

Fire Tower Road and Portertown Road Widening Project

STIP Project Number U-5870 and U-5785

WBS Number 44357.1.1 & 54046.1.1

Proposed Widening of SR 1708 (E Fire Tower Road) and SR 1726
(Portertown Road) from West of E Arlington Boulevard to NC 33 (E Tenth
Street)
Pitt County

ADMINISTRATIVE ACTION

STATE ENVIRONMENTAL ASSESSMENT/
FINDING OF NO SIGNIFICANT IMPACT

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Submitted pursuant to the North Carolina State Environmental Policy Act



APPROVED:

7/12/2018

Date

DocuSigned by:

Preston Hunter

5433AB43E8E9415...

Preston Hunter, P.E.
Division Engineer
NCDOT of Highways – Division 2

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July 2018

Documentation prepared for NCDOT Division of Highways - Division 2:

7/12/2018 11:32:32 AM EDT DocuSigned by:
Maria Rogerson
CB5A4DFB490A4FC...

Date Maria Rogerson, P.E.
Project Engineer
NCDOT Division of Highways – Division 2

Document Prepared By:

Three Oaks Engineering, Inc.
Durham, North Carolina

7/12/2018 9:41:02 AM EDT DocuSigned by:
Craig M. Young
DD3A49A9CC86481...

Date Craig Young, P.E.
Project Manager
Three Oaks Engineering, Inc.



7/12/2018 9:39:48 AM EDT DocuSigned by:
Suzanne U. Young
07D0EDE11F7B4F4...

Date Suzanne Unger Young, P.E.
Project Engineer
Three Oaks Engineering, Inc.



Project Fact Sheet

Project Location

City of Greenville, Pitt County, North Carolina

Summary

The North Carolina Department of Transportation (NCDOT) is proposing to widen SR 1708 (E Fire Tower Road) from west of E Arlington Boulevard to SR 1726 (Portertown Road), and Portertown Road from E Fire Tower Road to 10th Street (NC 33), from a two-lane undivided road to a four-lane, raised median divided road in the City of Greenville in Pitt County, North Carolina. The proposed action is listed in the NCDOT 2018-2027 State Transportation Improvement Program (STIP) as Projects No. U-5870 and U-5785 and is being state funded. This State Environmental Assessment/Finding of No Significant Impact (EA/FONSI) was prepared to consider the effects of the proposed project on the built and natural environment.

Project Sponsor

NCDOT Division of Highways – Division 2

Contact Person

Ms. Maria Rogerson, P.E.
NCDOT Division of Highways - Division 2
Project Engineer
1037 WH Smith Boulevard
Greenville, NC 27835
(252) 439-2830
marogerson@ncdot.gov

Comments

Comments on this Environmental Assessment can be made in writing by sending a letter or email to Dwayne Alligood at the address below. Written comments are due by the close of business on August 31, 2018 to:

Vaughn & Melton
STIP Projects U-5870 and U-5785
3115 Trent Road
New Bern, NC 28562
dhalligood@vaughnmelton.com

Authors & Principal Contributors

NCDOT Division of Highways - Division 2
Three Oaks Engineering
Vaughn & Melton

Document Availability

This Environmental Assessment is available online at the following link:
<https://www.ncdot.gov/projects/firetowerporterto wnwidening/>

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

NCDOT Division of Highways - Division 2
Project Development Unit
1037 W.H. Smith Boulevard
Greenville, NC 27835

NCDOT Division of Highways – Division 2
Division Office
2815 Rouse Road Extension
Kinston, NC 28504

City of Greenville Public Works
1500 Beatty Street
Greenville, NC 27834

PROJECT COMMITMENTS

Fire Tower Road and Portertown Road Widening Project

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July 2018

Cultural Resources

In 2002, the Red Banks Primitive Baptist Church and Cemetery (PT0049) was listed on the National Register of Historic Places (NRHP) for its eligibility under Criterion C for its distinctive architecture and Criteria Consideration A for religious properties deriving primary significance from architectural or artistic distinction or historical importance. The NRHP boundary for Red Banks Primitive Baptist Church (PT0049) has since been enlarged and now encompasses Red Banks Cemetery (Site 31PT460**), located east of the church along Fire Tower Road. Through coordination under Section 106 of the National Historic Preservation Act between the US Army Corps of Engineers, North Carolina State Historic Preservation Office (NC-HPO), and NCDOT, the following commitments were made regarding the Red Banks Primitive Baptist Church and Cemetery (PT0049):

1. All access points to the church property will be preserved.
2. Protective fencing will be in place along the construction easement line prior to and during project construction. Installation of such fencing will occur in a sensitive manner, avoiding direct impacts to any and all grave sites and anomalies.
3. No storage or staging of materials and equipment will occur within the National Register of Historic Places (NRHP) boundary.
4. No traffic signal cabinet will be located within the NRHP boundary of the church or at the northeast corner of Fire Tower Road and East 14th Street.
5. If utility relocation necessitates tree-clearing within the NRHP boundary of the church, additional review will be needed with NCHPO.
6. All marked and unmarked human remains within the ROW will be removed per applicable state statutes (NC GS 65 and NC GS 70) and reinterred at an appropriate site. Further consultation

with the NC-HPO, the State Archaeologist, and the Office of State Archaeology (OSA) and coordination with NCDOT ROW, NCDOT Division 2, and NCDOT's Archaeology and Historic Architecture Groups will be required prior to disinterment.

Division 2 Construction, Resident Engineer's Office

Coordination with both Pitt County Schools and Pitt County Emergency Services will take place regarding the required detour during work on the bridge over Hardee Creek, as well as other road closures.

In order to have time to adequately reroute school buses, Pitt County Schools will be contacted at 252-916-0944 at least one month prior to road closure.

Pitt County Emergency Services will be contacted at 252-902-3950 at least one month prior to road closure to make the necessary temporary reassignments to primary response units.

Due to the increased traffic volume observed along E Fire Tower Road and Portertown Road during ECU football game days and other major community events, traffic control measures will be coordinated with the City of Greenville to ensure that impacts to major traffic-generating community events are minimized during construction.

Hydraulic Unit – FEMA Coordination

The Hydraulics Unit will coordinate with the NC Floodplain Mapping Program (FMP), to determine the status of the project regarding the applicability of NCDOT'S Memorandum of Agreement, or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

Division Construction - FEMA

This project involves construction activities on or adjacent to FEMA-regulated stream(s). Therefore, the Division shall submit sealed as-built construction plans to the Hydraulics Unit upon completion of project construction, certifying that the drainage structure(s) and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.

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from West of E Arlington Boulevard to NC 33 (E Tenth Street)
Pitt County

SUMMARY

TYPE OF ACTION

This is a State Environmental Assessment/Finding of No Significant Impact (EA/FONSI).

DESCRIPTION OF PROPOSED ACTION

North Carolina Department of Transportation (NCDOT) State Transportation Improvement Program (STIP) Projects No. U-5870 and U-5785 (referred to herein as the “Fire Tower Road and Portertown Road Widening” project) propose to widen SR 1708 (E Fire Tower Road) from west of E Arlington Boulevard to SR 1726 (Portertown Road), and Portertown Road from E Fire Tower Road to 10th Street (NC 33), from a two-lane undivided road to a four-lane, raised median divided road in the City of Greenville in Pitt County, North Carolina. The project also has several other improvements:

- intersection improvements at the Charles Boulevard/E Fire Tower Road intersection and at the E Arlington Boulevard/Fire Tower Road intersection to accommodate predicted levels of future traffic
- constructing bicycle lanes from Charles Boulevard to NC 33
- widening of existing roundabout at E Fire Tower Road and Portertown Road from one circulating lane to two circulating lanes
- constructing a new roundabout with two circulating lanes at the intersection of Portertown Road and Eastern Pines Road
- narrowing the existing bridge over Hardee Creek for eastbound traffic and adding a new, second bridge for westbound traffic
- upgrading the Portertown Road crossing of the Carolina Coastal Railroad tracks with new gates and signals.

PROJECT BENEFITS

The proposed project would have a positive overall impact by improving traffic flow and reducing congestion, as well as reducing crashes and enhancing connectivity.

SUMMARY OF ENVIRONMENTAL EFFECTS

Thirty-one residential and three business relocations are anticipated due to the Fire Tower Road and Portertown Road Widening project. Land uses in the area would not be adversely impacted. There would be no adverse impacts on historic architectural resources and no archaeological resources would be impacted. No parks,

recreational facilities, wildlife or waterfowl refuges would be impacted. No effects on federally protected plant or animal species are expected. There would be approximately 0.13 acres of wetland impacts and 672 feet of stream impacts as a result of the proposed improvements. There would be 118 traffic noise impacts to noise-sensitive receptors that will remain after construction; noise barriers were determined to be preliminarily feasible and reasonable in six locations. The project would not have an adverse effect on air quality. No adverse impacts to the community or environmental justice populations are expected.

ANTICIPATED PERMITS

A Nationwide Clean Water Act Section 404 Permit issued by the United States Army Corps of Engineers (USACE) and a 401 Water Quality Certification issued by the North Carolina Department of Environmental Quality, Division of Water Resources (NCDWR), are anticipated to be required for this project.

COORDINATION

Several federal, state, and local agencies were consulted during the preparation of this document. Comments were provided by the following agencies:

- US Fish and Wildlife Service
- US Environmental Protection Agency Division 4
- NC Wildlife Resources Commission
- NC Division of Coastal Management
- NC Department of Natural and Cultural Resources – Division of Park and Recreation
- City of Greenville
- Greenville Urban Area Municipal Planning Organization (MPO)
- Pitt County

ADDITIONAL INFORMATION

Additional information concerning the proposed project and assessment can be obtained by contacting:

- Maria Rogerson, P.E., Project Engineer
- NCDOT Division of Highways - Division 2
- 1037 WH Smith Boulevard
- Greenville, NC 27835
- Telephone: (252) 439-2830

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Acronyms and Abbreviations

AADT	average annual daily traffic
APE	area of potential effects
BG	Block Group
BMP	best management practice
CFR	Code of Federal Regulations
CT	Census Tract
CTP	Comprehensive Transportation Plan
CSX	CSX Transportation
DSA	Demographic Study Area
EA/FONSI	Environmental Assessment/Finding of No Significant Impact
ECU	Eastern Carolina University
EJ	environmental justice
ETJ	extraterritorial planning jurisdiction
FEMA	Federal Emergency Management Agency
GPR	ground-penetrating radar
GREAT	Greenville Area Transit
HQW	High Quality Waters
LEP	Limited English Proficiency
LOS	Level of Service
MPO	Metropolitan Planning Organization
NCAC	North Carolina Administrative Code
NCDOT	North Carolina Department of Transportation
NCDEQ	North Carolina Department of Environmental Quality
NCDWR	North Carolina Division of Water Resources
NC-HPO	North Carolina State Historic Preservation Office
NS	Norfolk Southern Railway
NRHP	National Register of Historic Places
NRTR	Natural Resources Technical Report
NWP	federal Nationwide Permit
ORW	Outstanding Resource Waters
PNA	Primary Nursery Areas
ROW	right of way
SEPA	State Environmental Policy Act
STI	Strategic Transportation Investments
STIP	State Transportation Improvement Program
USACE	United States Army Corps of Engineers
UST	underground storage tank
vpd	vehicles per day
WQC	Water Quality Certification
WS-I/WS-II	water supply watersheds

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Proposed Widening of SR 1708 (E Fire Tower Road) and SR 1726 (Portertown Road)
from NC 43 (Charles Boulevard) to NC 33 (E Tenth Street)

Pitt County

1 GENERAL DESCRIPTION

North Carolina Department of Transportation (NCDOT) State Transportation Improvement Program (STIP) Projects No. U-5870 and U-5785 (referred to herein as the “Fire Tower Road and Portertown Road Widening” project) are the widening of SR 1708 (E Fire Tower Road) from west of E Arlington Boulevard to SR 1726 (Portertown Road), and Portertown Road from E Fire Tower Road to 10th Street (NC 33), from a two-lane undivided road to a four-lane, raised median divided road in the City of Greenville in Pitt County, North Carolina. The project also has several other improvements:

- intersection improvements at the Charles Boulevard/E Fire Tower Road intersection and at the E Arlington Boulevard/Fire Tower Road intersection to accommodate predicted levels of future traffic
- constructing bicycle lanes from Charles Boulevard to NC 33
- widening of existing roundabout at E Fire Tower Road and Portertown Road from one circulating lane to two circulating lanes
- constructing a new roundabout with two circulating lanes at the intersection of Portertown Road and Eastern Pines Road
- narrowing the existing bridge over Hardee Creek for eastbound traffic and adding a new, second bridge for westbound traffic
- upgrading the Portertown Road crossing of the Carolina Coastal Railroad (CLNA) tracks with new gates and signals.

NCDOT has identified the primary purpose and need of the proposed project as being to improve traffic flow and reduce congestion, as well as to reduce crashes and enhance connectivity.

This environmental document has been prepared in accordance with the North Carolina State Environmental Policy Act of 1971 (SEPA), 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, and is intended for use by both decision makers and the public. It includes the disclosure of relevant environmental information regarding the proposed project.

1.1 Project Setting

The proposed project falls entirely within the city limits or extraterritorial jurisdiction (ETJ) of the City of Greenville. Development in the project study area is primarily medium-density residential, with commercial/retail development located at both project termini, in the vicinity of E Arlington Boulevard and E Fire Tower Road to the west and E 10th Street (NC 33) to the east. There are also active agricultural operations located near both ends of the project, with large

(20-plus acre) active farms located at the rear of the Pinewood Memorial Park Cemetery and on the north side of E Fire Tower Road east of Charles Boulevard (NC 43).

The project corridor links two routes that are important to the local and regional highway network: of note, Charles Boulevard (NC 43) is a designated Military Commuting Route. Another important transportation route that crosses the study area is the CLNA, which connects agricultural facilities and industries in Eastern North Carolina to the larger rail networks of CSX Transportation (CSX) and Norfolk Southern Railway (NS). An at-grade crossing of the CLNA is located on Portertown Road approximately one quarter mile southwest of the eastern project terminus.

A project vicinity map is shown in **Figure A-1**, Appendix A.



2 PURPOSE OF AND NEED FOR ACTION

The Fire Tower Road and Portertown Road Widening project is a proposal by the NCDOT to widen SR 1708 (E Fire Tower Road) from west of E Arlington Boulevard to SR 1726 (Portertown Road), and Portertown Road from E Fire Tower Road to 10th Street (NC 33), from existing two-lane roads to four-lane, median divided roads. The project is included in NCDOT's 2018-2027 STIP. In 2013, the improvements on E Fire Tower and Portertown Roads were prioritized by NCDOT using the process defined in the Strategic Transportation Investments (STI) law. STI uses the Strategic Mobility Formula to allocate available transportation funds based on data-driven scoring and local input. The projects ranked above others within NCDOT's Division 2 based 50 percent on data (for congestion, benefit/cost, safety, freight and military, and accessibility/congestion) and 50 percent on rankings by local planning organizations and the Division.

2.1 Study Area

The project study area is located in the City of Greenville, in Pitt County, in the Inner Coastal Plain region of eastern North Carolina. Greenville is the county seat of Pitt County, and home to Eastern Carolina University (ECU) which is the third largest campus within the University of North Carolina system. The study area is bound to the west by Wimbledon Drive (just west of E Arlington Boulevard) and to the east by 10th Street (NC 33). Along this route, the study area generally follows E Fire Tower Road and Portertown Road, and expands to the north and south to accommodate improvements at intersecting roads. The project study area is shown in **Figure A-2**, Appendix A.

2.2 Project Needs

The proposed action responds to the following transportation needs:

- Current and future predicted traffic congestion within the project corridor
- Higher crash rate along E Fire Tower and Portertown Roads than statewide rate for similar roads
- Lack of access control (numerous street and driveway connections), which increases congestion and travel delays
- Lack of access control also creates conflicts between traffic turning into driveways/side streets and traffic traveling along E Fire Tower and Portertown Roads
- Need for improved east-west connectivity between NC 43 and NC 33.

2.3 Project Purpose

Given the need described above, the purpose of the proposed action is to improve traffic flow and reduce congestion, as well as to reduce crashes and enhance connectivity.

2.4 Project Description

2.4.1 Project History

The *Greenville Urban Area Thoroughfare Plan*, adopted by the Greenville Urban Area MPO in December 2004 and the NCDOT Board of Transportation in February 2005, shows that the recommended improvements for E Fire Tower Road (SR 1708) and Portertown Road (SR 1726) are for four travel lanes with bicycle and pedestrian accommodations throughout the project study area.

In 2013, the improvements on E Fire Tower and Portertown Roads were prioritized by NCDOT using the process defined in the Strategic Transportation Investments (STI) law. STI uses the Strategic Mobility Formula to allocate available transportation funds based on data-driven scoring and local input. The projects ranked above others within NCDOT's Division 2 based 50 percent on data (for congestion, benefit/cost, safety, freight and military, and accessibility/congestion) and 50 percent on rankings by local planning organizations and the Division.

2.4.2 System Linkage

2.4.2.1 Existing Road Network

The project study area includes the following arterial and collector roads:

- E Arlington Boulevard – within the project limits is a five-lane undivided minor arterial roadway with a center left-turn lane at the intersection with E Fire Tower Road (SR 1708). The surrounding land use is commercial in nature. The most recent Average Annual Daily Traffic (AADT) available for the study area roadway network is from 2016. In 2016, the AADT on E Arlington Boulevard was 23,000 vehicles per day (vpd).
- E Fire Tower Road (SR 1708) – E Fire Tower Road between NC 43 and Portertown Road is a two-lane undivided roadway. Land use along E Fire Tower Road within the project limits is mostly residential except near the intersection of NC 43 and E Fire Tower Road where land use is mostly commercial. 2016 AADT tends to vary significantly along E Fire Tower Road. The AADT of 22,000 vpd west of E 14th Street is significantly higher than AADT east of E 14th Street (16,000 vpd). The functional classification of E Fire Tower Road also varies within the project limits. Between NC 43 and E 14th Street, it is classified as a minor arterial. Between E 14th Street and Portertown Road, it is classified as a major collector.
- Charles Boulevard (NC 43) – NC 43 within the project limits is a five-lane, undivided roadway with a two-way center left-turn lane and is classified as a minor arterial. The 2016 AADT along NC 43 north and south of E Fire Tower Road is 22,000 vpd and 21,000 vpd respectively.

- E 14th Street (SR 1704) – E 14th Street within the project limits is a two-lane, undivided road and is classified as a minor arterial. Land use along E 14th Street is mostly residential. The 2016 AADT along E 14th Street north of E Fire Tower Road is 12,000 vpd.
- Portertown Road (SR 1726) – Portertown Road within the project limits is a two-lane, undivided road and is classified as a major collector. Land use along Portertown Road is mostly residential. The 2016 AADT along Portertown Road within the project limits ranges from 12,000 vpd to 13,000 vpd.
- E 10th Street (NC 33) – NC 33 is a five-lane, undivided road with a two-way center left-turn lane and is classified as a minor arterial. The 2016 AADT along NC 33 south of Portertown Road is 21,000 vpd. Land use along NC 33 within the vicinity of the project area is mostly commercial.

2.4.2.2 Other Modes of Transportation

Bicycle and Pedestrian

The Portertown Road (SR 1726) bridge over Hardee Creek has sidewalks along both sides of the bridge; however, there are no existing connecting sidewalks.

The roundabout located at the intersection of E Fire Tower Road (SR 1708) and Portertown Road (SR 1726) includes curb cuts for pedestrians within the raised concrete islands in each leg of the intersection; however, there are no painted crosswalks and there are no existing connecting sidewalks along the roads feeding into the roundabout.

The City of Greenville and Pitt County Bike Map shows that E Fire Tower Road between E Arlington Boulevard and Charles Boulevard (NC 43), and from 14th Street (SR 1704) to Portertown Road and Portertown Road to E 10th Street (NC 33) is a suitable bike route best used by experienced cyclists because of higher speeds and/or higher traffic volumes. Within the project study area, Charles Boulevard (NC 43) and County Home Road (SR 1725) are also marked as suitable routes best used by experienced cyclists.

Local bicycle, pedestrian, and greenway master plans were in the process of being updated at the start of the planning process for the Fire Tower Road and Portertown Road widening project. The Greenville Urban Area MPO with the City of Greenville completed the update in 2017, titled the *Greenville Urban Area Active Transportation Master Plan*. The update identifies Fire Tower Road/Portertown Road between Charles Boulevard and NC 33 as a Major Corridor Improvement Project currently In Development. Within the expanded study area of this project between Wimbledon Drive and Charles Boulevard, the plan identifies Fire Tower Road as part of a Strategic Bikeway Network and recommends a shared Use Path or a Separated Bikeway and Pedestrian facility. Other planned improvements within the study area include:

- Separated Bikeway and Pedestrian Facility or Shared Use Path for Charles Boulevard, Arlington Boulevard/County Home Road, and Portertown Road south of the Fire Tower Road intersection
- Neighborhood Bikeway along King George Road between Fire Tower Road and York Road
- Pedestrian Crossing Improvements at the following intersections with Fire Tower Road: Arlington Boulevard/County Home Road, Charles Boulevard, 14th Street.

Transit

Greenville Area Transit (GREAT) operates a fixed-route transit service, throughout Greenville, Monday through Saturday, between 6:25 AM and 7:00 PM on weekdays (reduced hours on Saturday). There is currently no transit service along the project corridor, however two routes extend near each of the project termini. Route 5 operates along 10th Street (NC 33), and extends to Portertown Road (SR 1726), and also operates along a short stretch of Portertown Road to access the Food Lion and Walmart shopping centers. Route 1 operates along Charles Boulevard (NC 43), extending as far as

Smythewyck Drive, one block north of E Fire Tower Road (SR 1708); this stop is ranked in the top 20 stops for GREAT in terms of daily boarding. The project study area includes the Smythewyck Drive intersection with Charles Boulevard.

The City of Greenville's *Short-Range Transit Plan*, adopted in 2013, includes a stated objective to institute transit service along growth corridors including E Fire Tower Road (SR 1708).

Railroads

The project study area includes a crossing of the CLNA, which connects agricultural facilities and industries in Eastern North Carolina to the larger rail networks of CSX Transportation (CSX) and Norfolk Southern Railway (NS). An at-grade crossing of the CLNA is located on Portertown Road approximately one quarter mile southwest of the eastern project terminus. The protected crossing includes flashing light signals with automatic gates.

2.4.3 Social and Economic Conditions

2.4.3.1 Existing Conditions

As noted above, land use in the project study area is primarily medium-density residential, with commercial/retail development located at both project termini, in the vicinity of E Arlington Boulevard and E Fire Tower Road to the west and E 10th Street (NC 33) to the east. The study area includes one potentially low-income community. The Highland Park mobile home park is located on approximately 14-acres near the eastern end of the project on Portertown Road (SR 1726), south of the CLNA railroad tracks. Approximately 80 mobile homes are located in the park.

Several community resources are located within the project study area, including the following places of worship:

- Congregation Bayt Shalom is located at 4351 E. 10th Street
- Greater Life Ministry is located at 4310 Eastern Pines Road
- Cedar Grove Missionary Baptist Church is located at 3170 E. Fire Tower Road
- St. Timothy's Episcopal Church is located at 107 Louis Street
- New Destiny Pentecostal Holiness Church is located at 2600 E. Fire Tower Road
- Red Banks Primitive Baptist Church and adjacent cemetery are located at 2601 E. Fire Tower Road
- Grace Freewill Baptist Church is located at 3551 Charles Boulevard.

Several other cemeteries are also located within the project study area:

- Pinewood Memorial Park Cemetery is located at 4150 E. 10th Street
- The City of Greenville's Homestead Memorial Gardens Cemetery is located at 4251 E. 10th Street
- A private cemetery is located on the south side of Portertown Road across the street from Cardinal Drive, at 1951 Portertown Road
- A cemetery owned by the Pitt County Historical Society is located on the north side of Fire Tower Road adjacent to the Red Banks Primitive Baptist Church near 2601 E. Fire Tower Road.

Red Banks Primitive Baptist Church and the adjacent cemetery to its the east are owned by Pitt County Historical Society and are a featured site on the North Carolina Civil War Trails, part of a three-state heritage tourism venture that leads travelers to more than 700 interpreted Civil War sites. The church is listed on the National Register of Historic Places.

2.4.3.2 Future Development

There are a few vacant commercial sites at the east end of the project on Portertown Road near the Food Lion shopping center. The City of Greenville Planner reported that these parcels will likely be developed for retail use in the future, but there are currently no plans for development.

2.4.3.3 Land Use Plans

The City of Greenville's long-range comprehensive plan, *Horizons 2026: Greenville's Community Plan* (August 2016), identifies land use, transportation, recreation and parks, historic preservation and environmental protection goals and policies. The Future Land Use and Character Map included in the plan expresses the City's intent for how Greenville should grow in the future. Similar to previously adopted Future Land Use Maps, the map identifies 16 Character Areas divided into three distinct features; Activity Centers, Neighborhoods, and Special Districts. These types of places share attributes of urban form and function, including the size and type of buildings and their relationship to the street; the surrounding street and block pattern; parking and access; as well as land uses or types of development. Within the E Fire Tower Road and Portertown Road Widening project study area, the Future Land Use and Character Map identifies residential low to medium density (LMDR) development for most of the corridor, with some commercial (C), office institutional (OI), and traditional neighborhood medium to high density (TNMH) development near both ends of the project. In addition, the map identifies a potential conservation/open space (PCOS) along Hardee Creek and high density residential (HDR) development planned in the southwest quadrant of the CLNA railroad crossing.

2.4.4 Transportation Planning

2.4.4.1 Overview of the Thoroughfare Planning Process

The thoroughfare planning process is a comprehensive transportation planning process that integrates urban area planning practices with local, regional, and statewide transportation planning practices. The process identifies transportation planning needs by evaluating land development and population growth trends in rural counties and urbanized areas. The process begins through a cooperative effort between NCDOT's Transportation Planning Branch and local planning officials. Socio-economic data is collected, including business and residential area inventories, existing street inventories, identification of environmental constraints, and historical growth information. A base (existing) year transportation model is built. Utilizing input from local planning officials, land development and population growth trends are projected and applied to the model. Through this modeling process and local knowledge of the area's socio-economic conditions, the thoroughfare planning team identifies transportation deficiencies and determines short- and long-term solutions for eliminating or diminishing those deficiencies.

2.4.4.2 MPO Transportation Planning

The *Greenville Urban Area Thoroughfare Plan*, adopted by the Greenville Urban Area MPO in December 2004 and the NCDOT Board of Transportation in February 2005 shows that the recommended improvements for E Fire Tower Road (SR 1708) and Portertown Road (SR 1726) are for four travel lanes with bicycle and pedestrian accommodations throughout the project study area. The recommended typical section varies by corridor segment from five lanes, curb and gutter, with standard inside lanes & widened outside curb lanes with sidewalks; to four lanes divided with raised median, curb and gutter, standard inside lanes with widened outside curb lanes with sidewalks. The recommended cross section for E Fire Tower Road is for five lanes from Charles Boulevard (NC 33) to Kittrell Road (SR 1725); and four lanes divided from Kittrell Road to Portertown Road. The recommended cross section for Portertown Road between E Fire Tower Road and 10th Street (NC 33) is five lanes.

The Greenville Urban Area MPO *Comprehensive Transportation Plan* (CTP) was originally adopted in 2009. A revised CTP was adopted by the MPO in 2011 and by the North Carolina Board of Transportation (NCBOT) in 2012. Currently, an update to the CTP has been developed and is expected to be considered by the NCBOT in the near future but has not occurred as of March 2018. The update includes a recommendation for STIP Projects U-5870 and U-5785 as a four-lane divided boulevard.

The Greenville Urban Area MPO *Metropolitan Transportation Improvement Program* (MTIP) for FY 2018-2027 recommends widening Fire Tower Road to multi-lanes from Charles Boulevard (NC 43) to 10th Street. The Greenville Urban MPO *Bicycle and Pedestrian Master Plan*, adopted in 2011 indicates planned sidewalks for both sides of E Fire Tower Road (SR 1708) and Portertown Road (SR 1726) through the project study area, as well as a bicycle lane. The Bicycle and Pedestrian Master Plan was in the process of being updated at the start of the planning process for the Fire Tower Road and Portertown Road widening project. The 2017 update which also includes updated greenway plans is titled the Greenville Urban Area Active Transportation Master Plan. The updated plan identifies Fire Tower Road/Portertown Road as a Major Corridor Improvement Project currently In Development. The plan includes a more general recommendation that such major corridors implement NCDOT's Complete Streets Policy during redevelopment to safely accommodate access and travel for all users.

2.4.4.3 Other Proposed Road Improvements

Other transportation projects in and around the vicinity of the proposed project that are included in the NCDOT 2018-2027 STIP are shown in **Figure A-3**, Appendix A and listed below.

- STIP Project U-5917 proposes to widen 14th Street (SR 1704) from Red Banks Road to E Fire Tower Road (SR 1708). Right of way (ROW) is scheduled for 2020 and construction is scheduled for 2022. The southern terminus for STIP U-5917 is within the study area for STIP U-5785.
- STIP Project U-2817 proposes to widen Evans Street/Old Tar Road (SR 1700) from Greenville Boulevard (264-A) to Worthington Road (SR 1711). ROW is scheduled for 2019 and construction is scheduled for 2021. STIP U-2817 is located approximately two miles to the west, and parallels Charles Road (NC 43), the western terminus of STIP U-5785.
- STIP Project U-5991 proposes to widen Charles Boulevard (NC 43) from Fire Tower Road (SR 1708) to Worthington Road (SR 1711). ROW is scheduled for 2021 and construction is scheduled for 2023.

In addition to the above NCDOT STIP Projects, the City of Greenville in coordination with NCDOT is undertaking a corridor study for 10th Street from Evans Street to Oxford Road. The 10th Street study will evaluate improvements for a three-mile-long corridor that serves motorists, pedestrians, bicyclists and transit users. The corridor project begins approximately one mile north of the Fire Tower Road and Portertown Road widening project eastern terminus.

3 ALTERNATIVES ANALYSIS

Study alternatives considered for the East Fire Tower Road and Portertown Road Widening project include a No-Build Alternative and one Build Alternative. Descriptions of the study alternatives are presented in this section.

3.1 No-Build Alternative

The No-Build Alternative assumes the proposed project is not completed and no improvements other than typical maintenance activities would be made to East Fire Tower Road or Portertown Road. Although the No-Build Alternative would not meet the project's purpose and need, the No-Build Alternative was retained for further study to provide a baseline for comparing impacts.

3.2 "Best Fit" Build Alternative

The proposed improvements would widen East Fire Tower Road and Portertown Road to a four-lane, raised median divided road. There are significant constraints within the project corridor, including residences and businesses, intersecting streets, a property listed on the National Register of Historic Places, and the existing bridge over Hardee Creek. Due to the large number of constraints, the designs were developed as a single "best fit alternative" (as opposed

to widening only on one side of the existing road or the other) with goal of minimizing the number of properties impacted. As part of the minimization effort, the median was reduced from the standard 23-feet to 16-feet.

The objective of the design team was to minimize property impacts within the constraints of the project. In locations where the designs require right of way to be acquired from one side of the existing road and not the other, it is either because the impacts would be greater on the opposite side of the road or because constraints precluded widening onto the opposite side.

3.3 Traffic Estimate and Traffic Capacity Analysis

NCDOT uses traffic estimates and traffic capacity analyses to assess whether the proposed project will provide for adequate traffic operations in the design year. A traffic estimate provides projected traffic volumes for a future year. Traffic volume is measured in annual average daily traffic (AADT). A traffic capacity analysis is developed based on the traffic estimate. The capacity analysis evaluates congestion levels, typically measured in terms of level of service (LOS).

The traffic estimate and traffic capacity analysis for the E Fire Tower Road and Portertown Road Widening project used 2040 as the horizon (design) year.

3.3.1 Traffic Estimate

A traffic estimate for the E Fire Tower Road and Portertown Road Widening project was prepared by STV Engineers, Inc. (May 2016). In coordination with NCDOT Transportation Planning Branch, STV Engineers, Inc. developed an appropriate compound annual growth rate to be used for design year volume estimation. The traffic estimate also used historic traffic volumes, current traffic counts (collected in January and February 2016), and the Greenville Urban Area MPO Travel Demand model data. Based on the estimate, the annual average daily traffic on E Fire Tower Road and Portertown Road in the project study area will range from 11,000 to 32,400 AADT in 2040.

3.3.2 Traffic Capacity Analysis

The original capacity analysis was developed by STV for the project in May of 2016. STV also developed a supplemental analysis (May 2018) during the process of the study in order to expand the original study area and to analyze the quadrant intersections recommended for the East Arlington Boulevard and South Charles Boulevard intersections with East Fire Tower Road. All traffic analyses were completed using TransModeler (version 4.0). TransModeler is simulation-based traffic software that can simulate complex traffic scenarios.

The analyses evaluated traffic operations of the study area network based on existing roadway geometries and traffic control using 2040 design year traffic data. The only exception to this is E 14th Street. Under NCDOT STIP U-5719, E 14th Street is proposed to be widened to a four-lane road. It was assumed that this widening would be completed by 2040. Therefore, E 14th Street was considered as a four-lane roadway in both the 2040 No-Build and 2040 Build scenarios. No preliminary/conceptual geometric design was available for the intersection of E Fire Tower Road and E 14th Street during the time of this study. Therefore, it was assumed that the two lanes on the southbound approach of E 14th Street will terminate as separate left and right turn lanes.

The area studied for the 2016 capacity analysis extended along E. Fire Tower Rd. and Portertown Rd. from NC 43 (Charles Boulevard) to NC 33 (E. 10th Street). The study area for the March 2018 capacity analysis analyzed the E. Fire Tower Road and NC 43 (Charles Boulevard) and the E. Fire Tower Road and Arlington Boulevard quadrant roadway intersection improvements. **Tables 3-1** and **3-2** below show the LOS results for signalized intersections and roundabouts in the 2016 and 2018 capacity analysis, respectively. These tables provide a general summary of the traffic capacity analyses. More detailed information can be found in the *Traffic Operation Analysis Report, U-5785/U-5870, SR 1708 (E.*

Fire Tower Road)/SR 1726 (Portertown Road) Multilane, (STV Engineers Inc., 2016) and Traffic Capacity Analysis Report, STIP U-5785, (STV Engineers Inc., May 2018).

Table 3-1. LOS Results – Roundabouts and Signalized Intersections East of NC 43 (Charles Blvd)

Intersection	Peak Level of Service (LOS)			
	2016 Existing (AM/PM)	2040 Future Year No-Build (AM/PM)	2040 Build with Widening (AM/PM)	2040 Build with Median U-Turn Improvements (AM/PM)
SR 1708 (E. Fire Tower Road) at SR 1704 (E. 14th Street)	C/F	D/F	E/F	B/B
SR 1708 (E. Fire Tower Road) at SR 1726 (Portertown Road)	B/B	B/C	E/F	A/C
SR 1726 (Portertown Road) at SR 1727 (Eastern Pines Drive) [3-Leg Unsignalized]	F/F (All movements)	F/F (All movements)	-	-
SR 1726 (Portertown Road) at SR 1727 (Eastern Pines Road) [Roundabout]	-	-	A/B	A/C
SR 1726 (Portertown Road) at NC 33 (E. 10th Street)	C/F	C/F	F/F	-

Table 3-2. LOS Results – E. Fire Tower Rd. and E. Arlington Blvd. Intersection and E. Fire Tower Rd. and NC 43

Intersection	Peak Level of Service (LOS)			
	2016 Existing (AM/PM)	2040 Future Year No-Build (AM/PM)	2040 Build Concept 1 (AM/PM)	2040 Build Concept 2 (AM/PM)
SR 1708 (E. Fire Tower Road) at E. Arlington Boulevard/County Home Road	E/F	F/F	D/F	E/E
E. Arlington Boulevard at Turnbury Drive (Quadrant)*	-	-	-	B/D
E. Fire Tower Road at Turnbury Drive (Quadrant)*	-	-	-	B/D
SR 1708 (E. Fire Tower Road) at NC 43 (Charles Boulevard)	F/F	F/F	F/F	D/D
E. Fire Tower Road at Kittrell Road (Quadrant)*	-	-	-	D/E
NC 43 (Charles Boulevard) at Bells Fork Road*	-	-	-	D/B
NC 43 (Charles Boulevard) at Turnbury Drive*	-	-	-	B/D

* - Intersection was signalized in the 2040 Build Concept 2

3.3.2.1 2016 Existing Scenario

A traffic analysis of the study corridor for the existing condition shows that the intersection of E Fire Tower Road at NC 43 operates at LOS F during both peak hours. All four approaches of this intersection also experience significant queuing

during the PM peak hour. The intersection of E Fire Tower Road and Arlington Boulevard operates at LOS E or worse during both peak hours with all lane groups operating at LOS E or worse in the PM peak hour. The intersection of E 14th Street at E Fire Tower Road also operates at LOS C during the AM peak hour and LOS F during the PM peak hour. Both lane groups of the southbound approach of E 14th Street operate at LOS F during the PM peak hour and experience queuing problems. The intersection of NC 33 at Portertown Road operates at LOS C during both peak hours; however, four lane groups operate at LOS E or worse during one or both peak hours. Thirteen of the 42 lane groups operate at LOS E or worse during one or both the peak hours at the unsignalized intersections.

3.3.2.2 2040 No-Build Scenario

The 2040 No-Build analysis shows what the traffic operation is anticipated to be if no changes are made to the corridor. Based on the analysis results, it is anticipated that traffic operations at all four signalized intersections would deteriorate significantly compared to existing conditions. All four intersections are anticipated to experience significant delay and operate at LOS F both overall and for the majority of individual movements during the PM peak hour. Significant queuing is also anticipated along both E Fire Tower Road and Portertown Road. Based on the observation of the simulation model, it is anticipated that queues at the signalized intersections would propagate beyond the adjacent upstream intersections, resulting in network gridlock and blocking access to intersections from side streets. As a result, a majority of the movements at unsignalized intersections are anticipated to operate at LOS E or worse during one or both peak hours.

3.3.2.3 2040 Build with Widening

The 2040 Build with widening shows what the traffic operation is expected to be if only E Fire Tower Road and Portertown Road are widened and an access control strategy for the side streets, along with a median, were implemented and built along the corridor. The intersection of Portertown Road and Eastern Pines Road was also analyzed as a roundabout in this scenario. The signalized intersections in the study area analyzed would operate at a LOS E or worse during both peak hours. Additionally, twenty of the twenty-six movements at the unsignalized operate at a LOS E or worse during one or both peak hours.

3.3.2.4 2040 Build with Median U-Turn Improvements

The 2040 Build with Median U-turn improvements shows what the traffic operation would be with the 2040 Build with Widening improvements along with additional improvements to the NC 43 (Charles Blvd) and East Fire Tower Road intersection and the Portertown Road and NC 33 intersection. Five of the six signalized intersections in the study area analyzed would operate at a LOS D or better in both peak periods. The NC 43 (Charles Blvd) and East Fire Tower Road intersection was analyzed with a quadrant left roadway in the northwest quadrant. Note that this quadrant roadway is located in a different area than the other quadrant roadways discussed in this report. The LOS results for the Portertown Road and NC 33 intersection for this scenario were not reported since no changes will be made to NC 33 in this project.

3.3.2.5 2040 Build Concept 1

The 2040 Build Concept 1 analyzed the NC 43 (Charles Blvd) and East Fire Tower Road intersection and the Portertown Road and NC 33 intersections. All approaches to both intersections had dual left turn lanes and a single right turn lane added to them. Both intersections operated at LOS F overall during both peak periods with the majority of lane groups operating at a LOS E or worse.

3.3.2.6 2040 Build Concept 2

The 2040 Build Concept 2 removed all left turn movements from the intersections of E. Fire Tower Road at NC 43 and E. Fire Tower Road at E. Arlington Boulevard / County Home Road and redirected them to quadrant roadways. The location

of the quadrant roadways are discussed in Section 4.3. Additionally, a new signal was coded at the intersection of NC 43 at Turnbury Drive. The intersection of NC 43 at Smythewyck Drive remained as a right-in, right-out intersection. In this scenario, five of the seven signalized intersections operate at a LOS D or better. In general, the 2040 Build Concept 2 performed better than the 2040 Build Concept 1 and 2040 No-Build in terms of the measures of effectiveness analyzed.

3.4 Recommended Alternative

The “Best Fit” Alternative is the Recommended Alternative for the E Fire Tower Road and Portertown Road Widening project. This alternative would satisfy the purpose and need for the project by improving traffic flow, reducing congestion, removing potential conflict points for crashes (e.g., removing locations where left turning vehicles could hit oncoming traffic), and improving connectivity between Charles Boulevard (NC 43) and 10th Street (NC 33). This alternative is consistent with NCDOT’s NCDOT 2018-2027 State Transportation Improvement Program, as well as Greenville Urban Area MPO and City of Greenville local transportation plans.

The recommended alternative minimizes environmental impacts and costs by reducing the median width to the maximum extent practicable, minimizing right of way width to reduce property impacts, installing retaining walls to minimize property impacts, and shifting the alignment in multiple locations in order to minimize property impacts.

3.5 Cost Estimates

The cost estimates for the project are summarized in **Table 3-3**.

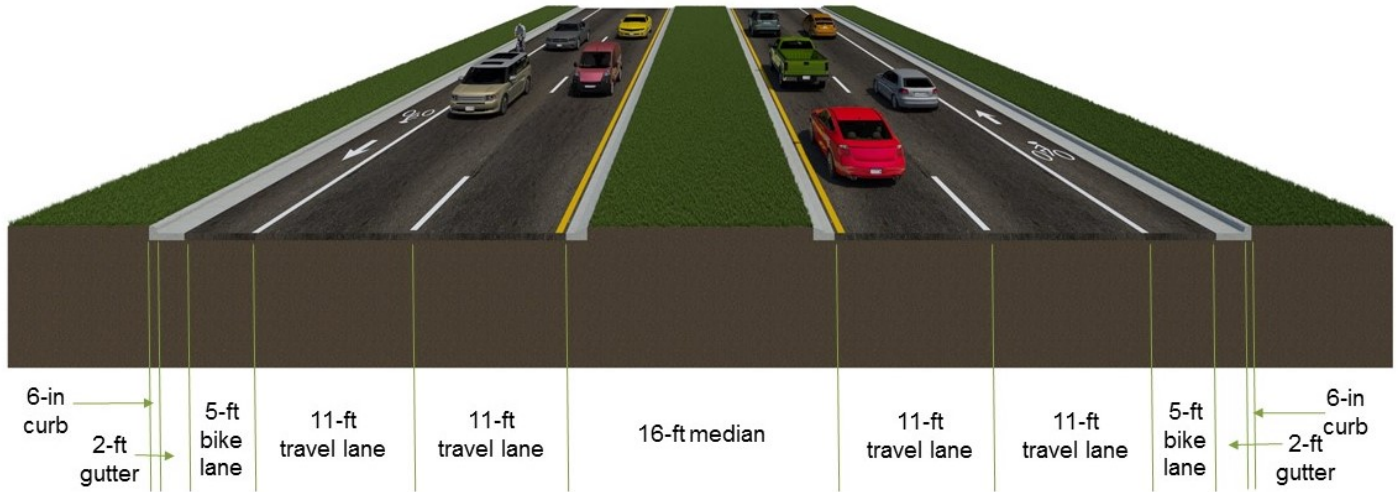
Table 3-3. Cost Estimates

Type	NCDOT 2018-2027 STIP	Current Cost
Right-of-Way	\$24,125,000 (U-5870: \$22,452,000 + U-5785: \$1,673,000)	\$28,420,300
Utilities*	\$1,210,000 (U-5870: \$956,000 + U-5785: \$254,000)	\$2,135,000
Construction	\$22,116,000 (U-5870: \$17,556,000 + U-5785: \$4,560,000)	\$25,400,000
Total Cost	\$47,451,000	\$55,955,300

4 PROPOSED IMPROVEMENTS

4.1 Roadway Typical Section

The proposed improvements would widen Fire Tower Road and Portertown Road to a four-lane, raised median divided road. As shown below, a five-foot bicycle lane will be added in both directions from Charles Boulevard to NC 33. A two-foot gutter will also be added to both sides of the road. The concrete curb will be an additional six inches. The proposed 16-foot wide raised median will provide for left turns at median breaks. U-turn movements will be provided at multiple locations throughout the corridor. Initially, grass will be planted in the medians; however, through future coordination with the City of Greenville a plan for additional landscaping may be developed and funded through local cost sharing agreements.



4.2 Right-of-Way and Access Control

The proposed raised median will provide for left turns at median breaks. U-turn movements will be provided at multiple locations throughout the corridor.

4.3 Intersecting Roads

Proposed changes to intersecting roads are as follows:

4.3.1 Intersections of E Fire Tower Road and NC 43 (Charles Boulevard) and E Fire Tower Road and E Arlington Boulevard (Proposed Quadrant Intersections)

To accommodate the predicted future traffic volumes, the project proposes two quadrant intersection designs that would replace the existing intersections of E Fire Tower Road with NC 43 (Charles Boulevard) and E Arlington Boulevard. The quadrant designs remove all left turns at NC 43 (Charles Boulevard) and E Arlington Boulevard, and relocate these turning movements to quadrant roadways nearby. The quadrant design removes left turns from an intersection, reducing it to a two-phase signal and improving efficiency which should then result in a reduction in the intersection delay. It also removes conflicting left-turns from the intersection, thereby reducing crash potential. Another benefit of this design is that it avoids having to widen roadways to add multiple additional turn lanes, which would have additional property impacts. It also allows for the median to be used for left turn access into business driveways at several locations, an addition that could not occur if the median had to be used for left turn lanes for the main intersections.

The northwest quadrant relocates the existing left turns at the intersection of E Fire Tower Road and E Arlington Road, as follows:

- Vehicles heading east on E Fire Tower Road wanting to go north on E Arlington Boulevard would turn left onto a new unnamed road (before the E Arlington Boulevard intersection), then turn left at the intersection of that unnamed road with E Arlington Boulevard
- Vehicles heading west on E Fire Tower Road wanting to head south on E Arlington Boulevard would go through the E Arlington Boulevard intersection, turn right onto the new unnamed road, then turn left of the intersection of that unnamed road with E Arlington Boulevard
- Vehicles heading north on E Arlington Boulevard wanting to go west on E Fire Tower Road would go through the E Fire Tower Road intersection, turn left onto the new unnamed road, then turn right onto E Fire Tower Road
- Vehicles driving south on E Arlington Boulevard wanting to go east on E Fire Tower Road would turn right onto the new unnamed road (before the E Fire Tower Road intersection), then turn left onto E Fire Tower Road

The southeast quadrant relocates the existing left turns at the intersection of E Fire Tower Road and NC 43 (Charles Boulevard) as follows:

- Vehicles heading east on E Fire Tower Road wanting to go north on NC 43 (Charles Boulevard) would go through the NC 43 (Charles Boulevard) intersection, turn right onto Kittrell Road, then turn right onto NC 43 (Charles Boulevard)
- Vehicles heading west on E Fire Tower Road wanting to go south on NC 43 (Charles Boulevard) would turn left onto Kittrell Road (before the NC 43 (Charles Boulevard) intersection), then turn left onto NC 43 (Charles Boulevard)
- Vehicles heading north on NC 43 (Charles Boulevard) wanting to go west on E Fire Tower Road would turn right onto Kittrell Road (before the E Fire Tower Road intersection), then turn left onto E Fire Tower Road
- Vehicles heading south on NC 43 (Charles Boulevard) wanting to go east on E Fire Tower Road would go through the E Fire Tower Road intersection, turn left onto Kittrell Road, then turn right onto E Fire Tower Road

As part the quadrant designs, the following intersection improvements are proposed:

- Turnbury Drive/new Turnbury Drive Extension and E Arlington Boulevard – A traffic light will be installed at the intersection of Turnbury Drive/new Turnbury Drive Extension and E Arlington Boulevard. All turning movements (left, right, and straight) from E Arlington Boulevard onto both the new Turnbury Drive Extension and existing Turnbury Drive will be permitted. Eastbound vehicles on the new Turnbury Drive extension will be permitted to turn left or right onto E Arlington Boulevard and continue straight across E Arlington Boulevard onto the existing Turnbury Drive. Westbound vehicles on Turnbury Drive will not be able to continue straight onto the new Turnbury Drive Extension, but will need to turn left or right onto E Arlington Boulevard.
- Turnbury Drive and NC 43 (Charles Boulevard) – A traffic signal will be installed at the intersection of Turnbury Drive and NC 43 (Charles Boulevard). All turning movements at the intersection will remain in place.
- E Arlington Boulevard and Smythewyck Drive – Turn lanes will be added to E Arlington Boulevard to allow left turns onto Smythewyck Drive from either the north or south. A channelization island in the median will prevent left turns from Smythewyck Drive onto E Arlington Boulevard. Vehicles wanting to turn left onto E Arlington Boulevard from eastbound Smythewyck will need to turn right on E Arlington Boulevard, then turn right on E Fire Tower Road, and then turn right into the commercial development to access Smythewyck Drive. Vehicles wanting to turn left onto E Arlington Boulevard from westbound Smythewyck will need to turn right on E Arlington Boulevard to the intersection with the new unnamed road / Turnbury Drive to turn make a series of left turns through the commercial development to return to Smythewyck Drive.

- Smythewyck Drive and NC 43 (Charles Boulevard) – A channelization island in the median will prevent left turns from Smythewyck Drive onto NC 43 (Charles Boulevard). Vehicles wanting to turn left onto NC 43 (Charles Boulevard) will need to turn right onto NC 43 (Charles Boulevard), then turn right onto E Fire Tower Road, then turn right onto E Arlington Boulevard, and turn right onto Turnbury Drive to access the traffic light at Turnbury Drive and NC 43 (Charles Boulevard).
- E Arlington Boulevard and E Fire Tower Road – All left turns will be restricted at this intersection and vehicles will use the quadrant designs as described above.
- Tennyson Drive and E Fire Tower Road – A left turn lane will be added to E Fire Tower Road to allow eastbound vehicles to turn onto Tennyson Drive. A channelization island will prevent vehicles leaving Tennyson Drive from turning left onto E Fire Tower Road; instead, eastbound vehicles will turn right onto E Fire Tower Road and travel west Arlington Boulevard, turn right, then left onto the new Turnbury Drive Extension, then left onto Fire Tower Road.

4.3.2 Intersection of E Fire Tower Road and Kittrell Road

Kittrell Road is proposed to be utilized for the southeast quadrant intersection described above. Left turns will be allowed to and from E Fire Tower Road. South of the intersection with E Fire Tower Road, Kittrell Road will be realigned to the east to connect directly with westbound SR 1729 (Bells Fork Road). A new connector road will provide access from Kittrell Road onto eastbound SR 1729 (Bells Fork Road). At the request of the public, a roundabout was evaluated at this location, but the traffic volumes did not support a roundabout design.

4.3.3 Intersection of NC 43 (Charles Boulevard) and SR 1729 (Bells Fork Road)

A traffic signal will be installed at the intersection of NC 43 (Charles Boulevard) and SR 1729 (Bells Fork Road). All existing turning movements at the intersection will remain in place.

4.3.4 Intersection of E Fire Tower Road and E 14th Street

The existing traffic signal at the intersection of E Fire Tower Road and E 14th Street will remain in place, and all existing turning movements at the intersection will remain in place. The project will add a second left turn lane on E 14th Street (to head westbound on E Fire Tower Road) and on E Fire Tower Road (to head northbound on E 14th Street). The design teams have coordinated on the tie in location of project U-5917 with the Fire Tower Road project. Design files have been shared to coordinate as best as possible, and the U-5917 project team participated in the Section 106 coordination meeting for the Red Banks Primitive Baptist Church and Cemetery. Project U-5917 is in its early phases and lane requirements at the intersection with Fire Tower are still being determined.

4.3.5 Unsignalized Roads Intersecting E Fire Tower Road

- Meeting Place – A channelization island in the median will limit Meeting Place to right-in/right-out only. Vehicles wanting to turn left from E Fire Tower Road onto Meeting Place will continue to Cleere Court to make a U-turn to access Meeting Place. Vehicles wanting to turn left from Meeting Place onto E Fire Tower Road will need to turn right onto E Fire Tower Road and travel to the intersection with Kittrell Road to make a U-turn onto E Fire Tower Road.
- Cleere Court – A left turn lane will be added to E Fire Tower Road to allow vehicles to turn onto Cleere Court. A channelization median will prevent vehicles leaving Cleere Court from turning left onto E Fire Tower Road; instead, vehicles will turn right onto E Fire Tower Road and travel to the intersection with Kittrell Road to make a U-turn onto E Fire Tower Road.
- Pinetree Lane - A channelization island in the median will limit Pinetree Lane to right-in/right-out only. Vehicles wanting to turn left from E Fire Tower Road onto Pinetree Lane continue to Kittrell Road to make a U-turn onto

E Fire Tower Road to access Pinetree Lane. Vehicles wanting to turn left from Pinetree Lane onto E Fire Tower Road will need to turn right onto E Fire Tower Road and travel to the intersection with E 14th Street to make a U-turn onto E Fire Tower Road.

- Eleanor Street – A channelization island in the median will prevent left turns from Eleanor Street to E Fire Tower Road. Vehicles wanting to turn left from Eleanor Street onto E Fire Tower Road will need to turn right onto E Fire Tower Road and travel to the intersection with Mary Beth Drive / Lee Street to make a U-turn onto E Fire Tower Road. A left turn lane will be added to E Fire Tower Road to allow vehicles to turn left onto Eleanor Street
- Mary Beth Drive (West) – A channelization island in the median will limit Mary Beth Drive to right-in/right-out only. Vehicles wanting to turn left from E Fire Tower Road onto Mary Beth Drive will continue to Mary Beth Drive (East) / Lee Street to make a U-turn to access Mary Beth Drive. Vehicles wanting to turn left from Mary Beth Drive onto E Fire Tower Road will need to turn right onto E Fire Tower Road and travel to the intersection with Eleanor Street to make a U-turn onto E Fire Tower Road.
- Mary Beth Drive (East) – A left turn lane will be added to E Fire Tower Road to allow vehicles to turn left onto Mary Beth Drive (East). A channelization island in the median will prevent vehicles leaving Mary Beth Drive (East) from making left turns onto E Fire Tower Road. Vehicles wanting to turn left from Mary Beth Drive (East) onto E Fire Tower Road will need to turn right onto E Fire Tower Road and travel to the intersection with Eleanor Street to make a U-turn onto E Fire Tower Road.
- Lee Street – A channelization island in the median will prevent left turns from E Fire Tower Road onto Lee Street. Vehicles wanting to turn left from E Fire Tower Road onto Lee Street will continue to Mary Beth Drive (West) to make a U-turn to access Lee Street. A channelization island in the median will prevent vehicles leaving Lee Street from making left turns onto E Fire Tower Road. Vehicles wanting to turn left from Lee Street onto E Fire Tower Road will need to turn right onto E Fire Tower Road and travel to the intersection with Avalon Lane to make a U-turn onto E Fire Tower Road.
- King Arthur Road – A median will limit King Arthur Road to right-in/right-out only. Vehicles wanting to turn left from E Fire Tower Road onto King Arthur Road will continue to Avalon Lane to make a U-turn to access Meeting Place. Vehicles wanting to turn left from King Arthur Road onto E Fire Tower Road will need to turn right onto E Fire Tower Road and travel to the intersection with Eleanor Street to make a U-turn onto E Fire Tower Road.
- Avalon Lane – A left turn lane will be added to E Fire Tower Road to allow vehicles to turn left onto Avalon Lane. A channelization island in the median will prevent vehicles leaving Avalon Lane from making left turns onto E Fire Tower Road. Vehicles wanting to turn left from Avalon Lane onto E Fire Tower Road will need to turn right onto E Fire Tower Road and travel to the intersection with Mary Beth Drive (East) / Lee Street to make a U-turn onto E Fire Tower Road.

4.3.6 Existing Roundabout at E Fire Tower Road/Portertown Road/Robin Road

The project will widen the existing roundabout at E Fire Tower Road and Portertown Road from one circulating lane to two circulating lanes for eastbound traffic between E Fire Tower Road, Portertown Road, and Robin Road. One circulating lane will remain for westbound traffic travelling from Robin Road or northbound Portertown Road to E Fire Tower Road. The existing slip lane from Portertown Road to E Fire Tower Road will be shifted slightly west to accommodate the new designs.

4.3.7 Unsignalized Roads Intersecting Portertown Road

- Cardinal Drive – A median will limit Cardinal Drive to right-in/right-out only. Vehicles wanting to turn left from Portertown Road onto Cardinal Drive will continue to Williamsbrook Lane to make a U-turn to access Cardinal Drive. Vehicles wanting to turn left from Cardinal Drive onto Portertown Road will need to turn right onto

Portertown Road and travel to the roundabout at E Fire Tower Road/Portertown Road/Robin Road to return onto Portertown Road.

- King George Road – A left turn lane will be added to King George Road to allow vehicles to turn left onto Portertown Road. A channelization island in the median will prevent vehicles on Portertown Road from making left turns onto King George Road. Vehicles wanting to turn left from Portertown Road onto King George Road will need to continue to Williamsbrook Lane to make a U-turn onto Portertown Road.
- Robin Road (East) – A channelization island in the median will limit Robin Road (East) to right-in/right-out only. Vehicles wanting to turn left from Portertown Road onto Robin Road will need to travel to the roundabout at E Fire Tower Road/Portertown Road/Robin Road to return onto Portertown Road to access Robin Road (East). Alternatively, the vehicles can exit onto Robin Road from the roundabout. Vehicles wanting to turn left from Robin Road onto Portertown Road will need to turn right onto Portertown Road and continue to Williamsbrook Lane to make a U-turn onto Portertown Road.
- Williamsbrook Lane – A left turn lane will be added to Portertown Road to allow vehicles to turn left onto Williamsbrook Lane. Additionally, a right turn lane will be added to Portertown Road to provide access to Williamsbrook Lane. A channelization island in the median will prevent vehicles leaving Williamsbrook Lane from making left turns onto Portertown Road. Vehicles wanting to turn left from Williamsbrook Lane onto Portertown Road will need to turn right onto Portertown Road and travel to the roundabout at E Fire Tower Road/Portertown Road/Robin Road to return onto Portertown Road.
- Willow Run Drive – A left turn lane will be added to Portertown Road to allow vehicles to turn left onto Willow Run Drive. A channelization island in the median will prevent vehicles leaving Willow Run Drive from making left turns onto Portertown Road. Vehicles wanting to turn left from Willow Run Drive onto Portertown Road will need to turn right onto Portertown Road and travel to the U-turn lane between Rocket Road and Rhema Street to make a U-turn onto Portertown Road.
- Brook Creek Lane – A median will limit Brook Creek Lane to right-in/right-out only. Vehicles wanting to turn left from Portertown Road onto Brook Creek Lane will continue to the U-turn lane between Rocket Road and Rhema Street to make a U-turn to access Brook Creek Lane. Vehicles wanting to turn left from Brook Creek Lane onto Portertown Road will need to turn right onto Portertown Road and travel to the intersection with Williamsbrook Lane / Willow Run Drive to make a U-turn onto Portertown Road.
- Rocket Road – A median will limit Rocket Road to right-in/right-out only. Vehicles wanting to turn left from Portertown Road onto Rocket Road will continue to the U-turn lane between Rocket Road and Rhema Street to make a U-turn to access Rocket Road. Vehicles wanting to turn left from Rocket Road onto Portertown Road will need to turn right onto Portertown Road and travel to the intersection with Williamsbrook Lane / Willow Run Drive to make a U-turn onto Portertown Road.
- Rhema Street – A median will limit Rhema Street to right-in/right-out only. Vehicles wanting to turn left from Portertown Road onto Rhema Street will continue to the roundabout at Portertown Road and Eastern Pines Road to return on Portertown Road to access Rhema Street. Vehicles wanting to turn left from Rhema Street onto Portertown Road will need to turn right onto Portertown Road and travel to the intersection with Williamsbrook Lane / Willow Run Drive to make a U-turn onto Portertown Road.
- Elkin Ridge Drive – A median will limit Elkin Ridge Drive to right-in/right-out only. Vehicles wanting to turn left from Portertown Road onto Elkin Ridge Drive will continue to the roundabout at Portertown Road and Eastern Pines Road to return on Portertown Road to access Elkin Ridge Drive. Vehicles wanting to turn left from Elkin Ridge Drive onto Portertown Road will need to turn right onto Portertown Road and travel to the intersection with Williamsbrook Lane / Willow Run Drive to make a U-turn onto Portertown Road.

- Eastern Pines Road – The project will construct a new roundabout with two circulating lanes at the intersection of Portertown Road and Eastern Pines Road.

4.3.8 Intersection of Portertown Road and NC 33 (E 10th Street)

The project will maintain the existing double left-turn lanes from Portertown Road onto NC 33 (East 10th Street). No improvements will be made along NC 33 (E 10th Street).

4.4 Bicycle and Pedestrian Facilities

The project designs include five-foot bicycle lanes in both directions from Charles Boulevard to NC 33. The project designs also include sidewalks throughout the length of the project corridor, and along some of the intersecting streets in the commercially developed area at the west end of the project. Sidewalks will be constructed along both sides of E Fire Tower Road from west of E Arlington Boulevard to Portertown Road, and along Portertown Road from E Fire Tower Road to NC 33. Sidewalks will also be constructed along both sides of Charles Boulevard from Turnbury Drive to Bells Fork Road; along Bells Fork Road/Kittrell Road from Charles Boulevard to E Fire Tower Road; along E Arlington Boulevard from E Fire Tower Road to Turnbury; and, along both sides of the new Turnbury Drive Extension. Appropriate locations for pedestrian crosswalks will be evaluated as part of the final design phase of the project.

The inclusion of sidewalks in this project is made possible through a construction and long-term maintenance cost sharing agreement between the City of Greenville and NCDOT.

4.5 Railroad Crossing

The project will upgrade the Portertown Road crossing of the CLNA tracks with new gates, signals, and crossing surface materials. The new crossing will also accommodate bicycle and pedestrian movements across the tracks. Preliminary discussions have been held with CLNA and the NCDOT Rail Division to discuss alignment of the new crossing and design requirements. CLNA has indicated that they will utilize their consulting firm for design of the crossing. The crossing will be closed to vehicular traffic for two to three days during construction of the crossing, and a detour will be put in place.

4.6 Utilities

Construction of the proposed project will 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. The preliminary cost estimate for relocation of water and sewer lines is included in the total estimated cost for this project, as shown in **Table 3-3**. Responsibility for the costs associated with the relocation of other utilities will be borne by the utility providers, or will be determined through future coordination.

4.6.1 Overhead Utilities

Overhead powerlines are located through the project study area with power service provided by the Greenville Utilities Commission (GUC). There are no high-tension overhead transmission lines found along the project. CenturyLink and Suddenlink are internet, cable television and phone service providers, and have above-ground facilities throughout the project study area.

4.6.2 Underground Utilities

GUC provides electric, sewer, and natural gas services within the project study area. GUC and Eastern Pines Water Corporation both provide water service within the project study area. In addition, both CenturyLink and Suddenlink have buried fiber cables within the project study area.

5 PREDICTED ENVIRONMENTAL EFFECTS OF PROPOSED ACTION

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

This section of the EA provides a summary of potential impacts to the natural environment within the project study area. A Natural Resources Technical Report (NRTR) (Vaughn & Melton and Three Oaks Engineering, 2018) were prepared for this project, and includes further details related to the natural environment. Field investigations were conducted in December 2015 and March 2018. Walking surveys were undertaken to determine natural resource conditions and to document natural communities, wildlife, and the presence of protected species or their habitats. Wetland and stream delineations were also completed.

5.1.1 Water Resources

Water resources in the project study area (**Table 5-1**) are part of the Tar-Pamlico River basin [US Geological Survey (USGS) Hydrologic Unit 03020103] and Neuse River basin (USGS Hydrologic Unit 03020202). Nine stream channel reaches and one open water area were identified in the study area (**Figure A-2**). Only the three reaches of Fork Swamp are in the Neuse River basin; the other water resources are in the Tar-Pamlico River basin. The location of each water resource is shown in the Environmental Features Map **Figure A-4**, Appendix A.

Table 5-1. Water Resources in the Study Area

Resource Name	Map ID	River Basin	NCDWR Index Number	Best Usage Classification
Hardee Creek	Hardee Creek (SA)	Tar-Pamlico	28-97	C;NSW
UT to Hardee Creek	SB	Tar-Pamlico	28-97	C;NSW
UT to Hardee Creek	SC	Tar-Pamlico	28-97	C;NSW
Meeting House Branch	Meeting House Branch (SD)	Tar-Pamlico	28-97-1	C;NSW
UT to Meeting House Branch (at 14 th St)	SE	Tar-Pamlico	28-97-1	C;NSW
UT to Meeting House Branch (at Charles Blvd)	SF	Tar-Pamlico	28-97-1	C;NSW
Fork Swamp (at Charles Blvd)	Fork Swamp A	Neuse	27-94-4	C;NSW
Fork Swamp (at Sheetz)	Fork Swamp B	Neuse	27-94-4	C;NSW
Fork Swamp (at Wimbledon Dr)	Fork Swamp C	Neuse	27-94-4	C;NSW
UT to Hardee Creek Pond	P1	Tar-Pamlico	None assigned	C;NSW

All streams, wetlands, and ponds found within the project study area have been classified as potential Jurisdictional “Waters of the United States”, shown in **Table 5-2** and **Table 5-3** below, and in the Environmental Features Map, **Figure A-4**, Appendix A. One open water area is present within the project study area. SC flows into P1, which eventually flows into Hardee Creek. P1 is an in-line pond. The information contained below is subject to change upon final approval by the USACE and NCDWR.

The main stem of Hardee Creek, the main stem of Meeting House Branch, and the main stem of Fork Swamp are present within the project study area. These channels have been designated as Nutrient Sensitive Waters, indicating waters needing additional nutrient management due to being subject to excessive growth of microscopic or macroscopic vegetation.

Table 5-2. Jurisdictional Characteristics of Water Resources in the Study Area

Map ID	Length (Feet)	Classification	Compensatory Mitigation Required	River Basin Buffer	
SA	169	Perennial	Undetermined	Applicable	
SB	118	Intermittent	Undetermined	Applicable	
SC	99	Intermittent	Undetermined	Applicable	
SD	150	Perennial	Undetermined	Applicable	
SE	335	Intermittent	Undetermined	Applicable	
SF	51	Intermittent	Undetermined	Applicable	
Fork Swamp A	46	Perennial	Undetermined	Applicable	
Fork Swamp B	105	Perennial	Undetermined	Applicable	
Fork Swamp C	72	Perennial	Undetermined	Applicable	
P1*	<0.01 acre	NA	1	Undetermined	Applicable
Total	1,145				

* Open Water pond area represented as acreage, and not included in the total length (Feet)

There are no designated anadromous fish waters or Primary Nursery Areas (PNA) present in the study area. There are no designated Outstanding Resource Waters (ORW), High Quality Waters (HQW) or water supply watersheds (WS-I or WS-II) within 1.0 mile downstream of the study area. The North Carolina 2014 Clean Water Act Final 303(d) list of impaired waters identifies no impaired waters within the project study area.

Four jurisdictional wetland areas were identified within the study area, as shown in the Environmental Features Map, **Figure A-4**, Appendix A. Wetland classification and quality rating data are presented in **Table 5-3** below.

Table 5-3. Jurisdictional Characteristics of Wetlands in the Study Area

Map ID	NCWAM Classification	Hydrologic Classification	NCDWR Wetland Rating	Areas (Acres)
WA	Riverine Swamp Forest	Riparian	76	0.33
WB	Riverine Swamp Forest	Riparian	76	0.15
WC	Hardwood Flat	Non-riparian	29	0.05
WD	Bottomland Hardwood Forest	Riparian	42	0.07
			Total	0.60

Extending 25 feet from the slope stakes (i.e., construction limits) of the preliminary designs to account for potential changes during final design, there would be approximately 672 feet of jurisdictional streams, less than 0.01 acres of an open water in-line pond, and approximately 0.13 acres of jurisdictional wetlands that would be impacted by the Fire Tower Road and Portertown Road Widening Project. Impacts to jurisdictional resources are shown in **Table 5-4** and **5-5**.

Table 5-4. Impacts to Jurisdictional Streams

Map ID	Classification	Compensatory Mitigation Required	River Basin Buffer	Length in Study Area (Feet)	Estimated Impacts (Slope Stake Line + 25 feet)
SA	Perennial	Undetermined	Applicable	169	0
SB	Intermittent	Undetermined	Applicable	118	118
SC	Intermittent	Undetermined	Applicable	99	98
SD	Perennial	Undetermined	Applicable	150	34
SE	Intermittent	Undetermined	Applicable	335	335
SF	Intermittent	Undetermined	Applicable	51	32
Fork Swamp A	Perennial	Undetermined	Applicable	46	43
Fork Swamp B	Perennial	Undetermined	Applicable	105	0
Fork Swamp C	Perennial	Undetermined	Applicable	72	12
P1*	NA	Undetermined	Applicable	<0.01 acre	<0.01 acre
				Total	672

* Open Water pond area represented as acreage, and not included in the total length in Study Area (Feet) or total length in Estimated Impacts (Feet)

Maps depicting stream and wetland impacts are shown in the Environmental Features Map, **Figure A-4**, 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 5-5. Impacts to Jurisdictional Wetlands

Map ID	NCWAM Classification	Hydrologic Classification	NCDWR Wetland Rating	Area in Study Area (Acres)	Estimated Impacts (Slope Stake Line + 25 feet)
WA	Riverine Swamp Forest	Riparian	76	0.33	0.10
WB	Riverine Swamp Forest	Riparian	76	0.15	<0.01
WC	Hardwood Flat	Non-riparian	29	0.05	0.02
WD	Bottomland Hardwood Forest	Riparian	42	0.07	<0.01
Total				0.60	0.13

5.1.1.1 Avoidance and Minimization

Attempts to avoid and minimize impacts to streams and wetlands were made during the design process to the extent practicable. The designs were developed to avoid impacts to streams and wetlands by shifting the alignment away from those resources where possible. In locations where streams and wetlands could not be avoided, the fill slopes were designed as steeply as allowable in order to minimize impacts.

5.1.1.2 Permits

A federal Nationwide Permit (NWP) 14 will likely be applicable. A NWP No. 33 may also apply for temporary construction activities such as stream dewatering, work bridges, or temporary causeways that are often used during bridge construction or rehabilitation. The USACE holds the final discretion as to what permit will be required to authorize project construction. If a Section 404 permit is required, then a Section 401 Water Quality Certification (WQC) from the NCDWR will be needed.

5.1.1.3 Compensatory Mitigation

Compensatory mitigation is meant to replace, at a minimum of 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 project. If on-site mitigation is not feasible, mitigation will be provided by the North Carolina Division of Mitigation Services (formerly the Ecosystem Enhancement Program).

5.1.2 Riparian Buffers

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 includes portions of both the

Tar-Pamlico River basin and the Neuse River basin and is subject to the both the Tar-Pamlico River Basin Buffer Rules (15A NCAC 02B .0261) and Neuse River Buffer Rules (15A NCAC 02B .0233). Any non-exempt activity within the 50-foot (15.2-meter) wide riparian buffer along all perennial and intermittent streams in the Tar-Pamlico and Neuse basins requires an authorization certificate. **Table 5-6** 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 5-6. Riparian Buffer Impacts

	Zone 1 Buffer Estimated Buffer Impacts (Slope Stake Line + 25 feet) (square feet)	Zone 2 Buffer Estimated Buffer Impacts (Slope Stake Line + 25 feet) (square feet)
Neuse Basin	5,636.79	4,523.61
Tar-Pamlico Basin	40,842.74	25,015.27

5.1.3 Biotic Resources

Three terrestrial communities were identified in the study area: maintained/disturbed, riverine swamp forest, and mixed hardwood forest. A brief description of each community type follows. The coverage of these terrestrial communities in the study area is identified in **Table 5-7** and shown in **Figure A-5**, Appendix A.

Table 5-7. Coverage of Terrestrial Communities in the Study Area

Community	Coverage (acres)	Impacts (acres)
Maintained/ Disturbed	168.8	97.35
Riverine Swamp Forest	0.7	0.24
Mixed Hardwood Forest	2.7	0.73
Total	172.2	98.32

5.1.4 Endangered Species Act 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 is subject to review by the US Fish and Wildlife Service.

The species protected in Pitt County are identified in **Table 5-8**:

Table 5-8. Federally Protected Species in Pitt County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	N	No Effect
<i>Trichechus manatus</i>	West Indian Manatee	E	N	No Effect
<i>Elliptio steinstansana</i>	Tar River Spiny mussel	E	Y	NLAA
<i>Elliptio lanceolata</i>	Yellow Lance	T	Y	NLAA
<i>Haliaeetus leucocephalus</i>	Bald Eagle	BGPA	Y	No Effect

E – Endangered; T – Threatened; BGPA – Bald and Golden Eagle Protection Act; NLAA – Not Likely to Adversely Affect

5.1.4.1 Red-cockaded woodpecker

USFWS Recommended Survey Window: year round; November-early March (optimal)

Habitat Description: The red-cockaded woodpecker typically occupies open, mature stands of southern pines, particularly longleaf pine (*Pinus palustris*), for foraging and nesting/roosting habitat. The red-cockaded woodpecker 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 red-cockaded woodpecker is normally no more than 0.5 miles.

Biological Conclusion: No Effect

Potentially suitable nesting and foraging habitat for this species is not present within the project study area. Although there are small stands of pine trees scattered throughout the project study area, they are small in areal extent, and separated from other pine stands by hardwood stands, residential, agricultural and/or commercial areas.

5.1.4.2 West Indian manatee

USFWS Recommended Survey Window: year round

Habitat Description: 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 in 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.

Biological Conclusion: No Effect

Potentially suitable habitat for this species is not present within the project study area. All stream channels within the project study area are relatively shallow (water depths of 0.5 to 4 feet at the time of review) and are separated from the Tar River or Neuse River by several dams and/or culverts.

5.1.4.3 Tar River spiny mussel

USFWS Recommended Survey Window: year round (as conditions allow)

Habitat Description: The Tar spiny mussel is endemic to the Tar and Neuse River drainage basins in North Carolina. This mussel is generally found in streams with fast flowing, well-oxygenated, circumneutral pH water. The bottom should be composed of unconsolidated gravel and coarse sand. The water needs to be relatively silt-free, and stream banks should be stable, typically with many roots from adjacent riparian trees and shrubs.

Biological Conclusion: Not Likely to Adversely Effect

Potentially suitable habitat for this species is present within Meeting House Branch and Hardee Creek in the project study area. While both streams are generally slow flowing, there are numerous small riffle/run habitats with gravel/sand substrate interspersed along their respective courses. Mussel surveys were conducted in both streams on April 02, 2018. Three mussel species including the Eastern Elliptio, Variable Spike and Northern Lance were found in Hardee Creek. While the Tar River Spiny mussel was not found during the survey, and is unlikely to occur within the project area, its presence cannot be entirely discounted based on a one-time survey, given presence of suitable habitat and other freshwater mussel species.

5.1.4.4 Yellow Lance

USFWS Recommended Survey Window: year round (as conditions allow)

Habitat Description: The Yellow Lance is currently thought to be distributed in the Atlantic Slope river basins from the Neuse River Basin in North Carolina north to the Rappahannock River Basin in Virginia, except for the Roanoke River Basin, as well as the Patuxent River Basin in Maryland and possibly the Potomac River Basin in Virginia and Maryland (USFWS 2017). This species has been found in multiple physiographic provinces, from the foothills of the Appalachian Mountains, through the Piedmont and into the Coastal Plain, in small streams to large rivers, in substrates primarily consisting of clean sand, occasionally gravel, with a high dissolved oxygen (DO) content (USFWS 2017, Adams et al 1990). In North Carolina, the Yellow Lance is known from the Neuse and Tar River drainages.

Biological Conclusion: Not Likely to Adversely Affect

While both streams are generally slow flowing, there are numerous small riffle/run habitats with gravel/sand substrate interspersed along their respective courses. Mussel surveys were conducted in both streams on April 02, 2018. Three mussel species including the Eastern Elliptio, Variable Spike and Northern Lance were found in Hardee Creek. While the Yellow Lance was not found during the survey, and is unlikely to occur within the project area, its presence cannot be entirely discounted based on a one-time survey, given presence of suitable habitat and other freshwater mussel species.

5.1.4.5 Bald Eagle and Golden Eagle Protection Act

Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.

A desktop-GIS assessment of the project study area, as well as the area within a 1.13-mile radius (1.0 mile plus 660 feet) of the project limits, was performed on 21 December 2015 using 2014 color aerials. A reach of the Tar River is within the search radius of the project study area and is likely large enough and sufficiently open to be considered a potential feeding source. However, a review of the NC Natural Heritage Program database on 7 December 2015 revealed no known occurrences of this species within 1.0 mile of the project study area. Due to the lack of known occurrences, and minimal impact anticipated for this project, it has been determined that this project will not affect this species.

5.2 Cultural Resources

The Fire Tower Road and Portertown Road Widening Project is subject to the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 306108), and implementing regulations (see 36 CFR Part 800), which require Federal agencies to consider the effects of Federally funded, licensed, or permitted actions on properties listed on or eligible for the National Register of Historic Places (NRHP).

The NRHP is a list of the nation's cultural resources that are considered worthy of preservation. Listed and eligible resources must meet at least one of the four NRHP key criteria:

- Criterion A - associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B - associated with the lives of persons significant in our past; or
- Criterion C - 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; or
- Criterion D - have yielded or may be likely to yield, information important in prehistory or history.

Section 106 coordination for the project was conducted with the North Carolina State Historic Preservation Office (NC-HPO) and the US Army Corps of Engineers (USACE). Due to the need for a Nationwide Clean Water Act Section 404 Permit, USACE is the lead federal agency for the Fire Tower Road and Portertown Road Widening Project under Section 106.

5.2.1 Historic Architectural Resources

A historic architecture survey and evaluation of the proposed improvements for the Fire Tower Road and Portertown Road Widening Project (MdM Historical Consultants (MdM), 2016) determined that the Red Banks Primitive Baptist Church and Cemetery (PT0049), which was listed in the NRHP in 2002, retains all of the features that justify its NRHP eligibility, and that its boundary should be expanded to include its associated cemetery, Red Banks Cemetery (Site 31PT460**) to the east of the church building (**Figure A-6**, Appendix A). The survey and evaluation determined that there were no other NRHP-eligible resources within the project area of potential effects (APE).

NCDOT conducted a ground-penetrating radar (GPR) survey of the Red Banks Cemetery to determine if graves are present within the existing Right of Way along Fire Tower Road. As a result of the GPR survey, a total of 27 marked graves and possible graves fall within the existing ROW and construction easement for the proposed project.

A determination of effects form signed June 29, 2018, finds that the project would have no adverse effect on the resource provided that NCDOT commit to the following:

- All access points to the church property will be preserved.
- Protective fencing will be in place along the construction easement line prior to and during project construction. Installation of such fencing will occur in a sensitive manner, avoiding direct impacts to any and all grave sites and anomalies.
- No storage or staging of materials and equipment will occur within the National Register of Historic Places (NRHP) boundary of the church.
- No traffic signal cabinet will be located within the NRHP boundary of the church or at the northeast corner of Fire Tower Road and East 14th Street.

- If utility relocation necessitates tree-clearing within the NRHP boundary of the church, additional review will be needed with NCHPO.
- All marked and unmarked human remains within the ROW will be removed per applicable state statutes (NC GS 65 and NC GS 70) and reinterred at an appropriate site. Further consultation with the NC-HPO, the State Archaeologist, and the Office of State Archaeology (OSA) and coordination with NCDOT ROW, NCDOT Division 2, and NCDOT's Archaeology and Historic Architecture Groups will be required prior to disinterment.

The Historic Architecture and Landscapes Assessment of Effects Form can be found in Appendix B.

5.2.2 Archaeological Resources

An archaeological survey and evaluation of the proposed improvements for the Fire Tower Road and Portertown Road Widening Project (Environmental Services, Inc. (ESI), 2016) determined that there are no archaeological sites with the project's APE that are eligible for the NRHP.

5.3 Parks, Recreational Areas, and Wildlife and Waterfowl Refuge

There are no municipal, state, or federal parks, recreational areas, or wildlife or waterfowl refuges in the project study area. Therefore, there would be no impacts to these resources.

There is one existing private community nature trail in the project study area, and several planned separated bikeway or pedestrian facilities, shared use paths, or neighborhood bikeways within or adjacent to the project study area. As described in Section 2.4.2.2, the *Active Transportation Plan* (Greenville Area MPO, 2017) incorporates planning for pedestrian, bicycle and greenway facilities for the Greenville urban area in one comprehensive planning document. The City's planned Eastside Community Park will be built on City-owned land adjacent to the City's Homestead Memorial Garden cemetery at the east end of the project. One of the park entrances will likely connect to 10th Street (NC 33) outside of, but adjacent to the project study area. The project is not anticipated to have an impact on these resources.

5.4 Farmland Soils

The project is located within a 2014 Census Designated Urbanized Area and is, therefore, not subject to Federal Farmland Protection Policy Act (FPPA) protections.

The project study area includes portions of seven parcels used for agriculture, totaling approximately 202 acres. As shown in the Community Context Map, **Figure A-7**, Appendix A, the agricultural fields are located in the vicinity of the Portertown Road/CLNA railroad crossing near the eastern terminus, and in the vicinity of the Charles Boulevard/Fire Tower Road intersection near the western terminus. The project would either have ROW impacts or require easements on four of the parcels, require the relocation of one farmhouse, and may have temporary access impacts on agricultural operations during construction.

The project would have ROW impacts and require easements for the farm operation located at the Portertown Road/Eastern Pines Road intersection. In addition to the road widening, the project proposes a roundabout at this intersection and improvements for the CLNA railroad, which would result in impacts to the farm and may relocate the driveway access to the property.

The project would likely require a sliver of land for a utility/drainage/construction easement from the farm property on the east side of Charles Boulevard at the Turnbury Drive intersection.

The project would require a small amount of ROW along the Fire Tower Road frontage of the two adjacent agricultural fields located near the Fire Tower Road/Kittrell Road intersection; additionally, the proposed realignment of Kittrell Road would split one parcel, requiring the farmhouse residence to be relocated.

5.5 Social Effects

The Community Impact Assessment completed for the proposed project (Three Oaks Engineering, 2018) details the character of the study area and surrounding vicinity. This report examines, in depth, how the proposed project would interact within the social and natural context of the area. Community resources in the area surrounding the project, such as commercial areas, bus stops, places of worship, cemeteries and nature trails are presented in **Figure A-7**, Appendix A.

5.5.1 Neighborhoods and Communities

Development within the project study area is primarily medium-density residential, with commercial/retail development located at the project termini intersections with Charles Boulevard to the west, and 10th Street to the east. Potential impacts to the neighborhoods and communities located along the project corridor include impacts on community cohesion and displacements as described in further detail below in Section 5.5.1.1. Most of the relocation impacts affect single family homes that lie directly along Fire Tower Road and Portertown Road. The project will also require the reinterment of several graves located within the existing ROW as discussed in Section 5.2; however, the graves will be relocated on the same property. The project designs utilize retaining walls to minimize right-of-way impacts in two neighborhood locations: along Portertown Road in the Willow Run neighborhood, and on the south side of E Fire Tower Road at the intersection with Regalwood Road. Adverse impacts to community cohesion could be offset by improved connectivity between neighborhoods provided by sidewalks that are included in the project designs.

5.5.1.1 Relocation

Acquisition of approximately 31 residences and 3 businesses will be required to accommodate the proposed improvements. The Relocation Report completed for the project (NCDOT, March 2018) estimated that residential relocations would include 26 homeowners and 5 tenant-occupied homes, and that the business relocations would include 2 tenants, and 1 owner-occupied business. In addition to relocations, the project would have ROW impacts on multiple properties, which may also involve the loss of trees, landscaping, and fencing for which compensation is provided through negotiated ROW agreements. Efforts to avoid and minimize ROW and relocation impacts will continue through the final design phase of the project.

The Relocation Report (included in Appendix C) determined that there is adequate housing available nearby, and that business services would still be available after the project. Relocation impacts would be mitigated through relocation assistance programs offered by NCDOT.

5.5.2 Environmental Justice

Census data indicate a notable presence of low-income Environmental Justice (EJ) populations and populations protected by Title VI and related statutes within the Demographic Study Area (DSA). **Table 5-9** displays US Census data regarding low income populations within the Demographic Study Area (DSA) for the project. The threshold used to determine the notable presence of low income EJ populations is any Census Tract (CT) Block Group (BG) where the percentage of the population in any of the poverty categories (Below Poverty Level, Very Poor, or Near Poor) equals or exceeds 25% of the total population of that BG; or, any BG where the percentage of the population in any of the poverty categories exceeds the county average by five percentage points.

Table 5-9. Poverty Levels

Poverty	Total Population for whom Poverty Status is Determined	Below Poverty Level		Very Poor: Under 50% of Poverty Level		Near Poor: Between 100% and 149% of Poverty Level	
		#	%	#	%	#	%
CT 301, BG 2	2,041	123	6.0%	76	3.7%	52	2.5%
CT 302, BG 3	1,510	202	13.4%	80	5.3%	180	11.9%
CT 302, BG 4	1,875	27	1.4%	27	1.4%	31	1.7%
CT 502, BG 1	4,777	2,597	54.4%	1,834	38.4%	505	10.6%
CT 502, BG 3	1,503	325	21.6%	275	18.3%	249	16.6%
CT 1002, BG 1	2,669	52	1.9%	37	1.4%	60	2.2%
CT 1003, BG 1	1,434	142	9.9%	-	0.0%	-	0.0%
CT 1003, BG 2	2,377	138	5.8%	54	2.3%	490	20.6%
DSA	18,186	3,606	19.8%	2,383	13.1%	1,567	8.6%
Pitt County	167,669	42,743	25.5%	22,154	13.2%	17,835	10.6%
North Carolina	9,592,619	1,667,465	17.4%	725,635	7.6%	1,049,151	10.9%

Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table C17002, "Ratio of Income to Poverty Level in the Past 12 Months."

The criteria for low-income populations was met in the following Census Tract (CT) Block Groups (BG):

- CT 502, BG 1 where 54.4% of the population is Below Poverty Level, and 38.4% of the population is considered Very Poor
- CT 502, BG 3 where 18.3% of the population is considered Very Poor and 16.6% is considered Near Poor compared to 13.2% and 10.6%, respectively, in Pitt County
- CT 1003, BG 2 where 20.6% of the population is considered Near Poor compared to 10.6% in Pitt County.

Highland Park mobile home park, which may be home to low income populations, is located on approximately 14 acres near the eastern end of the project on Portertown Road (SR 1726), south of the CLNA tracks. The project would have ROW impacts on the mobile home park and may require relocation of five of the approximately 80 mobile home currently located in the park.

While notably adverse community impacts are anticipated with this project they appear to affect all populations equivalently; thus, impacts to low-income populations do not appear to be disproportionately high and adverse. Benefits and burdens resulting from the project are anticipated to be equitably distributed throughout the community. No disparate impacts are anticipated under Title VI and related statutes.

5.5.3 Limited English Proficiency

Census data do not indicate Limited English Proficiency (LEP) populations meeting the US Department of Justice LEP Safe Harbor threshold or a notable presence within the DSA.

5.5.4 Visual Impacts

The visual landscape at the western end of the project is commercial in nature with stores, restaurants, gas stations, and professional offices surrounding the E Arlington Boulevard and Charles Boulevard intersections with Fire Tower Road (**Figure A-7**, Appendix A). Between Charles Boulevard and Wimbledon Drive, Fire Tower Road is a five-lane road with turn lanes at intersections. Two short unconnected sidewalks are also found at this end of the project.

The visual impacts of the proposed improvements at the west end of the project are anticipated to be minor. The pavement markings and addition of raised medians and sidewalks would be visually compatible with the surrounding commercial development.

Two agricultural fields bordering Fire Tower Road provide a brief visual transition between the commercial development surrounding Charles Boulevard and the residential area to the east. Single family homes dominate the residential development in the middle of the project; this land use represents the majority of the project. The existing two-lane roadway is currently bordered by grass shoulders and tree-lined residential properties, with several places of worship located on landscaped lots interspersed throughout. Most of the subdivision entrances onto the project corridor have signage and landscaping. An existing roundabout is located where Fire Tower Road intersects Portertown Road.

The project would have a moderate visual impact within the middle, residential section of the project. Although the wider roadway with grass medians, sidewalks, and grass shoulders is compatible with a residential suburban environment, it would represent a visual change. The existing single-lane roundabout at the intersection of Fire Tower Road and Portertown Road would be re-constructed with a dual-lane roundabout but would not differ substantially from a visual perspective. The proposed new roundabout at the Portertown Road/Eastern Pines Road would present a minor visual change but would be compatible with the surrounding environment. Some of the existing trees and landscaping throughout this section would be eliminated to construct the project. Initially, grass will be planted in the medians; however, through future coordination with the City of Greenville a plan for additional landscaping may be developed and funded through local cost sharing agreements. Such landscaping may serve to mitigate some of the visual impacts. In response to comments received from the Willow Run neighborhood, the designs were revised to include a landscaped island at the entrance to the subdivision, which will serve to maintain a similar appearance to the entrance.

At the eastern end of the project, the single track CLNA railroad crosses the project at grade, and a large agricultural field lends a rural feel to the landscape. However, between the railroad tracks and the project terminus, the view is dominated by a developing retail shopping center on the south side of Portertown Road and a large cemetery on the north side.

The wider roadway with raised medians and sidewalks proposed at the east end of the project would be compatible with the surrounding developing commercial environment, and thus would have minor visual impacts.

5.5.5 Economic Effects

The anticipated direct economic effects related to the widening project are expected to be minimal. There are existing commercial developments at both ends of the study area that are comprised of a variety of business from small businesses to gas stations to Wal-Mart and Harris Teeter grocery stores. Some of the direct driveway accesses to these developments will change; however, connection to the businesses will remain through new or existing connections. Additionally, the new quadrant roadways at the western end of the study area will provide additional access opportunities for planned development of the surrounding parcels.

5.6 Land Use

The project is located in the City of Greenville, which is the County Seat of Pitt County and home to Eastern Carolina University, the third largest campus within the University of North Carolina System. Existing land use in the area surrounding the project is primarily medium density residential development, comprised mostly of single family homes. However, concentrations of commercial/retail development surround the intersections at each end of the project, and some agriculture fields remain in the area as described in Section 5.5 above. The project falls entirely within the city limits or ETJ of the City of Greenville, and land use and zoning along the project corridor is established by the City of Greenville Planning and Zoning Commission.

The project is consistent with local land use plans. The City of Greenville Future Land Use Plan Map indicates medium density residential development is planned for most of the project study area, with high-density residential planned near the railroad tracks. Commercial/office institutional development is shown for the parcels surrounding the intersections at both ends of the project. Any changes to zoning within the project study corridor would require re-zoning approval by the Planning and Zoning Commission and the City Council.

5.7 Indirect and Cumulative Effects

In addition to direct effects on the surrounding human and natural environment, transportation projects may sometimes have substantial indirect and cumulative effects. Indirect effects are caused by the project, but occur later in time or farther removed in distance, but are still reasonably foreseeable. Examples include growth-inducing effects related to induced changes in the pattern of land use, population density, or growth rate and related effects on natural systems. Cumulative effects are the impact on natural resources that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

This project is not anticipated to induce changes in land use given the current level of development in the surrounding area, existing zoning protections, and future land use plans. As noted in Section 5.7 above, any changes to zoning within the project study corridor would require re-zoning approval by the Planning and Zoning Commission and the City Council. Furthermore, the project does not have substantial direct impacts to streams and wetlands, as described in Section 5.1 above. Therefore, substantial indirect and cumulative effects from this project are not anticipated.

5.8 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. The Traffic Noise Report (TNR) utilized computer models created with the FHWA Traffic Noise Model software (TNM 2.5) to predict existing and future noise levels and define impacted receptors in the vicinity of the proposed project. Ten (10) noise-sensitive receptors are proposed to be removed due to the additional ROW needed for the construction of the new roadway. Future build (2040) traffic is predicted to impact one hundred eighteen (118) of the remaining noise-sensitive receptors. Three (3) noise-sensitive receptors are predicted to experience noise levels that result in a substantial noise increase. See **Figure A-8**, Appendix A for the locational of noise receptors with predicted impacts.

Consideration for noise abatement measures was given to all impacted receptors in the future build scenario. Noise abatement measures were determined to be preliminarily feasible and reasonable in six locations. For some of the remaining impacted receptors, abatement was preliminarily found to not be feasible due to site access constraints where the driveways of each property and other side streets were located such that a noise wall would not be able to be constructed to adequately provide the required abatement. For other impacted receptors, abatement was preliminarily

found to not be feasible because at least two impacted equivalent residences would not receive a 5 dB(A) reduction by any noise abatement measures. For abatement to be feasible, at least two impacted receptors must receive a 5 dB(A) noise level reduction. The other impacted receptors were considered isolated impacts (only one impacted equivalent residence). Therefore, abatement at these locations cannot provide the necessary noise reduction.

Construction noise impacts – some of them potentially extreme – may occur due to the proximity of noise-sensitive receptors to project construction activities. All reasonable efforts should be made to minimize exposure of noise-sensitive areas to construction noise impacts.

Preliminary consideration for traffic noise abatement measures was given to all impacted receptors following the criteria for feasibility and reasonableness as prescribed in the NCDOT Traffic Noise Policy (October 6, 2016). A final determination of noise abatement measures will be made upon completion of the project design, the public involvement process, concurrence with the NCDOT policy, and FHWA approval.

Please refer to the full technical report entitled U-5870 and U-5785 Traffic Noise Report (Kimley-Horn and Associates, 2017) and U-5785 Traffic Noise Report Addendum (Kimley-Horn and Associates, 2018) for more detailed analysis of traffic noise, which can be viewed at the Division of Highways – Division 2 Project Development Office at 1037 W.H. Smith Boulevard, Greenville, NC 27835.

5.9 Air Quality Analysis

Vehicles are a major contributor to decreased air quality because they emit a variety of pollutants into the air. Motor vehicles emit carbon monoxide (CO), nitrogen oxide, (NO_x), hydrocarbons (HC), particulate matter, sulfur dioxide (SO₂), and lead (Pb) (listed in order of decreasing emission rate). Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. New highways or the widening of existing highways increase localized levels of vehicle emissions, but these increases could be offset due to increases in speeds from reductions in congestion and because vehicle emissions will decrease in areas where traffic shifts to the new roadway. Significant progress has been made in reducing criteria pollutant emissions from motor vehicles and improving air quality, even as vehicle travel has increased rapidly. The project is located in Pitt County, which has been determined to comply with the National Ambient Air Quality Standards.

An Air Quality Report was prepared to complete the assessment requirements of the 1990 Clean Air Act Amendments. For projects such as this, where the design year average annual daily traffic (AADT) traffic volumes are projected to be no more than 140,000 to 150,000, a quantitative mobile source air toxic analysis is not required.

Based on the findings in the Air Quality Report, the project is not anticipated to create any adverse effects to air quality. For more details on the analysis, please refer to the document: Air Quality Report, SR 1708 (E Fire Tower Road) and SR 1726 (Portertown Road) (Kimley-Horn and Associates Inc., 2017), which can be viewed at the Division of Highways – Division 2 Project Development Office at 1037 W.H. Smith Boulevard, Greenville, NC 27835.

5.10 Hazardous Materials

In November 2015 and March 2018, geotechnical pre-screenings for the project were conducted. The pre-screenings found three active or closed underground storage tanks (USTs) and one auto repair shop that will be impacted by the project. The locations of these sites can be seen in **Figure A-9**, Appendix A. The descriptions for these sites and their anticipated impact can be seen in **Table 5-10** below. A detailed study of these sites should also be performed and field verified prior to construction.

Table 5-10. Hazardous Materials Sites

Site	Type	Location	Property Name	Anticipated Impact	Anticipated Risk
1	Auto Repair Shop and Car Wash	1625 E. Firetower Rd Greenville, NC 27858	Havoline Express Lube & Auto Spa	Petroleum Contaminated Soil	Low
2	UST	1826 E. Arlington Blvd Greenville, NC 27858	Walmart Super Center #737	Petroleum Contaminated Soil	Low
3	UST	2100 County Home Rd Greenville, NC 27858	Sheetz #391	Petroleum Contaminated Soil	Low
4	UST	1900 E. Firetower Rd Greenville, NC 27858	Harris Teeter Fuel 288-Firetower	Petroleum Contaminated Soil	Low
5	Auto Repair Shop	3810-3840 S. Charles Blvd Greenville, NC 27858	Greenville Auto World	Petroleum Contaminated Soil	Low
6	UST	3805 S. Charles Blvd Greenville, NC 27858	Speedway # 8215	Petroleum Contaminated Soil	Low
7	UST	3801 S. Charles Blvd Greenville, NC 27858	Handy Mart #54	Petroleum Contaminated Soil	Low
8	Auto Repair Shop	2219 Kittrell Rd Greenville, NC 27858	S1 OffRoad	Petroleum Contaminated Soil	Low
9	UST	4300 Eastern Pines Dr. Greenville, NC 27858	Shade Tree Barber Shop	Petroleum Contaminated Soil	Low
10	UST	1201 Portertown Rd 4300 E. 10th St Greenville, NC 27858	Sheetz #415	Petroleum Contaminated Soil	Low

5.11 Construction Impacts

5.11.1 Air Quality

During construction of the proposed project, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise disposed of by the Contractor. Any burning done will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina SIP for air quality in compliance with 15A NCAC 2D.1903. Care will be taken to insure burning will be done at the greatest distance practical from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Burning will be performed under constant surveillance. Also during construction, measures will be taken to reduce the dust generated by construction when the control of dust is necessary for the protection and comfort of motorists or area residents.

5.11.2 Noise

The predominant construction activities associated with this project are expected to be earth removal, hauling, grading, and paving. Temporary and localized construction noise impacts will likely occur as a result of these activities. During

daytime hours, the predicted effects of these impacts will be temporary speech interference for passers-by and those individuals living or working near the project. During evening and nighttime hours, steady-state construction noise emissions such as from paving operations will be audible, and may cause impacts to activities such as sleep. Sporadic evening and nighttime construction equipment noise emissions such as from backup alarms, lift gate closures (“slamming” of dump truck gates), etc., will be perceived as distinctly louder than the steady-state acoustic environment, and will likely cause severe impacts to the general peace and usage of noise-sensitive areas – particularly residences.

Generally, low-cost and easily implemented construction noise control measures should be incorporated into the project plans and specifications to the extent possible. These measures include, but are not limited to, work-hour limits, equipment exhaust muffler requirements, haul-road locations, elimination of “tail gate banging”, ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication.

5.11.3 Water Quality

Water quality within the study may be temporarily impacted by roadway construction activities primarily through the erosion of disturbed soil during construction. Water quality may also be affected by other construction activities such as vegetation clearing, tree removal, and fertilizer and pesticide use during soil stabilization and revegetation.

A sedimentation and erosion control plan will be developed prior to the initiation of construction in accordance with NCDOT standards and best management practices (BMPs). The plan will incorporate the requirements of the North Carolina Sedimentation Pollution Control Act of 1973, and the BMPs to control nonpoint source impacts from new roadway projects. Temporary and permanent erosion control measures will be utilized throughout the project to prevent off-site sedimentation of adjacent streams and properties.

5.11.4 Maintenance of Traffic

The proposed widening of the existing roadways will have some impact on existing traffic while the project is under construction. Existing travel patterns may need to be altered for some amount of time to accommodate the construction activities. Existing through traffic would remain on Fire Tower Road and Portertown road with minimal delay, with the exception that a detour will be required for 30 to 40 days while work is being completed on the existing bridge over Hardee Creek. The planned detour will use Eastern Pines Road and LT Hardee Road, with a temporary four-way stop at the intersection of Eastern Pines Road and LT Hardee Road. Coordination with both Pitt County Schools and Pitt County Emergency Services will take place regarding the required detour. Additionally, existing traffic using the roundabout at E Fire Tower Road and Portertown Road will likely be maintained without the need for rerouting, except during the construction of the new CLNA railroad crossing. The crossing will be closed to vehicular traffic for two to three days during construction of the crossing, and a detour will be put in place. Detailed traffic control plans will be determined during the final design of the project.

Due to the increased traffic volume observed along E Fire Tower Road and Portertown Road during ECU football game days and other major community events, traffic control measures will be coordinated with the City of Greenville to ensure that impacts to major traffic-generating community events are minimized during construction.

5.11.5 Construction Materials and Waste

Precautions will be taken to prevent contamination of any watersheds or streams by improper disposal and storage of materials, wastes, and accidental spillage of fuels or other harmful substances during construction. NCDOT specifications for roads and structures and water quality protection best management practices require the contractor to exercise every reasonable precaution throughout construction of the project to prevent pollution of rivers, streams, and water

impoundments. Pollutants such as chemicals, fuels, lubricants, bitumens, raw sewage, and other harmful wastes would not be discharged into or alongside rivers, streams, or impoundments, or into natural or man-made channels emptying into such receiving waters. Solid wastes will be disposed of in strict adherence to NCDOT standard specifications and BMPs. The contractor will be required to observe and comply with all laws, ordinances, regulations, orders, and decrees regarding the disposal of solid waste.

Three USTs and one auto repair shop identified during geotechnical prescreening as likely to be impacted by the project, and any other abandoned USTs found to be located within the ROW will be handled in accordance with 40 CFR 280.72 after notifying the North Carolina Department of Environmental Quality (NCDEQ) regional offices of their presence.

5.12 Summary of Environmental Impacts

This section provides a summary of the anticipated environmental impacts as a result of this project. These impacts are summarized below in **Table 5-11**.

Table 5-11. Summary of Environmental Impacts

Environmental Resource	Impact
Terrestrial communities - Maintained/Disturbed	97.35 (acres)
Terrestrial communities - Riverine Swamp Forest	0.24 (acres)
Terrestrial communities - Mixed Hardwood Forest	0.73 (acres)
Jurisdictional Streams	672 (feet)
Jurisdictional Wetlands	0.13 (acres)
Jurisdictional Ponds	<0.1 (acres)
Tar-Pamlico River Riparian Buffers	Zone 1: 40,842.74 (square feet) Zone 2: 25015.27 (square feet)
Neuse River Riparian Buffers	Zone 1: 5636.79 (square feet) Zone 2: 4523.61 (square feet)
Rare and Protected Species	○
Historic Architecture Properties	○
Archaeological Resources	○
Parks, Recreational Areas, Wildlife and Waterfowl Refuge	○
Neighborhoods/Communities	●
Environmental Justice	○
Relocations	●
Bicycle and Pedestrian Facilities	+
Public Facilities and Services	○
Economic	○
Land Use, Zoning, and Development	○
Indirect and Cumulative Effects	○
Traffic Noise	●
Air Quality	○
Hazardous Materials	○

Key: + Positive Impact, ● Negative Impact, ○ None/Negligible Impact

6 STAKEHOLDER INVOLVEMENT

6.1 Agency Coordination

In February 2016, project scoping information sheets for the Fire Tower Road and Portertown Road Widening project were sent to local, state, and federal agencies. A copy of the scoping information sheets and a summary of the comments received are provided in Appendix D. These comments were taken into consideration during the development of the project and coordination will continue, as necessary, throughout the final design, permitting, and construction processes.

6.2 Project Website

NCDOT maintains a website for the Fire Tower Road and Portertown Road Widening project:

<https://www.ncdot.gov/projects/FireTowerPortertownWidening/>. The website includes an overview of the project, materials presented at the public meeting, and other project updates.

6.3 Local Officials Meeting and Public Meeting – September 2016

A local officials meeting and an open-house public meeting were held on Thursday, September 22, 2016, at the Pitt County Community Schools and Recreation Building at Alice Keene Park to provide the public with information about the proposed project. The local officials meeting was held from 10:00 am to 11:30 pm and was attended by 18 representatives of the City of Greenville, Pitt County, Greenville Urban Area MPO, and Greenville Utilities Commission. After the project team presented an overview of the project, the attendees then watched a slide presentation about the project (the same one shown later at the open-house public meeting), viewed the project maps, and were provided the opportunity to ask questions of the project team. Most questions related to potential property impacts and relocations.

The open-house public meeting was held from 4:00 pm to 7:00 pm. The meeting was advertised in the local paper and on the project website, and postcard announcements were mailed to approximately 1,160 nearby property owners. The meeting was attended by 210 members of the public. A looping slide show presentation provided background information about the need for the project, the proposed design, and the project schedule. Large maps of the proposed project were on display, and NCDOT and consultant staff were on hand to answer questions and listen to input from citizens. Two NCDOT Right of Way staff were also on hand to answer questions about the NCDOT right of way acquisition process.

Public meeting attendees were invited to provide written comments at the meeting, through mail or email, or online via the NCDOT project website. A total of 117 comments were submitted to NCDOT prior to the meeting, at the meeting, or during the following 30-day public comment period. A summary of comments received at the public meeting and responses to those comments is included in Appendix E.

6.4 Local Officials Meeting and Public Meeting – July 2017

A second local officials meeting and an open-house public meeting were held on Monday, July 31, 2017, at the Pitt County Community Schools and Recreation Building at Alice Keene Park to provide the public with an update on the development of the project and to share information about design changes subsequent to the September 2016 meeting. The local officials meeting was held from 10:00 am to 11:30 pm and was attended by 6 representatives from the City of Greenville, Pitt County, and the Greenville Urban Area MPO. After the project team presented an overview of changes that have been made to the project designs and explained the proposed new concept of restricting left turns at the Charles Boulevard/Fire Tower Road intersection and E Arlington Boulevard/Fire Tower Road intersection and the improvements for the street network surrounding these intersections, the attendees then watched a video presentation of the corridor that showed a visualization of the proposed lane configuration on top of the existing roadway (the

visualization was also shown at the public meeting). The attendees were provided the opportunity to ask questions of the project team. Most questions were related to potential impacts on access to businesses, and how traffic patterns would change.

The open-house public meeting was held from 4:00 pm to 7:00 pm. The meeting was advertised in the local paper and on the project website, and postcard announcements were mailed to approximately 1,220 nearby property owners and residents and hand-delivered to approximately 30 affected businesses located adjacent to the Charles Boulevard/ Fire Tower Road intersection and E Arlington Boulevard/Fire Tower Road intersections where new designs are proposed. The meeting was attended by 244 members of the public. A looping video presentation provided a visualization of the proposed designs laid on top aerial photography showing the existing corridor. Staffed information stations were set up to address noise, traffic, and ROW acquisition questions. Large maps of the proposed project were on display, and NCDOT and consultant staff were on hand to answer questions and listen to input from citizens.

Public meeting attendees were invited to provide written comments at the meeting, through mail or email, or online via the NCDOT project website. A total of 89 comments and 249 signatures on form letters were submitted to NCDOT prior to the meeting, at the meeting, or during the following 30-day public comment period. A summary of comments received at the public meeting and responses to those comments is included in Appendix E.

6.5 Other Public Outreach

Property owners located directly along the project corridor were mailed notification letters on December 1, 2015, prior to the initiation of field studies in the project corridor. Also during December 2015, the Greenville Urban Area MPO advertised the acceleration of the schedule for the U-5785 and U-5870 projects in local newspapers, and solicited written comments for a 10-day period beginning on December 21, 2015. No public comments were received regarding the projects.

Two meetings were held with owners of business properties located near the Charles Boulevard/Fire Tower Road intersection, and the E Arlington Boulevard/Fire Tower Road intersection, to provide information about the project extension and obtain input and answer questions about the project. The first meeting, held on June 22, 2017 was attended by the owners of four businesses, including Basil's Restaurant, Parker's Barbeque and a farm property. The presentation included information about the need to extend the project scope to address current and future traffic needs, alternatives considered, and a discussion of how traffic would flow under the preferred alternative that utilizes left quadrant intersection designs. The attendees were in general agreement regarding existing traffic issues and the need for improvements, but had concerns about impacts to their businesses. Questions and concerns raised by the attendees included: concerns about property impacts; questions regarding change in access and travel routes to reach specific businesses; concerns about impacts to parking; and, interest in the project being completed as soon as possible to minimize uncertainty and thus facilitate development. NCDOT representatives expressed a commitment to evaluate the concerns raised at the meeting and modify designs where feasible, and to continue coordination with the attendees regarding the proposed designs and ongoing efforts to minimize impacts to the business properties.

A second meeting was held October 11, 2017 to provide an additional opportunity for business owners to learn about the project extension and proposed intersection improvements, and provide input. No formal presentation was made at the meeting which was attended by the owners of three businesses (Basil's Restaurant, Brody Company, and Party Makers). Questions and concerns raised by the attendees included: concerns about loss of parking; changes in access and travel routes; driveway access; and, interest in learning about any recent changes that had been made to the designs. The attendees were in general agreement regarding existing traffic issues and the need for improvements, but had concerns about impacts to their businesses. NCDOT representatives informed the attendees that the Department

would continue its commitment to continued coordination with regard to proposed work and impacts to business properties.

A meeting was held with representatives of St. Timothy's Episcopal Church in October 2017 to discuss the church community's concerns about impacts to church property, and community activities and events held on church property. NCDOT representatives expressed a commitment to evaluate the concerns and modify the designs where feasible. Subsequently, the project designs were revised to minimize impacts by shifting the alignment 10 feet away from the church, reducing the width of proposed right of way to 100 feet (50 feet on each side of Fire Tower Road), and to also include construction of a steel beam guard rail along the front of the St. Timothy Church property.

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 federal, state, and local agencies, and the public, it is the finding of NCDOT that this project would not have a significant adverse impact upon the human or natural environment. The proposed project is consistent with local plans and would not disrupt communities. Public comments will be taken into consideration as the Best Fit Build Alternative is carried through final design and construction. 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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