STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

JAMES B. HUNT JR.
GOVERNOR

E. NORRIS TOLSON
SECRETARY

March 16, 1998

MEMORANDUM TO: Mr. Clark Jenkins, Member, Board of Transportation
Mrs. Carolyn Grant, Member, Board of Transportation
Mr. D. R. Dupree, Division Engineer, Division 4
Mr. D. A. Allsbrook, Jr., P.E., Division Engineer, Division 5
Mr. David D. King
Mr. W. H. Webb, P.E.
Mr. J. M. Lynch, P.E. (6) Attention: Roberto Canales, P.E.
Congestion Management Engineer
Mr. J. B. Williamson
Mr. H. F. Vick, P.E. (2)
Mr. R. L. Hill, P.E.
Mr. G. T. Shearin, P.E.
Mr. M. R. Poole, P.E.
Mr. A. L. Avant (2)
Mr. J. D. Lane
Mr. T. A. Peoples, P.E.
Mr. David Smith, P.E.

FROM: David G. Modlin, Ph.D., P.E.
Head of Feasibility Studies

SUBJECT: Feasibility Study # R-2587, US 158 from I-85 (West of Norlina) to SR 1405 (East of Littleton), Warren and Halifax Counties.

Our staff has completed a feasibility study for the subject proposed project. This brief analysis suggests improvements that would be logical if the project were to be funded. A copy of our report is attached for your information.

DGM/joa

Attachment

cc: Mr. L. A. Sanderson, P.E.
Mr. D. R. Morton, P.E.
Mr. David W. Conner, Sr., P.E.

FEASIBILITY STUDY

US 158
From I-85 (West of Norlina)
To SR 1405 (East of Littleton)
Warren and Halifax Counties

Divisions 4 & 5

R-2587

Prepared by the
Program Development Branch
Division of Highways
N. C. Department of Transportation

David W. Conner, Sr., P.E.
Highway Planning Engineer

David G. Modlin, Jr., Ph.D., P.E.
Head of Feasibility Studies

2/26/98
Date

R-2587

US 158
From I-85 (West of Norlina)
To SR 1405 (East of Littleton)
Warren and Halifax Counties

Divisions 4 & 5

I. General Description

This preliminary study describes recommended improvements to US 158 in Warren and Halifax Counties. It is recommended that US 158 be realigned and widened from I-85 in Warren County to approximately 0.3 miles (0.5 km) east of SR 1405 (on the east side of Littleton), in Halifax County. The recommended alignment includes new bypasses of the Ridgeway community, the Town of Norlina, the Warren Plains community, the Town of Macon, the Vaughan community, and the Town of Littleton. The project has a length of approximately 24 miles (39 km). For a location map, please see Figure 1.

The recommended cross section is a 4-lane, divided, shoulder section with two 12-foot (3.6-m) wide travel lanes in each direction, a 46-foot (14.0-m) wide median, 2-foot (0.6-m) wide paved inside shoulders, and 10-foot (3.0-m) wide outside shoulders of which 4 feet (1.2 m) are paved.

It is recommended that the project be constructed on a 250-foot (76.2-m) wide right-of-way and access should be limited to one access per parcel. It is estimated that the project will require the relocation of 66 residences and 5 businesses.

The total cost for right-of-way and construction is estimated to be $82,900,000 as follows:

Right-of-Way	$18,500,000
Construction	64,400,000
Total Cost	$82,900,000

This study is the initial step in the planning and design process for this project and is not to be considered the product of exhaustive environmental or design investigations. The purpose of the study is to describe the problem, recommend a treatment including costs, and identify potential problem areas that deserve consideration in the planning and design phases.

II. Need For Project

The purpose of this project is to improve the traffic carrying capacity of US 158 and to improve the roadway to the standards of the North Carolina Intrastate System. US 158 is a part of the Intrastate System, which is defined and funded by the North Carolina Highway Trust Fund.

US 158, within the project termini, is designated as a principle arterial on the North Carolina Statewide Functional Classification System.

Existing US 158 is generally a 2-lane roadway with 12-foot (3.6-m) wide travel lanes, 2-foot (0.6-m) wide paved shoulders, and 6-foot (1.8-m) to 8-foot (2.4-m) wide soil shoulders. The roadway goes through and is generally the main route through the Ridgeway community, the Town of Norlina, the Warren Plains community, the Town of Macon, the Vaughan community, and the Town of Littleton. To widen the roadway to a multi-lane, high speed facility through these areas would require numerous relocations which in some instances would drastically alter the character of the communities. Therefore, bypasses of these areas are recommended.

The recommended route is generally rural in nature and is characterized by woodlands, farmlands, light density residential development, and rolling terrain. There are scattered residences along the existing roadway with some commercial development at major intersections.

From the Town of Norlina, westward, existing US 158 is common with US 1 and does not currently intersect I-85. Access to I-85 is by way of existing secondary roads. The recommended project would intersect I-85 and would utilize much of the existing alignment of SR 1224. SR 1224 is a 2-lane shoulder section with pavement widths from that vary from 17 feet (5.2 m) to 22 feet (6.7 m). The roadway does not have paved shoulders but does have 4-foot (1.2-m) to 6-foot (1.8-m) wide soil shoulders. Access to I-85 from SR 1224 is via an existing diamond interchange.

There is one existing structure located along the recommended project route. Bridge # 107, over Smith Creek, is located on SR 1224 at approximately 0.1 miles (0.2 km) southeast of I-85. The bridge, which was built in 1952, has a clear deck width of 19.3 feet (5.9 km) and is 46 feet (14.0 m) long. The bridge has a sufficiency rating of 34.7 out of a possible 100 points.

Within the project termini, the 1996 Average Daily Traffic (ADT) estimate, on existing US 158, is estimated to range from approximately 2,600 vehicles per day (vpd), near Warren Plains, to approximately 6,400 vpd, in Norlina and Littleton. Along the recommended project route, it is anticipated that the design year traffic volumes will range from 5,000 vpd to 10,000 vpd.

The current Level of Service (LOS) is estimated to generally be Level C; however, Level D is prevalent through the Town of Norlina and the Town of Littleton. Along the recommended project route, it is anticipated that the Level of Service will be Level A through the design year.

During the period from February 1, 1994, through January 31, 1997, there were 164 accidents reported on US 158 between SR 1224, in Warren County and SR 1405, in Halifax County. This resulted in an accident rate of 174 accidents per 100 million vehicle miles (Acc/100MVM), compared to a statewide average of 155 Acc/100 MVM for all rural US routes during 1996. There was 1 fatality reported during the

period and 67 of the accidents resulted in non-fatal injuries. The most prevalent accident types were rear-end (31.7%), ran off road (18.3%), and animal (14.6%). The recommended improvements should reduce the potential for these types of accidents.

III. Detailed Description

It is recommended that US 158 be realigned and widened from I-85 in Warren County to approximately 0.3 miles (0.5 km) east of SR 1405 (on the east side of Littleton) in Halifax County. The recommended alignment includes new bypasses of the Ridgeway community, the Town of Norlina, the Warren Plains community, the Town of Macon, the Vaughan community, and the Town of Littleton. The project has a length of approximately 24 miles (39 km). For a location map, please see Figure 1.

The recommended cross section, for the full project length, is a 4-lane, divided, shoulder section with two 12-foot (3.6-m) wide travel lanes in each direction, a 46-foot (14.0-m) wide median, 2-foot (0.6-m) wide paved inside shoulders, and 10-foot (3.0-m) wide outside shoulders of which 4 feet (1.2 m) are paved.

A detailed description of the recommended alignment and improvements is as follows:

1. Widen and realign SR 1224 from I-85 to existing US 158. This segment would require replacing Bridge # 107 with new dual bridges having a clear deck width of 38 feet (11.6 m).
2. Construction, on new location, from existing US 158, at SR 1224, to the US 158-US 401 intersection, south of Norlina.
3. Widen existing US 158 from the US 158-US 401 intersection, south of Norlina, to the US 158 Bypass-US 158 Business intersection, southwest of Macon. This segment will require the construction of a new box culvert at Owens Creek.
4. Construction, on new location, from the US 158 Bypass-US 158 Business intersection, southwest of Macon, to US 158, at approximately 0.2 miles (0.3 km) west of SR 1505. This segment would require the construction of a new box culvert at Walkers Creek.
5. Widen existing US 158 from approximately 0.2 miles (0.3 km) west of SR 1505 to approximately 1.0 miles (1.6 km) east of SR 1505.
6. Construction, on new location from approximately 1.0 miles (1.6 km) east of SR 1505 to US 158, at approximately 0.5 miles (0.8 km) west of SR 1349.
7. Widen existing US 158, from approximately 0.5 miles (0.8 km) west of SR 1349, to SR 1357, west of Littleton.
8. Construction, on new location, from SR 1357, west of Littleton to US 158, at approximately 0.3 miles (0.5 km) east of SR 1405, in Halifax County.

It is recommended that the project be constructed on a 250-foot (76.2-m) wide right-of-way and access should be limited to one access per parcel. It is estimated that the project will require the relocation of 66 residences and 5 businesses.

The total cost for right-of-way and construction is estimated to be $82,900,000 as follows:

Right-of-Way	$18,500,000
Construction	64,400,000
Total Cost	$82,900,000

IV. Other Comments

An environmental screening was not conducted for this study; however, due to the construction potential in the areas of Smith Creek, Owens Creek, and Walkers Creek, Corps of Engineers permits and wetlands mitigation may be required. The costs for wetlands mitigation is not included as part of the above estimated project costs.

No provisions for bicycles have been included in this report.

Oakley Hall (National Register Site WR7) is located on the south side of existing US 158 at approximately 0.8 miles (1.3 km) west of SR 1224. This property should not be affected by the recommended alignment.

There is an old house located in the northwest corner of the US 158-SR 1224 intersection. Although not included on the National Register of Historical Places, at this time, the house may have historical significance. Widening in this area should be asymmetrical to the east.

Chapel of the Good Shepherd (National Register Site WR3) is located on the east side of SR 1107 at approximately 0.2 miles (0.3 km) south of existing US 158. This property should not be affected by the recommended alignment.

BEGIN PROJECT

BRIDGE # 107

END PROJECT

SR 1405

SR 1357

SR 1349

SR 1505

SR 1224

I-85

US 158

US 401

WARREN PLAINS

NORLINA

RIDGEWAY

MACON

VAUGHAN

LITTLETON

WARRENTON
POP. 946

MIDDLEBURG
POP. 129

Drewry

Manson

Soul City

Oine

Wise

Oakville

Five Forks

Church Hill

Epworth

LAKE GASTON

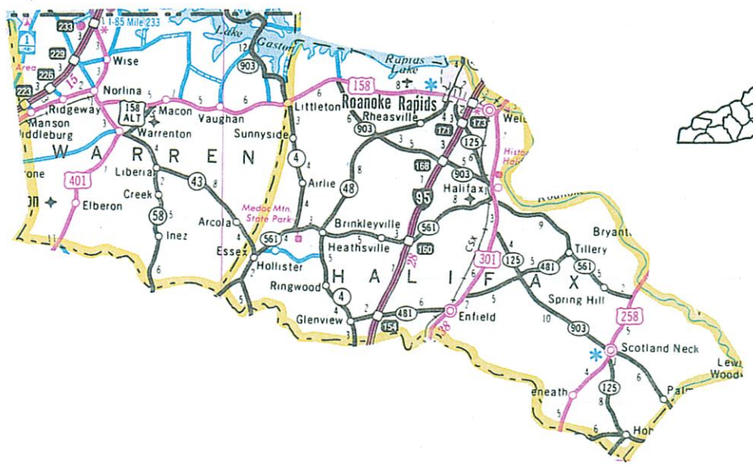
SMITH CREEK

OWENS CREEK

WALKERS CREEK

N

1 0 1 2 3 4 MILES



LEGEND

- R-2587
- Old House
- Oakley Hall
- Chapel of the Good Shepherd

North Carolina Department of Transportation
Program Development Branch

R-2587

US 158
from I-85
to SR 1405 east of Littleton

Halifax & Warren Counties

DIVISIONS 4 & 5 FIGURE 1