C.F. Harvey Parkway
STIP No. R-5703

Environmental Assessment

June 2016

AECOM

C.F. HARVEY PARKWAY
ALONG C.F. HARVEY PARKWAY/NC 148 FROM NC 58 TO NC 11
EXTENSION
LENOIR COUNTY
WBS NUMBER 46375
STIP PROJECT NUMBER R-5703

ADMINISTRATIVE ACTION

STATE ENVIRONMENTAL ASSESSMENT

N. C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Submitted Pursuant to the North Carolina State Environmental Policy Act

Transportation

APPROVED:

06/23/2016
Date

John Rouse, PE
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Division of Highways
North Carolina Department of Transportation

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DOCUMENT PREPARATION BY:
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Project Fact Sheet

PROJECT LOCATION

Lenoir County, North Carolina

ABSTRACT

The North Carolina Department of Transportation (NCDOT) is proposing to extend NC 148 (C.F. Harvey Parkway) on new location as a four-lane, median-divided freeway with full control of access in Lenoir County, North Carolina. The project extends from NC 58 to NC 11 in Lenoir County, north of the City of Kinston. The proposed action is listed in the NCDOT 2016-2025 State Transportation Improvement Program (STIP) as Project Number R-5703 and is being state funded. This State Environmental Assessment (EA) was prepared to consider the effects of the proposed project on the built and natural environment.

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NCDOT Division Highways - Division 2

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COMMENTS

Comments on this Environmental Assessment can be made in writing by sending a letter or email to Kory Wilmot at the address below. Written comments are due by the close of business on August 1, 2016 to:
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DOCUMENT AVAILABILITY

This Environmental Assessment is available online at the following link:
https://www.ncdot.gov/projects/CFharveyPkwyExt/default.html

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

NCDOT Division Highways - Division 2
105 Pactolus Hwy (NC 133)
Greenville, NC 27835

NCDOT Kinston District Office
1629 U.S. 258 South
Kinston, NC 28504

Kinston-Lenoir County Public Library
510 N. Queen Street
Kinston, NC 28501

Lenoir County Courthouse
County Manager's Office
130 N. Queen St
Kinston, NC 28501

148 C. F. HARVEY PARKWAY EXTENSION

NC Transportation

PROJECT COMMITMENTS

Environmental Assessment

For

C.F. Harvey Parkway (NC 148) Extension

From NC 58 to NC 11

Lenoir County, North Carolina

WBS Number 46375, STIP Project No. R-5703

The following special commitments have been agreed to by NCDOT:

- Additional archaeological investigations will be conducted on the preferred corridor during final design
- The NCDOT Geotechnical Unit/GeoEnvironmental Section will further assess the affected properties for hazardous materials and make right-of-way acquisition recommendations accordingly. Should hazardous substance sites be discovered during construction activities, measures to minimize and/or mitigate potential impacts would be implemented

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Acronyms and Abbreviations

AADT	average annual daily traffic
BAU	biological assessment unit
BFE	base flood elevation
BMP	best management practice
CFR	Code of Federal Regulations
CIA	Community Impact Assessment
CTP	Comprehensive Transportation Plan
CWA	Clean Water Act
EA	Environmental Assessment
ECU	East Carolina University
EJ	environmental justice
EMS	emergency medical services
FEMA	Federal Emergency Management Agency
GTP	Global TransPark
LOS	level of service
mph	miles per hour
NCAC	North Carolina Administrative Code
NCDOT	North Carolina Department of Transportation
NCDWR	North Carolina Division of Water Resources
NRTR	Natural Resources Technical Report
RPO	rural planning organization
STI	strategic transportation investment
STIP	State Transportation Improvement Program
USACE	United States Army Corps of Engineers
USC	United States Code
UST	underground storage tank
v/c	volume to capacity

1. DESCRIPTION OF PROPOSED ACTION

1.1 GENERAL DESCRIPTION

The North Carolina Department of Transportation (NCDOT) is proposing to extend NC 148 (C.F. Harvey Parkway) on new location as a four-lane, median-divided freeway with full control of access in Lenoir County, North Carolina. The project extends from NC 58 to NC 11 in Lenoir County, north of the City of Kinston. The project vicinity and project study area are shown on Figure 1 and Figure 2, respectively. The proposed action is listed in the NCDOT 2016-2025 State Transportation Improvement Program (STIP) as Project Number R-5703 and is being state funded. This State Environmental Assessment (EA) is being conducted for the project in accordance with the North Carolina State Environmental Policy Act, which was established to ensure that state agencies review the environmental effects of all activities that involve an action by a state agency and expenditure of public monies, or involve the private use of public land, and have a potential negative environmental effect upon natural resources, public health and safety, or natural beauty, or negatively impact historic or cultural elements of the state.

1.2 PROJECT HISTORY AND STATUS

Planning for the C.F. Harvey Parkway Extension formally began in 2007 when it was listed in the Kinston Comprehensive Transportation Plan (CTP). The CTP planning process is a locally driven planning process that identifies transportation needs in the community and was officially adopted by the City of Kinston and Lenoir County. The projects that were included in the adopted CTP are shown on Figure A-1 in Appendix A.

Following the adoption of the Kinston CTP, NCDOT conducted a feasibility study to determine the viability of this project (NCDOT, 2012). The results of the feasibility study, along with local support, led to the project being listed in the NCDOT 2016-2025 STIP as Project Number R-5703. Through the application of North Carolina's Strategic Transportation Investment (STI) law, it was determined that R-5703 is a high priority transportation project. As part of the STI prioritization process, this project received maximum points at both the division and regional prioritization levels due to the projected improvements to mobility and increased freight from the Global TransPark (GTP). Also, the project has been prioritized as the first choice for Lenoir County and the Eastern Carolina Rural Planning Organization (RPO).

C. F. Harvey Parkway
STIP Project No. R-5703

Figure 1
Project Vicinity

Legend

- Study Area
- Alternative 1
- Alternative 2
- US Highway
- NC Highway
- State Road
- Local Road
- Railroad
- County
- Kinston Regional Jetport
- Global TransPark Complex Boundary
- Municipal Area
- Water

0 0.5 1 1.5 Miles

This map is for reference only.
Sources: NCDOT, NCDEQ, CGIA, NCSHPO, NCWRC, NRCS, Lenoir County, USFWS, EPA, USDA, NCDCM, DWQ, City of Kinston, NCEM, NCOneMap, ESRI and AECOM.

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C. F. Harvey Parkway
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Figure 2
Project Study Area and Alternatives

Legend

- Study Area
- Alternative 1
- Alternative 2
- NC Highway
- State Road
- Local Road
- Railroad
- Kinston Regional Jetport
- Municipal Area
- Water

0 1,500 3,000 4,500 Feet

This map is for reference only.
Sources: NCDOT, NCDEQ, CGIA, NCSHPO, NCWRC, NRCS, Lenoir County, USFWS, EPA, USDA, NCDCM, DWQ, City of Kinston, NCEM, NCOneMap, ESRI and AECOM.

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1.3 COST ESTIMATES

The cost estimates for the project are summarized in Table 1.

Table 1: Cost estimates

Type	NCDOT 2016-2025 STIP (June 2015)[a]	Current Cost		
		Alternative 1	Alternative 2	Date
Right-of-Way	$5,332,000	$5,295,000	$6,690,000	6/2016
Utilities	$640,000	$2,979,372	$2,945,076	6/2016
Construction	$56,886,000	$73,100,000	$86,500,000	6/2016
Total Cost	$62,858,000	$81,374,372	$96,135,076	6/2016

[a] NCDOT 2016-2025 STIP.

1.4 OTHER STIP PROJECTS IN THE AREA

Other transportation projects in and around the vicinity of the proposed project that are included in the NCDOT 2016-2025 STIP are listed in Table 2 and are shown on Figure A-2 in Appendix A. Projects listed in the City of Kinston CTP were not included, as it is not a fiscally constrained plan associated with any funding mechanisms.

Table 2: Other transportation improvement projects in the vicinity of the project

STIP Number	Description	Right-of-Way	Construction
B-4566	Replace bridge 530045 over the Neuse River along NC 903	Fiscal year (FY) 2022	FY 2024
B-5619	Replace bridge 530152 over Neuse River overflow along SR 1389 (Hardy Bridge Road)	FY 2022	FY 2023
B-4569	Replace bridge 530068 over Groundnut Creek along SR 1515 (Aldridge Store Road)	FY 2019	FY 2020
B-4926	Replace bridge 530020 over Neuse River and bridge 530034 over Neuse River overflow along NC 55	FY 2019	FY 2020
B-4565	Replace bridge 530042 and bridge 530043 over Neuse River. Replace bridge 530026 and bridge 530028 over Neuse River overflow along NC 58	Under construction	Under construction

Source: NCDOT 2016-2025 STIP.

2. PURPOSE AND NEED FOR PROJECT

This section establishes the purpose of and need for the project and identifies potential secondary benefits.

2.1 NEED FOR THE PROJECT

The primary need for the proposed action is a lack of direct connectivity between US 70 and NC 11 to adjacent regional and area activity centers north and west of Kinston including the GTP; the Kinston Regional Jetport; the US 70 Industrial Park; industrial facilities along NC 11; shopping centers along US 70; the East Carolina University (ECU) Medical Center; and the communities of Grifton, Ayden, Winterville, and Greenville.

2.2 PURPOSE

The primary purpose of the proposed action is to improve regional and area connectivity in areas north and west of Kinston among US 70, NC 58, NC 148, and NC 11.

2.3 POTENTIAL SECONDARY BENEFITS

In addition to addressing the primary need, the potential exists for the following additional benefits as a result of the proposed action:

- Increase access to areas north and west of Kinston and GTP with commercial centers and businesses that are located northeast of Kinston along NC 11, as well as residential and agricultural areas.
- Support growth objectives at GTP, which depends on direct highway access for its overall operation.

3. ALTERNATIVES

3.1 ALTERNATIVES FOR THE PROPOSED ACTION

3.1.1 Alternative Modes of Transportation

The alternative modes of transportation option includes measures such as walking, bicycling, carpooling, telecommuting, and using public transportation to lessen the public's dependence on the automobile. Lenoir County Transit provides on-demand paratransit services in Lenoir County for those with disabilities and/or without access to transportation. These services will not meet the purpose and need for the project; therefore, alternative modes of transportation are not being considered for this project.

3.1.2 No-Build Alternative

A No-Build Alternative would not extend C.F. Harvey Parkway from NC 58 to NC 11 and therefore would not improve regional and area connectivity in areas north and west of Kinston and does not meet the purpose and need for this project. The No-Build Alternative would also not be consistent with the Kinston CTP. However, the No-Build Alternative is always included as a benchmark against which the impacts of other alternatives can be compared.

3.2 BUILD ALTERNATIVES

Two build alternatives for the project were developed and are described below. The build alternatives are shown on Figure 2.

3.2.1 Alternative 1

Alternative 1 begins at the intersection of C.F. Harvey Parkway (NC 148) and NC 58, and extends over to NC 11 on new location. Alternative 1 is approximately 4 miles long and intersects with NC 11 slightly north of the NC 55 and NC 11 intersection.

3.2.2 Alternative 2 (Recommended)

Alternative 2 begins in the same location as Alternative 1, at the intersection of C.F. Harvey Parkway (NC 148) and NC 58. Alternative 2 extends over to NC 11 on new location, farther north of Alternative 1. Alternative 2 is approximately 6.5 miles long and intersects with NC 11 near the Grainger Station Road (SR 1835) and NC 11 intersection.

4. PROPOSED IMPROVEMENTS

This chapter describes the proposed improvements associated with the project.

4.1 ROADWAY CROSS-SECTION AND ALIGNMENT

As determined in the feasibility study completed on the project (NCDOT, 2012), the typical section is proposed as a four-lane, median-divided facility with full control of access (Figure 3).

4.2 DESIGN CRITERIA

Design criteria developed for the project alternatives are shown in Table 3.

Table 3: Design criteria

Factor	Classification
Facility Type/Functional Classification	Freeway
Terrain Type	Level
Design Speed	70 miles per hour (mph)
Posted Speed	65 mph
Right-of-Way Width	300 feet
Control of Access	Full
Rumble Strips (Y/N)	Y
Ultimate Typical Section Type	4-lane divided shoulder
Lane Width	12 feet
Sidewalks (Y/N)	N
Bicycle Lanes (Y/N)	N
Median Width	46 feet
Shoulder Width – Inside Median	6 feet
Shoulder Width – Outside Median	12 feet
Horizontal Alignment	8%
Cross Slopes	2.5%

C. F. Harvey Parkway
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Figure 3
Proposed Typical Section

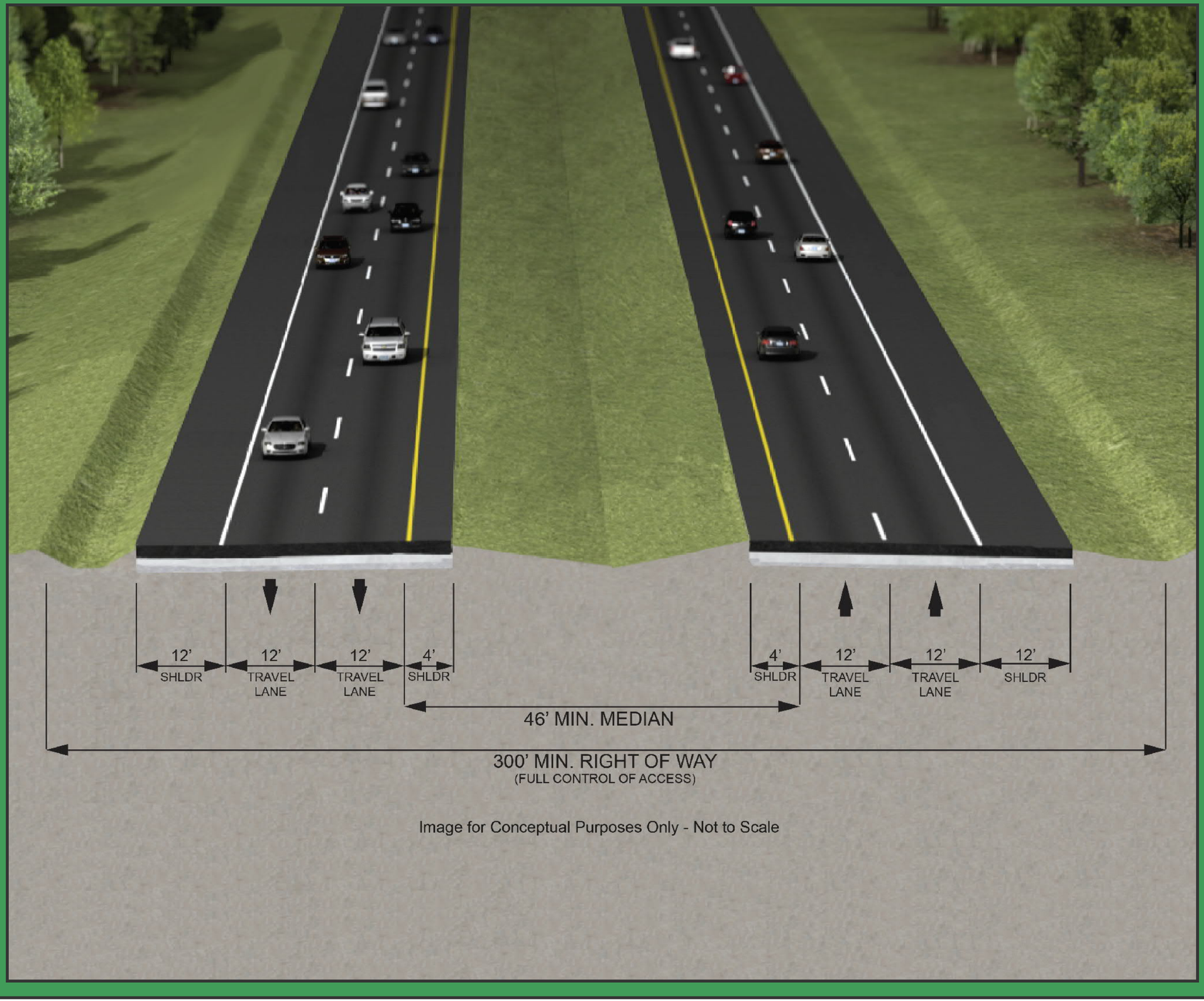

Image for Conceptual Purposes Only - Not to Scale

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4.3 INTERSECTING ROADWAYS

The proposed project may cross, relocate, or close several existing roads within the project study area. A summary of these locations and how they would be crossed is shown in Table 4. Instances that require service roads to maintain access are described in Section 4.4.

Table 4: Summary of roadways in the project study area

Roadway	Type of Facility	Alternative 1	Alternative 2
NC 58	2-lane, highway	Interchange	Interchange
Humphrey Road	2-lane, local road	Existing intersection with NC 58 will be shifted south to only provide access to parcels south of alternative; realignment at NC 58, with new NC 58 intersection north of alternative	Existing intersection with NC 58 will be closed with a cul-de-sac; realignment at NC 58, with new NC 58 intersection north of alternative
Dickerson Road	2-lane, local road	No changes	Road will be closed with cul-de-sac; and access to NC 58 provided via Humphrey Road realignment
Hugo Road	2-lane, local road	Grade separated	Grade separated
Wallace Family Road	2-lane, local road	Grade separated	Grade separated
Tilghman Mill Road	2-lane, local road	Grade separated	No changes
Hamilton Road	2-lane, local road	No changes	Road will be closed with cul-de-sacs
Ferrell Road	2-lane, local road	No changes	Grade separated
Sharon Church Road	2-lane, local road	No changes	Grade separated
NC 11	4-lane, divided highway	Interchange	Interchange

4.4 SERVICE ROADS

As a part of the project, several service roads will be required to maintain access to parcels. The service roads proposed for Alternative 1 are described in Table 5 and service roads proposed for Alternative 2 are described in Table 6. Locations of service roads for each alternative are shown on Figure A-3 in Appendix A.

Table 5: Proposed service roads for Alternative 1

Roadway	Location	Description
Humphrey Road	Inset 1: South of Alternative 1 near NC 58	Realigned at NC 58 to avoid the turn lane to the ramp onto Alternative 1; cul-de-sac at Alternative 1 crossing
Humphrey Road	Inset 1: North of Alternative 1 near NC 58	New intersection with NC 58 extending east, parallel to Alternative 1, tying into existing Humphrey Road
Stonyton Lane	Inset 3: South end of Stonyton Lane off of Tilghman Mill Road	Closure of Planters Drive intersection with Tilghman Mill Road; Stonyton Lane to be extended to Tilghman Mill Road to maintain access
Arnold Family Road	Inset 4: North end of Arnold Family Road off of Lemuel Dawson Road	Extend Arnold Family Road over to Bill Herring Road
Lemuel Dawson Road	Inset 4: West of NC 11, south of Alternative 1	Realign Lemuel Dawson Road to connect to NC 11 south of the existing intersection with NC 11 in order to avoid the acceleration lane from the ramp from Alternative 1

Table 6: Proposed service roads for Alternative 2

Roadway	Location	Description
Humphrey Road	Inset 1: North of Alternative 2 near NC 58	Realign Humphrey Road, parallel to Alternative 2, to connect into NC 58 while avoiding the turn lane to the ramp onto Alternative 2
Morris Drive	Inset 2: East of NC 11 and north of Alternative 2	Extend service road from Morris Drive southwest to provide access to properties that will lose direct access to NC 11

4.5 RAILROAD CROSSINGS

Alternative 1 will cross a railroad that is owned and operated by CSX Transportation. This railroad is located parallel to NC 11, approximately 800 feet to the northwest of NC 11 (see Figure 2). The crossing will be grade separated. Alternative 2 will not cross any railroads.

4.6 STRUCTURES

Each alternative would include multiple structures. Table 7 summarizes the proposed structures by alternative.

Table 7: Proposed structures by alternative

Location	Proposed Structure	Size
Alternative 1		
Over NC 58	Dual bridges	50 feet by 135 feet
Over Hugo Road	Dual bridges	40 feet by 160 feet
Over Wallace Family Road	Dual bridges	40 feet by 138 feet
Over Tilghman Road	Dual bridges	40 feet by 175 feet
Over Briery Run	Dual bridges	40 feet by 305 feet
Over CSX Railroad	Quad bridges (2 for mainline, 2 for ramps)	24 feet by 240 feet
Over NC 11	Dual bridges	40 feet by 240 feet
Approximately 2,165 feet west of NC 58	Extend existing culvert	50 feet
Approximately 765 feet east of Hugo Road	Culvert	280 feet
Approximately 2,730 feet northeast of Lemuel Dawson Road	Extend existing culvert	35 feet
Alternative 2		
Over NC 58	Dual bridges	50 feet by 138 feet
Over Hugo Road	Dual bridges	40 feet by 135 feet
Over Wallace Family Road	Dual bridges	40 feet by 120 feet
Over Stonyton Creek	Dual bridges	40 feet by 955 feet
Over Ferrell Road	Dual bridges	40 feet by 125 feet
Over Sharon Church Road	Dual bridges	40 feet by 265 feet
Over NC 11	Dual bridges	24 feet by 240 feet
Approximately 2,165 feet west of NC 58	Extend existing culvert	50 feet

4.7 UTILITIES

Construction of the proposed project will likely require some degree of adjustment, relocation, or modification to existing public utilities. The known utilities, as of this project development, that are located in the project study area are described in the following sections. Detailed information on specific utilities will be identified by the NCDOT Location & Surveys group prior to final design and construction.

4.7.1 Overhead Utilities

No high-tension overhead transmission lines are located within the project study area. Overhead powerlines are found throughout the project study area and are provided by Duke Energy.

4.7.2 Underground Utilities

Natural gas service is provided by Piedmont Natural Gas and is available throughout the project study area. Natural gas lines run underground along NC 58, Hugo Road, Wallace Family Road, and several other locations. Telephone and broadband internet is provided by CenturyLink and SuddenLink.

Public water service is available throughout the project study area through the Neuse Regional Water and Sewer Authority. Its member service providers include the City of Kinston, Greene County Water, and North Lenoir Water Corporation.

The public sewer system is provided by the City of Kinston and is only available to the southernmost portion of the project study area at the eastern terminus of Alternative 1.

4.8 TRAFFIC OPERATIONS

Multiple traffic scenarios were studied for the project, which include the following:

- 2012 Existing Conditions
- 2040 No-Build Alternative
- 2040 Build Alternative 1
- 2040 Build Alternative 2

In addition, scenarios that included the Kinston Bypass project (STIP No. R-2553) were also evaluated in the traffic capacity analysis, but were not included in this summary since the Kinston Bypass project is not currently funded in the STIP. The roadways in the project study area that were evaluated are summarized in Table 8.

Table 8: Existing roadway conditions

Roadway	Description	Vehicles per Day	Speed Limit
C.F. Harvey Parkway (NC 148)	4-lane, divided roadway	2,400	60 mph
NC 58	2-lane, undivided roadway	5,000	55 mph
NC 11	4-lane, divided roadway	15,000	55 mph
Ferrell Road	2-lane, undivided roadway	2,300	55 mph
NC 55	2-lane, undivided roadway	2,800	55 mph

Table 9 provides a general summary of the traffic capacity findings, which are discussed in the following sections. More detailed information can be found in the *Traffic Capacity Analysis Report, NC 148 (C.F. Harvey Parkway) Extension* (AECOM, 2016g).

Table 9: No-build and build conditions level of service summary

Intersection	AM Peak Level of Service (LOS)				PM Peak Level of Service (LOS)			
	2012 Existing	2040 No-Build	2040 Build Alt 1	2040 Build Alt 2	2012 Existing	2040 No-Build	2040 Build Alt 1	2040 Build Alt 2
NC 11 at NC 55	D	F	D	D	D	F	C	D
NC 11 at Ferrell Road	F	F	F	C	E	F	F	C
C.F. Harvey Parkway at NC 58	B	B	-	-	A	B	-	-
Westbound C.F. Harvey Parkway ramps at NC 58	-	-	C	C	-	-	C	C
Eastbound C.F. Harvey Parkway ramps at NC 58	-	-	C	C	-	-	C	C

4.8.1 2012 Existing Conditions

Two out of the three intersections analyzed performed at a level of service (LOS) D or better in both peak hours. The intersection of NC 11 at Ferrell Road operates at LOS F in the a.m. peak hour and LOS E in the p.m. peak hour for the 2012 Existing Conditions scenario.

4.8.2 2040 No-Build Alternative

One out of the three intersections analyzed will perform at LOS D or better in both peak hours. The intersections of NC 11 at NC 55 and NC 11 at Ferrell Road will operate at LOS F in both peak hours for the 2040 No-Build Alternative.

4.8.3 2040 Build Alternative 1

Three out of the four intersections analyzed will perform at LOS D or better in both peak hours. The intersection of NC 11 at Ferrell Road will operate at LOS F in both peak hours; however, it should be noted that the excessive delay at this intersection is from minor side

street movements and adding additional lanes will not resolve this issue. It is likely that this intersection would not currently meet signal warrants and should be monitored for potential operational issues in the future.

None of the four intersections analyzed present "excessive" queuing issues, defined by queue lengths of 200 feet in excess of the available storage bay. In general, queue lengths are handled adequately by the available storage.

All of the segments within the proposed freeway network are projected to operate at LOS A in both peak hours. The isolated ramps will operate with a volume to capacity (v/c) ratio no worse than 0.25.

4.8.4 2040 Build Alternative 2

Four out of the four intersections analyzed will perform at LOS D or better in both peak hours for the 2040 Build Alternative 2.

None of the four intersections analyzed present excessive queuing issues, defined by queue lengths of 200 feet in excess of the available storage bay. In general, queue lengths are handled adequately by the available storage.

All of the segments within the proposed freeway network are projected to operate at LOS A in both peak hours. The isolated ramps operate with a v/c ratio no worse than 0.25.

4.9 CRASH ANALYSIS

A Crash Analysis was performed for this EA, which included the major existing roadways within the project study area. This analysis included data from the five-year period leading up to spring 2016. The analysis compares the crash rates of the roadways within the project study area to other roadways throughout the state with similar design features. In general, the existing roadways in the project study area have a higher crash rate than the statewide crash rates. Several of the roadway segments have a crash rate that exceeds the critical crash rate for similar road types. In most cases, these segments have a relatively minor traffic volume, which means that only a few crashes can lead to a high crash rate. For most of the segments studied, the majority of crashes occurred as a result of crashing into animals within the right-of-way or by contacting fixed roadside objects. The full results of the analysis can be found in the *Crash Analysis, NC 148 (C.F. Harvey Parkway) Extension* (AECOM, 2016c).

5. ENVIRONMENTAL EFFECTS

In this section, the existing economic, social, physical, and natural environments within the project study area are described and assessed for potential impacts from the project. In some instances, the information presented in this section is a summary of information that was previously analyzed in more detailed technical reports, in which case those respective technical studies are noted by reference. Copies of these technical studies are available by contacting NCDOT.

5.1 NATURAL RESOURCES

Section 5.1 describes the environmental consequences to the natural resources. More detailed information on the natural resources can be found in the *Natural Resources Technical Report* (NRTR) (AECOM, 2016f).

5.1.1 Biotic Resources

Biotic resources include terrestrial and aquatic communities. This section describes the biotic communities found in the project study area, the relationships between fauna and flora within these communities, and the potential impacts associated with the implementation of the proposed project. The composition and distribution of biotic communities throughout the project study area are reflective of the topography, soils, hydrology, and past and present land uses.

5.1.1.1 Terrestrial Communities

The main terrestrial communities found in the project study area include pine plantation, mixed hardwood forest, and maintained/disturbed communities. More information on the terrestrial community types and locations in the project study area are provided in the NRTR. Anticipated impacts to each terrestrial community type by alternative are provided in Table 10 and are shown on Figure A-4 in Appendix A.

Table 10: Anticipated impacts to terrestrial communities

Community [a]	Alternative 1 (acres)	Alternative 2 (acres)
Maintained/Disturbed	192.9	258.7
Bottomland Hardwood Forest (w) (f)	0.2	-
Hardwood Flat (w) (f)	10.7	15.6
Hardwood Flat – Clearcut (w)	-	0.5
Loblolly Pine Plantation (f)	11.1	1.0
Mesic Mixed Hardwood Forest (f)	21.1	27.4
Non-tidal Freshwater Marsh (w)	0.9	1.4
Pine Flat (w) (f)	0.02	0.02

Community [a]	Alternative 1 (acres)	Alternative 2 (acres)
Pine Flat – Clearcut (w)	3.0	1.2
Pine Flat - Loblolly Pine Plantation (w) (f)	15.8	0.6
Seep (w) (f)	0.6	-
Headwater Forest (w) (f)	-	1.7
Riverine Swamp Forest (w) (f)	-	0.02
Total Wetland Communities	31.2	21.0
Total Forested Communities	59.5	46.3

[a] (w) denotes wetland community, (f) denotes forested community
Note: Impacts reported based upon preliminary design slope stakes limits plus 40 foot buffer

Terrestrial communities will be impacted by construction as a result of grading and paving that is associated with the project. The project study area is in a disturbed state from decades of farming and development that resulted in clearing activities. Many of the plant communities within the area are fragmented by previous human activity. Project impacts from the construction of either build alternative would be limited to areas encompassed by the right-of-way needs (slope stakes limits plus 40 foot buffer) for the project. Habitat impacts would occur during clearing and grubbing for construction or altered as a result of construction. Temporary fluctuation in populations of animal species that utilize terrestrial areas is anticipated during the course of construction. Slow-moving, burrowing, and/or subterranean organisms would be directly impacted by construction activities, while mobile organisms would be displaced to adjacent communities. Competition within the adjacent communities may affect the populations of relocated organisms by either increasing or decreasing competitive pressure on the individuals inhabiting the area. These impacts will be minimized as much as possible by restricting land clearing and construction operations within the project right-of-way. Off-site staging and stockpiling areas will be located to impact the least amount of natural habitat as possible. Stockpiling and staging areas will be revegetated after construction, which could provide replacement habitat for some species.

5.1.1.2 Invasive Species

In the NRTR, 14 invasive species were identified as being known to occur in Lenoir County. However, the physical presence of any invasive species in the project study area was not assessed. As part of best management practices (BMP), NCDOT will manage invasive plant species as appropriate.

5.1.2 Water Resources

All streams, wetlands, and ponds found within the project study area have been classified as Jurisdictional "Waters of the United States." Environmental consequences to these resources are discussed in section 5.1.3.

No designated anadromous fish waters or primary nursery areas are present in the project study area.

No streams within the project study area are designated as trout water by the North Carolina Wildlife Resources Commission.

No streams within the project study area are included in the North Carolina 2014 Final 303(d) List of Impaired Waters due to sedimentation or turbidity.

The North Carolina Division of Water Resources (NCDWR) Biological Assessment Unit (BAU) database of benthic macroinvertebrate assessment data was accessed in December 2015, and as of this time, there have been no BAU sample points taken within the project study area.

No fish monitoring data are available for the project study area.

5.1.3 Jurisdictional Issues

Waters of the United States include surface waters and wetlands (inundated or saturated areas that support vegetation typically adapted to wet conditions) as defined in 33 Code of Federal Regulations (CFR) 328.3. Impacts to Waters of the United States fall under the jurisdiction of the United States Army Corps of Engineers (USACE) through Section 404 of the Clean Water Act (CWA) (33 United States Code [USC] 1344) and under the jurisdiction of the North Carolina Department of Environmental Quality Division of Water Resources through the Section 401 Water Quality Certification Process (NC General Statutes Chapter 143 Article 21, Part 1).

A detailed analysis of the project's impacts to CWA Waters of the United State can be found in the NRTR.

All streams and wetlands in the project study area are within the Middle Neuse river basin (United States Geological Survey Hydrologic Unit 03020202). Individual classification, physical characteristics, and location of each stream and pond are provided in the NRTR.

Impacts to jurisdictional resources are shown in Table 11 and Table 12. Maps depicting stream and wetland impacts are shown on Figure A-5 and Figure A-6, respectively, in Appendix A.

USACE, NCDWR, and North Carolina Stream Assessment Method stream forms for each stream, as well as USACE wetland delineation forms and North Carolina Wetland Assessment Method wetland rating forms for each wetland, can be found in the NRTR.

Table 11: Anticipated stream impacts

Map ID/ Stream Name	Classification	Alternative 1 (linear feet)	Alternative 2 (linear feet)
23 - UT [a] to Stonyton Creek	Intermittent	-	209
33 - UT to Neuse River	Intermittent	-	84
40 - UT to Briery Run	Perennial	384	-
71 - UT to Jericho Run	Intermittent	140	-

Map ID/ Stream Name	Classification	Alternative 1 (linear feet)	Alternative 2 (linear feet)
72 - UT to Jericho Run	Perennial	74	-
72-trib - UT to Jericho Run	Intermittent	11	-
SAA - UT to Stonyton Creek	Perennial	165	161
SAB - UT to Stonyton Creek	Intermittent	401	401
SAB - UT to Stonyton Creek	Perennial	654	650
SAI - UT to Stonyton Creek	Perennial	895	-
SAC - UT to Stonyton Creek	Intermittent	-	176
SAC – UT to Stonyton Creek	Perennial	-	445
SAG - UT to Stonyton Creek	Perennial	-	289
SB - Beaverdam Branch	Perennial	-	549
SBA - UT to Beaverdam Branch	Perennial	-	123
SBC - UT to Beaverdam Branch	Intermittent	-	261
SBC - UT to Beaverdam Branch	Perennial	-	590
Total stream impacts		2,724	3,938

[a] UT means unnamed tributary

Note 1: Impacts reported based upon preliminary design slope stakes limits plus 40 foot buffer.

Note 2: Alternative 1 would impact two ponds: map ID: PC (0.29 acre) and map ID: PD (0.12 acre). Alternative 2 would not impact any ponds.

Table 12: Anticipated wetland impacts

Map ID	Type	Subtype	Alternative 1 (acres)	Alternative 2 (acres)
WA	Pine Flat	-	0.02	0.02
WA	Non-tidal Freshwater Marsh	-	0.83	0.82
WA	Hardwood Flat	-	0.00	0.00
WC	Pine Flat	Clearcut	0.79	0.79
WC	Pine Flat	Loblolly Pine Plantation	0.16	0.16
WD	Pine Flat	Clearcut	1.29	0.43
WE	Pine Flat	Loblolly Pine Plantation	6.16	-
WE	Pine Flat	Clearcut	0.92	-
WE	Hardwood Flat	-	0.02	-
WI	Riverine Swamp Forest	-	-	0.02
WI	Pine Flat	Loblolly Pine Plantation	-	0.43
WK	Hardwood Flat	Clearcut	-	0.46
WK	Hardwood Flat	-	-	14.16
WM	Non-tidal Freshwater Marsh	-	-	0.13
WP	Headwater Forest	-	-	0.81
WQ	Headwater Forest	-	-	0.18
WR	Headwater Forest	-	-	0.71
WS	Hardwood Flat	-	-	1.38
WS	Non-tidal Freshwater Marsh	-	-	0.47
WV	Pine Flat	Loblolly Pine Plantation	0.40	-
WY	Hardwood Flat	-	0.37	-
WZ	Pine Flat	Loblolly Pine Plantation	8.19	-
WAA	Hardwood Flat	-	10.28	-
WBB	Bottomland Hardwood Forest	-	0.17	-

Map ID	Type	Subtype	Alternative 1 (acres)	Alternative 2 (acres)
WBB	Non-tidal Freshwater Marsh	-	0.05	-
WCC	Seep	-	0.63	-
WGG	Pine Flat	Loblolly Pine Plantation	0.88	-
Total acreage			31.16	20.97

Note: Impacts reported based upon preliminary design slope stakes limits plus 40 foot buffer.

While efforts to avoid and minimize impacts to water resources were implemented during project development and preliminary design, some impacts to wetlands and streams will be unavoidable during construction.

Land development activities that may adversely impact wetlands require consent through permit approval from the regulating agency. At the federal level, under the CWA Section 404b(1) Guidelines (40 CFR 230) and USACE regulations (33 CFR 320.4(r)), USACE is obligated to require mitigation for any unavoidable impacts to wetlands and streams as a condition of permit approval.

5.1.3.1 Avoidance and Minimization

Considerations made during project development and preliminary design included crossing wetland systems in the narrowest area feasible and being cognizant of where wetland systems were bisected. Commitments made by NCDOT to avoid and minimize impacts are as follows:

- Alternative 1, at the Briery Run crossing, it was agreed to extend the bridge beyond the floodway to include the high quality wetlands.
- Alternative 2, at the Stonyton Creek crossing, the bridge will be extended to span the majority of the wetlands that are higher quality.
- Alternative 2, the bridge over Sharon Church Road (SR 1720) will be extended to bridge over the unnamed tributary to Beaverdam Branch, which will avoid the installation of a culvert that would be located under the western roadway bridge abutment if the bridge were not extended to span the stream.

Minimization also includes the examination of appropriate and practicable steps to reduce adverse impacts to streams and wetlands. General steps that should be implemented during the final design stage to minimize impacts by the proposed project include the following:

- Minimizing “in-stream” activities
- Strictly enforcing the sedimentation and erosion control recommended in NCDOT’s BMPs for the protection of streams and wetlands
- Decreasing the footprint of the proposed project through the reduction of right-of-way widths and steepening of fill slopes where possible
- Utilizing natural stream channel design principles when relocating streams

5.1.3.2 Compensatory Mitigation

Compensatory mitigation is meant to replace, on at least a one-to-one basis, the lost functions and values of natural streams and wetlands affected by development activities. NCDOT will investigate potential on-site stream and wetland mitigation opportunities for the preferred alternative. If on-site mitigation is not feasible, mitigation will be provided by the North Carolina Division of Mitigation Services.

5.1.4 Clean Water Act Permits

A Section 404 Individual Permit will likely be applicable due to the quantity of stream and wetland impacts anticipated for this project. USACE holds the final discretion as to which permit will be required to authorize project construction. If a Section 404 Individual Permit is required then a Section 401 Individual Water Quality Certification from the NCDWR will also be needed.

5.1.5 North Carolina River Basin Buffer Rules

Under the provisions of the CWA, the North Carolina Environmental Management Commission has adopted rules pertaining to maintaining vegetated buffers around riparian areas as part of the Nutrient Sensitive Water Management Strategies for select watersheds of North Carolina (15A North Carolina Administrative Code [NCAC] 2B).

The project study area is located within the Neuse River basin and is subject to the Neuse River Basin Buffer Rules (15A NCAC 02B .0233). Table 13 provides a summary of the buffer impact of streams identified within the project study area that have been determined by the NCDWR to be subject to the buffer rules.

Table 13: Buffer impacts by alternative

Alternative	Zone 1 buffer impacts (square feet)	Zone 2 buffer impacts (square feet)
Alternative 1	184,694	131,116
Alternative 2	240,451	182,952

Note: Impacts reported based upon preliminary design slope stakes limits plus 40 foot buffer.

5.1.6 Rare and Protected Species

Species with the federal status of endangered, threatened, proposed endangered, and proposed threatened are protected under provisions of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.). Any action likely to adversely affect a species classified as federally protected will be subject to review by the United States Fish and Wildlife Service.

Two endangered species are listed for Lenoir County: *Picodes borealis* (red-cockaded woodpecker) and *Aeschynomene virginiana* (sensitive joint-vetch). However, since no habitat is present in the project study area, neither alternative will have an impact on rare and federally protected species. More information can be found in the NRTR.

5.1.7 Soils

The Lenoir County Soil Survey (United States Department of Agriculture Natural Resources Conservation Service, 1977) identifies 17 soil mapping units, representing 12 soil series within the project study area. The process of soil development depends on both biotic and abiotic influences. These influences include past geologic activities, nature of present materials, environmental and human influences, plant and animal activity, duration of development, climate, and topographic position.

Anticipated impacts to each soil type by alternative are summarized in Table 14. The soils are shown on Figure A-7 in Appendix A. The project is expected to have a negligible overall impact to the region's topography, geology, and loss of or creation of soils.

Table 14: Anticipated soil impacts

Soil Type	Alternative 1 (acres)	Alternative 2 (acres)
Ra - Rains sandy loam	102.84	109.99
Go - Goldsboro loamy sand, 0 to 2 percent slopes	53.53	30.79
Nb - Norfolk loamy sand, 2 to 6 percent slopes	42.82	46.72
Na - Norfolk loamy sand, 0 to 2 percent slopes	32.03	34.92
Ly - Lynchburg sandy loam	7.76	29.67
Nc - Norfolk loamy sand, 6 to 10 percent slopes	13.56	12.28
BB - Bibb soils, frequently flooded	2.04	3.59
Cv - Craven fine sandy loam, 4 to 8 percent slopes	-	12.78
Jo - Johns sandy loam	-	4.35
Le - Leaf loam	-	12.95
Co - Coxville loam	-	4.69
Cr - Craven fine sandy loam, 1 to 4 percent slopes	-	-
Wc - Wagram loamy sand, 6 to 10 percent slopes	1.62	-
Lu - Lumbee sandy loam	-	3.31
Ka - Kalmia loamy sand, 0 to 2 percent slopes	0.09	-
Wb - Wagram loamy sand, 0 to 6 percent slopes	-	2.00
Ln - Lenoir Loam	-	0.02

Note: Impacts reported based upon preliminary design slope stakes limits plus 40 foot buffer.

5.2 CULTURAL RESOURCES

Cultural resources include historic architecture and significant archeological locations contained within the project study area that have the potential to be impacted by the project.

5.2.1 Historic Architectural Resources

Four historic architectural resources eligible for the National Register of Historic Places were identified in the *Historic Architecture Eligibility Evaluation Report* (AECOM, 2016d) as being within the project study area:

- Rountree-Askew-Moseley Farm (LR0797)
- Contentnea School (LR0800)
- Charles A. Broadway House (LR0802)
- Kinston DuPont Dacron Plant (LR1560)

A determination of effects meeting was held with the State Historic Preservation Office on April 26, 2016, to determine potential impacts to the four historic architectural resources that have been determined eligible for the National Register of Historic Places in the project study area. The locations of these historic architectural resources are shown on Figure A-8 in Appendix A. At this meeting it was decided that the project would have no effect on any of these properties. A summary of this meeting can be found in Appendix B.

5.2.2 Archaeological Resources

Two previously identified archeological sites (LR103 and LR318), which have been identified as potentially being eligible for the National Register of Historic Places, are located within the project study area.

No direct impacts are expected to the two archaeological sites that are located within the project study area during the construction of this project. NCDOT has requested that an intensive archeological survey be performed prior to construction. A copy of the archaeological survey recommendations, including the commitment to complete field investigations once a preferred corridor has been selected, can be found in Appendix B. No properties located along either alternative are owned by the State of North Carolina; therefore, a State Archaeological Resources Protection Act permit is not required.

5.3 AGRICULTURAL OPERATIONS

Lenoir County is characterized by large-scale agricultural operations. Most of the active farming operations in the project study area are farming crops such as corn, tobacco, and soybeans. Aerial imagery was used to identify several active farming operations within the project study area. The locations of these active farming operations are shown on Figure A-9 in Appendix A. Direct impacts will result in a loss of cropland from the purchase of right-of-way for the project. Based on the most recent agricultural data (adjusted into 2014 dollar terms), cropland revenues in Lenoir County average approximately $1,063 per acre. The loss of cropland (acres) and the loss of cropland revenues (2014 dollar terms) are broken down by build alternative in Table 15. However, the loss in cropland will be mitigated by the purchase of this land through the relocation process (see section 5.4.2) coupled with the availability of other comparable farmland in the area, which will allow impacted farming businesses to relocate and thereby avoid any future decrease in their farming activity and net earnings.

Table 15: Anticipated impacts to active farming operations

Alternative	Active Farming Operations (acres)	Projected annual Crop Revenues Losses (2014 dollar terms)
Alternative 1	99.52	$105,790
Alternative 2	167.67	$178,233

Note: Impacts reported based upon preliminary design slope stakes limits plus 40 foot buffer.

No voluntary agricultural districts are located within the project study area.

Operational impacts to active farming operations are also anticipated. The project will bisect some of the active farming operations and create a barrier that could add costs to farm operations. Temporary impacts during construction related to land needed for temporary right-of-way are also possible.

It is recommended that the NCDOT Project Engineer coordinate with local farmers, roadway design, and roadway construction to ensure that farmers continue to have access to their property during the construction phase and after the project is complete. Including design elements that would allow agricultural equipment to safely operate will serve as mitigation or minimization to potential impacts to agricultural operations.

5.4 COMMUNITY EFFECTS

This section summarizes the potential effects on the communities. Potential social effects were analyzed in the *Combined Short Form Community Impact Assessment* (CIA) (AECOM, 2016b). For more information on the analysis summarized in this section, please refer to the CIA.

5.4.1 Neighborhoods/Communities

The CIA identified several neighborhoods along the project corridors. These included residential areas along the following:

- Tilghman Mill Road
- Hamilton Road
- Mosely Lane
- Bill Herring Road
- Galadrim Road

Potential impacts to the neighborhoods and communities located near the project alternatives include impacts to community cohesion and displacements. Details on displacement to residences and businesses are discussed in section 5.4.2. Locations of these communities can be seen on Figure A-9 in Appendix A. Adverse impacts to community cohesion could be offset by improved access to employment centers.

Alternative 1 is expected to impact the residential developments along Mosely Lane and Bill Herring Road in the vicinity of NC 11. It is expected that Mosely Lane will be removed as a result of the project and thus all five residences along this road will be relocated. Aside from relocation effects (discussed in section 5.4.2), this community will likely experience a

loss of community cohesion, not only between these residences, but also with the adjacent community along Bill Herring Road with which they likely interact. One residence located on Bill Herring Road may be impacted by the project. Changes to how residences and the Jericho Church along Bill Herring Road are accessed from NC 11 will be altered, but no negative impacts from this are expected.

Alternative 2 is expected to impact the residential development along Hamilton Road. Three residences are expected to be directly impacted as part of the construction of this alternative. Aside from relocation effects (discussed in section 5.4.2), this community may experience a loss of community cohesion. Alternative 2 is also expected to impact Galadrim Road, where it is anticipated that seven homes will be directly impacted by this alternative. Impacts to community cohesion are expected.

5.4.2 Relocation

The impacts associated with the relocation of residential, business, and farm property located within the proposed right-of-way for the build alternatives are presented in this section. Relocation studies were conducted to estimate the number of residential and business relocations that would be necessary to implement the project. Details of this information are included in Appendix C. This section indicates properties that have the potential to be relocated by the project's alternatives and the associated impacts caused by those relocations.

Table 16: Relocation impacts by alternative

Alternative	Residences	Businesses	Farms
Alternative 1	9	1	0
Alternative 2	14	3	0

In addition to direct takings of residences, businesses, and farms; multiple properties would be impacted from the project, which could involve loss of trees, landscaping, and fences, and disruption of utilities. Efforts to avoid and minimize the number of relocations will continue through the final design phase of the project. Relocation impacts would be mitigated through implementation of the relocation assistance programs offered by NCDOT.

5.4.3 Environmental Justice

Title VI of the Civil Rights Act of 1964 protects individuals from discrimination on the grounds of race, age, color, religion, disability, sex, and national origin. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994), provides that each federal agency must make achieving environmental justice (EJ) a part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations. Special populations may include the elderly, children, the disabled, low-income areas, American Indians, and other minority groups. Potential impacts to the identified EJ communities are identified in the CIA.

As a result of the EJ analysis completed in the CIA, notably adverse community impacts are anticipated with this project and appear to affect all populations equivalently; thus, impacts to minority and low-income populations do not appear to be disproportionately high and adverse. Benefits and burdens resulting from the project are equitably distributed throughout the community.

5.4.4 Bicycle and Pedestrian Facilities

The affected environment includes all areas within the project study area. NCDOT-designated Lenoir County bicycle route 44 - Oak Tree Spoke and bicycle route 40 - County Loop are located within the project study area. Alternative 1 crosses bicycle route 44 along Wallace Family Road. Alternative 2 crosses bicycle route 44 along Wallace Family Road and bicycle route 40 along Sharon Church Road. These locations can be seen on Figure A-9 in Appendix A.

While both Alternative 1 and Alternative 2 will cross over designated bicycle routes, these crossings will be grade separated. Therefore, no impacts to the bicycle routes or the mobility of bicyclists are expected as a result of this project.

5.4.5 Public Facilities and Services

The following public facilities located within the project study area were identified:

- The GTP Global Training Center is located on NC 58, north of NC 148 and includes offices of GTP and the State Emergency Management Agency.
- Kinston Regional Jetport is located approximately 1 mile west of the project.
- The Contentnea-Savannah School, which serves grades K-8, is located at the intersection of Tilghman Mill Road and Ferrell Road.
- Jones Shekinah Church is located off of Humphrey Road near NC 58, adjacent to Alternative 1.
- Jericho Church is located off of Bill Herring Road near NC 11, adjacent to Alternative 1.
- Hugo Volunteer Fire & Emergency Medical Services (EMS) provides fire and EMS services to the entire project study area.

Alternative 1 will change how both the Jones Shekinah Church and Jericho Church are accessed, as roads that serve both facilities will be realigned and/or new service roads will be added. However, the changes to access are expected to have no impact on the operations or access to these facilities.

Alternative 2 will not have any impacts to public facilities.

Neither alternative is expected to have impacts to fire or EMS services. In instances where road closures are proposed, parallel roads offer similar accessibility to these properties; therefore, no impacts to fire or EMS services are anticipated.

5.5 ECONOMIC EFFECTS

The GTP, located along the existing C.F. Harvey Parkway (NC 148) just northwest of the project's western terminus, is a 2,500 acre multi-modal industrial park that offers quick access to air, rail, highways, and two international ports - the Port of Wilmington and the Port of Morehead City.

Other businesses located in the project study area include the following:

- Coastal Agro Business on NC 11
- DuPont Polymer Plant on NC 11
- Jeff's Auto Repairs on Hugo Road

Both alternatives will improve mobility and access within the project study area by increasing connectivity and improving access to GTP. The project also increases accessibility to the land near NC 58; as this land will now have direct access to NC 11 and points of interest, such as Greenville, the ECU Medical Center, and other communities, northeast of Kinston.

In addition, the two alternatives are expected to have a positive impact on GTP, as improved highway access is expected to make the business park more attractive to prospective tenants. Similarly, both alternatives would likely benefit other businesses, including Coastal AgroBusiness and the DuPont Plant that are located on NC 11, through an improved transportation system that may reduce costs. On the other hand, Alternative 2 is expected to directly impact Jeff's Auto Repairs, a small repair shop located along Hugo Road (SR 1004) that is operated out of a home. The locations of the businesses referenced are shown on Figure A-9 in Appendix A. Economic impacts to agricultural operations are discussed in section 5.3.

5.6 LOCAL AREA PLANS AND DEVELOPMENT

The following local area plans cover the project study area:

- Eastern Carolina RPO: This project is listed in the Eastern Carolina Final Assessment of NCDOT Division 2 projects and has been rated at 100 points.
- City of Kinston CTP (NCDOT, 2011): This project is also indicated in the Kinston CTP which was adopted in 2007.
- Kinston Comprehensive Pedestrian Plan (Rivers & Associates, 2008): This plan identifies the abandoned rail corridor (south of Alternative 1) as a proposed multi-use path. Local planners from the City of Kinston and Lenoir County indicated that this was not a project that they were currently pursuing or that had associated funding.
- *Lenoir County Future Land Use Plan* (2001): In this plan, most of the area within the project study area has been designated as a rural development area. Regional commercial centers are designated at planned intersections located at NC 11/NC 55 and near Graingers on NC 11. These are high traffic and high visibility locations suited for intensive development for a wide range of retail and service activities. Retail and service activities located in these centers will generate high volumes of traffic, will require regional exposure, and will serve a regional market. "Big-box" retail activities with expansive sites and large parking requirements are examples of the types of

intensive uses suited for these sites. NC 11 between Kinston and Graingers was identified as a highway commercial corridor. These are areas suited for a mixture of commercial and business uses that typically require high visibility and good road access.

- GTP Master Plan: This plan identifies the area east of NC 58 for commercial and industrial uses. In addition, officials from GTP indicated that land near the western terminus of the project, near NC 58, has been targeted for commercial development and a potential industrial park.

This project is consistent with each of the existing transportation plans, land use plans, and zoning regulations. Land use and zoning classifications from Lenoir County and GTP that are within the project study area can be seen on Figure A-10 in Appendix A.

Interviews with local officials representing the Eastern Carolina RPO, Lenoir County, the City of Kinston, and GTP were conducted to evaluate local plans and goals as part of the CIA. Through these interviews, each of the local entities stated the project fit into their respective organization's plans and goals related to growth and development.

This project will create new interchanges at NC 58 (western terminus) and along NC 11 (eastern terminus). These areas have the potential to become activity centers as they will open new areas for commercial development.

5.7 INDIRECT AND CUMULATIVE EFFECTS

This section summarizes the potential indirect and cumulative effects of the project and other actions in the same geographic area; and evaluates the interaction among the project, other actions, and the resources. For a more detailed analysis, please refer to the CIA.

5.7.1 Indirect Effects

Examination of the probable development areas shows that the project could encourage growth targeted in certain areas and/or influence future growth. Federal, state, and local regulations that include zoning ordinances and land use plans provide protections to the human and natural environmental features, which include historic and cultural resources, protected populations, wetlands, natural systems, and other important features. Indirect land use impacts to these resources should be limited by the regulations in place.

5.7.2 Cumulative Effects

This project is expected to contribute to indirect and cumulative effects from future changes. In the CIA report, it was estimated that the project will result in travel time savings of approximately 5 minutes, change property access and exposure, and create new land use/transportation nodes. Table 17 provides a summary of impaired and/or protected notable environmental features that are within the project study area and highlights likely foreseeable cumulative impacts from the proposed project.

Table 17: Summary of potential indirect and cumulative effects

Notable Environmental Resources	Description	Foreseeable Impacts
Environmental Justice	Populations including the Jericho community and three mobile home communities (two near NC 11 and one off of Hamilton Road).	Induced development may result in EJ populations being priced out of the community due to development pressures, increased air pollution, and potential barrier effects on community cohesion and the EJ communities.
Agricultural Operations	Agricultural operations exist within the project study area. Potential direct impacts to agricultural operations are assessed in the CIA.	Induced growth from the project will likely reduce agricultural operations within the project study area.
Targeted Local Watersheds	Three 14-digit Hydrologic Unit Code watersheds are found within the project study area, and one has been designated as Targeted Local Watersheds by the NCDMS. Targeted Local Watersheds have a high need for improvement and a high potential to benefit from restoration efforts, many of which occur in the form of mitigation from NCDOT.	Increased surface water runoff from induced growth could further contribute to the degradation of the targeted local watersheds; however, the Neuse River Rules and associated stormwater BMPs will minimize potential impacts.
Water Quality	Wetlands are located throughout the study area and are protected under Section 401 and 404 of the CWA.	Induced development may impact wetlands, but Section 401 and 404 of the CWA will provide protections.

5.8 FLOOD HAZARD EVALUATION

Briery Run and Stonyton Creek are Federal Emergency Management Agency (FEMA)-regulated streams with mapped floodplains and floodways. Alternative 1 crosses Briery Run, and Alternative 2 crosses Stonyton Creek. The potential crossings are on new location, and thus do not involve existing bridges or culverts. Briery Run and Stonyton Creek have

been studied by detailed methods within the Effective FEMA Flood Insurance Study dated April 16, 2013. The Effective HEC-RAS hydraulic model was obtained from the North Carolina Floodplain Mapping Program. Figure A-11 in Appendix A depicts the established limits of the flood hazard areas in the project study area.

The Alternative 1 bridge over Briery Run is proposed to be 305 feet long and will span the floodway. Interior bents will be located within the floodway and end bents are planned to be located within the floodway fringe. Interior bents and end bents are likely to cause an increase to the base flood elevation (BFE) and are likely to cause modifications to the floodway.

The Alternative 2 bridge over Stonyton Creek is proposed to be 955 feet long and will span the floodway and floodplain. Interior bents will be located within the floodway. Interior bents may cause an increase to the BFE and may result in modifications to the floodway.

Coordination will be required with North Carolina Floodplain Mapping, and a Conditional Letter of Map Revision may be needed prior to construction.

One property that was purchased through FEMA's Hazard Mitigation Grant Program is located within the project study area, but it is not near either project alternative.

5.9 TRAFFIC NOISE ANALYSIS

Traffic noise impacts and temporary construction noise impacts can be a consequence of transportation projects, especially for noise-sensitive land uses in close proximity to high-volume and/or high-speed existing steady-state traffic noise sources. A Traffic Noise Analysis was completed that utilized computer models created with the Federal Highway Administration Traffic Noise Model® v.2.5 to predict future noise levels and define impacted receptors along the proposed extension project. Existing traffic noise impacts one receptor in the vicinity of the proposed project. For design year 2040 traffic volumes, the no-build conditions impact four receptors. Overall, traffic noise impacts will lessen compared to existing conditions, since proposed build conditions will reroute traffic farther from several receptors that are impacted under existing conditions. Under proposed conditions, for which each of the build alternatives use the modeled traffic conditions in 2040, Alternative 1 and Alternative 2 both resulted with one impacted receptor each. Potential traffic noise locations can be seen on Figure A-12 in Appendix A.

Furthermore, temporary construction noise impacts may occur due to the close proximity of the noise-sensitive receptors to project construction activities. In the Traffic Noise Analysis, it is recommended that all reasonable efforts should be made to minimize exposure of noise-sensitive areas to construction noise impacts.

Consideration for noise abatement measures was given to all impacted receptors. Following the criteria for feasibility and reasonableness as prescribed in the 2011 NCDOT Traffic Noise Abatement Policy, noise abatement for this project was deemed not feasible or reasonable. Additional detailed study of potential mitigation measures shall not be necessary subsequent to selection of the final design of this project.

Please refer to the full technical report entitled *Traffic Noise Analysis, NC 148 (C.F. Harvey Parkway) Extension* (AECOM, 2016h) for a more detailed analysis of traffic noise.

5.10 AIR QUALITY ANALYSIS

An Air Quality Analysis was prepared for this project. The project is located in Lenoir County, which has been determined to comply with the National Ambient Air Quality Standards. Since the project is located in an attainment area, 40 CFR 51 and 93 are not applicable.

For projects where the design year average annual daily traffic (AADT) traffic volumes are projected to be 140,000 or less, a quantitative mobile source air toxic analysis is not required. The 2040 AADT is projected to be no more than 11,000; therefore, a qualitative analysis is sufficient.

Based on the findings in the Air Quality Analysis Report, the project is not anticipated to create any adverse effects on the air quality of this attainment area. For more details on the air quality analysis, please refer to the *Air Quality Analysis, NC 148 (C.F. Harvey Parkway) Extension* (AECOM, 2016a).

5.11 HAZARDOUS MATERIALS

In June 2016, a Geotechnical prescreening was conducted for the project. The results of the study identified a total of 3 active or closed underground storage tank (UST) sites which will be directly impacted by the project. The locations of these hazardous materials sites can be seen on Figure A-13 in Appendix A. Descriptions of each site and their anticipated risk can be seen in Table 18. A detailed study of the preferred alternative should be performed to field verify the hazardous waste sites and identify unknown sites prior to construction.

Table 18: Hazardous material sites

Site #	Type	Location	Property Name	Anticipated Impact	Anticipated Risk	Alternative Impacted
1	UST	827 Hugo Road, Kinston, NC	Jeff's Auto Repairs	USTs and/or chemical spills	Low	Alternative 2
2	UST	Hwy 11 North, Kinston, NC	Resident with Vehicle Recycling	Petroleum, USTs and/or chemical spills	Low	Alternative 1
3	UST	2760 Hwy 11 N., Kinston, NC	Clemmons Sales and Services	Petroleum, USTs and/or chemical spills	Low	Alternative 1

5.12 REQUIRED PERMITS

The proposed construction of the C.F. Harvey Parkway Extension project would result in several activities requiring environmental regulatory permits from state and federal agencies. A list of these permits, organized by issuing agency, is provided below. NCDOT would obtain all necessary permits prior to construction.

United States Army Corps of Engineers:

Section 404 Permit: any action that proposes to place fill into "Waters of the United States" falls under the jurisdiction of the USACE under Section 404 of the CWA (33 USC 1344). The CWA provides for public notice and review of pending Section 404 permit applications. Encroachments into areas determined as subject under the CWA must be reviewed and approved by the USACE through the Section 404 program.

A Section 404 Individual Permit will likely be applicable due to the quantity of stream and wetland impacts anticipated for this project. The USACE holds the final discretion as to what permit will be required to authorize project construction.

North Carolina Department of Environmental Quality, Division of Water Resources:

Section 401 Water Quality Certification: any activity that may result in discharge to navigable waters and requires a federal permit must obtain a certification through the NCDWR that such discharge would be in compliance with applicable state water quality standards. This permit is required in association with the Section 404 permitting process and is required prior to Section 404 authorization.

Neuse River Riparian Buffer Rules Authorization Certificate: any non-exempt activity within the 50-foot (15.2-meter) wide riparian buffer along all perennial and intermittent streams in the Neuse River Basin requires an authorization certificate. A list of allowable uses in the buffer areas is provided in the rules.

North Carolina Department of Environmental Quality, Division of Forest Resources:

Open Burning Permit: a permit is required to start a fire in woodlands or within 500 feet of woodlands under the protection of the Division of Forest Resources. Thirty-day permits can be issued for highway construction.

5.13 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This section provides a summary of the expected environmental consequences for each build alternative. The impacts are summarized by environmental resource in Table 19.

Table 19: Summary of environmental consequences

Environmental Resource	Alternative 1	Alternative 2
Terrestrial communities - wetland	31.2 acres	21.0 acres
Terrestrial communities – forested	59.5 acres	46.3 acres
Invasive species	O	O
Jurisdictional streams	2,724 linear feet	3,938 linear feet
Jurisdictional wetlands	31.16 acres	20.97 acres
Jurisdictional ponds	0.41 acres	O
Neuse River buffers – zone 1	184,694 square feet	131,116 square feet
Neuse River buffers – zone 2	240,451 square feet	182,952 square feet
Rare and protected species	O	O
Soils	O	O
Historic architecture properties	O	O
Archaeological sites	O	O
Agricultural operations	●	●
Neighborhoods/communities	●	●
Relocations	●	●
Environmental justice	O	O
Bicycle and pedestrian facilities	O	O
Public facilities and services	O	O
Economic	✚	✚
Land use, zoning, and development	✚	✚
Indirect and cumulative effects	O	O
Flood hazards	O	O
Traffic noise	●	●
Air quality	O	O
Hazardous materials	●	●

Key: ✚ Positive Impact; O None or Negligible; ● Negative Impact

6. COMMENTS AND COORDINATION

Coordination with the public, local officials, and state and federal agencies was ongoing throughout the planning and preliminary design phases of the project. This section summarizes all coordination and correspondence.

6.1 PUBLIC INVOLVEMENT

A public meeting and a local officials meeting was held to discuss the purpose and need of the project, explain and identify the two build alternatives, answer questions, and gather the public's feedback. NCDOT mailed 1,200 postcards informing the public of the meeting and invitations were mailed to representatives of governmental organizations and stakeholder groups. NCDOT also ran advertisements in local newspapers and radio stations about the public meeting.

NCDOT maintains a project website for the public that includes materials presented at public workshops and other project updates. NCDOT activated a toll-free project information hotline to allow the public to call for project information or project updates. NCDOT also provided materials for members of the public with limited English proficiency, which included Spanish translations of the project's postcard, flyer, handout, and comment sheet. The project hotline has Spanish translation available for the Spanish-speaking public to contact the project team. NCDOT also provided a Spanish translator at the workshop.

Both the local officials' meeting and the public meeting were held on November 19, 2015. The local officials' meeting was held at the GTP Training Center at which 24 attendees signed in. The public meeting was held at the Kinston High School at which 183 citizens signed in. Public comments were collected in writing at the public meeting and were accepted by email and postal mail until December 4, 2015. A copy of the minutes from the local officials meeting and a summary of the comments received at the public meeting can be found in Appendix D.

6.2 START OF STUDY LETTER

Upon project initiation, a Start of Study Letter was sent to the local, state, and federal agencies. A copy of the Start of Study Letter, the list of the contacts that were sent the Start of Study Letter, and a summary of the comments received are provided in Appendix E. These comments have been taken into consideration in the planning of this project and the preparation of this document.

6.3 AGENCY COORDINATION

The project team has actively coordinated, met, and sought input and approval from project stakeholders throughout the planning and preliminary design phases of the project and will continue to do so, as needed, throughout the remainder of the project. These coordination efforts are summarized in Appendix F.

7. BASIS FOR FINDING OF NO SIGNIFICANT IMPACT

Based upon a study of the proposed project documented in this assessment and upon comments received from state agencies, local agencies, and the public; it is the finding of the NCDOT that this project will not have a significant adverse impact upon the human or natural environment. The proposed project is consistent with local plans and will not disrupt communities. Per this evaluation, a Finding of No Significant Impact is applicable for this project. Therefore, no further environmental analysis is required.

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