where there exists the potential for development that would create operational or safety problems, longer lengths of access control should be provided (AASHTO 2011).

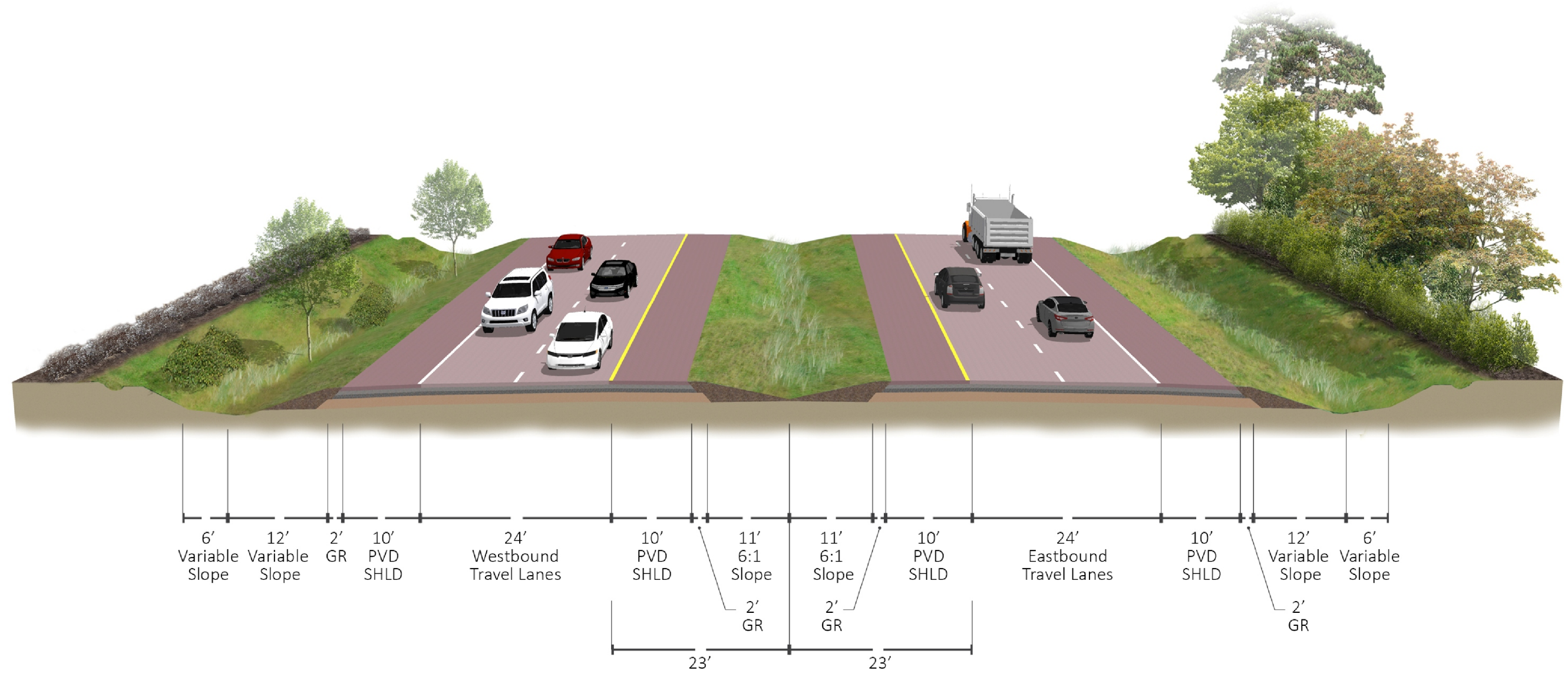


Source: AECOM

Figure 2-15:
Typical section without service road



KINSTON BYPASS
DEIS | R-2553



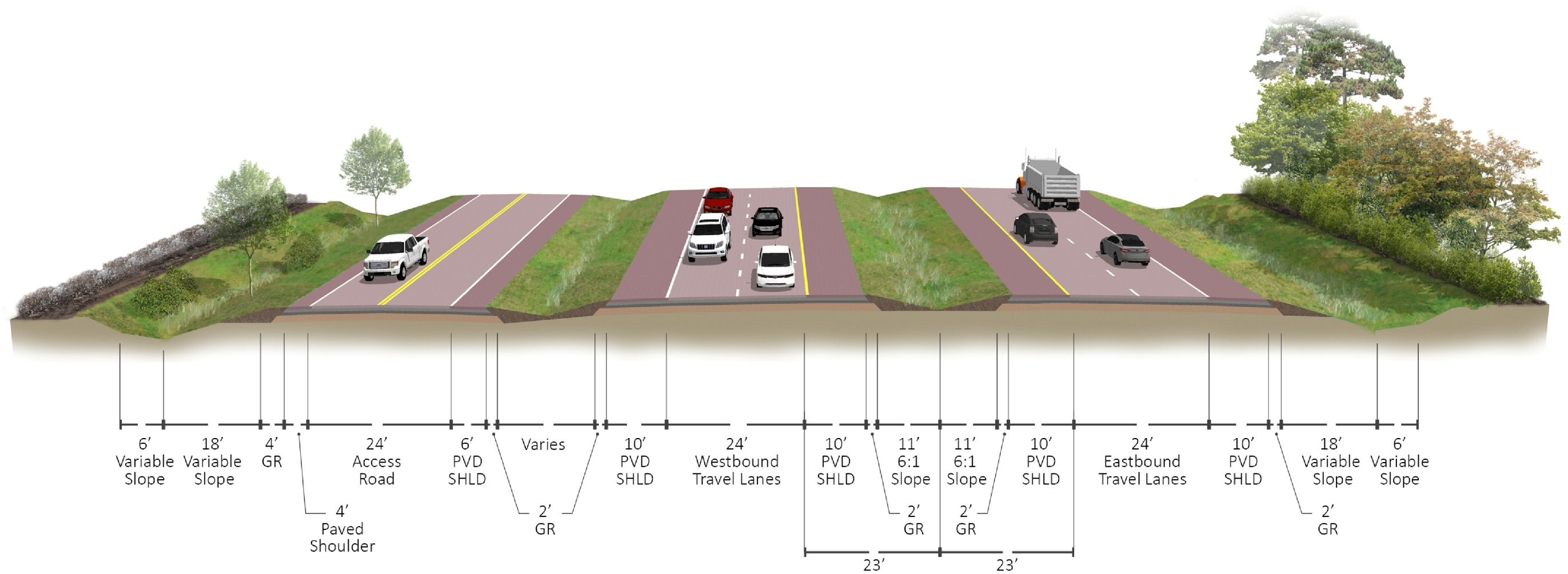


Source: AECOM

Figure 2-16:
Typical section with service road on one side



KINSTON BYPASS
DEIS | R-2553



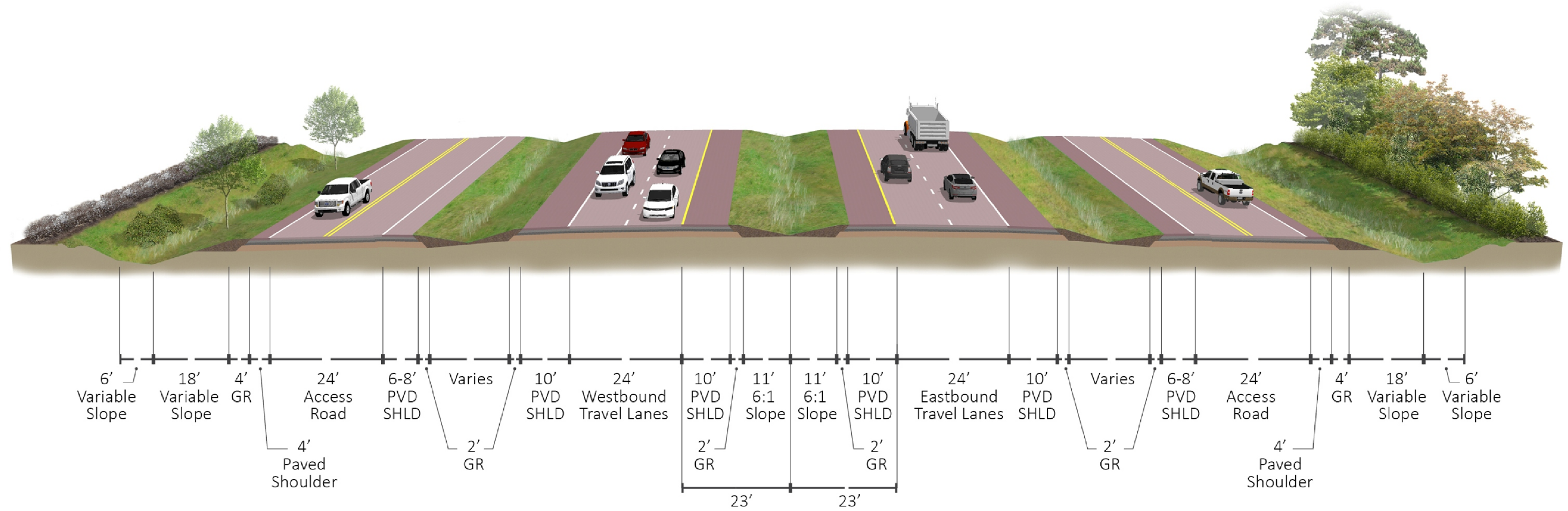


Source: AECOM

Figure 2-17:
Typical section with service road on both sides



KINSTON BYPASS
DEIS | R - 2553





Source: AECOM

Figure 2-18:
Typical section with narrow median and service road on both sides



KINSTON BYPASS
DEIS | R - 2553

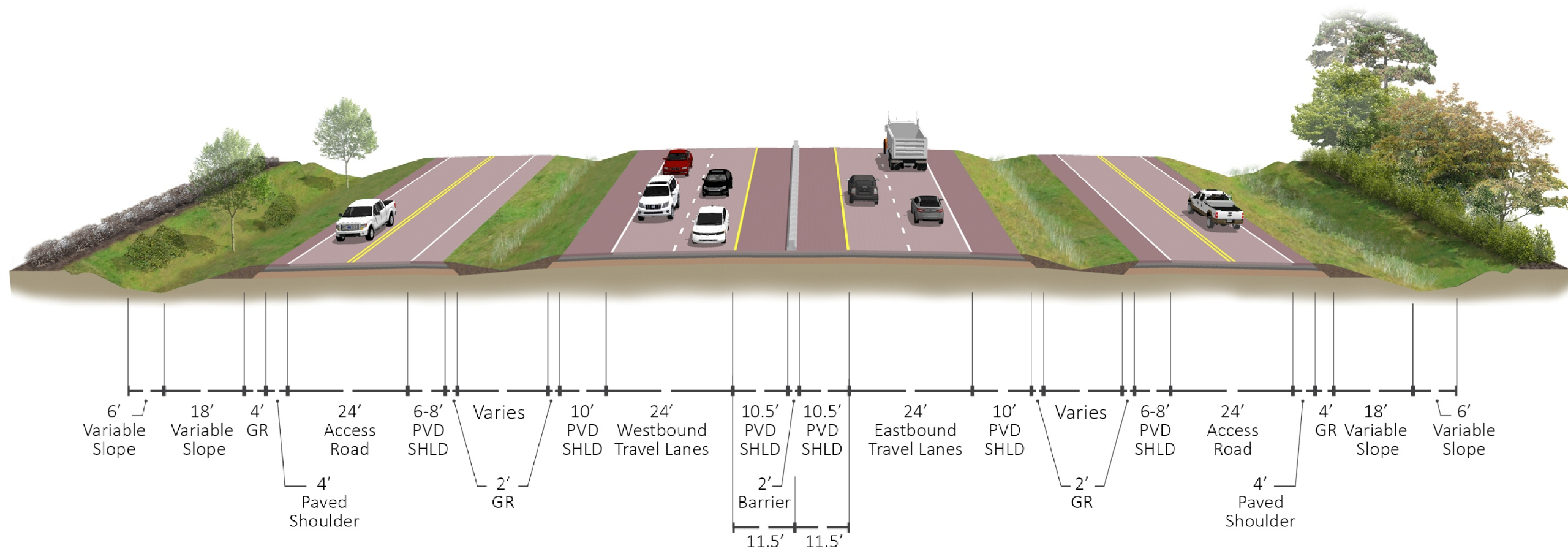


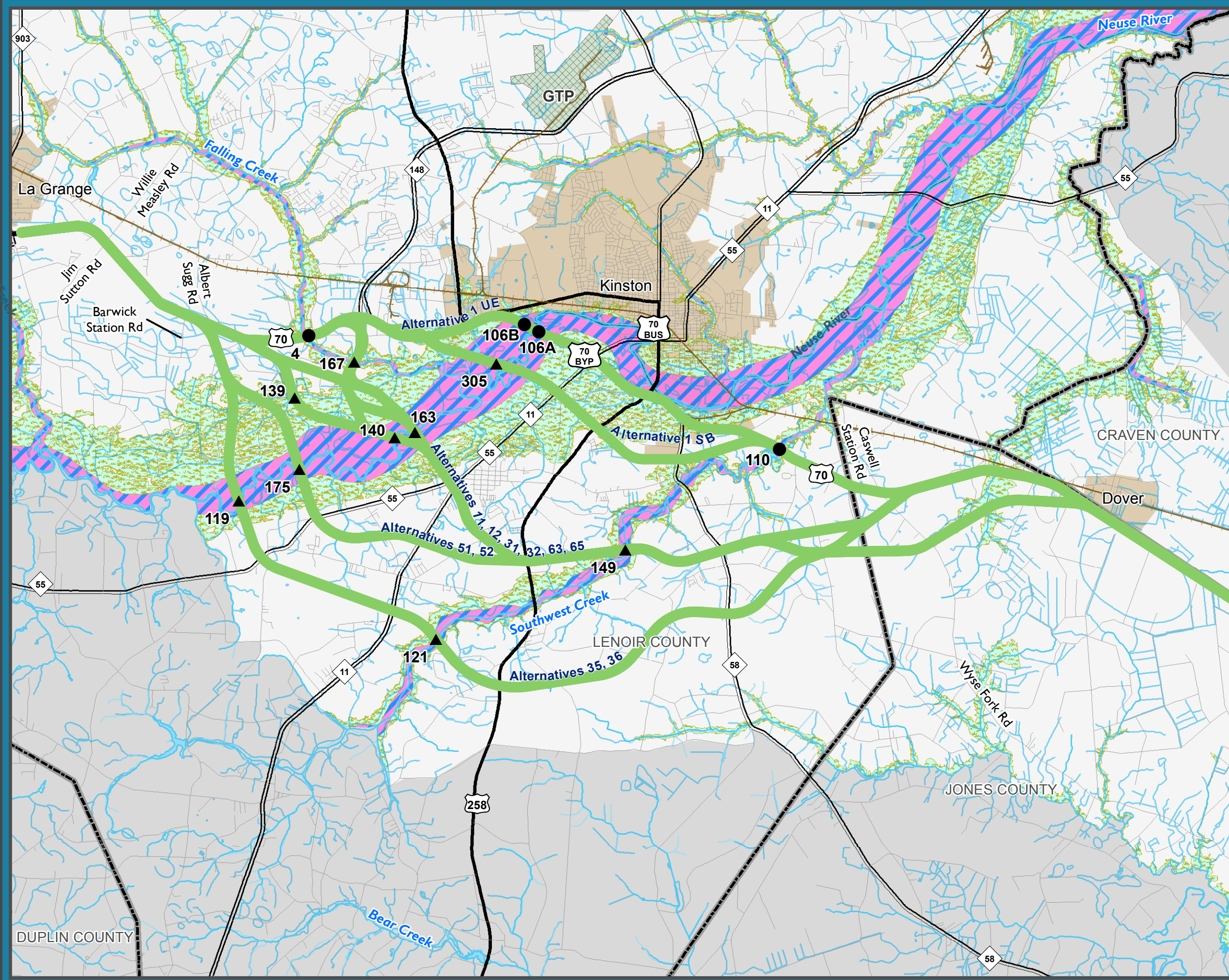
Figure 2-19:
Bridge locations

Legend

-  Detailed Study Alternatives
-  Railroad
-  US Highway
-  NC Highway
-  Secondary Road
-  Global TransPark (GTP)
-  Municipal Boundary
-  County Boundary
-  Proposed Bridge Crossing
-  Maintain Existing Bridge (with Potential Widening and/or Proposed Ramp/Service Rd. Bridge)
-  Floodplain
-  Floodway



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





2.4.3 Traffic Forecasting and Traffic Operations Analysis

Upon selection of the 12 DSAs, it was determined an updated traffic forecast and traffic operations analysis would be developed for use in refining the designs, as discussed in section 2.3.4. The updated peak hour volumes from the traffic forecast were used in the operations analysis to determine interchange configurations, number of lanes, and LOS.

2.4.3.1 Traffic Forecasting

The traffic forecast used for this project was conducted and furnished to AECOM by NCDOT (NCDOT 2016b). Using the traffic forecast and NCDOT's Intersection Analysis Utility tool, a.m. and p.m. peak hour volumes were developed for all of the alternatives being evaluated.

2.4.3.2 Traffic Operations Analysis Methodology

The *Traffic Capacity Analysis Report* (NCDOT 2017i) highway capacity analyses were based on methodologies from the *Highway Capacity Manual* (TRB 2010). Traffic modeling software used in the capacity analyses was Synchro 9.1 and SimTraffic 9.1 (Build 910, Rev 24), FREEVAL-E Version 1.00, and HCS 2010 Version 6.80. The analyses were conducted in accordance with the latest *NCDOT Congestion Management Capacity Analysis Guidelines* for STIP projects (NCDOT 2015b).

2.4.3.3 Traffic Operations Analysis

All the US 70 elements, whether freeway, ramp, or intersection, are operating at LOS D or better for all alternatives. One or two minor movements on service roads across the entirety of the project are operating at LOS E, and the volume-to-capacity ratios are so low that the cost of implementing additional improvements would outweigh any benefit gained.

2.4.4 Project Costs

The construction and right-of-way costs for the DSAs are included in Table 2-2. More information on the right-of-way costs is in Appendix D.

**Table 2-2: Project cost estimates per alternative**

	Const. Cost (millions)	Intelligent Transportation System Cost	Right-of-way Cost (millions)	Utilities Cost (millions)	Wetland and Stream Mitigation Costs (millions) ^a	Total Cost
1UE	\$245.90	\$450,000	\$183.07	\$12.83	\$12.94	\$455,190,000
1SB	\$292.80	\$450,000	\$123.71	\$10.80	\$12.25	\$440,010,000
11	\$284.10	\$450,000	\$78.33	\$9.13	\$12.13	\$384,140,000
12	\$299.00	\$450,000	\$85.05	\$9.43	\$13.39	\$407,320,000
31	\$284.20	\$450,000	\$63.50	\$7.84	\$12.29	\$368,120,000
32	\$288.90	\$450,000	\$66.99	\$8.08	\$13.55	\$377,970,000
35	\$290.40	\$450,000	\$65.49	\$8.62	\$13.94	\$378,900,000
36	\$297.80	\$450,000	\$64.20	\$7.98	\$12.81	\$383,240,000
51	\$296.20	\$450,000	\$54.56	\$7.93	\$11.72	\$370,860,000
52	\$275.80	\$450,000	\$57.38	\$9.88	\$12.98	\$356,490,000
63	\$355.90	\$450,000	\$64.01	\$7.88	\$13.44	\$441,680,000
65	\$358.90	\$450,000	\$61.18	\$7.63	\$12.18	\$440,340,000

Source: NCDOT Roadway Design Unit, NCDOT Right of Way Unit, and NCDOT Utilities Unit; NCDEQ 2018d.

^a Excludes stream buffer mitigation costs. Stream buffer zones will be mapped once the applicant's preferred alternative is selected and streams have been field-delineated.



CHAPTER 3

AFFECTED ENVIRONMENT



3. AFFECTED ENVIRONMENT

This chapter describes the existing conditions and characteristics of the project study area that could be affected by the proposed action. Information presented relates to the existing social, economic, cultural, physical, and natural environment settings. This chapter provides the basis for determining the specific impacts of each DSA, as discussed in chapter 4.

3.1 SOCIAL AND ECONOMIC RESOURCES

This section contains population, demographic, employment, community, and other social and economic information pertinent to the understanding of Lenoir, Craven, and Jones counties and the surrounding cities, towns, and communities within the project study area.

A Community Impact Assessment (CIA) was developed to gather information applicable to the social and economic resources in the study area (NCDOT 2018d). The CIA describes the existing conditions and trends of the area surrounding the Kinston Bypass project, inventories community resources, and includes the demographic data. The CIA is available on the project website. Consistent with NCDOT procedures, a direct community impact area (DCIA) and a demographic study area were defined in order to describe existing baseline conditions and determine potential project-related impacts to the human environment. The DCIA was created by buffering the DSAs by 1,000 feet. The demographic study area includes 16 block groups: 13 in Lenoir County, 1 in Jones County, and 2 in Craven County. The DCIA and the demographic study area are shown on Figure 3-1.

Community Impact Assessment

The CIA for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

Direct Community Impact Area

The direct community impact area is the area surrounding the project that is likely to be directly affected in any way during, throughout, and after project construction.

Demographic Study Area











The demographic study area is defined to provide demographic characteristics for the census block groups surrounding the project. Census block groups are the smallest geographic area from the 2010 US Census and 2011-2015 American Community Survey, and provide demographic data for the populations and their attributes within the direct community impact area.

3.1.1 Population and Demographics

According to the US Census Bureau, between 2000 and 2016 the populations of Craven, Jones, and Lenoir counties experienced growth rates of 0.4, 2.8, and -3.2 percent, respectively. Based on projections from the North Carolina Office of State Budget, growth rates are expected to remain much lower than the state as a whole through 2035 (Table 3-1).

Figure 3-1:
Direct community impact area
and demographic study area

Legend

-  Project Study Area
-  Direct Community Impact Area (DCIA)
-  Railroad
-  US Highway
-  NC Highway
-  Secondary Road
-  Municipal Boundary
-  County Boundary
-  Demographic Study Area
-  Block Group



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

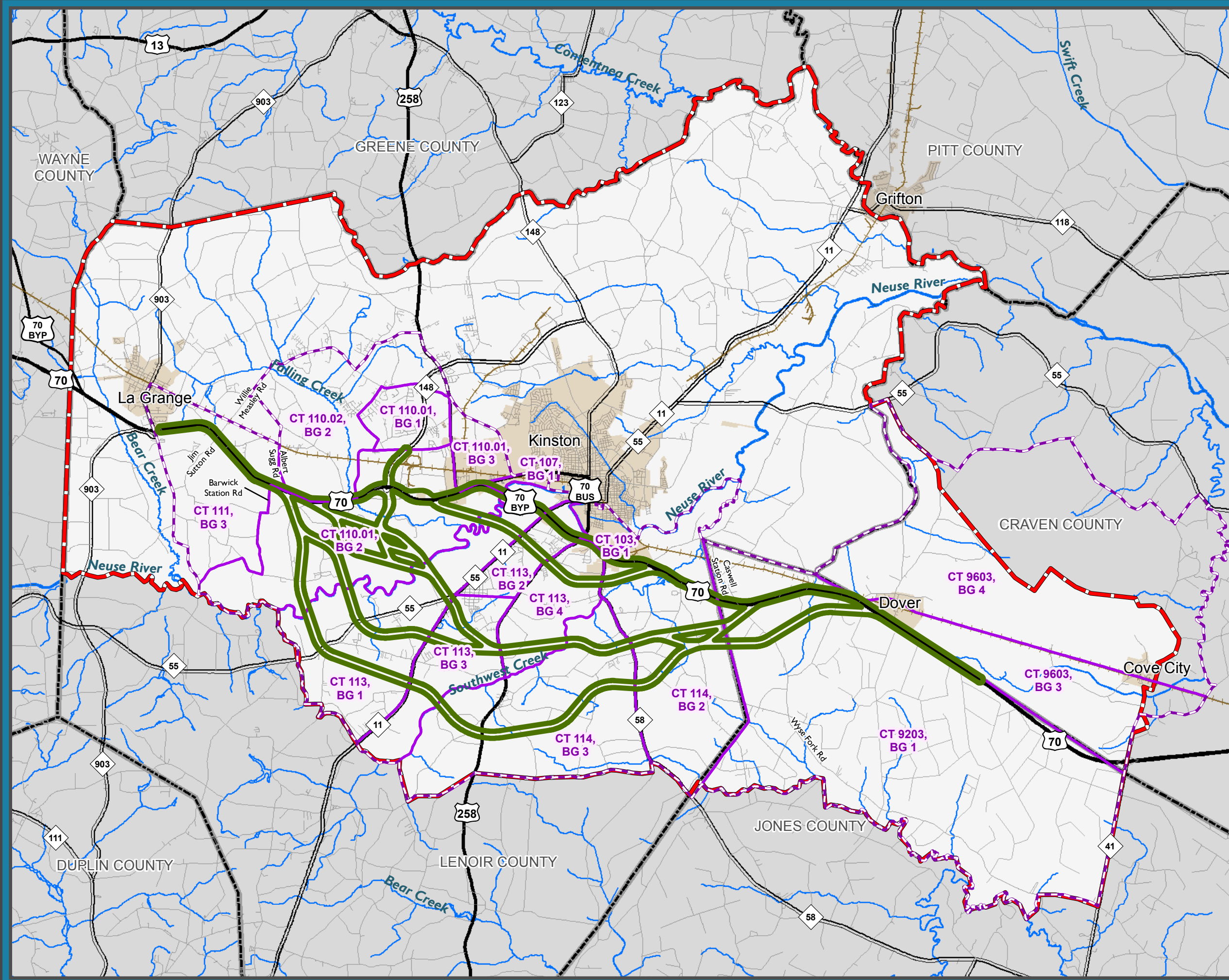




Table 3-1: Population growth forecasts

Area	2010	2020	2016 (Estimate)	2035	Difference (2010 to 2035)	Percent Change (2010 to 2035)	Annualized Growth Rate (2010 to 2035)
Craven County	104,182	103,899	103,737	104,104	-78	-0.07%	0.0%
Jones County	10,075	10,355	10,354	10,354	279	2.77%	0.1%
Lenoir County	59,488	57,146	57,587	55,494	-3,994	-6.71%	-0.2%
North Carolina	9,574,344	10,619,432	10,155,942	12,327,153	2,752,809	28.75%	0.7%

Source: North Carolina Office of State Budget Management; US Census Bureau 2000, 2010, 2016

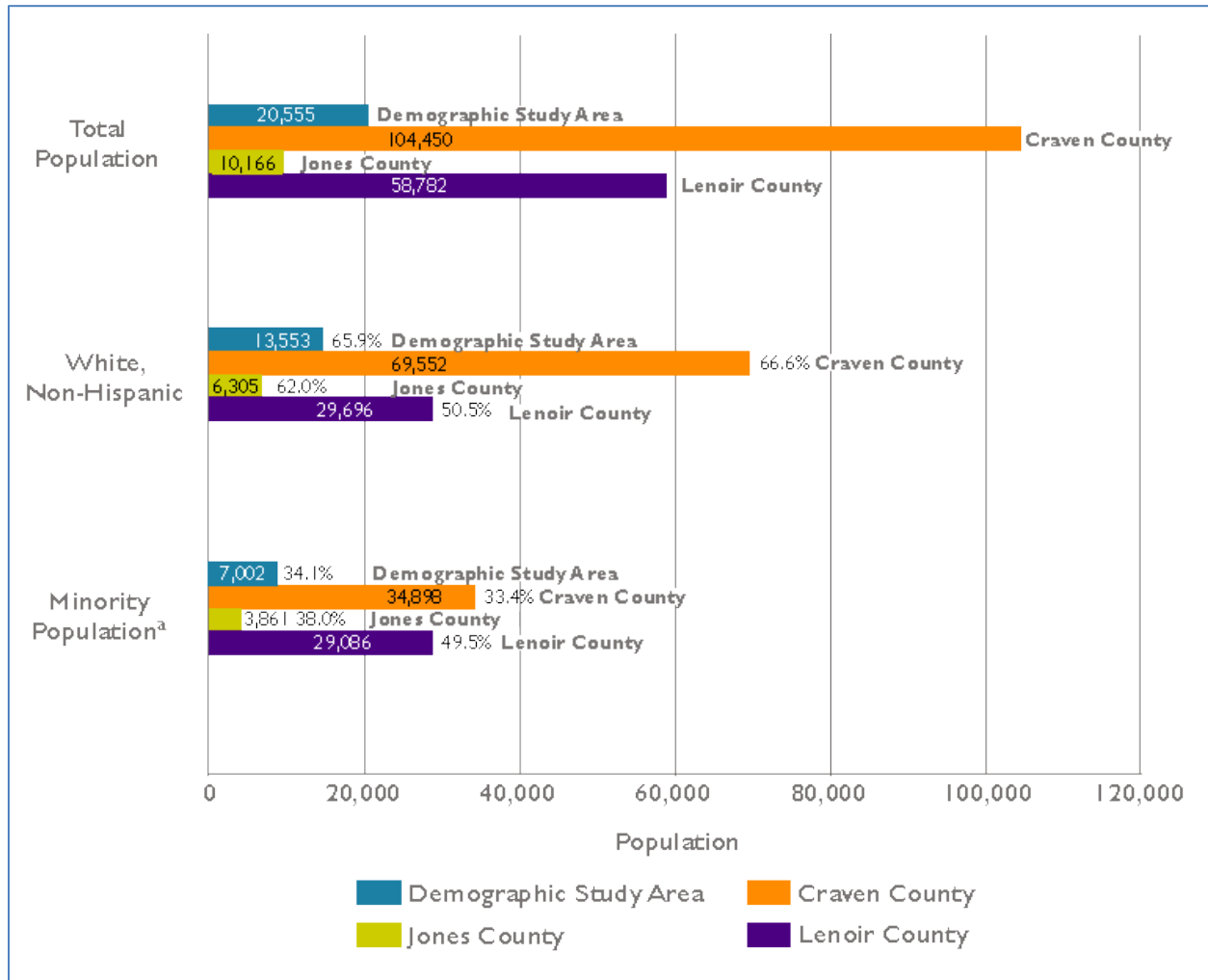
According to the American Community Survey (ACS), Lenoir County has a larger potential environmental justice (EJ) population, with 55.2 percent identifying themselves as White, 40.2 percent as African American, and the remaining 4.6 percent as Asian, Native Hawaiian/Pacific Islander, and mixed race. Table 3-2 and Table 3-3 compare the ethnic population and racial makeup of the demographic study area, Craven County, Jones County, and Lenoir County. Socioeconomic data on individual block groups is included in the CIA (NCDOT 2018d). Protected populations, including minority populations, are discussed further in section 3.1.7.

3.1.2 Housing

Lenoir County has over 27,000 housing units, 60 percent of which are single-family homes, 16 percent multi-family units, and 24 percent manufactured housing. Jones County has 4,863 housing units, of which 64.5 percent are single-family, 5 percent are multi-family, and 30.6 percent are manufactured housing, with nearly 15 percent of units vacant. Craven County has over 45,700 housing units, 71 percent of which are single-family homes, 14.5 percent multi-family units, and 14.5 percent manufactured housing. Lenoir and Jones counties have a lower median housing value (\$93,000 and \$93,900, respectively) than North Carolina (\$140,000). Craven County's median housing value is \$154,500.

According to the National Housing Preservation Database, Lenoir County has 1,076 affordable housing units and Craven County has 2,207 affordable housing units (Public and Affordable Housing Research Corporation 2017). The database includes an inventory of 10 federally assisted rental housing programs from the US Department of Housing and Urban Development and the US Department of Agriculture (USDA). Most of the affordable housing in Lenoir County is located within Kinston. A concentration of affordable housing units is also located in La Grange. In Craven County, most of the affordable housing is located in New Bern, which is located outside of the demographic study area. The National Housing Preservation Database does not include information for Jones County.

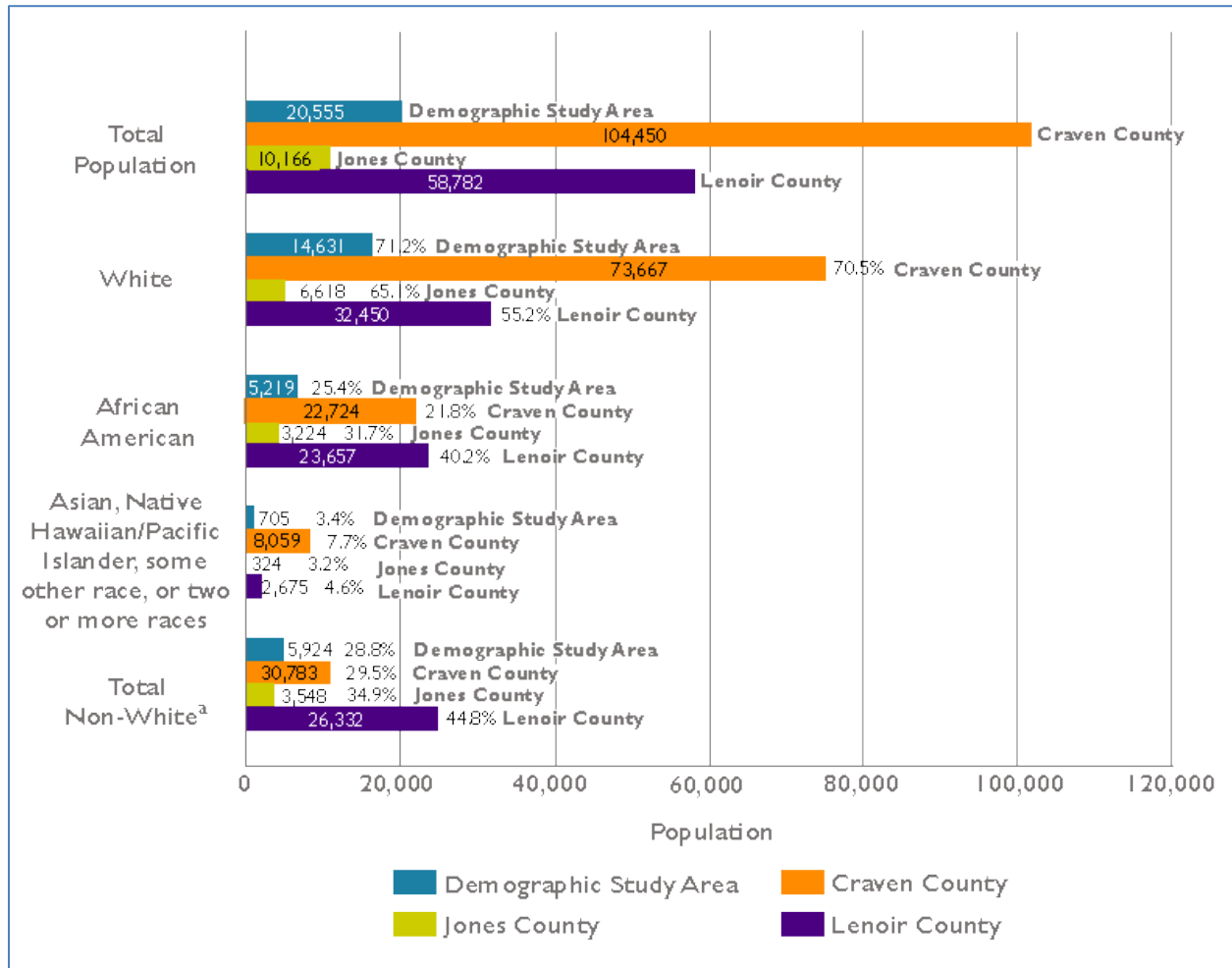
Table 3-2: Minority population



Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B03002, “Hispanic or Latino Origin by Race.”

^a Total non-White does not include Hispanic populations that are also White.

Table 3-3: Racial makeup



Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B02001, "Race."

^a Total non-White does not include Hispanic populations that are also White.



3.1.3 Economics and Employment

The Economic Impact Assessment (EIA) prepared for the proposed action identified and assessed the project study area’s current socioeconomic and market conditions, while also inventorying and assessing the businesses located within a quarter mile of US 70 and proposed routes for Alternatives 1SB and 51 (NCDOT 2018f). The EIA is available on the project website. The EIA chose the following four DSAs to analyze in the report:

- No-Build
- Alternative 1UE
- Alternative 1SB
- Alternative 51

These four DSAs were assessed in the EIA because it was determined that the differentiation of economic impacts from Alternatives 11, 12, 31, 32, 35, 36, 51, 52, 63, and 65 would be minimal, as they would be located along paths with similar land use and population and business density. Therefore, Alternative 51 was chosen as a representative alternative to be assessed in the EIA.

The EIA focused on analyzing the economic impacts to Lenoir County and the City of Kinston since all the economic activity that would be directly affected by the proposed action is within this area. Additional details regarding the methodologies are included in the EIA.

The North Carolina Department of Commerce Labor and Economic Analysis identifies the top employers in Craven, Jones, and Lenoir counties as those employers that have the largest number of employees. Table 3-4 shows the top 10 employers by employment range for Craven, Jones, and Lenoir counties.

Table 3-4: Top 10 employers by employment range in Craven, Jones, and Lenoir counties

County	Company Name	Industry	Employment Range
Craven	Department of Defense	Public Administration	1000+
Craven	Craven County Schools	Education & Health Services	1000+
Craven	Craven Regional Medical Center	Education & Health Services	1000+
Craven	BSH Home Appliances Corporation	Manufacturing	1000+
Craven	Moen Incorporated	Manufacturing	500-999
Craven	Wal-Mart Associates Inc.	Trade, Transportation, & Utilities	500-999
Craven	Craven County	Public Administration	500-999

Economic Impact Assessment

Economic impacts are the effects a project or policy has on the economy of a designated project area, measured in terms of the change in business sales, jobs, value added, income, or tax revenue.

The key components of the EIA include highway user impact analysis, business inventory, market assessment, and public outreach.

The EIA for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>



County	Company Name	Industry	Employment Range
Craven	Marine Corps Community Services	Trade, Transportation, & Utilities	500-999
Craven	Craven Community College	Education & Health Services	500-999
Craven	City of New Bern	Public Administration	250-499
Jones	Jones County Board of Education	Education & Health Services	100-249
Jones	US Postal Service	Trade, Transportation, & Utilities	100-249
Jones	County of Jones	Public Administration	100-249
Jones	Craven Regional Medical Center	Education & Health Services	50-99
Jones	Brookstone Living Center LLC	Education & Health Services	50-99
Jones	Universal Mental Health Services	Education & Health Services	50-99
Jones	Home Health and Hospice Care Inc.	Education & Health Services	Below 50
Jones	Smithfield Foods Inc.	Manufacturing	Below 50
Jones	Tar Heel Health Care Services LLC	Education & Health Services	Below 50
Jones	Blue Rock Structures Inc.	Construction	Below 50
Lenoir	Sanderson Farms Inc.	Manufacturing	1000+
Lenoir	North Carolina Department of Health & Human Services	Public Administration	1000+
Lenoir	Lenoir County Schools	Education & Health Services	1000+
Lenoir	Smithfield Foods Inc.	Manufacturing	500-999
Lenoir	Lenoir Memorial Hospital Inc.	Education & Health Services	500-999
Lenoir	Spirit AeroSystems	Manufacturing	500-999
Lenoir	Aristofraft/Decora/Schrock	Manufacturing	500-999
Lenoir	County Administration	Public Administration	500-999
Lenoir	Electrolux Home Products Inc.	Manufacturing	500-999
Lenoir	City of Kinston	Public Administration	250-499

Source: US Census Bureau 2016; North Carolina Department of Commerce 2016

The historical unemployment trends for the counties that encompass the demographic study area and North Carolina are shown in Table 3-5. In general, the unemployment rate of the three counties mirrors the unemployment rate of North Carolina.

Table 3-5: Unemployment percentage for Craven, Jones, and Lenoir counties

	2000	2005	2010	2015	2017
Craven County	4.1%	4.7%	10.7%	6.1%	4.7%
Jones County	4.5%	4.9%	11.2%	5.8%	4.5%
Lenoir County	5.2%	5.8%	11.9%	6.3%	4.6%
North Carolina	3.7%	5.2%	10.8%	5.7%	4.6%

Source: US Bureau of Labor Statistics 2018

According to the ACS the mean commute times for workers in the three counties that encompass the demographic study area are 20.8 minutes for Craven County, 25.5 minutes for Jones County, and 21.5 minutes for Lenoir County. Table 3-6 shows the percentage of workers who are employed outside of the community where they reside.

Table 3-6: Percentage of workers employed outside their residential community

Area	Percentage Working Outside Place of Residence
Cove City	44.8
Dover	72.0
Jackson Heights	21.2
Kinston	13.8
La Grange	39.8
Craven County	16.6
Jones County	69.0
Lenoir County	23.0

Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015)

3.1.4 Economic Development

Lenoir County is home to a diverse array of businesses from agriculture and aerospace manufacturing, to biotech and pharmaceutical companies. According to the US Census Bureau’s Longitudinal-Employer Household Dynamics Program (US Census Bureau 2018), the largest concentrations of jobs within Lenoir County are in downtown Kinston, at the C.F. Harvey Parkway interchange with US 70 (US 70 Industrial Park), and near the intersection of NC 58 and Airport Road (near Lenoir Memorial Hospital). Limited commercial enterprises exist within the Craven and Jones county areas within the project study area.

Highway market dependent businesses consist of retail and service businesses that obtain a major share of their business from non-local customers on a less planned or impulse basis. This is distinct from other businesses, which also rely on US 70 for customer access but are more



destinational for locals (or non-locals). The major highway market dependent businesses on US 70 consist of four business sectors:

- Food and beverage stores (grocery stores or mini-marts)
- Gasoline stores
- General merchandise stores (e.g., Walmart)
- Food services and drinking places (restaurants)

3.1.5 Median Income Values

According to the ACS, the median household income for the three counties that encompass the demographic study area is \$47,985 for Craven County, \$34,005 for Jones County, and \$34,717 for Lenoir County. The median household income in Kinston is lower than Lenoir County (\$28,060). Each county, as well as Kinston, lags behind the median household income for the state (\$46,868). Within the demographic study area, block groups with higher incomes are located just west of Kinston and to the southwest of Kinston along NC 11 and NC 55.

3.1.6 Communities and Neighborhoods

3.1.6.1 Lenoir County

Two towns/cities are located within the DCIA in Lenoir County: La Grange and Kinston. La Grange is a small town west of Kinston and north of US 70, with a population of approximately 3,000. La Grange has a small town center with minimal commercial/retail shops. The City of Kinston is centrally located in Lenoir County where several state and US highways intersect (US 70, US 258, NC 11, NC 55, NC 58). Kinston has been the county seat of Lenoir County since its formation in 1791.

The NC 11/55 corridor contains a mixture of residential, commercial, industrial, and community uses. Jackson's Crossroads, located where NC 11 and NC 55 split, has a shopping center and residential development. A notable feature in this area includes a house listed on the National Register of Historic Places (NRHP). A large cluster of single-family residences is located on the eastern side of NC 11/55 at Tyree Road.

Other single-family residential clusters are located in the unincorporated communities identified by the US Geological Survey (USGS) in the geographic names information system (GNIS), which include Albrittons, Bucklesberry, Little Baltimore, Sandy Bottom, Southwood, and Woodington (USGS 2018a). There are also several manufactured home parks.

Loftin's Crossroads is located in the southeastern portion of the DCIA at the intersection of NC 58 and Elijah Loftin Road. Loftin's Crossroads/Southwood has been identified as an activity center and contains a convenience grocery store and Southwood Elementary School is just north of the community.

Other residential areas within Lenoir County include a neighborhood along Cedar Dell Lane, just off of Kennedy Home Road located southwest of the C.F. Harvey interchange, the Howard Place Drive neighborhood, which is located off of NC 11, and the Murray Circle neighborhood, located along Whaley Road south of US 70.



3.1.6.2 Craven County

Craven County includes the Town of Dover. The Town of Dover has a population of approximately 400 and is marked by a clustering of residential development with a few community facilities. The area bounded by US 258 to the west, US 70 to the north, and NC 41 to the east is predominately agriculture and forestry interspersed with rural residential land uses.

3.1.6.3 Jones County

There are no towns within the DCIA in Jones County; however, the crossroad community of Wyse Forks is located near Wyse Fork Road and US 70. Wyse Forks consists of residences, community facilities, and a convenience store along Wyse Fork Road.

3.1.7 Protected Populations

3.1.7.1 Environmental Justice Populations

Based on demographic data available from the US Census ACS 5-year estimates (2011-2015) and NCDOT guidance, thresholds are used to determine the presence of EJ populations at the block group level. The thresholds are determined based upon the percentage of minorities and low income populations living in a block group compared to the overall county average. This analysis will be updated during the completion of the Final Environmental Impact Statement (FEIS) with the most recently available data from the US Census.

The standard of practice used by NCDOT for determining the presence of minority populations is when the percentage of minorities in a block group is 10 percentage points above the county average, or 50 percent, whichever is less. For this project, it was determined that the minority threshold is 43.4 percent for Craven County, 48 percent for Jones County, and 50 percent for Lenoir County.

Two block groups within the demographic study area surpass the minority thresholds for the presence of EJ, both of which are in Lenoir County. The block groups are census tract 103, block group 1 (100 percent minority population) and census tract 107, block group 1 (60.7 percent minority population). The minority populations by block group for the demographic study area are provided in Table 3-7. The location of these block groups is shown on Figure 3-2 and Figure 3-3.

**Table 3-7: Minority populations by block group**

County	Geography	Total Population	White, Non-Hispanic (#)	White, Non-Hispanic (%)	Minority Population (#) ^a	Minority Population (%) ^a
Craven	CT 9603, BG 3	600	345	57.5%	255	42.5%
Craven	CT 9603, BG 4	1,553	1,019	65.6%	534	34.4%
Jones	CT 9203, BG 1	1,306	786	60.2%	520	39.8%
Lenoir	CT 103, BG 1	780	-	0.0%	780	100.0%
Lenoir	CT 107, BG 1	759	298	39.3%	461	60.7%
Lenoir	CT 110.01, BG 1	2,361	1,850	78.4%	511	21.6%
Lenoir	CT 110.01, BG 2	1,104	596	54.0%	508	46.0%
Lenoir	CT 110.01, BG 3	1,040	669	64.3%	371	35.7%
Lenoir	CT 110.02, BG 2	1,625	1,305	80.3%	320	19.7%
Lenoir	CT 111, BG 3	1,354	888	65.6%	466	34.4%
Lenoir	CT 113, BG 1	1,581	896	56.7%	685	43.3%
Lenoir	CT 113, BG 2	1,452	791	54.5%	661	45.5%
Lenoir	CT 113, BG 3	1,348	952	70.6%	396	29.4%
Lenoir	CT 113, BG 4	551	385	69.9%	166	30.1%
Lenoir	CT 114, BG 2	1,424	1,242	87.2%	182	12.8%
Lenoir	CT 114, BG 3	1,717	1,531	89.2%	186	10.8%
n/a	Total for demographic study area	20,555	13,553	65.9%	7,002	34.1%
n/a	Craven County	104,450	69,552	66.6%	34,898	33.4%
n/a	Jones County	10,166	6,305	62.0%	3,861	38.0%
n/a	Lenoir County	58,782	29,696	50.5%	29,086	49.5%
n/a	North Carolina	9,845,333	6,324,373	64.2%	3,520,960	35.8%

Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B03002, “Hispanic or Latino Origin by Race.”

 - Above EJ threshold

^a Minority population includes all races that are non-White and Hispanic populations that are also White.

Figure 3-2:
Environmental justice
populations - A

Legend

-  Detailed Study Alternative
-  Observed EJ Population
-  Block Group Within the Demographic Study Area
-  Block Group Above Both Low-Income and Minority Threshold
-  Block Group Above the Low-Income Threshold
-  US Highway
-  NC Highway
-  Secondary Road
-  Municipal Boundary
-  County Boundary



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

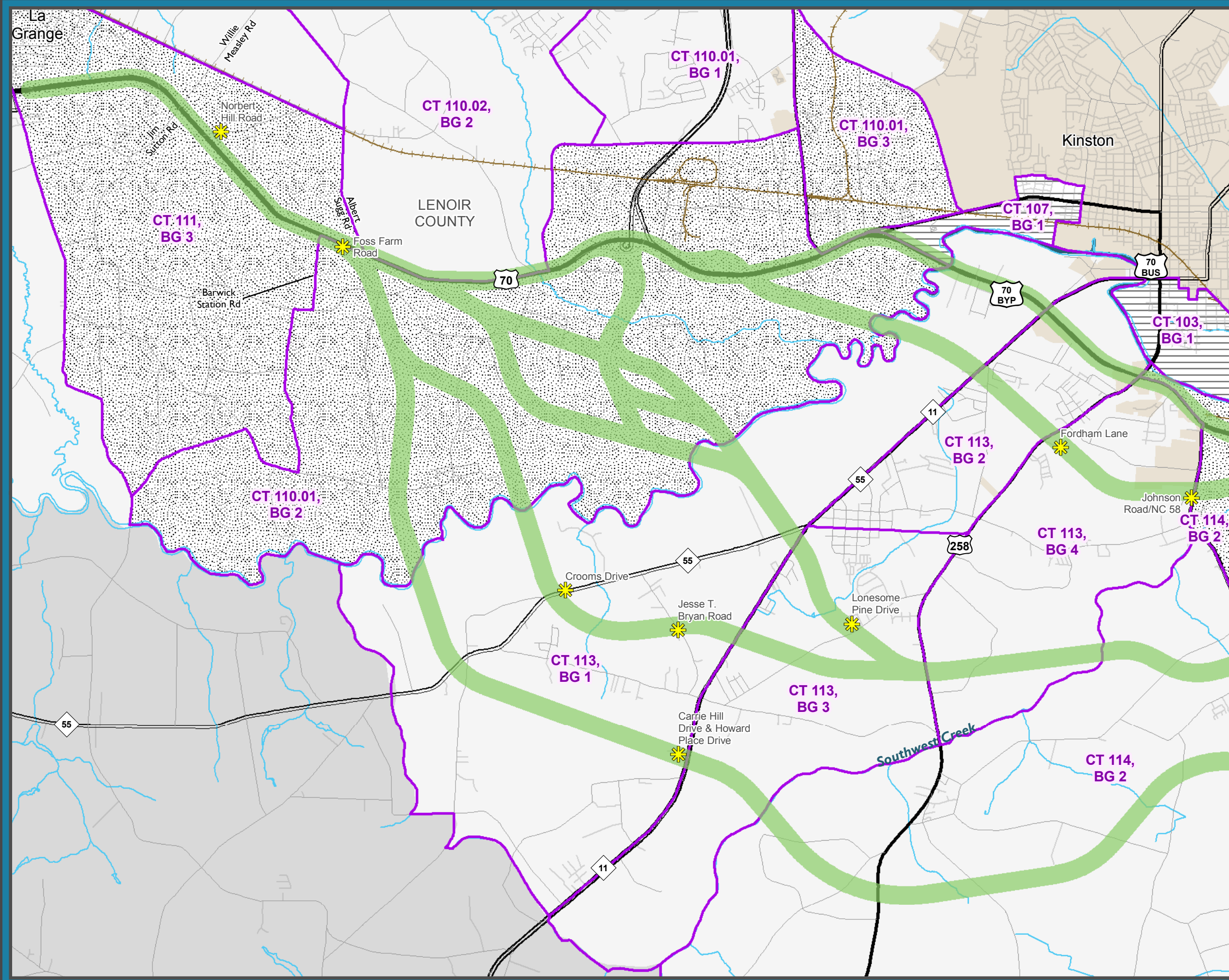
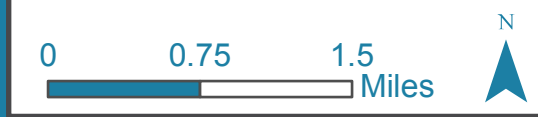


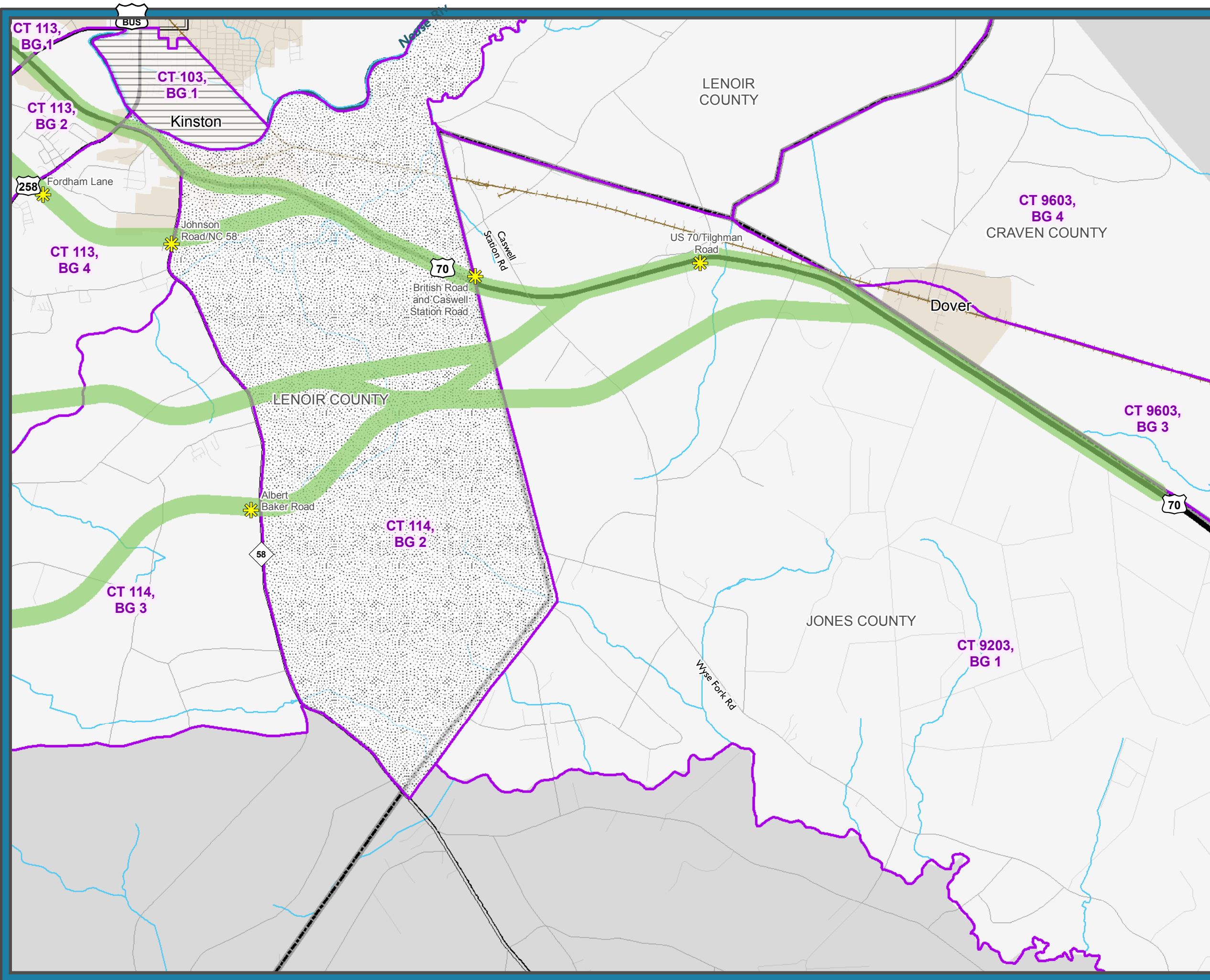
Figure 3-3:
Environmental justice
populations - B

Legend

- Detailed Study
- Observed EJ Population
- Block Group Within the Demographic Study Area
- Block Group Above Both Low-Income and Minority Threshold
- Block Group Above the Low-Income Threshold
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary



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



For low-income populations the standard of practice used by NCDOT for determining EJ populations is when the population of any of the poverty categories equals or exceeds 25 percent or when it is less than 25 percent, but exceeds the county average by 5 percentage points. The poverty categories within the census are below poverty, very poor (income is less than 50 percent of the poverty level), and near poor (income is 100 to 149 percent of the poverty level). The low-income threshold of each county for each category is established as the lower of 25 percent or 5 percentage points higher than the county average. The low income threshold is 20.6 percent for Craven County, 25 percent for Jones County, and 25 percent for Lenoir County. Very poor populations (under 50 percent of the poverty level) were identified and compared to the county rate for EJ screening. The very poor threshold is 12.1 percent for Craven County, 14.8 percent for Jones County, and 14.3 percent for Lenoir County. Populations that are considered near poor (between 100 and 149 percent of the poverty level) were identified and compared to the county rate. The near poor threshold is 15 percent for Craven County, 17.8 percent for Jones County, and 21.3 percent for Lenoir County.

Block groups that surpass one or more of the EJ thresholds for poverty are shown in Table 3-8 and on Figure 3-2 and Figure 3-3 and include the following:


- Census tract 103, block group 1
- Census tract 107, block group 1
- Census tract 110.01, block group 2
- Census tract 110.01, block group 3
- Census tract 111, block group 3
- Census tract 114, block group 2

Table 3-8: Block groups above the environmental justice poverty threshold

County	Census Tract, Block Group	Total Population for Whom Poverty Status is Determined	Below Poverty Level (#)	Below Poverty Level (%)	Very Poor: Under 50% of Poverty Level (#)	Very Poor: Under 50% of Poverty Level (%)	Near Poor: Between 100% and 149% of Poverty Level (#)	Near Poor: Between 100% and 149% of Poverty Level (%)
Craven	CT 9603, BG 3	600	68	11.3%	34	5.7%	23	3.8%
Craven	CT 9603, BG 4	1,521	229	15.1%	45	3.0%	174	11.4%
Jones	CT 9203, BG 1	1,306	174	13.3%	112	8.6%	72	5.5%
Lenoir	CT 103, BG 1	780	537	68.8%	292	37.4%	99	12.7%
Lenoir	CT 107, BG 1	759	228	30.0%	16	2.1%	159	20.9%
Lenoir	CT 110.01, BG 1	2,327	340	14.6%	159	6.8%	174	7.5%
Lenoir	CT 110.01, BG 2	1,091	88	8.1%	33	3.0%	285	26.1%
Lenoir	CT 110.01, BG 3	1,040	274	26.3%	252	24.2%	82	7.9%
Lenoir	CT 110.02, BG 2	1,625	184	11.3%	27	1.7%	191	11.8%
Lenoir	CT 111, BG 3	1,354	268	19.8%	200	14.8%	233	17.2%
Lenoir	CT 113, BG 1	1,581	34	2.2%	-	0.0%	208	13.2%
Lenoir	CT 113, BG 2	1,452	358	24.7%	12	0.8%	289	19.9%
Lenoir	CT 113, BG 3	1,348	90	6.7%	42	3.1%	156	11.6%
Lenoir	CT 113, BG 4	551	-	0.0%	-	0.0%	41	7.4%
Lenoir	CT 114, BG 2	1,422	200	14.1%	50	3.5%	329	23.1%
Lenoir	CT 114, BG 3	1,717	416	24.2%	106	6.2%	294	17.1%
n/a	Total for demographic study area	20,474	3,488	17.0%	1,380	6.7%	2,809	13.7%
n/a	Craven County	100,560	15,664	15.6%	7,163	7.1%	10,071	10.0%



County	Census Tract, Block Group	Total Population for Whom Poverty Status is Determined	Below Poverty Level (#)	Below Poverty Level (%)	Very Poor: Under 50% of Poverty Level (#)	Very Poor: Under 50% of Poverty Level (%)	Near Poor: Between 100% and 149% of Poverty Level (#)	Near Poor: Between 100% and 149% of Poverty Level (%)
n/a	Jones County	10,116	2,173	21.5%	990	9.8%	1,296	12.8%
n/a	Lenoir County	57,746	13,401	23.2%	5,385	9.3%	9,384	16.3%
n/a	North Carolina	9,592,619	1,667,465	17.4%	725,635	7.6%	1,049,151	10.9%

 - Above EJ threshold

In order to identify the presence of EJ populations at a more granular level, data on minority populations at the block level from the 2010 Decennial Census were evaluated using the same thresholds used for the block group analysis (43.4 percent for Craven County, 48 percent for Jones County, and 50 percent for Lenoir County). In addition, locations of EJ populations from observations, information provided by local officials, and EJ residential areas identified with the US Environmental Protection Agency's (USEPA) EJ Screening and Mapping Tool have also been included. As a result of block level analysis and field visits, the following locations of potential EJ populations within the DCIA have been identified and are also shown on Figure 3-2 and Figure 3-3.

- **Norbert Hill Road:** The Norbert Hill Road residential area, located on Norbert Hill Road between US 70 and Gregg Drive, contains low-income populations.
- **Foss Farm Road** (census tract 110.01, block group 2): The Foss Farm Road residential area, located on US 70 between Barwick Station Road and Albert Sugg Road, contains concentrations of minority and low-income populations.
- **Crooms Drive:** The Crooms Drive residential area, located on Crooms Drive off of NC 55, contains low-income populations.
- **Jesse T. Bryan Road:** The Jesse T. Bryan Road residential area, located off of Jesse T. Bryan Road and Barwick Road, contains low-income populations.
- **Carrie Hill Drive and Howard Place Drive:** The Carrie Hill Drive and Howard Place Drive residential area, located off of NC 11, contains low-income populations.
- **Lonesome Pine Drive:** The Lonesome Pine Drive residential area, located on Lonesome Pine Drive between Joe Nunn Road and Randy Road, contains low-income populations.
- **Albert Baker Road** (census tract 114, block group 3): The Albert Baker Road residential area, located on Albert Baker Road off of NC 58, contains concentrations of minority and low-income populations.
- **Fordham Lane** (census tract 113, block group 4): The Fordham Lane residential area, located on Fordham Lane off of US 258, contains a minority and low-income populations.
- **Johnson Road/NC 58** (census tract 113, block group 4): The Johnson Road/NC 58 residential area contains a minority population.
- **British Road and Caswell Station Road** (census 9203, block group 1 and census tract 114, block group 2): A minority residential area is located in the British Road and Caswell Station Road area, located on the north side of US 70 between British Road and Caswell Station Road.
- **US 70/Tilghman Road.** A cluster of housing that contains potential minority and low-income populations is located on the southern side of US 70 just west of its junction with Tilghman Road.

3.1.7.2 Limited English Proficiency

Limited English proficiency (LEP) individuals are defined by the US Census Bureau as speaking English less than very well. The US Department of Justice (USDOJ) LEP Safe Harbor policy (2002) requires that vital public involvement materials be translated if certain LEP population thresholds are surpassed. The thresholds set by NCDOT projects are 5 percent of the demographic study area or 1,000 individuals, whichever is less. If the thresholds are not met, but there is a notable LEP population, language assistance is required in the form of interpreters, local area contacts, and/or media campaigns. NCDOT defines a notable LEP population as being greater than 50 persons within a block group who speak English less than very well.

According to the US Census Bureau, 485 Spanish-speaking adults speak English less than very well in the demographic study area (3 percent of the total population). This total does not meet the USDOJ Safe Harbor policy threshold of 1,000 persons or 5 percent of the demographic study area. However, census data indicate a Spanish-speaking population exceeding 50 persons within the demographic study area that may require language assistance. Three block groups surpass the threshold for EJ LEP:

- Census tract 9603, block group 4 (Craven County)
- Census tract 113, block group 2 (Lenoir County)
- Census tract 113, block group 3 (Lenoir County)

To date, in order to satisfy the requirements of Executive Order 13166, Spanish interpreters have been available at public meetings and key project information has been translated into Spanish. The *Public Involvement Plan* for this project provides a summary of all language assistance actions that have taken place to date (NCDOT 2018h). The language assistance in Spanish for public involvement activities related to the proposed action will continue.

3.1.8 Community Facilities and Resources

Community facilities within the project study area include cemeteries, civic buildings, schools, churches, and an emergency services center. These facilities are important to the cultural, spiritual, health, and educational needs, and the overall quality of life for residents of Lenoir, Craven, and Jones counties. An overview map of the community features within the project study area is shown on Figure 3-4 and Figure 3-5.

The 2018 CIA identified 9 cemeteries and 21 churches within the DCIA (NCDOT 2018d). Three schools are located in the project study area, Southwood Elementary, Lenoir County Early College, and Woodington Middle School. The Woodmen of the World Lodge is located on US 70 at Whaley Road. The Kennedy Memorial Home, on Kennedy Home Road, is run by the Kinston Area Family Services branch of the organization Baptist Children's Homes. The towns of Dover and Cove City each have three churches, fire departments, and small stores. Cove City has a public library.

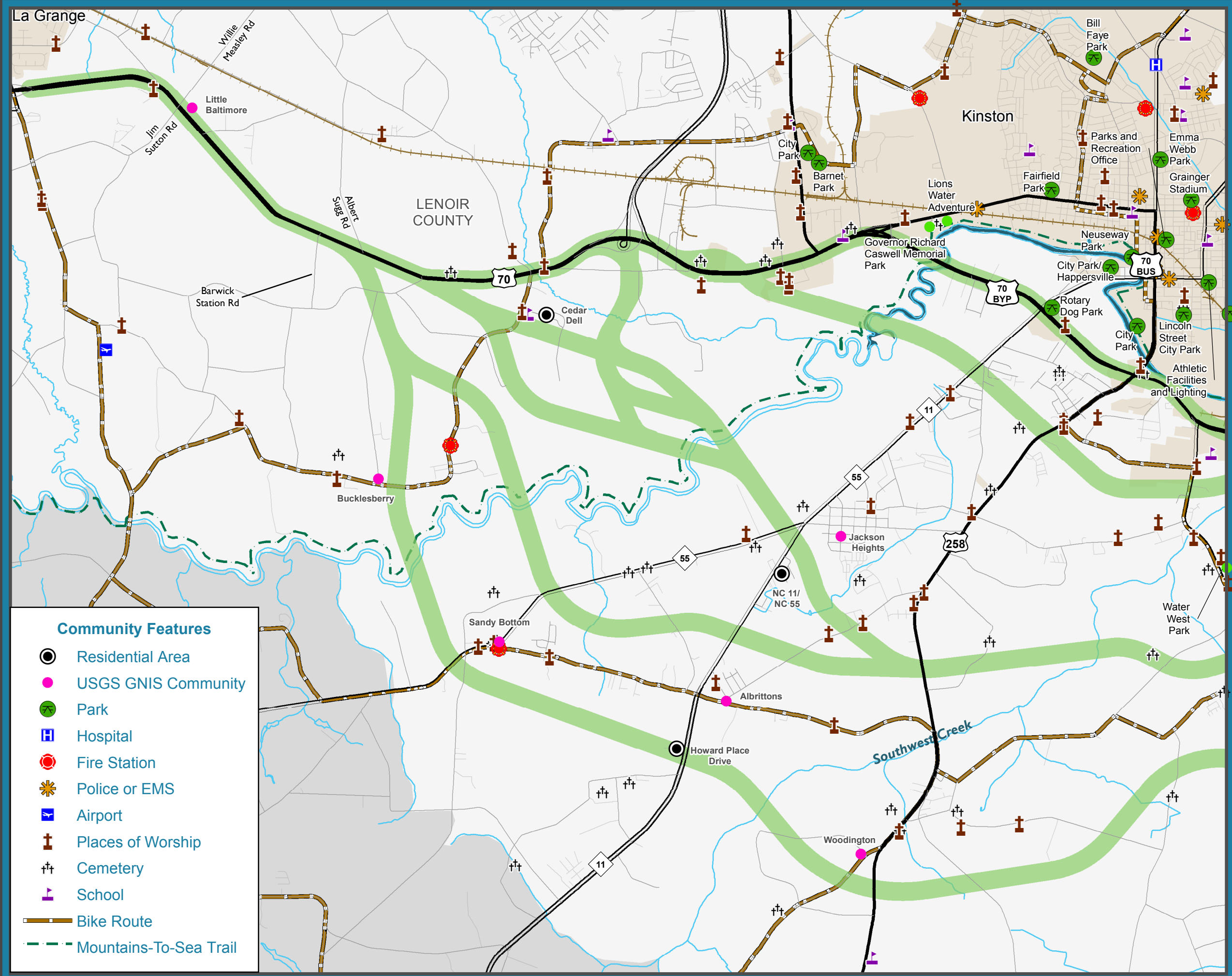
Figure 3-4:
Community features - A

Legend

- Detailed Study Alternatives
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary



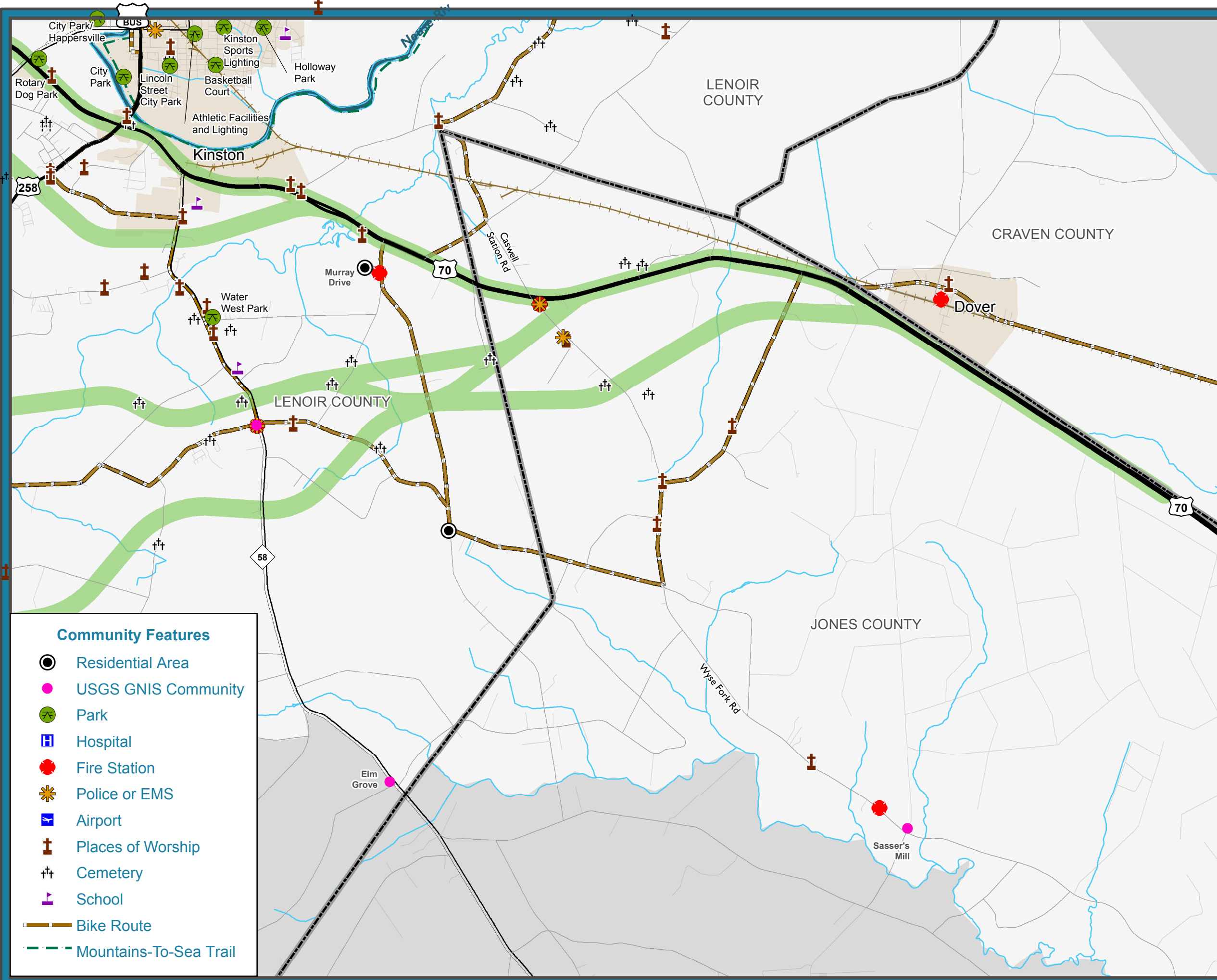
This map is for reference only.
Sources: AECOM, CGIA, City of Kinston, Craven County, ESRI, HPO, Jones County, Lenoir County, NCDOT, NCEM, NCONemap, NRCS, USFWS



Community Features

- Residential Area
- USGS GNIS Community
- Park
- Hospital
- Fire Station
- Police or EMS
- Airport
- Places of Worship
- Cemetery
- School
- Bike Route
- Mountains-To-Sea Trail

Figure 3-5:
Community features - B



Legend

- Detailed Study Alternatives
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary

Community Features

- Residential Area
- USGS GNIS Community
- Park
- Hospital
- Fire Station
- Police or EMS
- Airport
- Places of Worship
- Cemetery
- School
- Bike Route
- Mountains-To-Sea Trail



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





3.2 RECREATION AREAS

3.2.1 Bicycle and Pedestrian

Bicyclists are most likely to be found along the six bicycle routes that have been designated by NCDOT and mapped in the CTP in Lenoir County (Figure 3-4 and Figure 3-5), although no roads have dedicated bicycle lanes or wide paved shoulders. The Mountains-to-Sea Trail, a trail that runs through North Carolina from the Great Smoky Mountains to the Outer Banks, passes through the DCIA. This trail is a part of the North Carolina State Trails Program.

The route names and descriptions for the designated bicycle routes are:

- **County Loop.** A 59-mile route that circles Lenoir County and the four spoke routes, along the Mountains-to-Sea Trail to the west and south, Cobb, Neuse, and Faulkner roads to the east, and Cameron Langston, Taylor Heath, and Institute roads to the north.
- **Loftin’s Spoke.** An 8-mile route from downtown Kinston to Loftin’s Crossroads along US 258, Collier-Loftin Road, and NC 58.
- **Garden Spot Spoke.** A 16-mile route from Kinston northwest to Institute along Carey, Rouse, Shackelford, Poole, and Institute roads.
- **Connector Spoke.** An 11-mile connector route running between the County Loop and the town of Pink Hill in the south of Lenoir County. This route is primarily outside of the project study area.
- **Oak Tree Spoke.** A 15-mile route from Kinston northeast to Grifton along Heritage, Briery Run, Wallace Family, Cameron Langston, Sharon Church, and Grifton Hugo roads.
- **Tractor Spoke.** A 29-mile route from Kinston southwest to Pink Hill along Banks School, Kennedy Home, Pine Bush, Hardy Bridge, Smith Grady, and Old Pink Hill roads.

3.2.2 Parks and Recreation

The Kinston/Lenoir County Parks and Recreation Department maintains multiple park and recreation facilities. Within the DCIA, the Kinston Rotary Dog Park is located on NC 11/55 just north of US 70 (West New Bern Road) south of downtown Kinston, and the Governor Richard Caswell Memorial Park is located at 2612 West Vernon Avenue in Kinston just east of the US 70 Bypass split.

In addition to county parks, several neighborhood parks, community centers, a golf course, and tennis courts are located throughout the project study area. The Woodmen of the World Lodge on US 70 at Whaley Road and West Water Park on Strawberry Branch Road in Kinston are private recreational resources in the project study area.

There are no parks in the Craven or Jones counties portions of the DCIA. No Section 6(f) resources are located within the project study area.

Several historic areas associated with Civil War battles, including the First Battle of Kinston and the Wyse Fork Battlefield, are located near the existing US 70 corridor. The First Battle of Kinston is comprised of four archaeological sites. The Wyse Fork Battlefield historical area covers approximately 4,069 acres southeast of Kinston and is crossed by existing US 70. This

area includes several important historical sites associated with the 1865 Battle of Wyse Fork and is listed on the NRHP. The Blue-Gray Parkway, a designated scenic byway for its historical significance relating to the Civil War, runs south of the project study area.

3.3 LAND USE AND TRANSPORTATION

3.3.1 Existing Land Use

Land use within the project study area is primarily agricultural, with some commercial and industrial areas mixed with scattered rural single-family residential. The dominant natural features are the Neuse River and its associated floodplains and wetland system.

3.3.2 Land Use Plans and Zoning

Portions of the project study area are within the planning jurisdictions of Lenoir County, the Town of La Grange, City of Kinston, Jones County, and Craven County (Figure 3-6). These local governments have adopted land use plans, Coastal Area Management Act (CAMA) Land use plans, and comprehensive plans that set forth policies to guide land use in their respective jurisdictions.

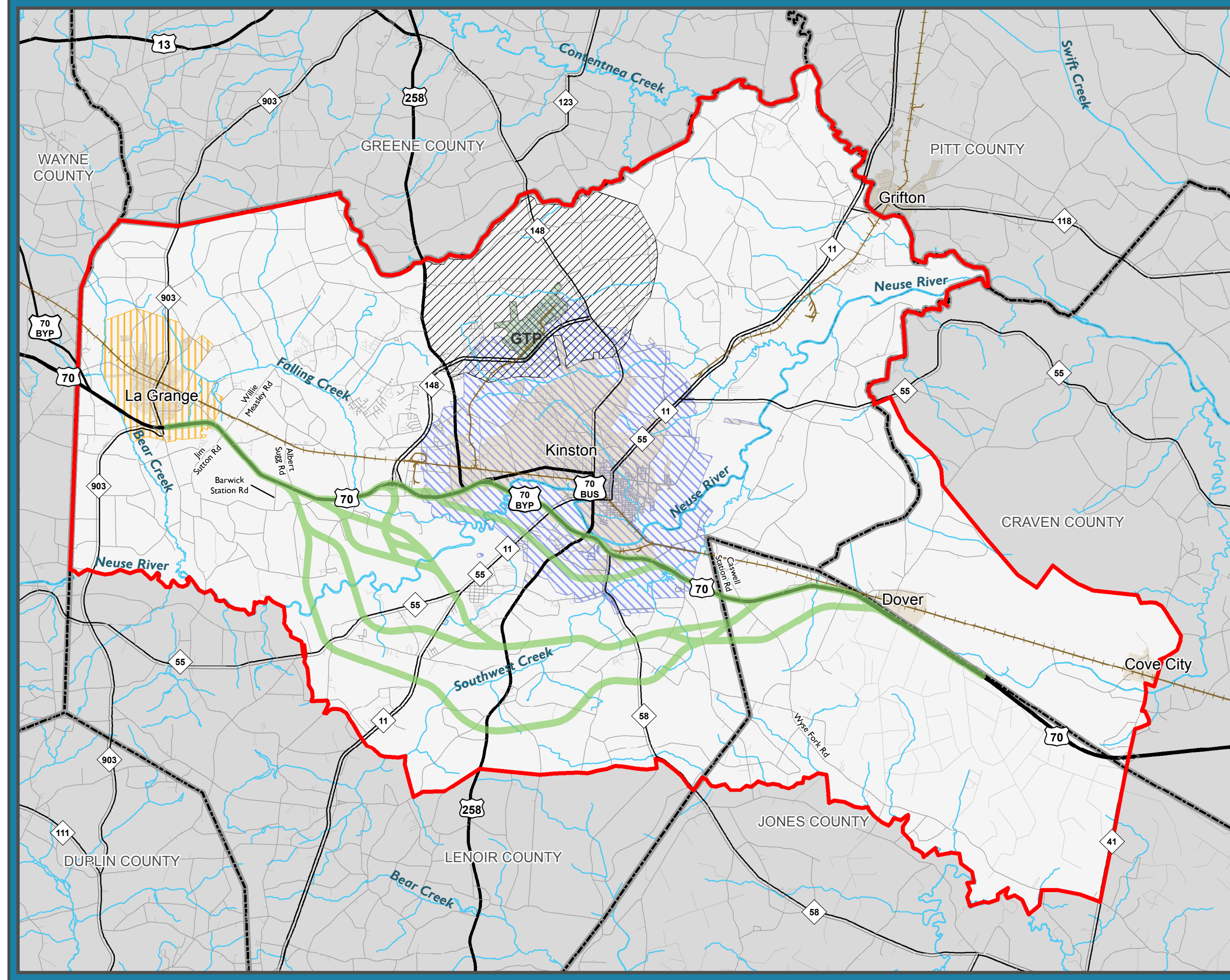
3.3.2.1 Lenoir County

The Lenoir County *Land Use Plan* was adopted in 2001 and applies to areas of the project study area that are in Lenoir County and outside municipal limits (Lenoir County 2001). The goals of the county's plan were developed around four points: economic development and job creation, farming and rural landscape, safe and efficient transportation, and quality residential communities. The *Land Use Plan* references the plans for the Kinston Bypass project.

The Lenoir County *Flood Damage Prevention Ordinance* is intended to minimize both public and private losses due to flood conditions (Lenoir County 2003a). The ordinance includes standards for development in the floodway or floodplain. Major provisions of the ordinance include the following:

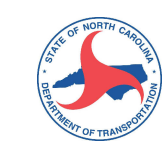
- Restrict or prohibit uses that are dangerous to health, safety, and property due to water or erosion hazards, or that result in damaging increases in erosion or floor heights or velocities.
- Require that uses vulnerable to floods, including facilities that serve such uses, be protected against flood damage at the time of initial construction.
- Regulate through a floodplain development permit the alteration of natural floodplains, stream channels, and natural protective barriers that accommodate flood waters.
- Control filling, grading, dredging, and other development that may increase erosion or flood damage.
- Prevent or regulate the construction of flood barriers that will unnaturally divert flood waters or that may increase flood hazards to other lands.

Figure 3-6:
Planning jurisdictions



Legend

- Project Study Area
- Detailed Study Alternatives
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Global TransPark (GTP)
- Municipal Boundary
- County Boundary
- GTP Planning Jurisdiction
- Kinston ETJ
- La Grange ETJ



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



The Lenoir County *Watershed Protection Ordinance* applies to a portion of the southwest area of the project study area (Lenoir County 2003b). It establishes density and intensity standards for residential and nonresidential development within the WS IV-CA (critical areas) and WS IV-PA (protected areas) of the watershed.

The Lenoir County *Zoning Ordinance* applies to areas of the project study area that are in Lenoir County and outside municipal limits (Lenoir County 2003c). The zoning ordinance contains three zoning districts: rural, commercial, and industrial. The zoning district standards apply to sites within the district and require minimum standards for the buildings, setbacks, driveways, and permitted and special uses. The county has separate ordinances, including flood damage and prevention ordinance, subdivision ordinance, watershed protection ordinance, and several others that regulate nuisance activities.

Lenoir County adopted the Voluntary Agricultural District (VAD) Ordinance in 2013 (Lenoir County 2013). The Lenoir County Voluntary Agricultural District Board governs the VAD Ordinance. There is one VAD, comprised of two properties, (PIN) 450200425447 and 450200523932, which is located in the portion of the DCIA in Lenoir County.

3.3.2.2 City of Kinston

In October 2015, Kinston adopted *Plan Kinston: Enhancing Perceptions, Promoting Growth, and Moving Forward*, as its comprehensive plan, which is used as the legal basis for land use regulations as well as a guide for city budgeting (City of Kinston 2015). The future land use map provided in the document defines much of the land adjacent to major highways in the project study area as mixed use. Other prominent land uses in the corridor are rural-residential and industrial.

The map also illustrates where in Kinston's city limits an extraterritorial jurisdiction (ETJ) is considered a flood hazard or wetland; much of the land surrounding US 70 receives this classification. This overlay is not considered a future land use category but displays potential environmental constraints to development in certain areas. The plan calls for stringent development standards, potential wetland mitigation, and compliance with the Lenoir County *Flood Damage Prevention Ordinance* in flood hazard and wetland areas.

Kinston also uses the *Unified Development Ordinance* as a basis for land development (City of Kinston 2017a). This ordinance applies to areas within the municipal limits of Kinston and within Kinston's ETJ. The zoning section has three broad categories of land uses: residential, commercial, and industrial. Each category has several subcategories of land uses. The objectives of the zoning ordinance are to guide appropriate use and development of parcels in a manner in which land uses would be compatible to neighboring parcels, topographic features, natural habitat, and infrastructure. The City of Kinston *Unified Development Ordinance* was adopted in November 2013 and updated in November 2017.

New development activities in the City of Kinston are required to meet nutrient reduction goals by implementing planning strategies and best management practices per the Neuse River Basin-Nutrient Sensitive Waters Management Strategy: Basinwide Stormwater Requirements (15A NCAC 02B .0235). Development activities cannot exceed certain nitrogen load loading rates. Secondly, there can be no net increase in peak flow leaving a development site compared to pre-development conditions for the 2-year, 24-hour storm event. Lastly, a 50-foot riparian buffer



must be maintained on all sides of intermittent and perennial streams, ponds, lakes, and estuaries in the Neuse River basin. The City of Kinston has implemented a stormwater permitting program for areas in its municipal jurisdiction for compliance with the Neuse River Basin-Nutrient Sensitive Waters Management Strategy: Basinwide Stormwater Requirements.

3.3.2.3 Town of La Grange

La Grange adopted its *Zoning Ordinance* in 2010 and it applies to land within the municipal boundary of La Grange and its ETJ. The majority of the land along existing US 70 is zoned Agriculture-Residential and Highway Commercial. The purpose of the Agriculture-Residential zone is to promote the rural character of the land and to provide open space. The purpose of the Highway Commercial zone is to cluster and encourage commercial and larger scale development that is intended to cater to vehicular traffic along the corridor (Town of La Grange 2010).

La Grange adopted its *Land Use Plan* in 2008 and it applies to land within the municipal boundary of La Grange and within its ETJ. The plan establishes the policies for regulating land use within the town. The *Land Use Plan* complements the *La Grange Zoning Ordinance*. The area around Willie Measley Road is projected to support heavy industrial use in the future (Town of La Grange 2008).

3.3.2.4 Craven County

Craven County does not implement county-wide zoning. Separate ordinances regulate subdivisions, manufactured home parks, flood damage prevention, off-premise signs, and on-site septic systems. Craven County also enacted ordinances that address encroachment issues at the Marine Corps Air Station Cherry Point and the Coastal Carolina Regional Airport. Craven County adopted a CAMA *Core Land Use Plan* in 2009 that establishes land use policies to guide development in the CAMA major and minor permitting process. Policies also address the need to guide development along the US 70 Corridor by enacting a corridor zoning ordinance (Craven County 2009).

Craven County, the Town of Dover, and Cove City are subject to the stormwater management requirements for development in coastal counties under the State Stormwater Guidelines (15A NCAC 02H .1005) and the 20 Coastal Counties Stormwater Law (15A NCAC 02H .1019). In Craven County, including the Town of Dover and Cove City, development activities are reviewed for compliance with the State Stormwater Program by the NCDWR Regional Office in Washington.

Craven County adopted the VAD Ordinance in January 2009. The Craven County Agricultural Advisory Board administers the VADs. There are no VADs in the portion of the DCIA in Craven County.

3.3.2.5 Jones County

The *Jones County Land Use Plan* was adopted on July 1, 2013, and establishes goals for the County's future land use, and implementation strategies for achieving the goals. Goals identified in the *Jones County Land Use Plan* are centered on future land use, agricultural preservation, transportation, environmental resources, and economic development. The plan references the 2009-2015 STIP; therefore, the Kinston Bypass project is not identified as a planned



transportation improvement project since the project was put on hold during this time (Jones County 2013).

Jones County does not implement county-wide zoning. The county does have a subdivision ordinance and a building code.

Jones County adopted the VAD Ordinance in 2007. The Jones County Voluntary Agricultural District Board governs the VAD Ordinance. There are no VADs in the portion of the DCIA in Jones County.

3.3.2.6 Resilient Redevelopment Plans

After flooding from Hurricane Matthew affected North Carolina in October 2016, the North Carolina General Assembly established the Resilient Redevelopment Program initiative as part of the 2016 Disaster Recovery Act (Session Law 2016-124). The plans for Lenoir, Craven, and Jones counties were completed in May 2017 and identify storm impacts, needs and opportunities, and strategies for rebuilding more resilient communities (Craven County 2017a; Jones County 2017; Lenoir County 2017a). The plans formulate revitalization projects for housing, infrastructure, economic development, and the environment for communities damaged by Hurricane Matthew. The plans address recovery and redevelopment projects and prioritize those for any supplemental disaster relief funding received from the federal government. Lenoir County’s plan includes five top ranked projects that focus on housing improvements, are county-wide, and are not site specific. Jones County’s plan includes five top ranked projects that focus on acquisition of flood-prone properties and residential dwellings. Craven County’s plan prioritizes three infrastructure projects for roadway, rail and emergency shelter retrofits, and two housing projects to elevate residential units that are outside of the project study area.

3.3.2.7 Floodplain Resolution

The City of Kinston, Town of La Grange, Lenoir County, and US 70 Corridor Commission presented a “Resolution Requesting Greater Efforts to Avoid Flooding Impacts within the Lower Neuse Basin” (Craven County 2017b). The resolution cites the damage caused by Hurricane Matthew and requests the State of North Carolina and appropriate federal agencies “engage, develop and financially support greater efforts to avoid devastating damages to persons and property in the Lower Neuse Basin through the implementation of flood control measures.” The resolution also requests that specific consideration be given to, among other issues, additional mitigation by NCDOT to address stormwater impacts from highway construction.

3.3.3 Transportation Planning

3.3.3.1 Local and Regional Plans

3.3.3.1.1 Lenoir County Comprehensive Transportation Plan

The Lenoir County CTP was developed by Lenoir County, Kinston, La Grange, Pink Hill, the Eastern Carolina Rural Planning Organization, and NCDOT in September 2018 (NCDOT 2018a). The CTP is a long range multi-modal transportation plan that covers the needs of Lenoir County through 2045. The plan addresses highway, rail, bicycle, and pedestrian improvements, as well as public transportation. The plan references the Kinston Bypass.

3.3.3.1.2 City of Kinston Comprehensive Pedestrian Plan

Kinston completed a *Comprehensive Pedestrian Plan* in February 2008 (City of Kinston 2008). Through a survey that was conducted as part of the planning study, citizens identified several factors that make walking in Kinston difficult or unpleasant, including the lack of sidewalks, poor lighting, and hazardous conditions. The *Comprehensive Pedestrian Plan* identifies and prioritizes 63 projects that will help alleviate these conditions. The most notable projects include constructing a pedestrian bridge over the Neuse River, implementing pedestrian safety measures throughout the community, creating a greenway master plan, and developing a safe route to school program. The plan also identifies pedestrian program recommendations as priority programs to be implemented. Programs include Safe Routes to School program, spot program to address problems at specific locations, sidewalk maintenance program, greenway master plan, annual safety roadshow, and pedestrian and motorist education and enforcement activities. The plan includes figures identifying the recommended and potential Safe Route to School zones, sidewalks, and greenways.

3.3.3.1.3 Jones County Comprehensive Transportation Plan

The 2016 Jones County CTP includes the Kinston Bypass and the need to upgrade US 70 to freeway standards in Jones County (NCDOT 2016a). The Jones County CTP is a cooperative effort among representatives of Jones County; the municipalities of Trenton, Maysville, and Pollocksville; the Eastern Carolina Rural Planning Organization; and the NCDOT.

3.3.3.1.4 Craven County Comprehensive Transportation Plan

A CTP is underway for Craven County and a document that describes what the CTP will address was published on November 8, 2017 (NCDOT 2017a). This CTP will aid in determining the transportation needs based on local vision, expected future population and employment growth, and locally adopted plans for Craven County.

3.3.3.2 Statewide Plans

The Strategic Transportation Investments (STI) law, passed in 2013, allows NCDOT to use its funding more efficiently and encourages thinking from a statewide and regional perspective while also working to meet local needs. STI established the Strategic Mobility Formula, which uses data-driven scoring and local input to prioritize projects and develop NCDOT's STIP. Projects in the STIP were determined based on strategic prioritization at the statewide, regional, and division levels, as well as public feedback and other factors. The Kinston Bypass is included as project number R-2553 in NCDOT's 2018-2027 STIP (NCDOT 2017h). STIP projects in and around the proposed action are listed in Table 3-9. The general locations of the STIP projects are shown on Figure 3-7.

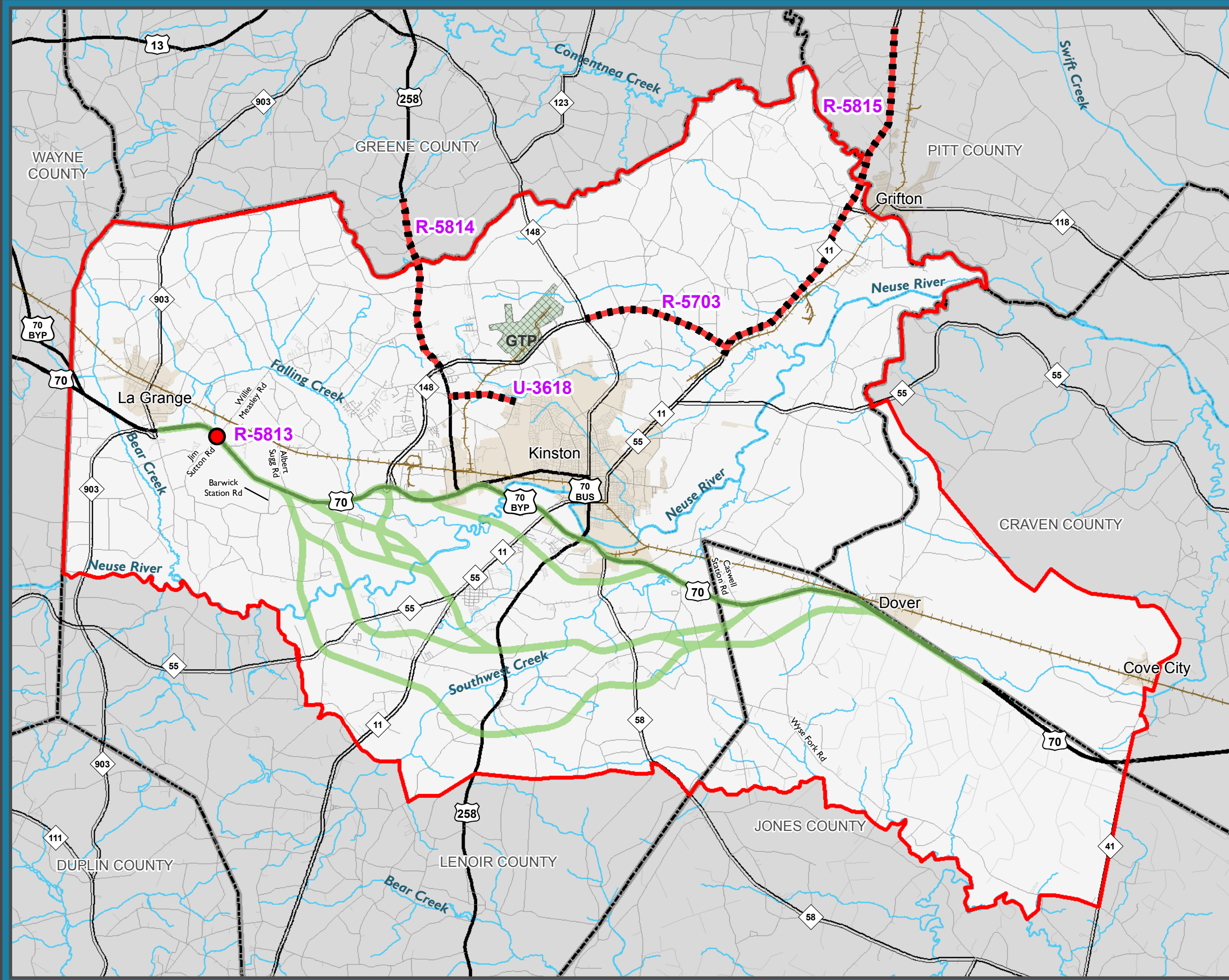


Table 3-9: Other STIP projects in the vicinity of the project study area

STIP No.	Type	Description	Schedule – Fiscal Year
R-5703	Regional	NC 148, NC 58 To NC 11. Construct multi-lane facility on New Location.	Construction – 2018
R-5813	Division	US 70, SR 1227 (Jim Sutton Road)/SR 1252 (Willie Measley Road)	Right-of-way –2023 Construction – 2025
R-5814	Division	SR 1101 (Browntown Road) to SR 2010 (C. F. Harvey Parkway). Widen to multi-lanes.	Right-of-way –2023 Construction – 2025
R-5815	Division	Proposed Greenville Southwest Bypass to Proposed Harvey Parkway Extension. Upgrade to interstate standards	Right-of-way – 2025 Construction – 2027
U-3618	Division	SR 1572 (Rouse Road) To US 258. Construct multi-lanes on new location.	Right-of-way – 2022 Construction – 2024

Source: NCDOT 2017h

Figure 3-7:
STIP projects in the vicinity of
the project study area



- Legend**
- Project Study Area
 - Detailed Study Alternative
 - Railroad
 - US Highway
 - NC Highway
 - Secondary Road
 - Global TransPark (GTP)
 - Municipal Boundary
 - County Boundary
 - STIP Project
 - STIP Project



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



3.4 CULTURAL RESOURCES

3.4.1 Historic Architectural Resources

In compliance with the requirements of Section 106 of the National Historic Preservation Act and the implementing regulations of 36 CFR 800, AECOM conducted a two-phase inventory and assessment of potential historic architectural resources within the Kinston Bypass project’s area of potential effects (APE). The APE is defined as the geographic area or areas within which a project may cause changes to the character or use of historic properties. The first phase was completed in May 2017 and the second phase, which resulted in a *Historic Architecture Eligibility Evaluation Report* (Historic Report) (NCDOT 2017d), was completed in September 2017. The Historic Report is available on the Kinston Bypass project website. Following review of the Historic Report and consultation among NCDOT, the North Carolina State Historic Preservation Office, and the USACE, it was determined that 15 historic properties within the APE were NRHP-listed, NRHP-eligible, or contributing components within an NRHP-listed historic district (NCDOT 2017c). The identity and NRHP status of these resources is summarized in Table 3-10. The location of the properties is depicted on Figure 3-8.

**Historic Architecture Eligibility
Evaluation Report**

The Historic Report for the Kinston Bypass can be found on the project website.
<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

Table 3-10: NRHP listed and eligible historic architectural resources

HPO Site #	Property Name	NRHP Status (Year)	NRHP Criteria ^a	Map ID # ^b
JN-0306	Wyse Fork Battlefield	Listed (2017)	A, D	15
LR-1203	Kelly’s Millpond Site	Determined eligible (1990), listed as contributing building to Wyse Fork Battlefield (2017)	D, Contributing	13
LR-1197	Cobb-King-Humphrey House	Listed as contributing building to Wyse Fork Battlefield (2017), determined individually eligible (2017)	A, C, Contributing	12
LR-1550	Kelly’s Pond Fire Lookout Tower	Determined eligible (2017)	A, C	14
LR-1185	Wooten-Whaley House (John Council Wooten House)	Listed as contributing property to Wyse Fork Battlefield (2017)	Contributing	8



HPO Site #	Property Name	NRHP Status (Year)	NRHP Criteria ^a	Map ID # ^b
LR-1186	Robert Bond Vause House	Listed as contributing property to Wyse Fork Battlefield (2017)	Contributing	9
LR-0008	Dempsey Wood House	Listed (1971)	C	3
LR-1040	Croom Meeting House	Determined eligible (2017)	A, C	7
LR-0927	James A. & Laura McDaniel House (“Maxwood”)	Determined eligible (1998)	C	6
LR-1189	Kennedy Memorial Home Historic District	Listed (2009)	A	10
LR-0001	Cedar Dell (Kennedy Memorial Home)	Listed (1971)	C	1
LR-0703	Dr. James M. Parrott House (“The Grove”)	Determined eligible (1998)	B, C	5
LR-0700	Henry Loftin Herring Farm	Determined eligible (1998)	A, C	4
LR-0005	Jesse Jackson House	Listed (1971)	C	2
LR-1195	Elijah Loftin Farm (Mossy Oaks)	Determined eligible (2017)	C	11

Source: NCDOT 2017c

HPO: Historic Preservation Office

^a NRHP criteria are as follows:

- A.** That are associated with events that have made a significant contribution to the broad patterns of our history.
- B.** That are associated with the lives of significant persons in our past.
- C.** That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.
- D.** That have yielded or may be likely to yield, information important in history or prehistory.

^b Map ID # refers to Figure 3-8.

Figure 3-8:
Historic architectural resources

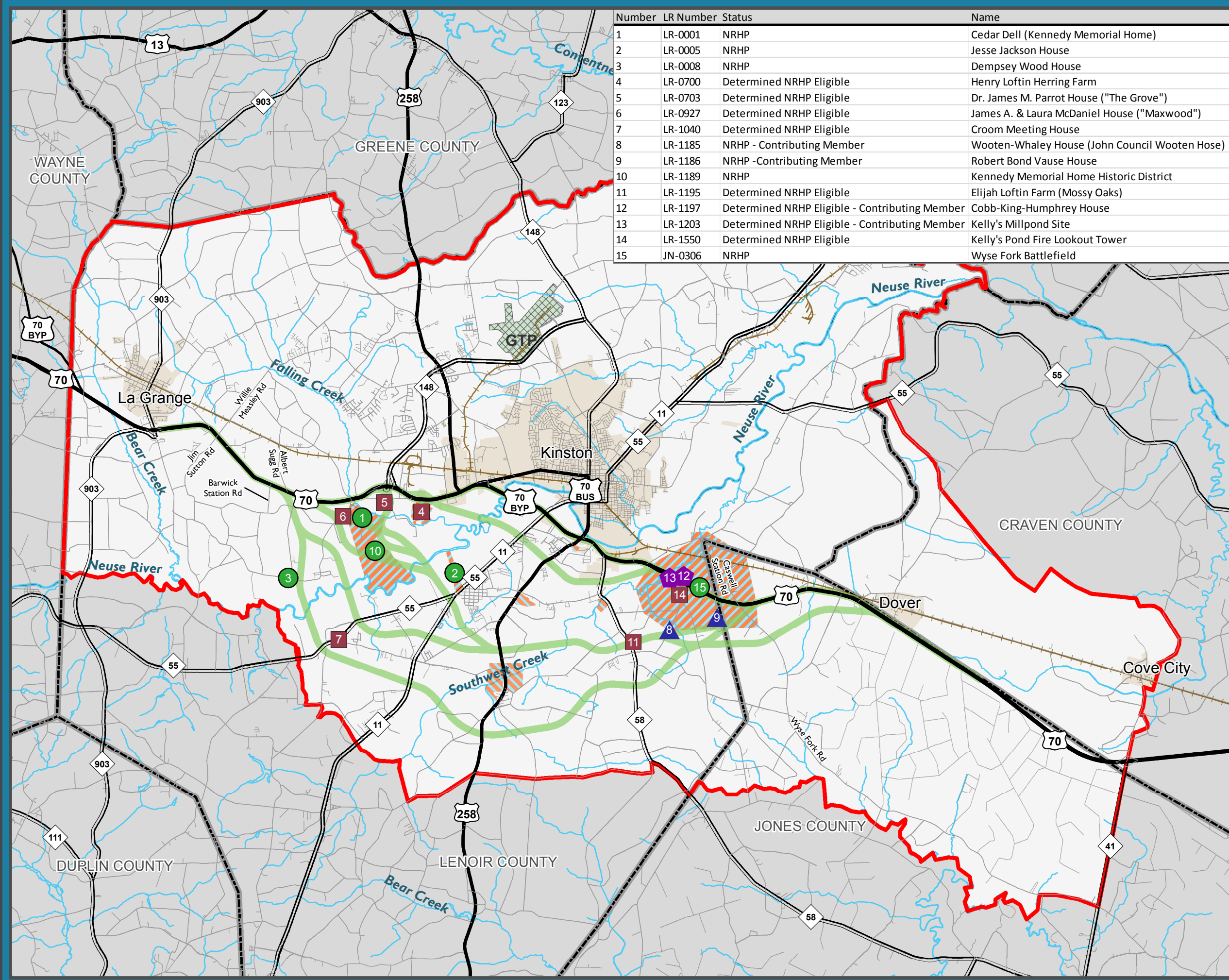
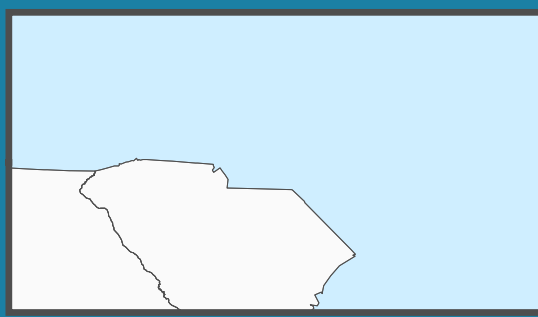
Number	LR Number	Status	Name
1	LR-0001	NRHP	Cedar Dell (Kennedy Memorial Home)
2	LR-0005	NRHP	Jesse Jackson House
3	LR-0008	NRHP	Dempsey Wood House
4	LR-0700	Determined NRHP Eligible	Henry Loftin Herring Farm
5	LR-0703	Determined NRHP Eligible	Dr. James M. Parrot House ("The Grove")
6	LR-0927	Determined NRHP Eligible	James A. & Laura McDaniel House ("Maxwood")
7	LR-1040	Determined NRHP Eligible	Croom Meeting House
8	LR-1185	NRHP - Contributing Member	Wooten-Whaley House (John Council Wooten Hose)
9	LR-1186	NRHP - Contributing Member	Robert Bond Vause House
10	LR-1189	NRHP	Kennedy Memorial Home Historic District
11	LR-1195	Determined NRHP Eligible	Elijah Loftin Farm (Mossy Oaks)
12	LR-1197	Determined NRHP Eligible - Contributing Member	Cobb-King-Humphrey House
13	LR-1203	Determined NRHP Eligible - Contributing Member	Kelly's Millpond Site
14	LR-1550	Determined NRHP Eligible	Kelly's Pond Fire Lookout Tower
15	JN-0306	NRHP	Wyse Fork Battlefield

Legend

- Project Study Area
 - Detailed Study Alternatives
 - Railroad
 - US Highway
 - NC Highway
 - Secondary Road
 - Global TransPark (GTP)
 - Municipal Boundary
 - County Boundary
- Eligible Resources
- NRHP Listed
 - Determined NRHP Eligible (DOE)
 - Contributing Resource to Wyse Fork Battlefield
 - Contributing Resource to Wyse Fork Battlefield and DOE
 - Historic Property Boundary
 - First Battle of Kinston Battlefield



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



3.4.2 Archaeological Resources

The methods and findings of the archaeological background investigations conducted for the Kinston Bypass project are reported in detail in the *Revised Terrestrial Archaeological Resources Predictive Model for the Administrative Action State Environmental Impact Statement, Kinston Bypass, Lenoir, Jones and Craven Counties, North Carolina; October 2017 Update* (Archaeological Report) (NCDOT 2017g). The Archaeological Report for the Kinston Bypass is available on the project website. A summary of the archaeological studies described in the report are presented in this section.

Archaeological Report

The Archaeological Report for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

Background research and analysis were used in conjunction with a descriptive predictive model to identify areas of high- and low-probability for containing archaeological sites. Variables used for the predictive model included soil drainage, proximity to water, topographic setting, proximity to historic roads, previously recorded Civil War historic resources, and disturbed/developed areas. In-river archaeological resources were not formally considered in the terrestrial model. Underwater archaeological studies will be conducted once the applicant's preferred alternative is selected to define specific river crossing locations (NCDOT 2017g).

The report determined that poorly drained soils are considered to have a low probability for the presence of archaeological sites and excessively drained soils have a high probability. Other high probability areas include the following:

- Areas within 100 meters (328 feet) on either side of permanent water
- Topographic features such as small rises in floodplains, bluff edge of uplands adjacent to the Neuse River, and the edge of pocosins/Carolina bays
- Areas within 100 meters (328 feet) of historic roads
- NRHP boundaries of Civil War-related resources (battlefields)

With the exception of Civil War sites, areas that have had activities associated with intense development will be classified as low-probability regardless of other variables.

Previously recorded Civil War historic sites include the First Battle of Kinston (December 1862) and the Battle of Wyse Fork (March 1865). Five areas where various battles took place during the First Battle of Kinston of 1862 have been determined. Sites 1, 2, and 4 are located within the project study area along US 258, Site 3 is located along NC 58, south of Will Baker Road, and Site 5 is located north of US 70, along Tower Hill Road. These locations were listed on the NRHP in 2006. Two more areas on either side of the Neuse River containing nineteenth century bridge pilings have also been included in the First Battle of Kinston resource; however, these were not listed on the NRHP with the other areas. In addition, a large area where the Battle of Wyse Fork of 1865 took place has been demarcated and was listed on the NRHP in July 2017 under criteria A and D (NCDOT 2017g). Through coordination with the North Carolina State Historic Preservation Office (HPO), archaeological field work will be conducted once the applicant's preferred alternative is selected as part of the HPO review and approval of the archaeological predictive model (see coordination letter dated June 22, 2009 in Appendix E).



3.5 VISUAL QUALITY AND AESTHETICS

The project study area is located in a rural area of the coastal plain of North Carolina. Topography within the project study area is relatively flat with elevations ranging from 14 to 30 feet above mean sea level. The dominant natural features within the project study area include the Neuse River and its associated floodplains and wetland systems.

The study area surrounding the existing US 70 Corridor is primarily comprised of highway commercial businesses, signage, and parking and lighting for those businesses. The area surrounding the new location DSAs is mostly an agricultural landscape that contains agricultural, forestry, open space, and rural residential land uses reflecting a long history of farming and forestry.

3.6 NATURAL RESOURCES

A GIS-based Natural Resources Technical Report (NRTR) was prepared for the Kinston Bypass (NCDOT 2017b). The NRTR for the Kinston Bypass is available on the project website. The NRTR study area extends 1 mile of the outside edge of each DSA corridor, and includes all areas between DSA corridors. The NRTR study area is approximately 211 square miles (135,146 acres).

Natural Resources Technical Report

The NRTR for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

Impact calculations and evaluations in both the NRTR and the DEIS are based on GIS data and are presented in chapter 4. Field verifications took place as part of the NRTR process and are described in the NRTR for each resource type (e.g. wetlands, streams, endangered species). Refer to the NRTR for details on specific methodologies used to perform analyses within the NRTR document.

3.6.1 Geology, Topography, Soils

The project study area lies in the Southeastern Plains and Middle Atlantic Coastal Plain physiographic regions of North Carolina and straddles the following North Carolina Level IV ecoregions: Southeastern Floodplains and Low Terraces, Carolina Flatwoods, and Rolling Coastal Plain (Griffith et al. 2002).

Southeastern Floodplains and Low Terraces are derived from Quaternary alluvial gravelly sand, sandy gravel, silt, and clay. Topography in these regions consists of major river floodplains and associated low terraces, low gradient streams with sandy and silty substrates, oxbow lakes, ponds, and swamps. The Carolina Flatwoods regions consist of Pleistocene and Pliocene marine sand, silt, and clay; Tertiary sand, silt, clay, and limestone; and some Cretaceous sand, silt, and clay. The topography is characterized by flat plains on lightly dissected marine terraces, swamps, low gradient streams with sandy and silty substrates, and Carolina bays. The Rolling Coastal Plain consists of Quaternary sand and clay decomposition residuum; middle and early Pleistocene marine sand, silt, and clay; Pliocene clay and sand; and saprolite and some Piedmont rock outcrops on side slopes. The topography typically consists of dissected irregular plains and smooth plains and broad interstream divides with gentle to steep side slopes dissected by



numerous small, low to moderate gradient sandy streams and major river floodplains and associated terraces (Griffith et al. 2002).

Elevations within the project study area range from 6 to 38 feet above mean sea level. The Neuse River flows through the project study area. The NRTR study area consists of portions of Lenoir, Jones, and Craven counties. The Lenoir County Soil Survey (USDA Natural Resources Conservation Service [NRCS] 2017c) identifies 38 soil types within the NRTR study area, the Jones County Soil Survey (USDA NRCS 2017b) identifies 20 soil types within the NRTR study area, and the Craven County Soil Survey (USDA NRCS 2017a) identifies 11 soil types within the NRTR study area. Appendix F contains a list of the soil types present within the NRTR study area.

3.6.2 Surface Water and Water Quality

3.6.2.1 Surface Water Characteristics

Water resources in the NRTR study area are part of the Neuse River basin and are contained within USGS hydrologic units 03020202, 03020203, and 03020204 and North Carolina Division of Water Resources (NCDWR) subbasins 03-04-05, 03-04-07, 03-04-08, and 03-04-11 (Figure 3-9). The NRTR study area includes 33 named streams and numerous unnamed tributaries to each of these named streams. The NRTR study area also includes one unnamed tributary to Mosley Creek, two unnamed tributaries to Jumping Run, and two unnamed tributaries to Rattlesnake Branch; however, these three named streams themselves do not flow within the project study area. Figure 3-10 shows the locations of these water resources. A list of the water resources and information on the classification of the water resources is located in Appendix F.

Hydrologic Unit Code

A sequence of numbers that identify a hydrologic feature like a river, river reach, lake, or watershed. The eight-digit hydrologic unit code identifies the region, subregion, basin, and subbasin of the hydrologic feature.

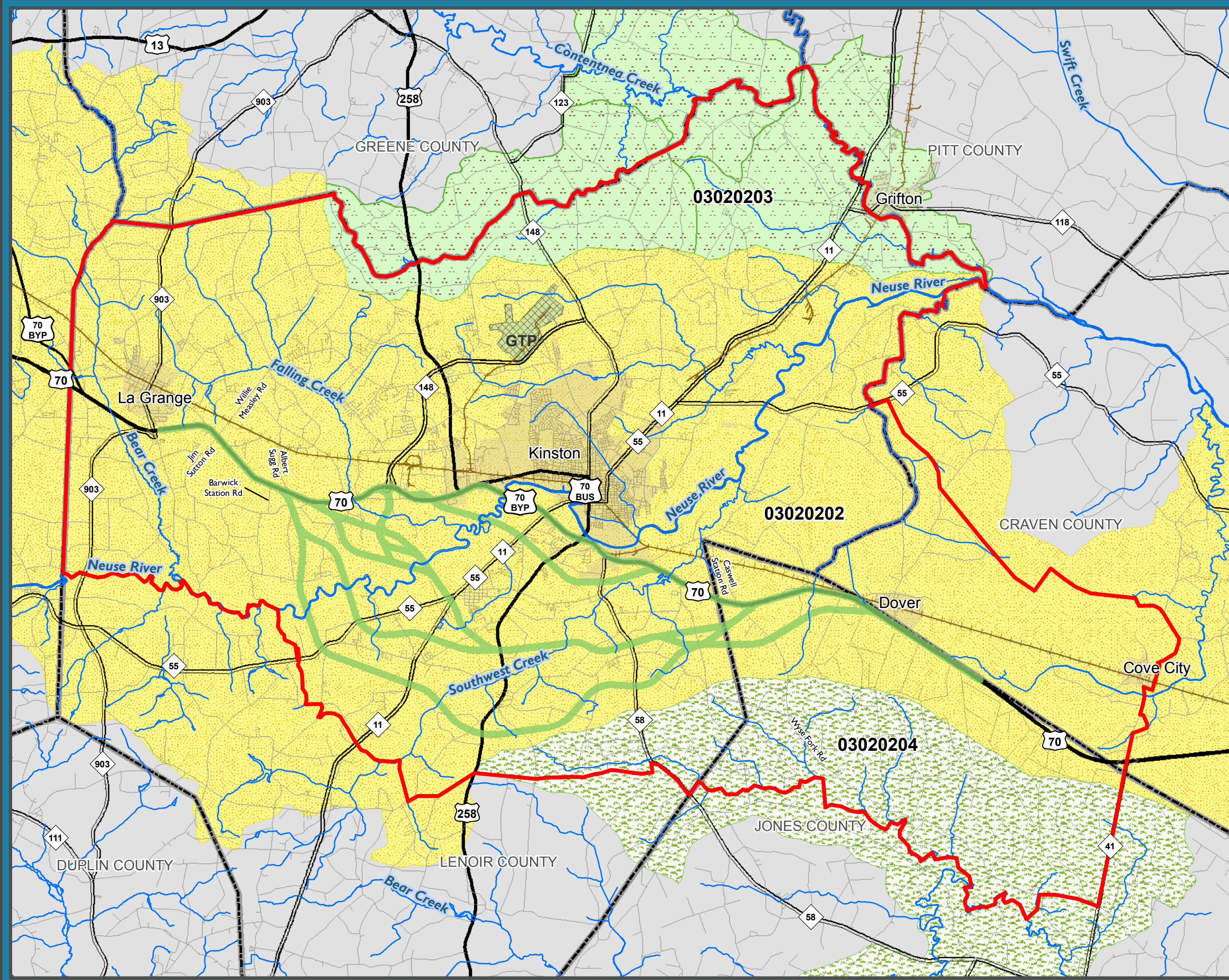
Subbasins

The North Carolina Division of Water Quality subdivides all river basins into subbasins. A river basin is the portion of land drained by a river and its tributaries. Each subbasin has its own characteristics.

3.6.2.2 Water Quality

North Carolina streams are assigned a best usage classification by the NCDWR, which reflects water quality conditions and potential resource use. Unnamed tributaries receive the same classification as the streams to which they flow. Appendix F contains the named water resources within the NRTR study area and the named water resources outside of the NRTR study area that have tributaries within the NRTR study area. The Best Usage Classification and Designation column in Appendix F, Table F-2 contains the assigned NCDWR best usage classification as well as other notable water designations. These include Class C Waters (C), Nutrient Sensitive Waters (NSW), Swamp Waters (Sw), Anadromous Fish Spawning Areas (AFSA), Inland Primary Nursery Areas (IPNA), and waters within a water supply watershed (WS-IV).

Figure 3-9:
Project study area
watersheds



Legend

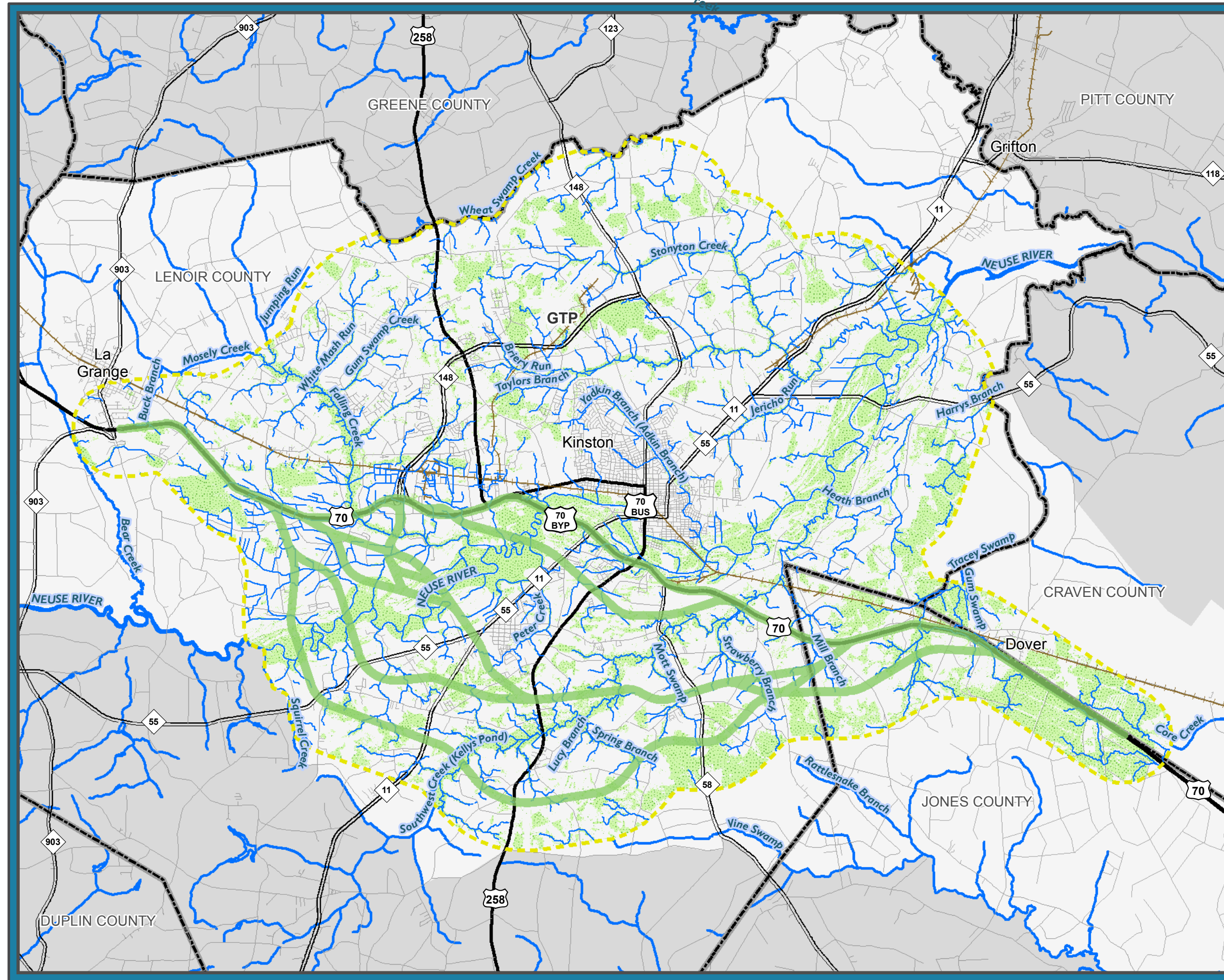
- Project Study Area
- Detailed Study Alternative
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Global TransPark (GTP)
- Municipal Boundary
- County Boundary
- USGS Hydrologic Unit
- 03020202
- 03020203
- 03020204



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



Figure 3-10:
Water resources



Legend

- NRTR Study Area
- Detailed Study Alternative
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Major Stream/River
- County Boundary
- NRTR Modeled Stream
- NRTR Modeled Wetland



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





Craven County is 1 of the 20 coastal counties covered by the CAMA, and shellfish growing area designations are reserved for waterbodies within the 20 coastal counties. Lenoir and Jones counties are not considered coastal counties and, therefore, are not considered for shellfish growing area designation (NCDEQ 2017c). In Craven County, the Trent River and a portion of the Neuse River on the boundary of the project study area are considered shellfish growing areas.

Appendix F also provides information on whether water resources within the NRTR study area are within a Federal Emergency Management Agency (FEMA) floodway. Floodplains and floodways are discussed further in section 3.7.

DWR Classifications

Class C: Waters protected for uses such as secondary recreation, fishing, wildlife, fish consumption, aquatic life, and agriculture. Secondary recreation includes uses involving human body contact with water.

Nutrient Sensitive Waters (NSW): Supplemental classification intended for waters needing additional nutrient management due to being subject to excessive growth of microscopic or macroscopic vegetation.

Swamp Waters (Sw): Supplemental classification intended to recognize those waters that have low velocities and other natural characteristics that are different from adjacent waters.

Water Supply IV (WS-IV): Waters used as sources of water supply for drinking, culinary, or food processing purposes where a WS-I, II, or III classification is not feasible. These waters are protected for Class C uses. Generally located in moderately to highly developed watersheds or protected areas.

In Lenoir County, land cover within the Neuse River basin is primarily agriculture and forest/wetland, with a small urbanized portion, specifically the City of Kinston. Streams within the project study area, the majority of which are occupied by NCDWR subbasin 03-04-05, have been affected by channelization and inadequate riparian buffers in agricultural areas. Many small tributaries in subbasin 03-04-05 flow through agricultural areas. In addition, there are a number of municipal/industrial and swine waste land application fields in the area. These land use practices along with the growing urban areas in this subbasin may be impacting the Neuse River near Goldsboro and Kinston (NCDENR 2009). However, no streams within the NRTR study area are on the North Carolina 2016 Final Section 303(d) list of impaired waters for sedimentation and turbidity (NCDEQ 2018c). Streams listed on the Section 303(d) list are in some way impaired and do not meet water quality standards identified by the state. By constructing roads in areas with streams listed as Section 303(d), it could potentially degrade the water body further. The NCDOT specifies that streams listed on the Section 303(d) list for sedimentation or turbidity institute stricter erosion control practices during construction.

Non-point source pollution refers to pollution that enters surface waters through stormwater or snowmelt runoff. Unlike point source pollution, non-point source pollution is diffuse in nature and occurs at random intervals depending on precipitation events. Major non-point sources of pollution within the project study area include agricultural runoff, municipal/industrial and swine waste land application fields, and growing urban areas within the City of Kinston.

Runoff from existing US 70, other roadways, and other impervious surfaces within the project study area is discharged to road shoulders, roadside ditches, and other unpaved surfaces. Roadway and impervious surface runoff can contain varying amounts of sediments, oils, grease,

and metals, all of which have the potential to degrade water quality. Common sources of such pollutants include vehicles, dust, and precipitation. Other sources include highway maintenance, accidental oil and gas spills, and losses from crashes.

3.6.3 Biotic Resources

3.6.3.1 Terrestrial Communities

Given the size of the NRTR study area, North Carolina's Coastal Change Analysis Program Regional Land Cover Data (C-CAP) were used to identify terrestrial communities in the NRTR study area (National Oceanic and Atmospheric Administration [NOAA] 2010). These community types were verified with aerial photography and USGS topographic mapping. Typically, terrestrial communities presented in an NRTR are classified based on species composition and topography. This approach differs from classifications presented within C-CAP data in that C-CAP data are based more on land cover type (residential or forested). For this reason, this approach results in a much larger number of classes than are typically identified in an NRTR. Table 3-11 provides a summary of each type of terrestrial community.

Sixteen C-CAP types were identified within the NRTR study area (Figure 3-11), which extends 1 mile from the outside edge of each DSA corridor and includes all areas between DSA corridors. These types were grouped into six terrestrial communities typical of those discussed in traditional NRTR documents, including one wetland type and open water. The C-CAP categories and their respective terrestrial community designations are shown in Table 3-11. The wetland type and open water were included so that their respective acreages could be accounted for.

3.6.3.2 Wildlife

Given the size of the NRTR study area, extensive field investigations did not take place during the development of the NRTR; therefore, data on wildlife are limited to field visits conducted during verification of model data, other brief field activities, and landowner accounts. A list of wildlife that could be expected to be present is also provided in Appendix F. Wildlife that were directly observed or determined to be present through evidence during field visits or landowner accounts are indicated with an asterisk (*) in Appendix F.

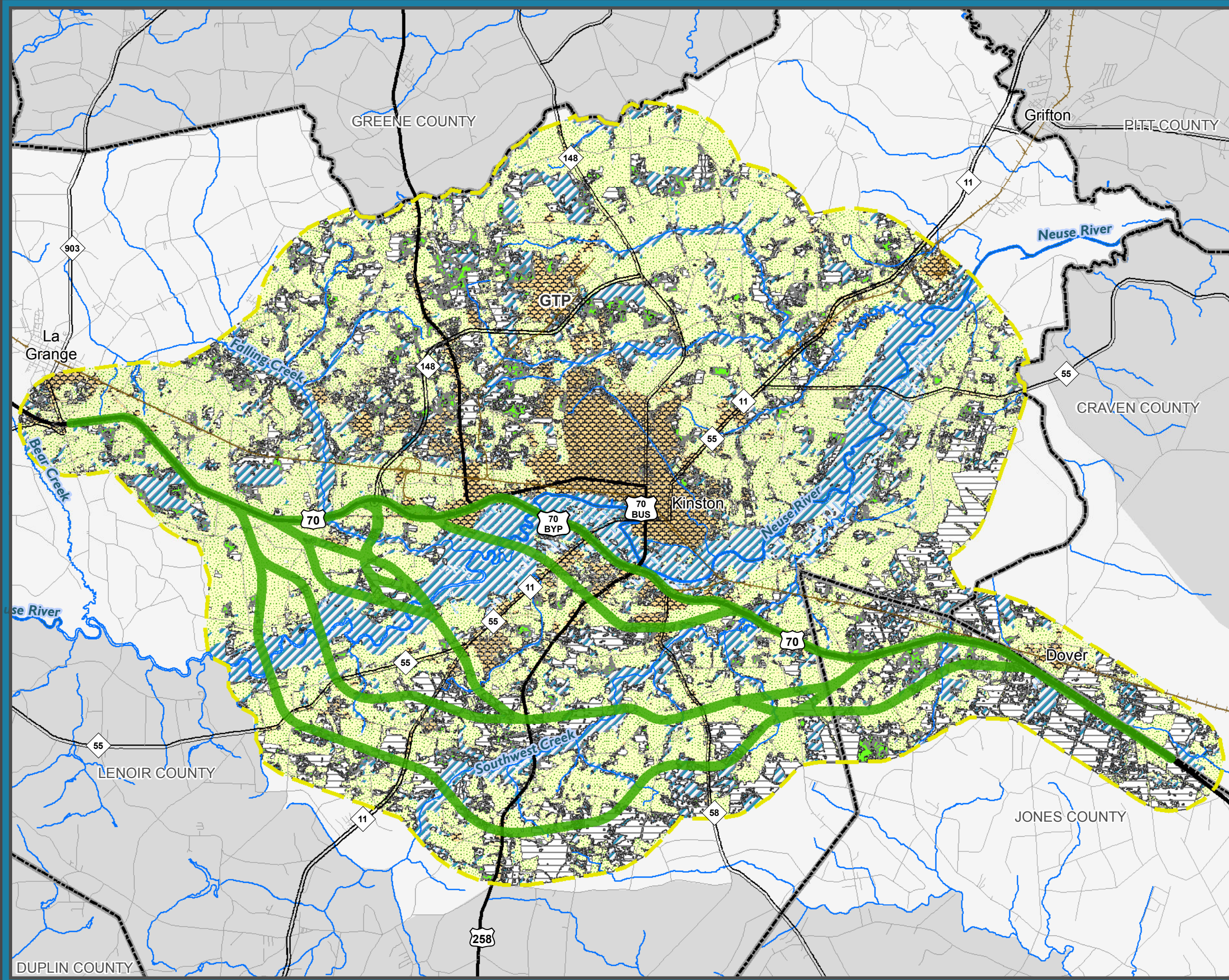
A variety of bird species are likely to occur within the project study area during certain times of the year. Since coastal North Carolina is part of the Atlantic Flyway (a bird migration route generally following the Atlantic Coast and the Appalachian Mountains), a large number of migratory birds use the region to rest. A list of common year-round, winter, and breeding resident birds is included in Appendix F. Mammals, reptiles, and amphibians likely to occur within the project study area are also included in Appendix F.

Table 3-1 I: Terrestrial community description

Terrestrial Community	Description
Maintained/disturbed	Include residential neighborhoods, commercial areas, industrial uses, power line rights-of-way, infrastructure, and road shoulders. Vegetation in this community is likely low growing grasses and herbs, and would include planted grasses on residential lawns and landscaped areas.
Agriculture	Scattered throughout the NRTR study area. This classification includes fallow fields, but not those transitioning to a scrub/shrub or forested state. Crops observed within the NRTR study area include cotton, soybean, tobacco, wheat, and hay.
Pine plantation	Present throughout the NRTR study area but are concentrated in the southern and eastern portions, south of existing US 70. The plantations within the project study area range from 5 to 40 years in age, although most appear to be between 20 and 25 years of age.
Forested upland	Include natural pine forests, hardwood forests, and mixed forests. Much of the NRTR study area has been subjected to some form of disturbance in the past, resulting in the dominance of mixed forests with dense understories in this category.
Palustrine wetland	Include all wetland types within the NRTR study area. Forested, emergent, and shrub/scrub categories have been grouped into this one wetland class. Most wetlands within the NRTR study area are associated with the Neuse River and the larger swamp systems that drain to the Neuse River.
Open water	Include the Neuse River and other large streams and ponds void of vegetation.

Source: NOAA 2010

Figure 3-11:
Terrestrial communities



Legend

- NRTR Study Area
- Detailed Study Alternative
- Railroad
- US Highway
- NC Highway
- Secondary Road
- County Boundary
- Terrestrial Communities**
- Agriculture
- Forested Upland
- Maintained/Disturbed
- Pine Plantation
- Palustrine Wetland
- Open Water



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



3.6.3.3 Invasive Species

The University of Georgia’s Center for Invasive Species and Ecosystem Health database of exotic plants and their occurrence by county was used to compile a list of potential invasive species within the project study area (University of Georgia 2018). Table 3-12 lists the species from that database known to occur within Lenoir, Jones, and Craven counties that also appear on the NCDOT Invasive Exotic Plant List for North Carolina (NCDOT 2012b) and their threat status.

Table 3-12: Invasive exotic plant species known to occur in Lenoir, Jones, and Craven counties

Common Name	Scientific Name	Threat Level	County
Mimosa	<i>Albizia julibrissin</i>	Moderate threat	Lenoir
Alligatorweed	<i>Alternanthera philoxeroides</i>	Threat	Lenoir, Jones, Craven
Asiatic dayflower	<i>Commelina communis</i>	Watch list	Lenoir, Jones, Craven
Brazilian waterweed	<i>Egeria densa</i>	Moderate threat	Lenoir, Craven
Japanese knotweed	<i>Reynoutria japonica</i>	Threat	Lenoir, Craven
English ivy	<i>Hedera helix</i>	Moderate threat	Lenoir
Japanese hop	<i>Humulus japonicus</i>	Watch list	Craven
Shrubby lespedeza	<i>Lespedeza bicolor</i>	Moderate threat	Lenoir, Jones
Sericea lespedeza	<i>Lespedeza cuneata</i>	Threat	Jones, Craven
Chinese privet	<i>Ligustrum sinense</i>	Threat	Lenoir, Jones, Craven
Japanese honeysuckle	<i>Lonicera japonica</i>	Moderate threat	Lenoir, Jones, Craven
Chinaberry	<i>Melia azedarach</i>	Watch list	Lenoir, Jones
Japanese stiltgrass	<i>Microstegium vimineum</i>	Threat	Lenoir, Jones, Craven
Chinese silvergrass	<i>Miscanthus sinensis</i>	Threat	Craven
Marsh dayflower	<i>Murdannia keisak</i>	Threat	Lenoir
Parrot feather milfoil	<i>Myriophyllum aquaticum</i>	Moderate threat	Jones
Princess tree	<i>Paulownia tomentosa</i>	Threat	Craven
Kudzu	<i>Pueraria montana var. lobata</i>	Threat	Lenoir, Jones, Craven
Multiflora rose	<i>Rosa multiflora</i>	Threat	Jones
Johnsongrass	<i>Sorghum halepense</i>	Moderate threat	Lenoir, Jones, Craven
Chinese tallowtree	<i>Triadica sebifera</i>	Watch list	Craven
Chinese wisteria	<i>Wisteria sinensis</i>	Moderate threat	Jones

Source: NCDOT 2012b

3.6.4 Aquatic Resources

Aquatic communities within the project study area include habitats ranging from small, intermittent brownwater tributaries, to large perennial slow-moving bottomland hardwood systems. These communities can support various fish, reptile, and amphibian species, as well as mollusks and crustaceans. Due to the fact that extensive field investigations did not take place during the development of the NRTR, data on aquatic species are limited to field visits conducted during verification of model data, other brief field activities, and landowner accounts. A list of aquatic species that could be expected to be present is also provided in Appendix F. Aquatic wildlife that were directly observed or determined to be present through evidence during field visits or landowner accounts are indicated with an asterisk (*) in Appendix F.

3.6.5 Protected and Conservation Lands

3.6.5.1 Hazard Mitigation Grant Program Properties

Over the past several decades, the City of Kinston and Lenoir County have been subjected to severe flooding along the Neuse River. Two severe flood events in 1996 and 1999, resulting from Hurricanes Fran and Floyd, respectively, prompted the local community to coordinate with state and federal government emergency management agencies to implement a relocation program for affected residents. The North Carolina Division of Emergency Management and FEMA assisted the City of Kinston and Lenoir County in utilizing the HMGP to relocate structures located within the floodplain of the Neuse River.

The HMGP is a federal buyout grant program facilitated through FEMA that is used to relocate businesses and residences outside of the floodplain. This effort covers an area of approximately 600 to 700 acres near the Neuse River and included 700 homes (Engesether 2009). This relocation plan has been, and continues to be, a major initiative for the community as it works on the plan's implementation. The HMGP places restrictive covenants on properties purchased under the HMGP that prohibit construction of any permanent structures or impervious surfaces within the properties.

In 2016, Hurricane Matthew affected several areas of eastern North Carolina, causing severe flooding that lasted for more than two weeks. Additional properties are anticipated to be added to the HMGP; however, this information has not been finalized. Additional information will be included in the Final Environmental Impact Statement.

3.6.5.2 NCNHP Managed Areas

The North Carolina Natural Heritage Program (NCNHP) managed areas are a diverse collection of properties and easements that are managed to some degree for conservation of biodiversity and ecosystem function. NCNHP maintains GIS data on most of the conservation land within North Carolina. In addition to areas actively managed for conservation, the data also include properties and easements that are not primarily managed for conservation but are of conservation interest. Conservation interest ranges from properties and easements that support rare species and intact, high-quality, natural communities to those that are simply open spaces in areas where open space is scarce (NCDEQ 2017b).



There are 16 NCNHP managed areas located entirely or partially within the project study area (Figure 3-12), totaling over 7,000 acres. Five of these are managed for biodiversity, and the remaining eleven are managed for multiple uses (Table 3-13).

3.6.5.3 NCNHP Natural Areas

The NCNHP has identified more than 2,500 terrestrial and aquatic natural areas across the state. Natural areas are designated based on the presence of rare species, exemplary or unique natural communities, important animal assemblages, or other important ecological features (NCDEQ 2017b). Natural areas are not protected by law but are recognized as important for conservation of the state’s biodiversity.

More than half of these areas are entirely or partially in conservation ownership. However, many remain privately owned and are unprotected from threats such as development. The NCNHP works with many partners, including state and federal conservation agencies, national conservation groups, and the land trust community, to implement protection for these ecologically significant areas. Through these partnerships, and using funding from federal sources, including the Clean Water Management Trust Fund and the Park and Recreation Trust Fund, the most important areas are brought into protection. Once a natural area is purchased, it is considered for dedication as a State Nature Preserve. More than 100 state- and privately-owned natural areas are now protected by dedication (NCDEQ 2017b).

Three NCNHP natural areas are located entirely or partially within the project study area, totaling approximately 1,469 acres (Figure 3-12). The Dover Bay Pocosin Natural Area is located along the northeast corner of the project study area and extends beyond the study area boundary. Approximately half of the Dover Bay Pocosin Natural Area is located within the project study area. The Trent River Aquatic Habitat Natural Area represents important habitat within the Trent River. The Trent River forms a portion of the southeastern boundary of the project study area. The Kelly’s Pond Natural Area is located along existing US 70, southeast of Kinston.

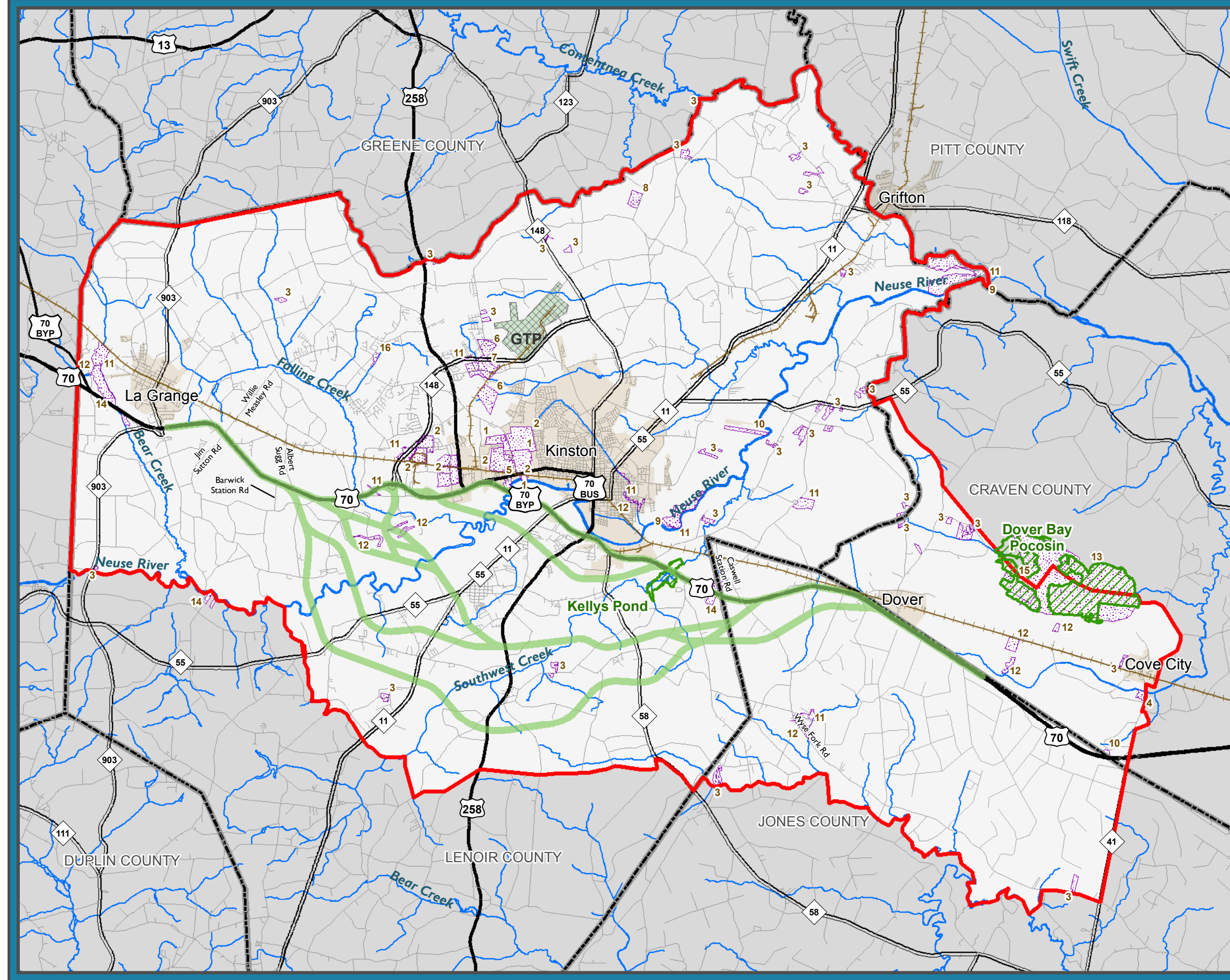
NCNHP natural areas are given ratings that identify their relative value compared to other areas within the state. Table 3-14 identifies each natural area’s R rating and C rating.

NCNHP Ratings

The **R rating** represents the element representational rating. The R rating is designed to indicate a natural area’s potential to contribute to a collection of the best locations for each tracked element within the state. The R3 rating indicates a high rating level, for natural areas containing the 3rd to 8th best examples of a tracked element within the state. The R5 indicates a general rating level, for natural areas containing one of the 30 best statewide examples of elements within it.

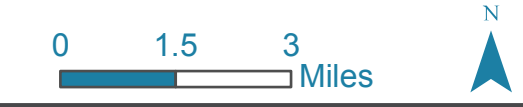
The **C rating** represents the element collective rating. The C rating evaluates the conservation value of each natural area based on the number of tracked elements present and the rarity of those elements, weighted in terms of both global imperilment and state imperilment. The C4 rating indicates a moderate rating level, containing a minimum of two elements. The C5 element indicates a general rating level, containing a minimum of one element.

Figure 3-12:
NCNHP natural and
managed areas



Legend

- Project Study Area
- Detailed Study Alternative
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Global TransPark (GTP)
- Municipal Boundary
- County Boundary
- NHP Natural Area
- NHP Managed Area
- 3** NHP Managed Area ID



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



Table 3-13: NCNHP managed areas in the project study area

Managed Area Name	Owner	Management Type	Status	Acres Within Project Study Area	Map ID # ^a
Caswell Developmental Center	North Carolina Department of Health and Human Services	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	State	287.3	1
Caswell Research Farm	North Carolina Department of Agriculture, Research Stations Division	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	State	995.2	2
Conservation Reserve Enhancement Program Easement	North Carolina Department of Agriculture, Division of Soil and Water Conservation	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	Easement	708.1	3
Craven County Open Space	Craven County	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	Local Government	30.7	4
CSS Neuse & Governor Caswell Memorial	North Carolina Department of Natural and Cultural Resources, Division of State Historic Sites and Properties	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	State	47.5	5
Cunningham Research Station	North Carolina Department of Agriculture, Research Stations Division	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	State	318.3	6



Managed Area Name	Owner	Management Type	Status	Acres Within Project Study Area	Map ID # ^a
Dobbs Youth Development Center	North Carolina Department of Public Safety	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	State	128.4	7
Lower Coastal Plain Tobacco Research Station	North Carolina Department of Agriculture, Research Stations Division	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	State	75.1	8
Ducks Unlimited (Wetlands America Trust) Easement	Ducks Unlimited (Wetlands America Trust)	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	Easement	697.2	9
North Carolina Clean Water Management Trust Fund Easement	North Carolina Department of Natural and Cultural Resources, Clean Water Management Trust Fund	Managed for biodiversity - disturbance events suppressed	Easement	92.9	10
NCDOT Mitigation Sites	NCDOT	Managed for biodiversity - disturbance events suppressed	Other Protection	1229.5	11
North Carolina Division of Mitigation Services Easement	NCDEQ, Division of Mitigation Services	Managed for biodiversity - disturbance events suppressed	Easement	625.3	12



Managed Area Name	Owner	Management Type	Status	Acres Within Project Study Area	Map ID # ^a
North Carolina Wildlife Resources Commission Easement	North Carolina Wildlife Resources Commission	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	Easement	1,558.5	13
North Carolina Coastal Land Trust Easement	North Carolina Coastal Land Trust	Managed for biodiversity - disturbance events suppressed	Easement	281.5	14
North Carolina Coastal Land Trust Preserve	North Carolina Coastal Land Trust	Managed for biodiversity - disturbance events suppressed	Private	232.7	15
USFWS Easement	USFWS	Managed for multiple uses - subject to extractive (e.g., mining or logging) or off-highway vehicle use	Easement	18.9	16
Total				7,327	

Source: NCDEQ 2017b

^a Map ID # refers to Figure 3-12.

Table 3-14: NCNHP natural areas in the project study area

Natural Area Name	Owner	R Rating	C Rating	Acres Within Project Study Area
Dover Bay Pocosin	North Carolina Coastal Land Trust, North Carolina GTP	R3	C4	1,254.1
Kelly's Pond	Private	R5	C5	193.4
Trent River Aquatic Habitat	Public Waters	Unrated	C4	21.6
TOTAL				1,469.1

Source: NCDEQ 2017b

3.6.5.4 NCDOT On-Site Mitigation Properties

NCDOT on-site mitigation properties are used to offset stream and wetland impacts incurred through the construction of NCDOT road projects and are intended to take place within, or directly adjacent to, the footprint of the project for which they will generate mitigation credits.

Five NCDOT on-site mitigation properties are located within the project study area. One is a wetland restoration site, one is a stream restoration site, and three are both wetland and stream restoration sites (Figure 3-13). The site names, associated STIP project, project type, and status are listed in Table 3-15.

Table 3-15: NCDOT on-site mitigation properties in the project study area

Site Name	STIP Project Number	Project Type	Status
Crescent Road	R-2719BA	Wetland/stream	Closed Out
Banks School Road (stream)	R-2719A	Stream	Monitoring
Banks School Road (wetland)	R-2719A	Wetland	Monitoring
Stallings	R-2539WM	Wetland/stream	Monitoring
Adkins Branch	R-2553WM	Wetland/stream	Transferred to the North Carolina Department of Environmental Quality Division of Mitigation Services

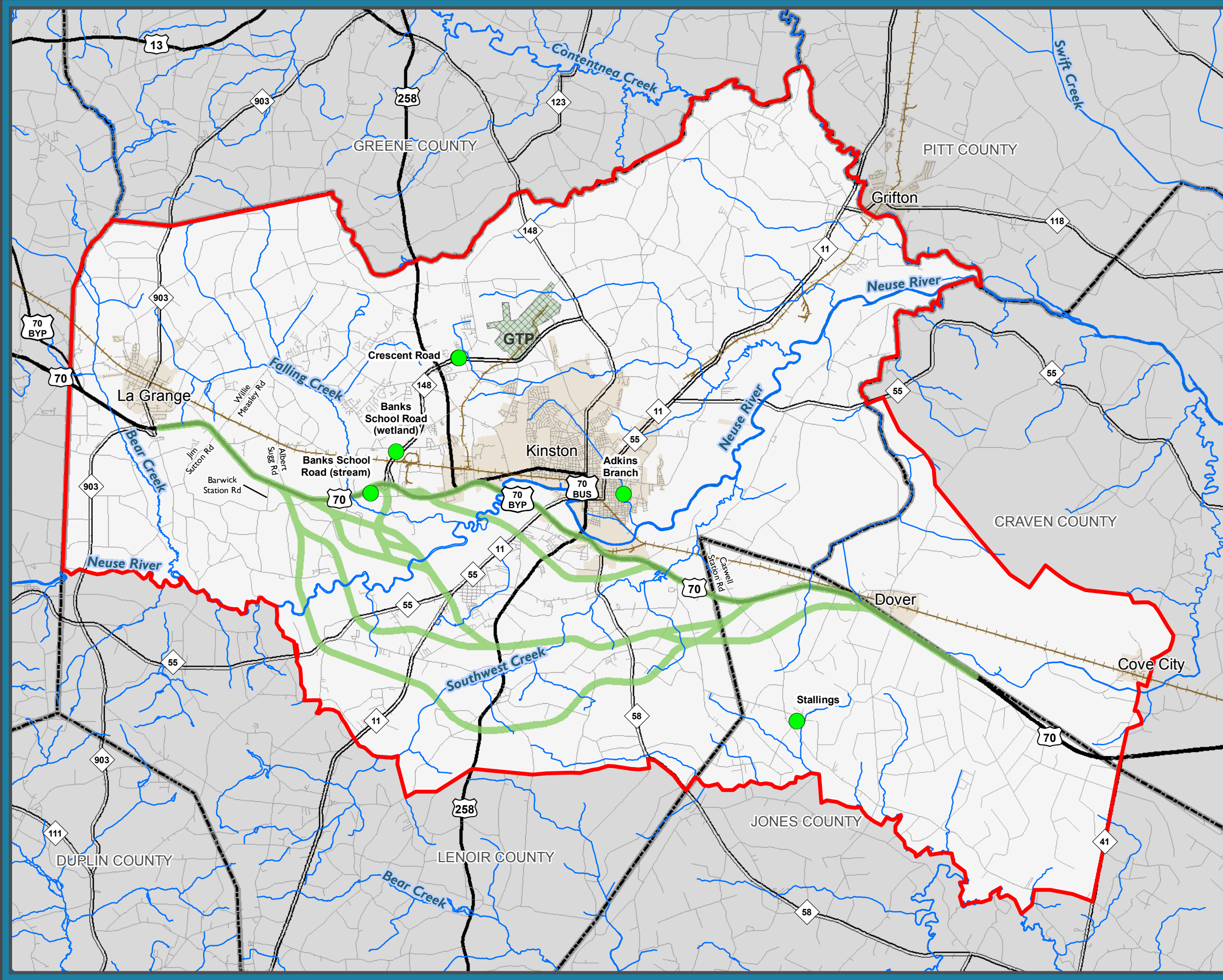
Figure 3-13:
On-site mitigation properties

Legend

-  Project Study
-  Detailed Study
-  Railroad
-  US Highway
-  NC Highway
-  Secondary Road
-  Global TransPark (GTP)
-  Municipal Boundary
-  County Boundary
-  NCDOT On-site Mitigation Property



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



3.6.6 Threatened and Endangered Species

Species with the federal classification of endangered, threatened, or officially proposed for such listing are protected under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The US Fish and Wildlife Service (USFWS) lists three federally protected species for Lenoir County (USFWS 2018c), nine federally protected species for Craven County (USFWS 2018a), and three federally protected species for Jones County (USFWS 2018b). The Atlantic sturgeon was previously listed as a federally protected species in all three counties by the USFWS; however, it is now listed by the NOAA Fisheries. All the federally-protected species listed for Lenoir, Jones, and Craven counties are shown in Table 3-16. A brief description of each species’ habitat requirements follows. Habitat requirements for each species are based on the best available information from referenced literature.

Table 3-16: Federally protected species listed for Lenoir, Jones, and Craven counties

Scientific Name	Common Name	Federal Status ^a	Habitat Present	County
<i>Aeschynomene virginiana</i>	Sensitive joint-vetch	T	No	Lenoir, Craven
<i>Alligator mississippiensis</i>	American alligator	T(S/A)	Yes	Craven, Jones
<i>Acipenser oxyrhynchus oxyrhynchus</i>	Atlantic sturgeon	E	Yes – Critical habitat in Neuse River	Lenoir, Craven, Jones
<i>Calidris canutus rufa</i>	Rufa red knot	T	No	Craven
<i>Chelonia mydas</i>	Green sea turtle	T	No	Craven
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	No	Craven
<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E	Yes	Craven
<i>Myotis septentrionalis</i>	Northern long-eared bat	T	Yes	Lenoir, Craven, Jones
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	Yes	Lenoir, Craven, Jones
<i>Trichechus manatus</i>	West Indian manatee	E	Yes	Craven

^a E – Endangered; T – Threatened; T(S/A) – Threatened Due to Similarity in Appearance

Sensitive joint-vetch

Sensitive joint-vetch grows in the mildly brackish inter-tidal zone where plants are flooded twice daily. This annual legume prefers the marsh edge at an elevation near the upper limit of tidal fluctuation, but can also be found in swamps and on river banks. Sensitive joint-vetch normally occurs in areas with high plant diversity where annual species predominate, and can grow in sand, mud, gravel, or peat substrates. Bare to sparsely vegetated substrates appear to be a microhabitat feature of critical importance to this plant. Such microhabitats may include accreting point bars that have not yet been colonized by perennial species, areas scoured out by ice, low swales within marshes, muskrat “eat outs” where this rodent removes all the vegetation within a small portion of the marsh, storm damaged areas, and saturated organic sediments of some interior marshes that have local nutrient deficiencies. In North Carolina, stable occurrences have been found in the estuarine meander zone of tidal rivers where sediments transported from up-river settle out and extensive marshes are formed. Additional North Carolina occurrences are also found in moist to wet roadside ditches and moist fields, but these are not considered stable populations.

Suitable habitat is not present for sensitive joint-vetch in the study area.

American alligator

In North Carolina, American alligators have been recorded in nearly every coastal county, and in many inland counties (up to the fall line). The alligator is found in rivers, streams, canals, lakes, swamps, and coastal marshes. Adult animals are highly tolerant of salt water, but the young appear to be more sensitive, with salinities greater than five parts per thousand considered harmful. The American alligator remains on the protected species list due to its similarity in appearance to the endangered American crocodile.

Suitable habitat is present for American alligator in the study area.

Atlantic sturgeon

The Atlantic sturgeon is a large fish that occurs in major river systems along the eastern seaboard of the US. It is an anadromous species that migrates to moderately-moving freshwater areas to spawn in the spring; in some southern rivers a fall spawning migration may also occur. Spawning occurs in moderately flowing water in deep parts of large rivers, usually on hard surfaces (e.g., cobble). Juveniles usually reside in estuarine waters. Subadults and adults live in coastal waters and estuaries when not spawning, generally in shallow nearshore areas dominated by gravel and sand substrates.

Suitable habitat is present for the Atlantic sturgeon within the entirety of the Neuse River in the study area. The Neuse River within Lenoir and Craven counties is listed as one of the Atlantic sturgeon critical habitat rivers in the Southeast US (NOAA 2017a, 2017b). The Neuse River does not flow through Jones County.

Rufa red knot

The rufa red knot is one of the six recognized subspecies of red knots, and is the only subspecies that routinely travels along the Atlantic coast of the US during spring and fall migrations. It is known to winter in North Carolina and to stop over during migration. Habitats used by red knots in migration and wintering areas are similar in character: coastal marine and estuarine habitats with large areas of exposed intertidal sediments. In North America, red knots are commonly

found along sandy, gravel, or cobble beaches, tidal mudflats, salt marshes, shallow coastal impoundments and lagoons, and peat banks. Ephemeral features such as sand spits, islets, shoals, and sandbars often associated with inlets can be important habitat for roosting.

Suitable habitat is not present for rufa red knot in the study area.

Green sea turtle

Green sea turtles are found in temperate and tropical oceans and seas. Nesting in North America is limited to small communities on the east coast of Florida requiring beaches with minimal disturbances and a sloping platform for nesting (they do not nest in North Carolina). The green sea turtle can be found in shallow waters. They are attracted to lagoons, reefs, bays, mangrove swamps, and inlets where an abundance of marine grasses can be found, as this is the principle food source for the green sea turtle.

Suitable habitat is not present for green sea turtle in the study area.

Leatherback sea turtle

Leatherback sea turtles are distributed worldwide in tropical waters of the Atlantic, Pacific, and Indian oceans. They are generally open ocean species, and may be common off the North Carolina coast during certain times of the year. However, in northern waters the species is reported to enter into bays, estuaries, and other inland bodies of water. Major nesting areas occur mainly in tropical regions. In the US, primary nesting areas are in Florida; however, nests are known from Georgia, South Carolina, and North Carolina as well. Nesting occurs from April to August. Leatherback sea turtles need sandy beaches backed with vegetation near deep water and generally with rough seas. Beaches with a relatively steep slope are usually preferred.

Suitable habitat is not present for leatherback sea turtle in the study area.

Rough-leaved loosestrife

Rough-leaved loosestrife, endemic to the Coastal Plain and Sandhills of North and South Carolina, generally occurs in the ecotones or edges between longleaf pine uplands and pond pine (*Pinus serotina*) pocosins in dense shrub and vine growth on moist to seasonally saturated sands and on shallow organic soils overlaying sand (spodosolic soils). Occurrences are found in such disturbed habitats as roadside depressions, maintained power and utility line rights-of-way, firebreaks, and trails. The species prefers full sunlight, is shade intolerant, and requires areas of disturbance (e.g., clearing, mowing, periodic burning) where the overstory is minimal. It can, however, persist vegetatively for many years in overgrown, fire-suppressed areas. The plant is known to occur on the Blaney, Gilead, Johnston, Kalmia, Leon, Mandarin, Murville, Torhunta, and Vaucluse soil series.

Suitable habitat is present for rough-leaved loosestrife in the study area.

Northern long-eared bat

Northern long-eared bat (NLEB) is found across much of the eastern and north central US and all Canadian provinces. Winter hibernating habitat consists of caves and abandoned mines with constant, cooler temperatures with high humidity and no air currents. While within hibernacula, they often form colonies with other bat species. Summer roosting occurs singly or in colonies underneath bark, in cavities and crevices of both live trees and snags, and to a lesser degree in human-made structures such as buildings, barns, bridges, behind window shutters, on utility

poles, and in bat houses. This species is a medium-sized bat with females tending to be slightly larger than males. Average body length ranges from 3 to 4 inches, with a wingspan ranging from 9 to 10 inches. This species is distinguished by its relatively long ears that extend beyond the nose when laid forward.

The USFWS developed a programmatic biological opinion (PBO) in conjunction with the FHWA, the USACE, and the NCDOT for the NLEB (USFWS 2016). The PBO covers the entire NCDOT program in Divisions 1 through 8, including all NCDOT projects and activities. The programmatic determination for the NLEB for the NCDOT program is “may affect, likely to adversely affect.” The PBO provides incidental coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all projects with a federal nexus in Divisions 1 through 8, which includes Lenoir, Jones, and Craven counties.

Red-cockaded woodpecker

The red-cockaded woodpecker (RCW) typically occupies open, mature stands of southern pines, particularly longleaf pine (*Pinus palustris*), for foraging and nesting/roosting habitat. The RCW excavates cavities for nesting and roosting in living pine trees, aged 60 years or older, which are contiguous with pine stands at least 30 years of age to provide foraging habitat. The foraging range of the RCW is normally no more than one-half mile. Suitable habitat is present for the RCW in the study area.

The USFWS was consulted regarding the occurrences and potential habitat for RCW in the study area during a field meeting held on October 23, 2013. It was noted the only known occurrence of RCW for Lenoir County is a historical record, and there is probably only a minimal chance of the presence of RCW, but it is prudent to consider since there is potential habitat for the species.

A summary of the field meeting can be found in the 2017 NRTR and is included in Appendix F.

West Indian manatee

West Indian manatees have been observed in all the North Carolina coastal counties. Manatees are found in canals, sluggish rivers, estuarine habitats, salt water bays, and as far off shore as 3.7 miles. They utilize freshwater and marine habitats at shallow depths of 5 to 20 feet. In the winter, between October and April, manatees concentrate in areas with warm water. During other times of the year habitats appropriate for the manatee are those with sufficient water depth, an adequate food supply, and proximity to freshwater. Manatees require a source of freshwater to drink. Manatees are primarily herbivorous, feeding on any aquatic vegetation present, but they may occasionally feed on fish.

Suitable habitat is present for West Indian manatee in the study area.

3.6.6.1 Bald Eagle and Golden Eagle Protection Act

On August 8, 2007, the USFWS removed the bald eagle (*Haliaeetus leucocephalus*) in the lower 48 states of the US from the federal list of threatened and endangered species. The bald eagle is, however, protected by the Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250), as amended. This law provides for the protection of the bald eagle and the golden eagle by prohibiting, except under specified conditions, the taking, possession, and commerce of such birds.

Habitat for the bald eagle primarily consists of mature forests in proximity to large bodies of open water for foraging. Large, dominant trees are utilized for nesting sites, typically within 1 mile of open water. Within the project study area, the banks of the Neuse River present potential bald eagle nesting habitat. Adjacent agricultural fields, small forested areas, and the Neuse River itself could provide foraging habitat. However, the project study area is fragmented by sporadic development and swamplands that do not represent ideal nesting or foraging areas.

3.6.6.2 Endangered Species Act Critical Habitat Designations

The USFWS has no listed critical habitat designations within Lenoir, Craven, or Jones counties (USFWS 2012, 2015, 2017). In a Final Rule dated September 18, 2017, NOAA defined critical habitat for Atlantic sturgeon (NOAA 2017a, 2017b). Their designation includes the Neuse River from just east of Raleigh in Wake County to the Pamlico Sound. The entire length of the Neuse River within Lenoir and Craven counties is within the limits of the defined critical habitat.

3.6.6.3 Essential Fish Habitat

A preliminary review of essential fish habitat within the project study area was conducted using the NOAA's online essential fish habitat mapper(<https://www.habitat.noaa.gov/application/efhmapper/index.html>). No essential fish habitat is present within the project study area. Verification of these preliminary findings will be coordinated with the NOAA, National Marine Fisheries Service, and NCDOT's Biological Surveys Group once the applicant's preferred alternative is selected.

3.6.7 Jurisdictional Issues

3.6.7.1 Clean Water Act Waters of the US

Jurisdictional waters of the US, including wetlands, are protected under Section 404 of the Clean Water Act as well as Section 10 of the Rivers and Harbors Act, as discussed in section 3.6.7.4. The USACE and USEPA jointly define wetlands as those areas that are inundated or saturated by surface or 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 (40 CFR 230.3). Section 404 jurisdictional wetlands are those areas satisfying the technical criteria contained in the USACE's *Wetlands Delineation Manual* (Environmental Laboratory 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (Environmental Laboratory 2010).

Both federal and state programs regulate activities conducted in wetlands in order to minimize the continued reduction and degradation of these resources and strive to achieve a "no net loss" policy. The federal program is based on Section 404 of the Clean Water Act and the USACE's implementing regulations (33 CFR 320-330). The state regulatory program is based on Section 401 of the Clean Water Act (33 U.S.C. 1341) and is regulated by NCDEQ.

Two ArcGIS models were used in order to assess potential stream and wetland impacts for the project. A jurisdictional stream model was created by NCDWR and a jurisdictional wetland model was created by NCDOT (NCDWR 2013; NCDOT 2011a). The NCDOT wetland model classified wetlands into two wetland types, non-riparian and riparian (NCDOT 2001a).



Impact calculations and evaluations presented in both the NRTR and the DEIS are based on GIS data. Detailed information about the development and use of these models can be found in Appendix F.

3.6.7.2 Coastal Area Management Act Areas of Environmental Concern

There is potential for the presence of CAMA areas of environmental concern (AEC) within the Craven County portion of the project study area. Craven County is one of the 20 designated coastal counties within North Carolina. The portion of the project study area within Craven County contains three named streams (Tracey Swamp, Gum Swamp, and Core Creek) and a large floodplain wetland system associated with Tracey Swamp. These streams and/or floodplain wetlands could be considered AECs by the NCDCM. Lenoir and Jones counties are not designated coastal counties for North Carolina.

3.6.7.3 North Carolina River Basin Buffer Rules

Streamside riparian zones within the project study area are protected under provisions of the Neuse River Buffer Rule administered by the NCDWR (15A NCAC 02B .0233). The purpose of the rule is to protect and preserve existing riparian buffers in the Neuse River basin to maintain their nutrient removal functions. The rule applies to a 50-foot-wide riparian buffer directly adjacent to surface waters in the Neuse River basin, including intermittent streams, perennial streams, lakes, ponds, and estuaries, excluding wetlands. The 50-foot riparian buffer width is applied to each side of the surface water, beginning at the most landward limit of the top of bank. Streams subject to the Neuse River Buffer Rules were identified based solely on their presence on 1:24,000 scale USGS topographical maps.

3.6.7.4 Rivers and Harbors Act Navigable Waters

The Neuse River and Contentnea Creek are considered navigable waters under Section 10 of the Rivers and Harbors Act of 1899. The USACE regulates Section 10 of this act, which requires that the building of any wharfs, piers, jetties, or other structures on, over, under, or affecting the navigable capacity of such waters be permitted and approved. In addition, the Neuse River, Contentnea Creek, and a portion of Falling Creek are considered navigable waters under Section 9 of the act, which is administered by the US Coast Guard (USCG). Impacts to these waters would require coordination and permitting with the USCG.

3.6.7.5 Wild and Scenic Rivers

No rivers or sections of river within or near the project study area are designated as wild, scenic, or recreational under the National Wild and Scenic Rivers Act or designated under the North Carolina Natural and Scenic Rivers Act.

Segments of the Neuse River within the study area are included in the National Park Service's Nationwide Rivers Inventory (NRI) list (National Park Service 2017). This list includes more than 3,200 free-flowing river segments believed to possess one or more "outstandingly remarkable" values. The section of the Neuse River identified on the NRI list begins outside of the project study area and continues towards Kinston, stopping just before the conveyance with



Falling Creek (south of Berkley Avenue) and begins again at Carolina Railroad Bridge and continues outside of the project study area. The Neuse River was listed in 1982 for having remarkable value for cultural, fish, geologic, historic, recreational, scenic, and wildlife (National Park Service 2017).

3.7 FLOODPLAINS AND FLOODWAYS

3.7.1 Existing Floodplains and Floodways

A large portion of the project study area contains floodplains and floodways associated with the Neuse River and its larger tributaries. Floodplains and floodways are mapped by FEMA under the National Flood Insurance Program. Flood Insurance Rate Maps for the project study area indicate that both 100-year and 500-year floodplains are present (FEMA 2018). Streams located within FEMA regulatory floodways are indicated on Figure 3-14. Floodways are also present along the main channel of the Neuse River and some of the larger tributaries, such as Bear Creek, Falling Creek, and Southwest Creek (Figure 3-14).

A floodway is defined as the channel of a river or watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations (FEMA 2018). Lenoir County implements the *Lenoir County Flood Damage Prevention Ordinance* (Lenoir County 2003a) as discussed in section 3.3.2.1.

3.7.2 Flood Analysis

As described in section 3.6.5.1, the City of Kinston and Lenoir County have been subjected to severe flooding along the Neuse River for the past several decades. The two most recent storm events to impact the area, Hurricane Matthew in 2016 and Hurricane Florence in 2018, prompted the NCDOT to complete a flood analysis for the project. The purpose of the analysis was to evaluate the 11 new location DSAs to determine whether or not they would be subject to flooding during such extreme events. Comparisons were made between the proposed road surface elevation and the water surface elevations for the 1 percent annual flood chance, 4 percent annual flood chance, and flood levels resulting from Hurricane Matthew. Methodologies used during the study are included in the R-2553 Kinston Bypass Flood Analysis Memo (AECOM 2018b). The Flood Analysis Memo for the Kinston Bypass can be found on the project website.

Flood Analysis Memo
The Flood Analysis Memo for the Kinston Bypass can be found on the project website. https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx
25-year Flood
A flood that has a 4 percent annual chance of occurring.
100-year Flood
A flood that has a 1 percent chance of being equaled or exceeded in any given year. Levels of flooding created by the 100-year storm are referred to as the base flood elevation.
500-year Flood
A flood that has a 0.2 percent annual chance of occurring.

3.8 FARMLAND

3.8.1 Farmland Soils

North Carolina Executive Order 96, Conservation of Prime Agricultural and Forest Lands, requires all state agencies to consider the impact of land acquisition and construction projects on prime farmland soils, as designated by the NRCS (State of North Carolina 1983). Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural products within allowable soil erosion tolerance. Prime and unique farmland soils are present throughout the study area (Figure 3-15).

3.8.2 Agricultural Resources

There are numerous active agricultural operations and farmlands within the study area. Most notable is the Sanderson Farms Processing Plant, located on Sanderson Way just south of the NC 148 and US 70 interchange. Crop farms and animal operations of all sizes are located throughout the DCIA.

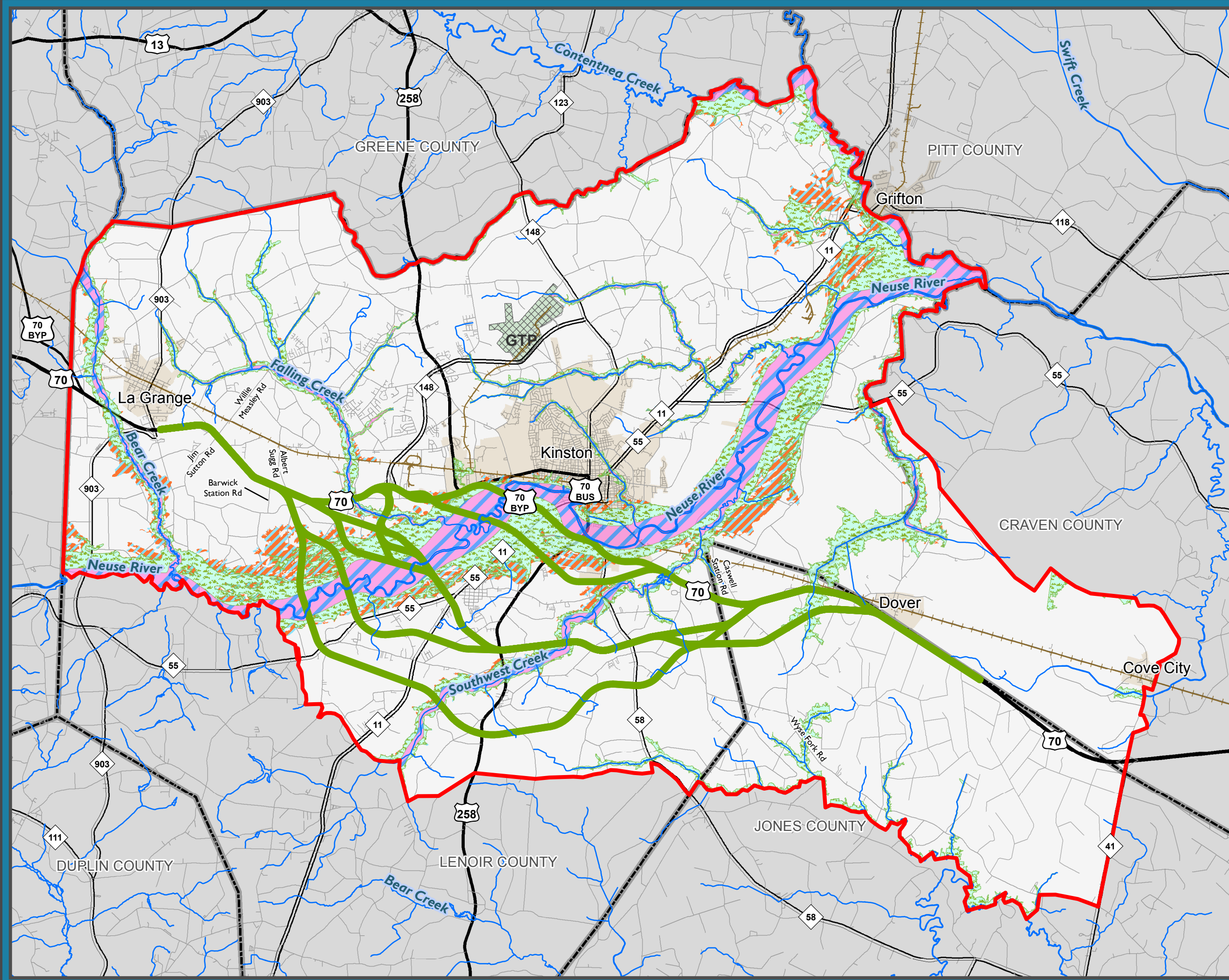
The NCDA&CS has a “Century Farm” program that recognizes family farms that have exceeded 100 years of continuous agriculture. There are 24 Century Farms in Lenoir County. While being recognized as a Century Farm provides no protections to the owners, it is a measure of community stability and shows the longevity and ties to a community that many families have had for more than 100 years. There is no mapping of the location of the 24 Century Farms in Lenoir County or for those located in Jones County (15) or Craven County (18).

3.8.3 Voluntary Agricultural Districts

Under North Carolina state law, local governments can offer VADs in the local jurisdictions, which provide landowners with a voluntary way to support the conservation and preservation of farmland from non-farm development. Lands under VAD protection have a conservation agreement between the landowner and the local jurisdiction that prohibits non-farm use or development for a period of at least 10 years.

In Lenoir County, eight VADs are located within the project study area, with one VAD that is composed of two parcels. In Jones County, there are two VADs within the project study area. In Craven County, there are six VADs within the project study area.

Figure 3-14:
Floodplains and floodways



Legend

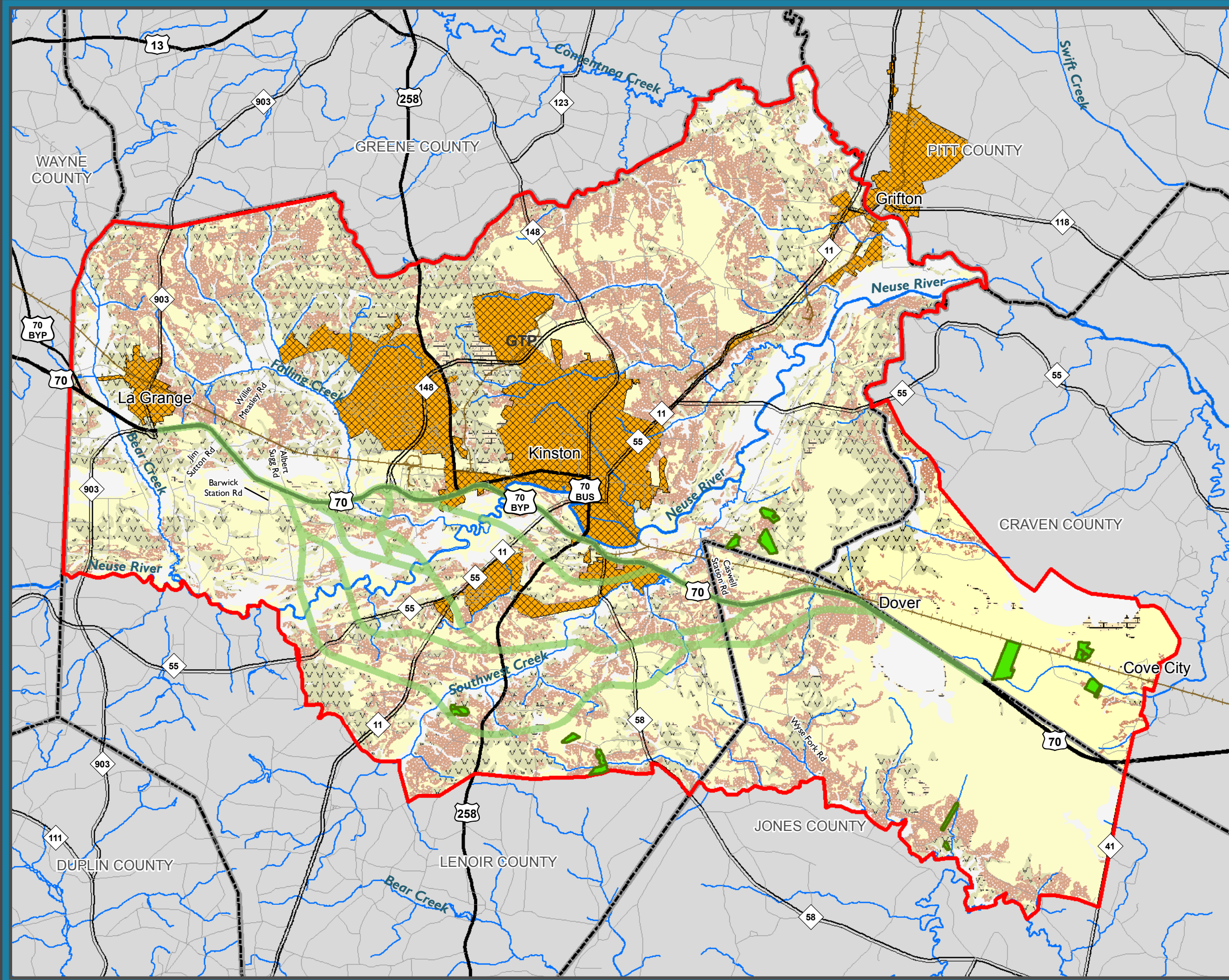
- Project Study Area
- Detailed Study Alternatives
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Global TransPark (GTP)
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain



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

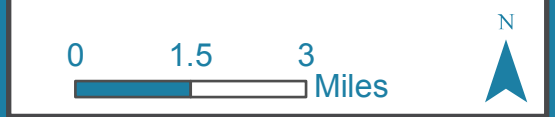



Figure 3-15:
Prime and unique farmland soils



Legend

- Project Study Area
- Detailed Study Alternative
- Railroad
- US Highway
- NC Highway
- Secondary Road
- County Boundary
- All areas are prime farmland
- Farmland of statewide importance
- Farmland of unique importance
- Not prime farmland/Prime farmland if drained
- Voluntary Agricultural District
- NC Urbanized Area





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





3.9 AIR QUALITY

The Federal Clean Air Act of 1970, as amended (42 U.S.C. 7401) was enacted for the purposes of protecting and enhancing the quality of the nation’s air resources to benefit public health, welfare, and productivity.

Air pollution is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by reducing visibility, damaging property, reducing the productivity or vigor of crops or natural vegetation, and/or harming human or animal health.

Air pollution originates from various sources. Emissions from industry and internal combustion engines are the most prevalent sources. The impact from highway construction ranges from intensifying existing air pollution problems to improving ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. Motor vehicles emit carbon monoxide, nitrogen oxide, hydrocarbons, particulate matter, sulfur dioxide, and lead (listed in order of decreasing emission rate).

A project-level air quality analysis was prepared for this project and is entitled *Air Quality Report, US 70 Kinston Bypass, Lenoir, Jones, and Craven Counties* (NCDOT 2018c). The Air Quality Report for the Kinston Bypass is available on the project website.

Air Quality Report

The Air Quality Report for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

3.9.1 Attainment Status

The Kinston Bypass project is located in Lenoir, Jones, and Craven counties, which are in attainment with the National Ambient Air Quality Standards (NAAQS); therefore, 40 CFR 51 and 93 are not applicable.

Non-attainment Areas

A non-attainment area is an area considered to have a concentration of one or more criteria pollutants in a geographic area found to exceed the regulated level for NAAQS.

3.9.2 Mobile Source Air Toxics

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that the USEPA regulate 188 air toxics, also known as hazardous air pollutants. The USEPA assessed this expansive list in its rule on the Control of Hazardous Air Pollutants from Mobile Sources (USEPA 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (USEPA 2018). In addition, the USEPA has identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the *National Air Toxics Assessment* (USEPA 2017). These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics (MSAT), the list is subject to change and may be adjusted in consideration of future USEPA rules.



A qualitative MSAT analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from various DSAs. The qualitative assessment presented in section 4.9 is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives* (FHWA 2011).

3.10 NOISE AND NOISE ABATEMENT CRITERIA

Noise can be described as any sound that is undesirable. The magnitude of noise is defined by its sound pressure level, which is related to the ratio of the measured sound pressure over a reference sound pressure. The reference pressure is the pressure of the weakest sound audible to a healthy human hearing system. The resulting quantities from the ratio equation are expressed in terms of decibels (dB) on the sound pressure level scale. A dB is an interval on the sound pressure level scale, with 0 dB as the threshold of hearing and 130 dB as the level that causes pain.

In order to determine that highway noise levels are or are not compatible with various land uses, FHWA has developed noise abatement criteria (NAC) and procedures to be used in the planning and design of highways.

The *Traffic Noise Report* was conducted to assess the probable traffic noise impacts of the US 70 Kinston Bypass project (NCDOT 2018j). The Traffic Noise Report can be found on the project website.

The project study area was divided into noise study areas (NSA), which included individual receptor locations. The receptors were grouped based on their location and potential for common noise mitigation measures. The results of the traffic noise modeling varied based on the various DSAs. Table 3-17 shows the NAC levels based on land use. The substantial noise level increase criteria is based on a comparison of the existing noise level with the predicted increase with respect to a change to noise levels of 10 dB(A) or more in the design year.

Traffic Noise Report

The Traffic Noise Report for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

Table 3-17: Noise abatement criteria (hourly equivalent A-weighted sound level)

Activity Category	Activity Criteria ^a L _{eq} (h) ^b	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B ^c	67	Exterior	Residential
C ^c	67	Exterior	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E ^c	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	--	--	Undeveloped lands that are not permitted

Source: NCDOT 2018i.

^a The L_{eq}(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

^b The equivalent steady-state sound level that, in a stated period of time, contains the same acoustic energy as the time-varying sound level during the same time period, with L_{eq}(h) being the hourly value of L_{eq}.

^c Includes undeveloped lands permitted for this activity category.



3.11 UTILITIES

3.11.1 Electric

Duke Energy Progress is the main energy provider in the area. In July 2015, Duke Energy Progress purchased a range of energy assets previously owned by the North Carolina Eastern Municipal Power Agency, a coalition of 32 cities and towns in eastern North Carolina that own and operate their own electric systems. Transmission power lines are mainly located in the southern portion of the study area below US 70 (Figure 3-16).

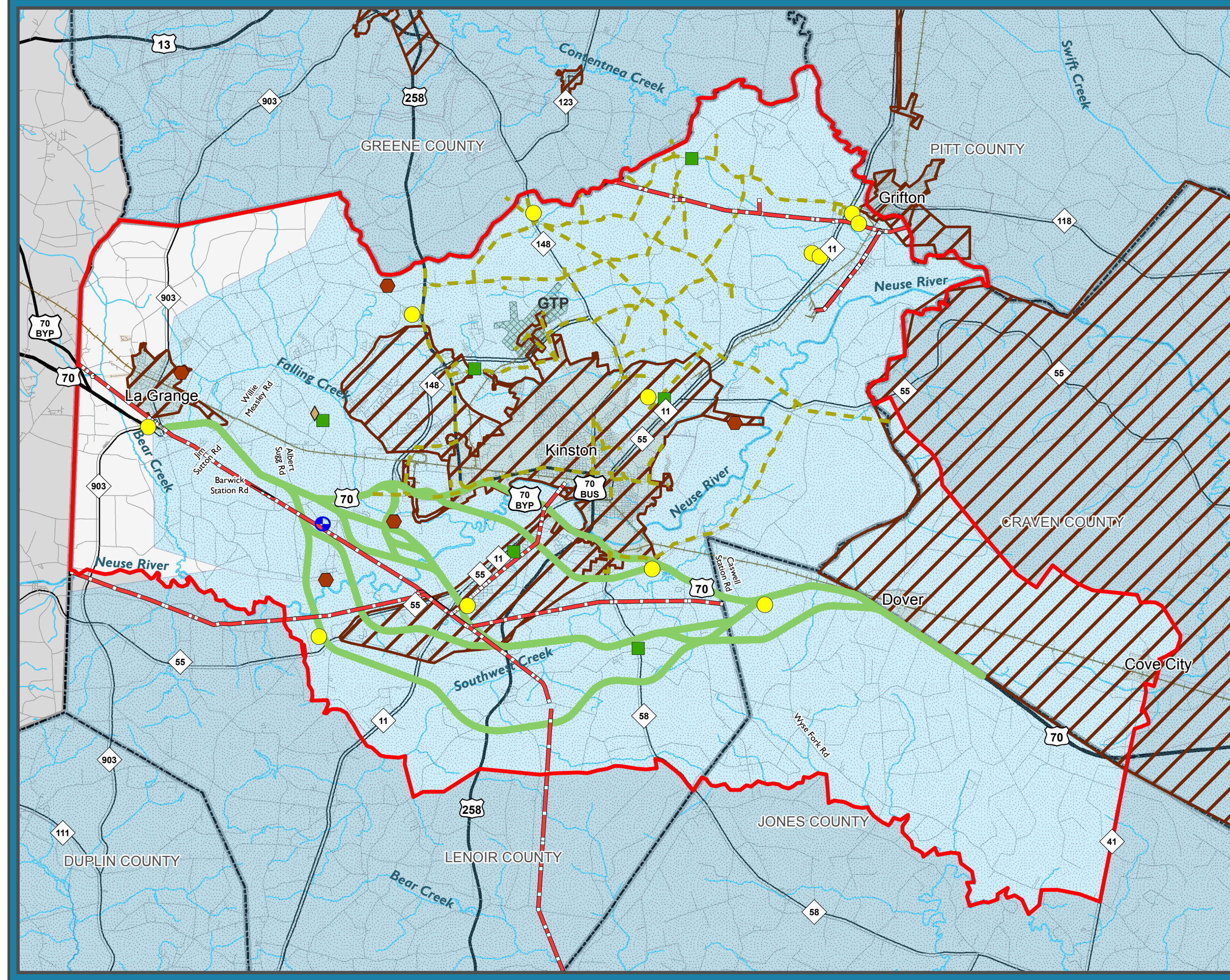
3.11.2 Water/Sewer

Nearly the entirety of the project study area is within a water distribution service area, with the exception of a small area west of La Grange. The area in and around Kinston is served by the City of Kinston; the area south and southwest of Kinston in Lenoir County is served by Deep Run Water Corporation; the area north, northwest, and northeast of Kinston is served by North Lenoir Water Corporation; the area in Jones County is served by Jones County; and the area in Craven County is served by Craven County. Figure 3-16 shows the water distribution service areas. With the exception of Craven County and Jones County, all regional municipalities are a part of the Neuse Regional Water and Sewer Authority. The Neuse Regional Water and Sewer Authority is a cooperative partnership of water and sewer providers that was formed in 2000 to develop regional solutions for meeting future needs.

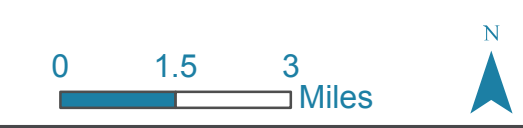
The CIA (NCDOT 2018d) and the Land Use Scenario Assessment (LUSA) (NCDOT 2018g) identify one water treatment plant in the project study area: the New Water Treatment Plant, owned by Lenoir County and located approximately one-half mile south of US 70 off Kennedy Home Road. The water treatment plant is operated by the Neuse Regional Water and Sewer Authority and began operation in 2008. It has been designed to allow for expansion and is permitted to withdraw 30 million gallons per day from the Neuse River. Through the use of its existing well field and its membership in the Neuse Regional Water and Sewer Authority, Kinston is projected to provide enough water service for the next 50 to 75 years. Neuse Regional Water and Sewer Authority service extends to approximately 100,000 citizens and commercial users in the area.

Sewer service is only available to the areas within and immediately outside of the municipal areas (Kinston/GTP and La Grange) and all of Craven County (Figure 3-16). The other rural areas are served via on-site septic systems. Future plans to extend sewer are somewhat limited, but include areas along US 70 (west of Kinston), US 258 (south of Kinston), NC 58 (south of Kinston), and further around the GTP.

Figure 3-16:
Utility services



- Legend**
- ▭ Project Study Area
 - ▭ Detailed Study Alternative
 - ▭ Wastewater Treatment Plant
 - ⊕ Water Treatment Plant
 - ◆ Landfill
 - Recycling Site
 - Solar Farm
 - +— Railroad
 - US Highway
 - NC Highway
 - Secondary Road
 - ▨ Global TransPark (GTP)
 - ▨ Municipal Boundary
 - ▭ County Boundary
 - Power Transmission Lines
 - - - Natural Gas Lines
 - ▨ Water Distribution Service Area
 - ▨ Sewer Service Area



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



3.11.3 Wastewater

Four wastewater treatment plants are in the project study area; two serve the general region and the other two are site specific. The two serving the general region are in Kinston and La Grange. In Kinston, the Kinston Regional Water Reclamation Facility was built in 2007 by expanding upon the former Northside Wastewater Treatment Plant. The Kinston Regional Water Reclamation Facility is a state-of-the-art facility built west of the Neuse River, south of NC 55 and has a daily operational capacity of 11.5 million gallons. The Kinston Regional Water Reclamation Facility also contains a 40 acre site used as a spray field, where sludge generated from the plant is “land applied” rather than being discharged directly into the Neuse River. The La Grange Wastewater Treatment Plant has a daily operational capacity of 75,000 gallons and is located along Mosley Creek. The two other facilities include locations at North Lenoir High School and Sanderson Farms. Each of these wastewater treatment plants was designed to serve their respective facilities.

3.11.4 Solid Waste/Recycling

The Lenoir County Landfill located at 2949 Hodges Farm Road serves Lenoir County residents by treating solid waste generated from residential and commercial uses, institutional non-hazardous solid wastes, and designated solid wastes (Lenoir County 2014).

The Tuscarora Landfill located at 7400 Old US Highway 70, approximately 5 miles east of Cove City, serves the residents of Craven County. This landfill is located outside of the project study area.

Lenoir County operates nine recycling sites; six sites are located in the project study area: Site 1, Dobbs Farm, is located on Robinson Road; Site 2, Fairground, is located on Fairground Road; Site 3, Loftin’s Crossroads, is located on Elijah Loftin Road; Site 5, Hodges Farm Road, is located on Hodges Farm Road in La Grange; Site 6, Wallace Road, is located on Wallace Road in Kinston; and Site 9, Hugo Crossroads, is located on Grifton-Hugo Road in Grifton.

3.11.5 Natural Gas

Piedmont Natural Gas is the sole natural gas provider within the project study area. Natural gas lines are mainly located in the northern portion of the project study area north of US 70 (Figure 3-16).

3.11.6 Solar Power Farms

Twelve commercial-scale solar power farms are located throughout the project study area (Figure 3-16). Information on the solar power farms is summarized in Table 3-18.

Table 3-18: Solar Power Farms in the project study area

Solar Power Farm	Utility Owner Name	Peak Power Generation Capacity (Megawatts)
Albemarle Solar Center	SRE Utility Solar 1, LLC	5
Crockett Farm	Crocket Farm, LLC	5
Exum Farm Solar, LLC	Cypress Creek Renewables	4.9
Highland Solar Center, LLC	SRE Utility Solar 1, LLC	5
Hood Farm	CD Global Solar Holdings, LLC	4.9
Innovative Solar 54	Innovative Solar 54	50
Kinston	Kinston Solar LLC	2
Kinston Davis Farm	Kinston Davis Farm, LLC	5
Kinston Solar	Cypress Creek Renewables	5
Lenoir Farm	Lenoir Farm LLC	5
Lenoir Farm 2	Lenoir Farm 2, LLC	5
Scarlet Solar	Cypress Creek Renewables	2

Source: U.S. Energy Information Administration 2019.

3.12 HAZARDOUS MATERIAL SITES

Hazardous material waste sites are regulated by state and federal agencies under the Resource Conservation Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act. Hazardous materials are generally defined as material or a combination of materials that present a potential hazard to human health or the environment.















The GeoEnvironmental Section of NCDOT conducted a preliminary alternatives analysis to identify the number and type of potentially hazardous materials sites within each 500-foot wide corridor that would pose a concern to NCDOT. Forty-two underground storage tanks (UST), landfills, and other potentially contaminated sites were identified, including 33 UST sites, 6 auto salvage operations, 1 landfill, and 2 industrial small quantity generators (SQG) of non-acute hazardous waste (Appendix G) (Figure 3-17).

3.13 MINERAL RESOURCES

The NCDEQ, Division of Energy, Mineral, and Land Resources identifies two mining pits within the vicinity of the DSAs, Clay Pit and Davis Pit. Both are past producing and no longer active mines located south of US 70 (NCDEQ 2018b; USGS 2018b).

Figure 3-17:
Hazardous materials
sites of concern

Legend

-  Project Study Area
-  Detailed Study Alternative
-  Railroad
-  US Highway
-  NC Highway
-  Secondary Road
-  Global TransPark (GTP)
-  Municipal Boundary
-  County Boundary
-  Landfill
-  Auto Salvage
-  Small Quantity Generator
-  Underground Storage Tank
-  Abandoned Mining Pit



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

