R-2564

location

FEASIBILITY STUDY

NC 94
FROM US 264 AT LAKE COMFORT
TO COLUMBIA
HYDE AND TYRRELL COUNTIES
R-2564

PREPARED BY
DIVISION ONE, CONSTRUCTION UNIT
DIVISION OF HIGHWAYS
N. C. DEPARTMENT OF TRANSPORTATION

R. E. Mullinax
Assistant Resident Engineer

J. L. McDonald, P. E.
Division Construction Engineer

7-6-90
Date

C. O. White, P. E.
Division Engineer

I. General Description

This report covers a preliminary study of the proposed upgrading of the existing roadway of NC 94 from US 264 near Lake Comfort to south Columbia Town Limits (see Fig. 1). The project is 35.4 miles long and is located in Hyde and Tyrrell counties. This project is included in the NCDOT Transportation Improvement Program for feasibility study from Fairfield to Columbia. However, during the study it was evident that NC 94 needed to be improved to have the same roadway section from US 264 to Columbia. NC 94 also has a functional classification as a rural major collector and is on the federal aid secondary rural system.

II. Purpose of Project

Existing Route Characteristics

NC 94 is the only north-south route running from US 264 near Lake Comfort to Columbia. It is also the only primary north-south route for Hyde and Tyrrell counties. Part of the project passes through Hollow Ground Swamp.

The existing cross section of NC 94 from US 264 thru Fairfield consists of 20 feet of pavement and 10-15 shoulders; from the north Fairfield Town limits to SR 1309 the cross section consists of an 18-foot paved roadway with variable 7 to 9 foot unpaved shoulders. From SR 1309 to south Columbia Town limits, the existing roadway cross section consists of a 22-foot paved roadway with variable 4 to 6 foot unpaved shoulders. Pavement conditions currently exhibit approximately 10% of moderate alligator cracking. The best available information indicates a variable 60 to 100 foot right of way. The existing vertical and horizontal alignments are good with the exception of three horizontal curves approximately midway in the project. Two of these curves are each rated at 25 MPH. The third is rated at 45 MPH. With the level terrain, the grade on the roadway is flat throughout the entire project. All intersections on the project are at grade and are stop sign controlled. There are also three bridges located within the project. Two of these currently have no weight restrictions. The third is a one lane, swing span bridge posted at single vehicle 12 tons and tractor-trailer 21 tons.

This swing span carries NC 94 across the Atlantic Intercoastal Waterway and direction of travel over the bridge is controlled by a traffic signal. The speed limit throughout the project is 55 MPH except for one 45 MPH zone extending from Fairfield Town Limits to 1.0 mile north and as mentioned prior.

Drainage is poor throughout much of the project. At high tide and during periods of rainfall, sections of NC 94 have standing water in the travel lanes. Compounding the problem, NC 94 also passes through Hollow Ground Swamp. Roadside development is primarily agricultural and farming.

Annual average daily traffic counts on NC 94 for 1989 reveal a high of 1600 VPD and a low of 400 VPD. Projected increases are a high of 4760 VPD and a low of 1820 VPD for the year 2010. Furthermore, NC 94 is used by both school buses and heavy farm equipment.

During the 35 month period from Jan. 1, 1986, to Nov. 30, 1989, a total of 56 accidents were reported in the studied portion of NC 94. Resulting accident rates for NC 94 reveal a high of 245.9 accidents per 100 million vehicle miles (ACC/100MVM) and a low of 75.1 ACC/100MVM. There were no reported fatalities during this period, and 19 non-fatal injuries. The primary accident type was run-offs. This figure does not include one side swipe. Run-offs accounted for 24 accidents or 43% of the total number of accidents. Other accident types were 16% striking animals and 41% miscellaneous driver errors (rear end, backing up, turning, etc.).

Need for Project

An improvement of NC 94 is needed to provide increased safety for the public and to meet minimum roadway design criteria. The proposed improvements to the drainage are needed to eliminate flooding problems along the existing roadway. The project will also provide increased capacity for existing and future traffic volumes.

III. Recommendations and Costs

An improvement to NC 94 to provide a wider two lane facility is warranted. The recommended cross section is 24-foot paved roadway with minimum 6-foot usable shoulders. Based on estimated future traffic volumes, a two lane width should be sufficient for many years. Specific improvements would include a leveling course from Fairfield Town Limits to 14.9 miles north. It is further recommended that efforts be made on NC 94 to improve drainage. These drainage improvements should include raising approximately 2.0 miles of roadway beginning at 11.2 miles north of Fairfield Town Limits by 2-feet with the use of Aggregate Base Course. In addition, the roadway should be raised 6-inches with the use of Bituminous Concrete Base Course for 1.0 mile immediately north of the 2-foot elevation improvement. The renovation of existing cross pipes is recommended, as well as the possible addition of new cross pipes. The specific improvements will have to be determined during the design of the project following a hydrographic study. Stabilization of an adjacent canal from Fairfield to a point 2.1 miles north is recommended. Furthermore, it is recommended that the right of way be cleared of all trees and brush, and the three sharp curves midway in the project be replaced with 6 degree or less curves.

The estimated costs of this project are:

Construction:	$ 9,000,000.00
Right of Way:	50,000.00
Total	$ 9,050,000.00

IV. Alternatives Considered

Since the project involves the upgrading of an existing roadway within an existing right of way, no alternative alignments were considered.

Replacement of the swing span bridge was not considered due to it being under the jurisdiction of the U. S. Army Corp of Engineers and beyond the scope of this study.

The "Do Nothing" alternative was considered. However, this alternative would lead to further deterioration of the existing roadway resulting in increasing maintenance costs and increased safety concerns.

Another alternative considered was resurfacing the existing roadway with a leveling course from Fairfield Town Limits to 14.9 miles north and a surface course from Fairfield Town Limits to Columbia Town Limits. This alternative would cost approximately $1,225,000.00. However, this alternative would do little for drainage problems associated with NC 94 and maintenance costs would continue to increase due to the deteriorating condition of the existing shoulders. Furthermore, it would do very little to decrease accidents and increase safety for the motorist.

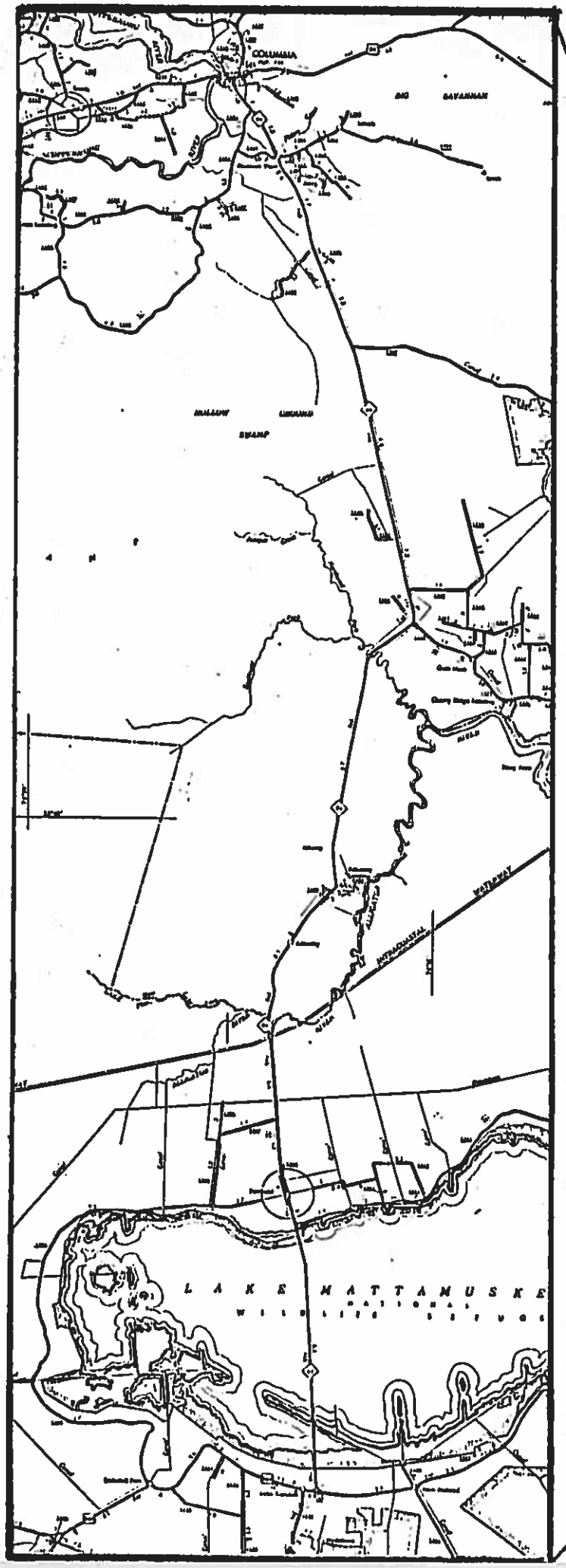
V. Environmental Concerns

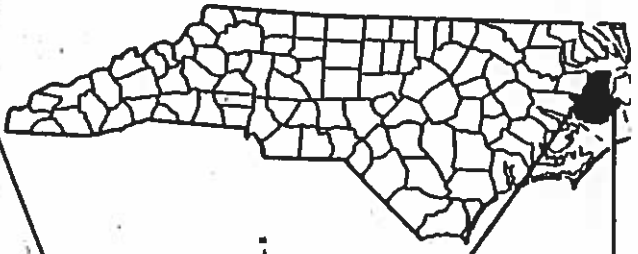
The implementation of the proposed project is not expected to result in any significant impacts on the environment. Impacts will be primarily related to the actual construction of the project and will cease upon completion of the project. These impacts include minor erosion and siltation, increased noise level from construction machinery, and delay and inconvenience to motorists using NC 94. Because of the close proximity of wetlands, the construction of this project may require a CAMA permit.

VI. Other Comments

The project should not have any significant adverse social, economic, or environmental consequences. Indeed, it should improve the economic outlook for the Town of Columbia and the Town of Fairfield. Furthermore, it should improve the motorist's driving environment by providing a safer roadway and improved aesthetics. The recommended improvements will also bring NC 94 into compliance with roadway design standards.

figure 1





NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
DIVISION 1, CONSTRUCTION UNIT

NC 94
FROM US 264 AT LAKE COMFORT
TO COLUMBIA
HYDE AND TYRRELL COUNTIES
R-2564

TABLE 2 DESIGN CRITERIA - MINIMUM PAVEMENT WIDTHS

DESIGN SPEED	CURRENT ADT LESS THAN 50	CURRENT ADT 50-250	CURRENT ADT 250-400	CURRENT ADT 400-750 *DHV 100-200	ADT 750-2000 *DHV 200-400	ADT 2000-OVER *DHV 400-OVER	ARTERIAL STREET	MULTILANE HIGHWAYS	INTERSTATE HIGHWAYS
	A*	A*					B*		
20	20	20	20	20	22	24	24		
30	20	20	20	20	22	24	24		
40	20	20	20	22	22	24	24		
50	20	20	20	22	24	24	24	24	24
60	20	20	22	22	24	24	24	24	24
65		20	22	24	24	24	24	24	24
70		20	22	24	24	24	24	24	24

A* FOR DESIGN SPEEDS OF 20, 30, 40, AND 50 MPH, SURFACE WIDTHS MAY BE REDUCED 2' ON HIGHWAYS WITH A CURRENT ADT LESS THAN 100 AND WITH LESS THAN 5% TRUCKS.

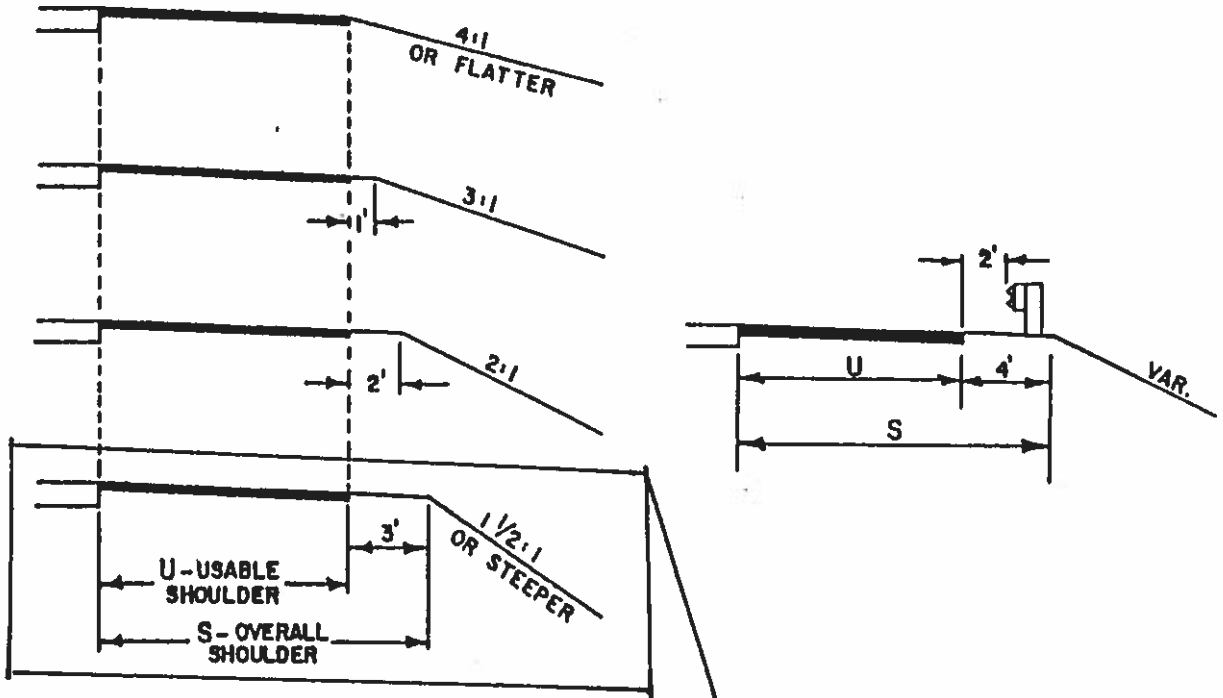
B* WHEN NECESSARY TO PROHIBIT EXCESSIVE RIGHT OF WAY COSTS, ARTERIAL STREETS MAY BE REDUCED TO 22'.

* DHV INDICATES FUTURE TWO WAY DESIGN HOURLY VOLUME.

ROADWAY DESIGN MANUAL

figure 2

USABLE SHOULDER



USABLE SHOULDER WIDTHS

	CURRENT ADT LESS THAN 50	CURRENT ADT 50 - 250	CURRENT ADT 250 - 400	CURRENT ADT 400-750 DHV 100 - 200	DHV 200 - 400	DHV 400 & OVER
LOCAL, COLLECTOR, MINOR ARTERIAL	2	4	4	6	8	8
MAJOR ARTERIAL	6	6	8	10	10	10