

FEASIBILITY STUDY

US 501 from Roxboro to the Virginia State Line
Person County
R-2241

Prepared by
Planning and Research Branch
Division of Highways
N. C. Department of Transportation

August, 1987

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This project was included in the 1987-1995 Transportation Improvement Program (TIP) for feasibility study and/or right of way protection. This report provides a brief, initial analysis of possible improvements. The project is not currently funded.

I. GENERAL DESCRIPTION

It is recommended that US 501 be widened to a 5-lane curb and gutter section from NC 49 in Roxboro to approximately 1500 feet north of SR 1330 (approximately 5.5 miles). The remaining portion of US 501 to the Virginia State Line is to be widened to a 4-lane divided shoulder section with a 46-foot median (approximately 5.2 miles). It is also recommended that the improvements be staged. The estimated total cost of the project is \$15,309,000.

II. EXISTING CONDITIONS

CLASSIFICATION: This portion of US 501 is classified as a rural minor arterial in the Statewide Functional Classification System, and is a part of the Federal Aid System (FAP 63-1).

HISTORICAL RESUME: The studied portion of US 501 was constructed in 1926 as a 16-foot wide concrete roadway. The route was subsequently widened to 33 feet from NC 49 in Roxboro to SR 1363, and to 36 feet from SR 1363 to SR 1351. In 1955, US 501 was widened to 24 feet on a new location (the present alignment) from SR 1351 to the Virginia State line.

Cross Section Description:

From NC 49 to SR 1524: 36-foot pavement with 8-foot shoulders.
From SR 1524 to the Virginia State line: 24-foot pavement
with 8 to 10-foot shoulders.

Claimed Right of Way:

From NC 49 to SR 1524: 60 feet
From SR 1524 to the Virginia State Line: 100 feet

ESTIMATED TRAFFIC VOLUMES:

At Roxboro Corporate Limits

1987 ADT = 4700 vpd

2007 ADT = 7800 vpd

Between SR 1330 and SR 1322	1987 ADT = 2300 vpd
	2007 ADT = 3700 vpd
Between SR 1322 and the Virginia State Line	1987 ADT = 2000 vpd
	2007 ADT = 3700 vpd

STRUCTURES:

- 1) Culvert #47 over Marlowe's Creek in Roxboro, built in 1926, with a present sufficiency rating of 64.6. The crossing is comprised of double 96-foot long 8 x 10-foot reinforced concrete box culverts. The structure is capable of carrying the full legal load.
- 2) Bridge #48 over the Norfolk & Western Railway, built in 1926, with a present sufficiency rating of 38.6. The bridge length is 127 feet, with a 28-foot clear roadway width. It is presently posted to carry the full legal load.
- 3) Bridge #204 over the CP&L railway spur, located approximately 1.3 mile south of the Virginia State Line. The bridge was built in 1980, and carries a present sufficiency rating of 96.4. Bridge length is 189 feet, with a clear roadway width of 40 feet. It is presently posted to carry the full legal load.

ACCIDENT INVENTORY: During the period starting in January 1984 and ending in January 1987, a total of 52 accidents were reported on the studied portion of US 501. The resulting accident rate is 193.31 accidents per 100 million vehicle miles (ACC/100 MVM). The statewide accident rate for similar routes was 167.5 ACC/10 MVM for the year 1986. The majority of accidents occurred in the vicinity of intersections. Approximately 30% of all accidents involved vehicles running off the road. However, these lacked a clustered pattern that may indicate a problematic location, except in the vicinity of the intersection with SR 1326. Accidents involving left-turning vehicles comprised 21.2% of the total, these may be reduced if turning-lanes are provided.

ALIGNMENT: Vertical and horizontal alignments are generally good except in the vicinity of the intersection with SR 1326 where US 501 forms an approximately 5°, 3000-foot long curve combined with approximately a 5% grade. Unrestricted sight distance on the majority of the route is in excess of 1500 feet.

LAND USE: (See Figure 2)

From Roxboro Corporate Limits to SR 1413: Mainly residential on the west side, and mixed residential and business use on the east side of US 501.

SR 1413 to SR 1500: Light density rural residential on the west, and mainly agricultural use on the east.

SR 1500 to the Virginia State Line: Game land, leased by the N. C. Fish and Wildlife Commission (see Figure 3); the Mayo Reservoir; and a CP&L power plant are also located in the vicinity.

UTILITIES: Water mains parallel the east side of the route, over-head power lines, and buried telephone cables parallel the west side.

SPECIAL CONCERNS:

- 1) The State of Virginia expressed some interest in improving its portion of US 501. Therefore, it is recommended that any improvements be coordinated with the State of Virginia D.O.T. The following person can be contacted:

Mr. Donald L. Eure, Planning & Scheduling Engineer
1221 East Broad Street
Richmond, Virginia 23219
Telephone: (804) 786-2918

- 2) Wetlands may be present in two sites, in the vicinity of Mitchell Creek, and an unnamed branch, ± 2800 feet and ± 600 feet north of SR 1326 respectively.

III. PROPOSED IMPROVEMENTS

It is recommended that the following improvements be staged according to traffic volumes, availability of funds, and improvements to US 501 in the State of Virginia to ensure the continuity of benefits to the traffic service. Improvement parts B, C, and D can not be recommended for implementation at the present due to the low projected traffic volumes. Therefore, they are presented here as conceptional improvements to be implemented when justified in the future. It is also recommended that improvements within the Roxboro Corporate Limits be programmed under a separate Urban project. The following recommended improvements are listed in order of their respective priority:

- A. Widen US 501 from NC 49 in Roxboro to SR 1352 (2.24 miles) to a 5 lane, 64-foot, face-to-face, curb and gutter section. This widening is to be symmetrical about the existing centerline of the road on 80 feet of right of way. This improvement will also include lengthening Culvert #47 by an additional ± 50 feet.
- B. From SR 1352 to ± 500 feet south of SR 1523 (0.95 mile), US 501 is to be relocated to the east of the existing alignment as shown in Figure 2. The cross-section is to be tapered to 4-lanes curb and gutter with a painted 4-foot median, then tapered back to 5 lanes approximately 500 feet south of SR 1523. The proposed right of way for this section is 80 feet. It is recommended that access to US 501 be restricted along the bridge #48 approaches and their

embankments. These improvements will also include a replacement bridge just east of the existing bridge #48, and the removal of the existing bridge. The replacement structure is estimated to be approximately 200 feet long with a clear roadway width of 56 feet.

- C. From SR 1523 to approximately 1500 feet north of SR 1330 (2.27 miles), US 501 should be widened to 5 lanes with either curb and gutter or shoulders. The choice of either section should be based on the construction and right of way cost, relocations, and farmland loss. It is estimated that the curb and gutter option will cause the least disruption, and the section can be contained within the presently claimed 100-foot right of way. It is also estimated that the shoulder option will require approximately a total of 150 feet of right of way.
- D. From approximately 1500 feet north of SR 1330 to the Virginia State Line (5.23 miles), US 501 should be widened to a 4-lane divided highway with a 46-foot grassed median and shoulders on 200 feet of right of way. The proposed widening will involve a new bridge parallel to the existing Bridge #204 over the CP&L railway span (approximately 1.2 mile south of the State Line) The new structure is estimated to be 200 feet long, with a clear roadway width of 38 feet.

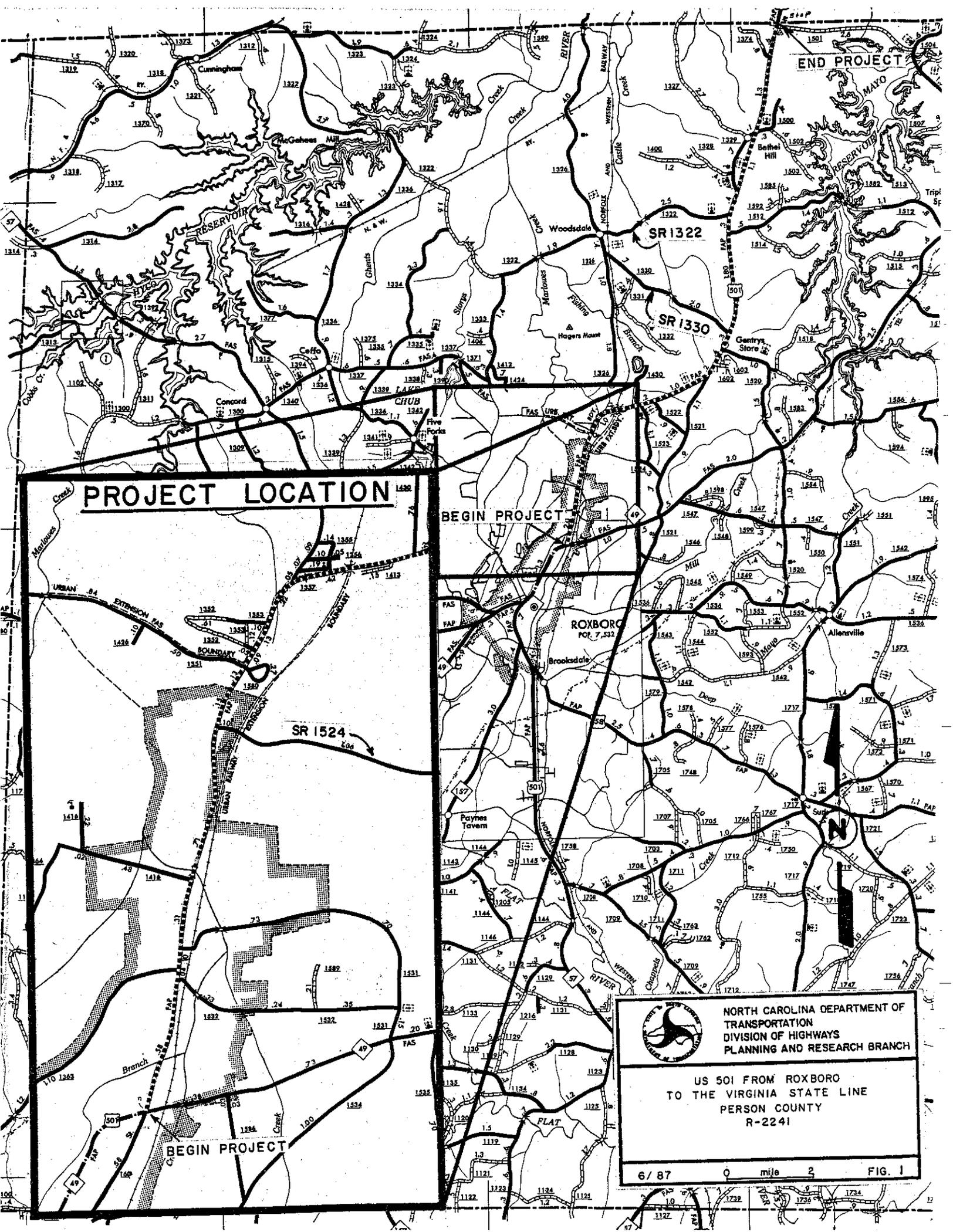
IV. ESTIMATED COST

<u>Improvement Part:</u>	<u>Estimated Cost</u>		
	<u>Construction</u>	<u>R/W</u>	<u>Total/Part</u>
A	\$1,700,000	\$2,570,000	\$ 4,270,000
B	\$1,600,000	\$ 629,500	\$ 2,229,500
C	\$2,000,000	\$1,421,500	\$ 3,421,500
D	\$4,100,000	\$1,288,000	\$ 5,388,000
TOTAL	\$9,400,000	\$5,909,000	\$15,309,000

V. FUTURE ACTIVITIES

If the project is to be implemented at a future date, all feasible alternatives and their associated impacts will need to be evaluated in a planning/environmental document prior to that time, and a final decision made as to the most appropriate improvement.

MBM/rm



PROJECT LOCATION

BEGIN PROJECT

END PROJECT

SR 1322

SR 1330

SR 1524

ROXBORO
POP. 7,532



**NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH**

**US 501 FROM ROXBORO
TO THE VIRGINIA STATE LINE
PERSON COUNTY
R-2241**

6 / 87 0 mile 2 FIG. 1



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US 501 FROM ROXBORO
TO THE VIRGINIA STATE LINE
PERSON COUNTY
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6/87

0 ft. 1000

FIG. 2

BEGIN PROJECT AT INTERSECTION
WITH NC 49-501 (± 1 1/2 MILES SOUTH)

PROPOSED 5-LANE CURB AND GUTTER
WITH 80 FT. R/W

SHEET 1 OF 5

ROXBORD CITY LIMIT

SR1524

SR1351

SR1352

SR1580

SR1553

NEW ALIGNMENT

PROPOSED C/A 4-LANE SECTION

SR15

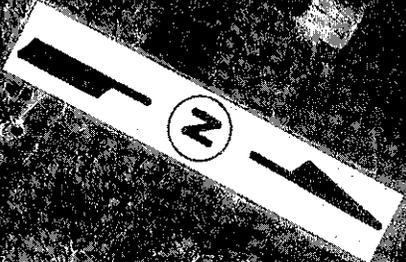
SR1413

SR1523

PROPOSE
REPLACI

NORFOLK AND WESTERN RAIL

MATCHLINE A



TION

SR1529

MATCHLINE A

K AND WESTERN RAILWAY

PROPOSED 4-LANE STRUCTURE
REPLACING 4-LANE EXISTING



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0 ft. 1000

FIG. 2

SHEET 2 OF 5



SR1522

US 501

SR1521

PROPOSED 5-LANE SHOULDER SECT
OR CURB AND GUTTER

MATCHLINE B

MATCHLINE B

EXISTING ROADWAY AND ALIGNMENT WITH GRADE ADJUSTMENTS
PROPOSED ROADWAY

PROPOSED 4-LANE DIVIDED HIGHWAY WITH 200 FT R/W



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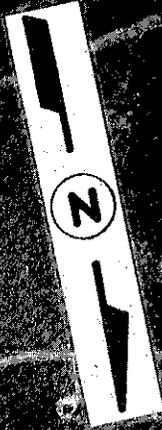
US 501 FROM ROXBORO
TO THE VIRGINIA STATE LINE
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6/87

0 ft 1000

FIG. 2

SHEET 3 OF 5



SR1512

SR1382

MATCHLINE C

MATCHLINE C

N



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6 / 87

0 ft. 1000

FIG. 2

SHEET 4 OF 5

PROPOSED ROADWAY

EXISTING ROADWAY AND ALIGNMENT
WITH GRADE ADJUSTMENTS

SR1329

SR1329

SR1500

US 501

PROPOSED

PROPOSED 4-1
WITH 200

MATCHLINE I

MATCHLINE D

US 501

PROPOSED 4-LANE DIVIDED HIGHWAY
WITH 200 FT R/W

PROPOSED 2-LANE STRUCTURE PARALLEL EXISTING



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US 501 FROM ROXBORO
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6 / 87 0 ft. 1000 FIG. 2

SHEET 5 OF 5

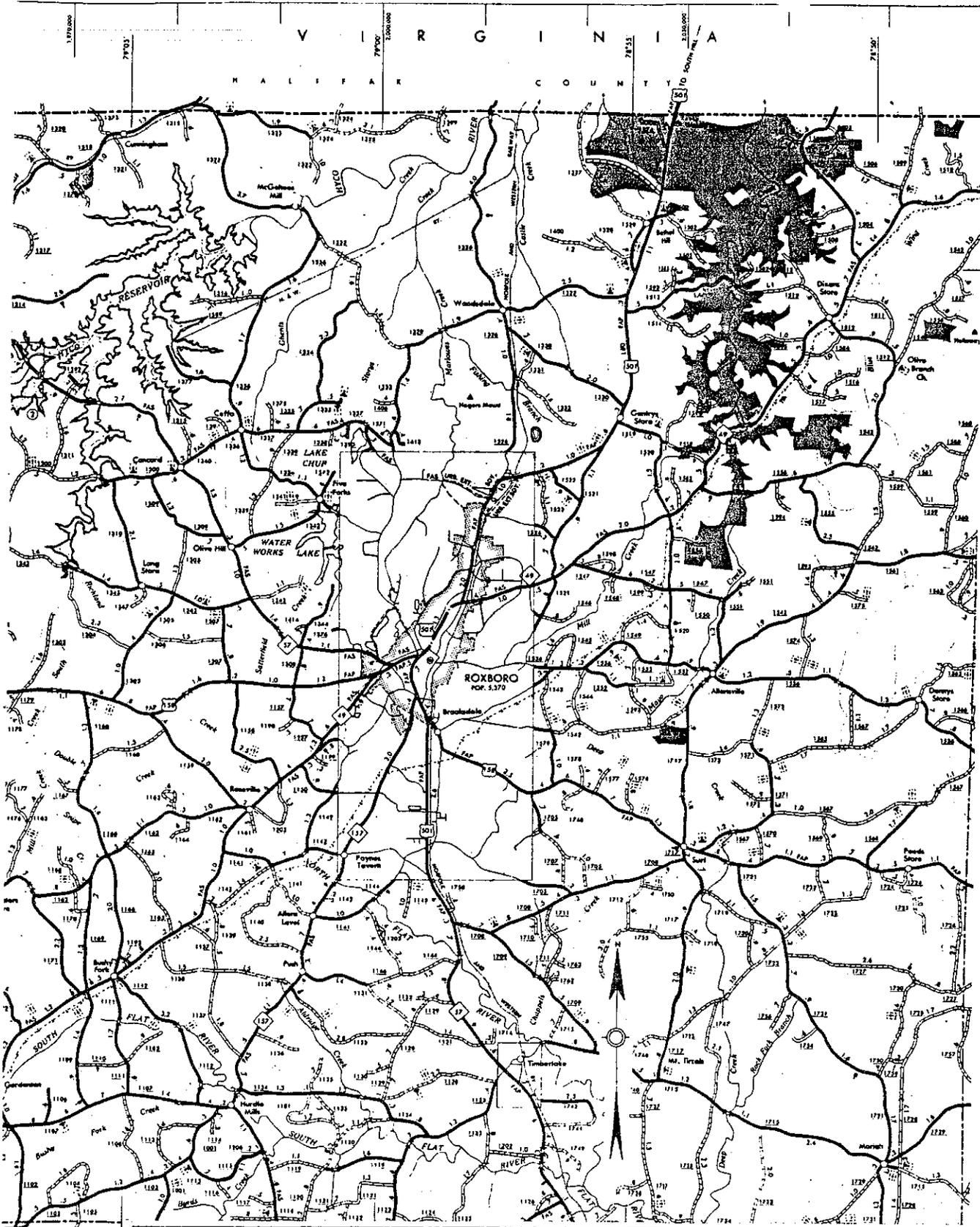
MAYO RESERVOIR

SR1374

SR1301

END PROJECT NC/VA LINE

PERSON GAME LAND
Carolina Power & Light Co., Continental Hopewell Woodlands Inc., Champion International, Person County (9,254 acres)



LOCATION OF
N.C. FISH AND WILDLIFE GAMELANDS
FIGURE 3