



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

March 30, 2011

MEMORANDUM

TO: Mr. Calvin W. Leggett, P.E.
Manager, Program Development Branch

FROM: Ms. Lynnise M. Hawes, P.E.
Feasibility Studies Engineer

SUBJECT: **R-2595** – Proposed widening of US 221 from NC 194 to NC 181; Avery County.

As requested, we have completed feasibility study R-2595 for the widening of US 221 from NC 194 to NC 181 in Avery County. This project proposes to construct a four-lane divided section of roadway for the limits mentioned above, a distance of approximately 9.1 miles.

Our evaluation of this project was based on a four-lane shoulder section, 102 feet from edge of pavement to edge of pavement with 12-foot travel lanes, a 46-foot depressed grass median, and 8-foot shoulders (4 feet of which is paved) on 250 feet of right of way. It is anticipated that sixty-nine (69) residences and forty-one (41) businesses would need to be relocated due to this project.

The estimated total cost of this project is as follows:

Construction.....	\$57,400,000
Right of Way.....	\$37,200,000
<u>Utility Relocation.....</u>	<u>\$1,300,000</u>
Total Cost.....	\$95,900,000

The current year Average Daily Traffic (ADT) along US 221 ranges from 5,800 vehicles per day (vpd) to 8,000 vpd. For the design year 2035, the traffic volume along US 221 is estimated to range between 8,100 vpd to 11,300 vpd. Truck traffic is estimated to make up approximately 11 percent of the daily traffic.

The existing segment of US 221 operates at a level of service (LOS) E under current traffic volumes. If no improvements are made in the 2035 design year, it is projected that the segment along US 221 will operate at a LOS F. With the proposed improvements, US 221 is projected to operate at a LOS D or better.

Between 2004 and 2007, 109 total crashes were reported within the project limits. The crash rate for US 221 is 175.66 crashes per 100 million vehicle miles (crashes/100MVM) traveled. This rate is lower

than the statewide rate of 220.00 crashes/100MVM for two-lane undivided United States routes. There were 40 non-fatal injury crashes, 68 property damage only crashes, and 1 fatal crash. The most prevalent types of crashes were Rear End (28%), Fixed Object (25%), Left Turn (13%), and Overturn/Rollover (11%).

There are several bridges located within the project study area. See Table 1 for detailed information.

A detailed investigation was not conducted for this feasibility study, however it is anticipated that there will be possible impacts to FR Gill State Forest Nursery, designated as a state owned property and lands managed for conservation and open space.

Maps at the Survey and Planning Branch of the North Carolina State Historic Preservation Office were used to determine if any historic properties on the National Register of Historic Places (NRHP) or state study lists exist within the proposed project study area. The following properties located within the proposed project study area were found to be potentially historic properties:

- Ray Wiseman House
- Crossnore Presbyterian Church

Several threatened and endangered species were identified within the project study area. See Table 2 for detailed information. Significant aquatic endangered species habitats and trout streams were identified in the project study area. Pineola Bog was identified as a Significant Natural Heritage Area. Mountain Bog State Natural Area was identified as a Natural Heritage Program managed area.

The proposed project study area is located in the French Broad and Catawba River Basins. US 221 crosses several water bodies in the project corridor. Stamey Creek, Buckwheat Branch, Bill White Creek, Crossnore Creek, and Clark Branch have a stream classification of C. White Pine Creek, Mill Timber Creek, Anthony Creek, and Grandmother Creek have a stream classification of C Tr. Linville River has stream classifications of B Tr and C Tr. These water bodies will likely need to be surveyed and have the appropriate coordination with the North Carolina Department of Environment and Natural Resources (NCDENR) and the U.S. Army Corps of Engineers (USACE) during any environmental document study. A portion of the project study area is located in a WS-IV Water Supply Watershed. Portions of the project study area are located within a floodplain.

US 221 crosses wetlands associated with Linville River, Stamey Creek, Buckwheat Branch, Bill White Creek, Crossnore Creek, Clark Branch, White Pine Creek, Mill Timber Creek, Anthony Creek, and Grandmother Creek and several jurisdictional wetland areas. Permitting with the U.S. Army Corps of Engineers (USACE) will likely need to be obtained before construction of the project, and appropriate mitigation measures should be taken if deemed necessary.

As you are aware, this work is preliminary and not the product of comprehensive environmental or design evaluations. If you should have further questions or additional information is needed, please do not hesitate to contact me at 715-5775, or via e-mail at lmhawes@ncdot.gov.

ATT: Table 1: Existing Bridges Information
Table 1: Threatened and Endangered Species
Project Map

cc: Al Avant, Assistant Branch Manager – Programming
Van Argabright, P.E., Manager – TIP Western Region
Michael A. Pettyjohn, P.E., Division 11 Engineer

Table 1. Existing Bridges within the project corridor.

Structure Number	Facility Carried	Feature Intersected	Structure Description	Structure Length	Vertical Clearance	Horizontal Clearance	Year Constructed	Sufficiency Rating
1	SR 1349	Linville River	Timber floor on I-beams	72'	N/A	15.8'	1955	73.1
12	SR 1525	Linville River	Prestressed concrete cored slab	212'	N/A	27.0'	2001	100.0
24	US 221	Linville River	Reinforced concrete deck on prestressed concrete girders	126'	N/A	33.6	1968	95.1
25	US 221	Timber Creek	Triple 8' x 8' RCBC	27'	N/A	22.0'	1941	91.5
27	US 221	Linville River	Reinforced concrete deck on girders	160'	N/A	25.9'	1941	50.8
31	SR 1545	Grandmother Creek	Single 28' x 14' RC spandrel filled arch	44'	N/A	22.0'	1941	81.2
143	SR 1536	Linville River	Timber floor on I-beams	64'	N/A	11.1'	1965	34.2
164	US 221/NC 181	Grandmother Creek	Double 13' x 12' RCBC	28'	N/A	26.0'	1990	98.8
165	US 221/NC 181	Linville River	Reinforced concrete deck on prestressed concrete girders	165'	N/A	28.0'	1990	79.4

Table 1. Threatened and endangered species within the project study area.

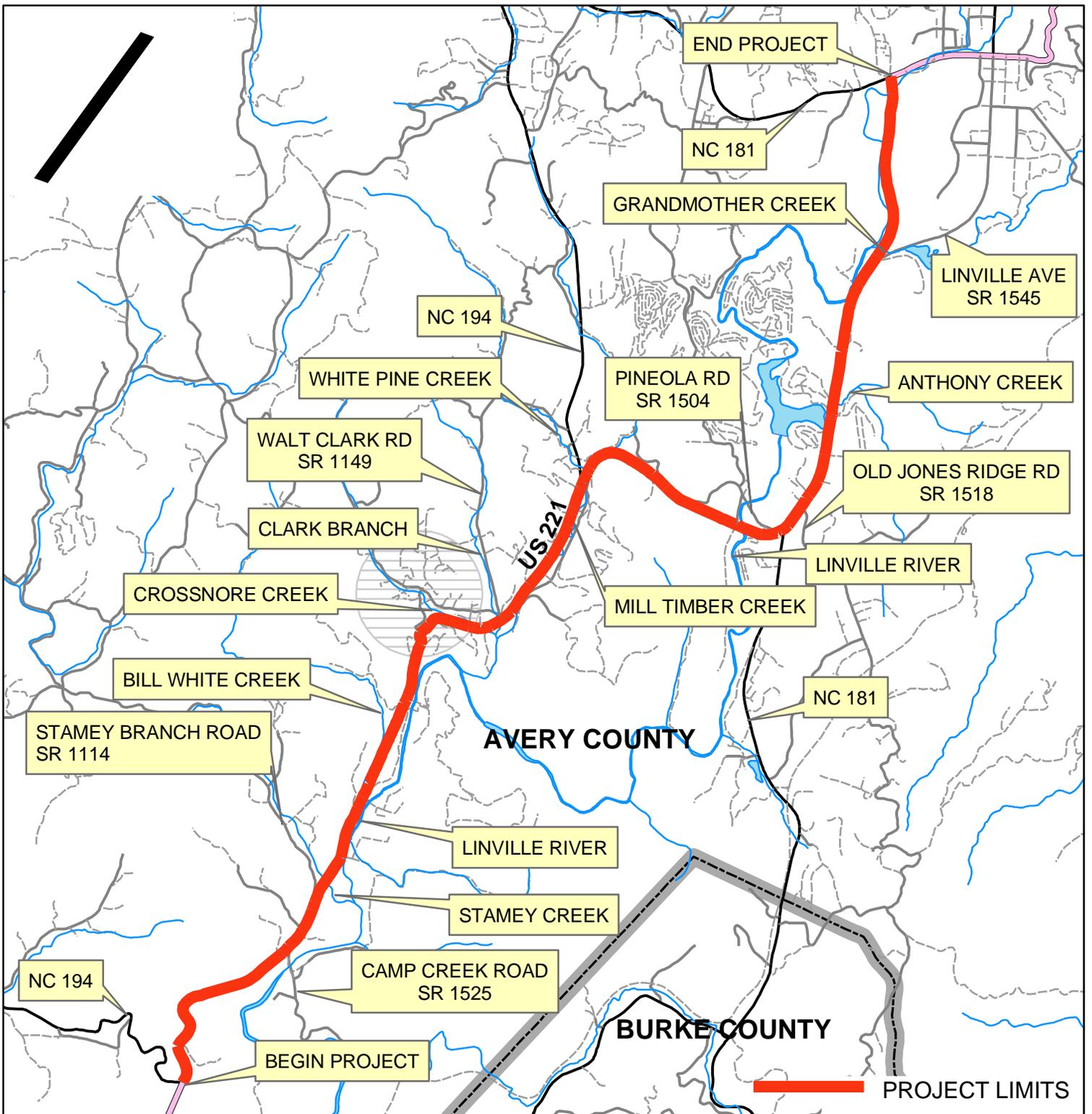
<u>Common Name</u>	<u>Scientific Name</u>	Federal Status	State Status
Bog Broom-Moss	<i>Dicranum undulatum</i>		SR-D
Bog Featherbells	<i>Stenanthium gramineum var. robustum</i>		SR-P
Bog Fern	<i>Thelypteris simulata</i>		T
Bog Jack-in-the-pulpit	<i>Arisaema triphyllum ssp stewardsonii</i>		SR-P
Bog Rose	<i>Arethusa bulbosa</i>		E
Bog Turtle	<i>Glyptemys muhlenbergii</i>	T	T
Cranberry	<i>Vaccinium macrocarpon</i>		SR-P
Four-toed Salamander	<i>Hemidactylium scutatum</i>		SC
Gray's Lily	<i>Lilium grayi</i>	FSC	T-SC
Greenfruit Bur-Reed	<i>Sparganium chlorocarpum</i>		SR-P
Magnolia Warbler	<i>Dendroica magnolia</i>		SR
Pretty Peat moss	<i>Sphagnum fallax</i>		SR-P
Rough Avens	<i>Geum laciniatum var. trichocarpum</i>		SR-P
Southern Dung Moss	<i>Splachnum pennsylvanicum</i>		SR-O
Three-seeded Sedge	<i>Carex trisperma</i>		SR-P
Yellow Avens	<i>Geum aleppicum</i>		SR-P

Definitions of Federal Status: T=Threatened, FSC=Federal "Species of Concern"

Definitions of State Status: T=Threatened, SR=Significantly Rare, SC=Special Concern

Definitions of State Status: -P=Peripheral, -L=Limited in NC, -T=Throughout the species

Definitions of State Status: -D=Disjunct, -O=Other



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 PROGRAM DEVELOPMENT BRANCH

R-2595
 US 221
 FROM NC 194 to NC 181

AVERY COUNTY

DIVISION 11 FIGURE 1