



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT JR.  
GOVERNOR

DIVISION OF HIGHWAYS  
P.O. BOX 25201, RALEIGH, N.C. 27611-5201

GARLAND B. GARRETT JR.  
SECRETARY

March 8, 1996

MEMORANDUM TO: Mr. Clark Jenkins, Member, Board of Transportation  
Mr. D. R. Dupree, Division Engineer, Division 4  
Mr. C. W. Leggett, P.E.  
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. D. R. Morton, 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. L. K. Barger, P.E.

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

SUBJECT: Feasibility Study # U-3464, Smithfield, US 301-NC 96 from  
NC 96 to SR 1107 (Brogden Road), Johnston County.

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: Dr. L. R. Goode, P.E.  
Mr. B. G. Jenkins, P.E.  
Mr. W. J. Watson, P.E.



FEASIBILITY STUDY

Smithfield  
US 301 - NC 96  
From NC 96 To SR 1107 (Brogden Rd.)  
Johnston County  
U-3464

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

*William J. Watson*  
William J. Watson, P.E.  
Highway Planning Engineer

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

*2/27/96*  
Date

Smithfield  
US 301 - NC 96  
From NC 96 To SR 1107 (Brogden Rd.)  
Johnston County  
U-3464

I. GENERAL DESCRIPTION

This preliminary study describes the proposed widening of US 301 - NC 96 from NC 96 to SR 1007 (Brogden Rd.) in Smithfield. The project location is shown on Figure 1. The proposed cross-section is a five-lane curb and gutter section, 64 feet (19.5 m) wide from face to face of curbs, for the entire project length of 3.7 miles ( 5.9 km). The required right-of-way width is 100 feet (30.5 m).

Three residential and 10 business relocations are anticipated due to this project.

Three bridges will require replacement and the traffic signal at the Brogden Road intersection will require revisions. Also, at the Brogden Road intersection, it is proposed to revise the intersection geometry. The existing intersection geometry is shown on Figure 2 and the proposed geometric layout is shown on Figure 3.

The total cost including construction and right-of-way is estimated to be \$16,000,000.

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

II. NEED FOR PROJECT

The purpose of this project is to increase the traffic carrying capacity and safety of US 301 in Smithfield. The project was requested by the Town of Smithfield.

US 301 - NC 96 is classified an Urban Other Principal Arterial in the North Carolina Statewide Functional Classification System and is a Major Thoroughfare on the Smithfield-Selma-Pine Level Thoroughfare Plan.

Land use along the project corridor is a mix of single family residential, commercial, and industrial development. Existing US 301 - NC 96 is a two-way, three-lane road with grass shoulders. The existing pavement is approximately 38

feet (11.6 m) wide and includes two travel lanes, a center turn lane, paved shoulder 2 feet (0.6 m) wide, and grass shoulders 2 feet (0.6 m) to 6 feet (1.8 m) wide.

Traffic volume estimates for the years 1995 and 2020 are 11,000 vehicles per day (vpd) and 24,000 vpd respectively. The Level of Service (LOS) without the proposed improvements is estimated to be LOS D in 1995 and LOS F in 2020. With the proposed improvements the LOS is estimated to be LOS A in 1995 and LOS C in 2020.

During the three year period beginning April 1, 1992 and ending March 31, 1995, there were 106 accidents reported on US 301 - NC 96 within the project limits. This resulted in a total accident rate of 498 accidents per 100 million vehicle miles (ACC/100MVM). This compares with the statewide average of 269 ACC/100MVM for all urban US routes, in North Carolina, for 1994.

There was one fatal accident reported and 46 accidents resulted in 78 injured persons. The most prevalent type accidents were Angle (27%), Rear End (23%), and Left Turn (14%).

The proposed wider cross-section with center turn-lane will reduce the potential for these type accidents.

### III. RECOMMENDATIONS

It is recommended to widen US 301 - NC 96 from NC 96 to SR 1007 (Brogden Rd.) in Smithfield. The project location is shown on Figure 1. The proposed cross-section is a five-lane curb and gutter section, 64 feet (19.5 m) wide from face to face of curbs, for the entire project length of 3.7 miles (5.9 km). The required right-of-way width is 100 feet (30.5 m). Berms 8 feet (2.4 m) wide will be provided behind the curbs on each side.

Three residential and 10 business relocations are anticipated due to this project.

Three bridges will require replacement and the traffic signal at the Brogden Road intersection will require revisions. Also, at the Brogden Road intersection, it is proposed to revise the intersection geometry. The existing intersection geometry is shown on Figure 2 and the proposed geometric layout is shown on Figure 3.

Bridge No. 70 over the Neuse River is 28 feet (8.5 m) wide, was built in 1926, and has a sufficiency rating of 49.0. This bridge will be replaced with a new bridge approximately 315 feet (96.0 m) long and 64 feet (19.5 m) wide.

Bridge No. 56 at Holts Lake is 28 feet (8.5 m) wide, was built in 1926, and has a sufficiency rating of 32.3. This bridge will be replaced with a new bridge approximately 210 feet (64.0 m) long and 64 feet (19.5 m) wide.

Bridge No. 37, near the west project terminal, carries US 301 - NC 96 over the CSX Railway. This bridge is 28 feet (8.5 m) wide, was built in 1926, and has a sufficiency rating of 62.8. This bridge will be replaced with a new bridge 52 feet (15.8 m) wide and approximately 188 feet (57.3 m) long.

At the west project terminal (shown on Figure 4), the proposed 5-lane cross-section will be reduced to a 4-lane section on the bridge over the CSX Railway by dropping the center turn lane. The cross-section will be reduced to 3 lanes approximately 200 feet (61 m) south of the CSX Bridge (just north of the US 301-NC 96 intersection) by dropping the outside southbound lane as an exit lane to US 301. The resultant 3-lane section will begin an immediate transition to a 4-lane section consisting of 1 southbound lane, 1 north bound left-turn lane, and 2 north bound through lanes. This 4-lane section will be approximately 150 feet (46 m) long. Within this section, on the west side, there is an exit ramp to southbound US 301, an entrance ramp to northbound US 301, and an entrance ramp to southbound NC 96. This 4-lane section will tie into the 2-lane NC 96 bridge over I-95 with a taper approximately 500 feet (153 m) long. The NC 96 bridge over I-95 will not require widening under this project. It is recommended that the widening be done on the east side of NC 96 between the existing bridge over I-95 and the new bridge over the CSX Railroad.

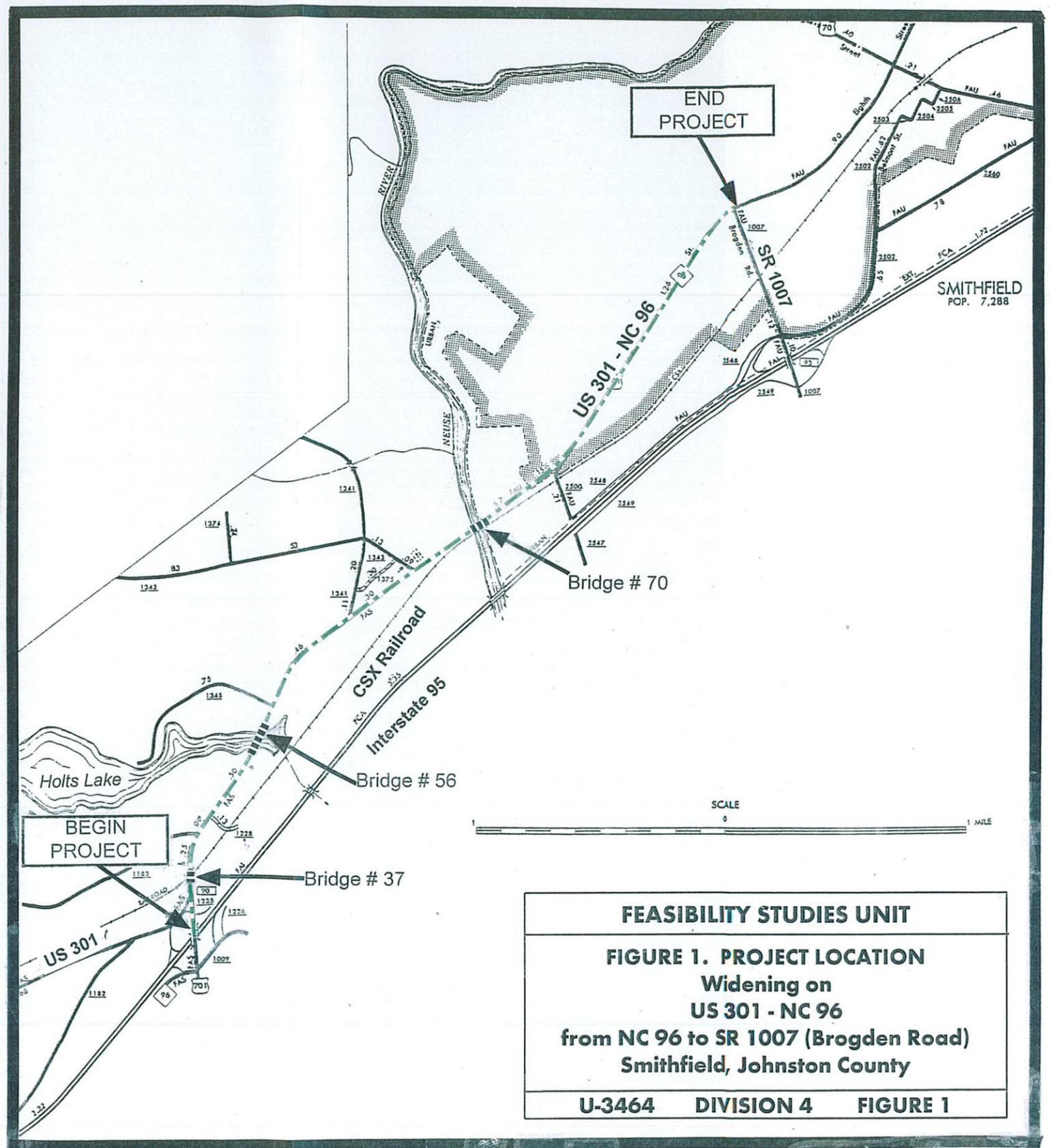
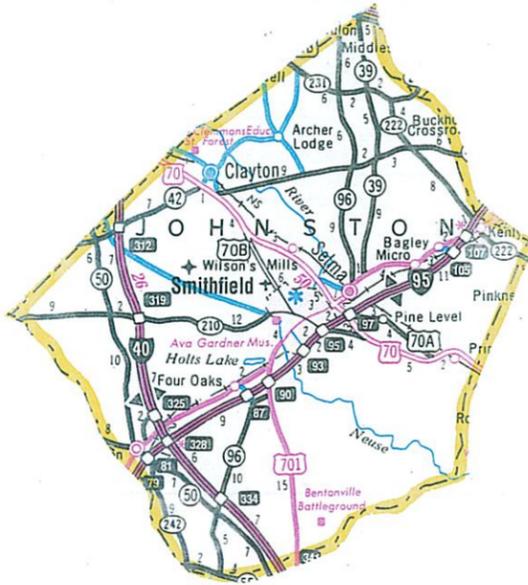
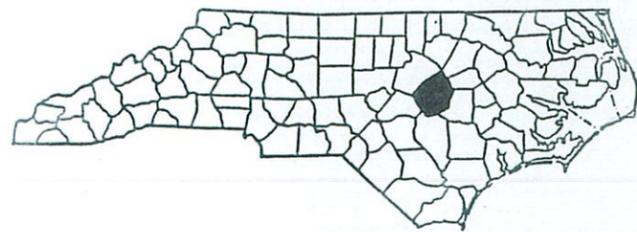
At the east project terminal, the proposed cross-section will match the existing 5-lane curb and gutter section on US 301 east of Brogden Road.

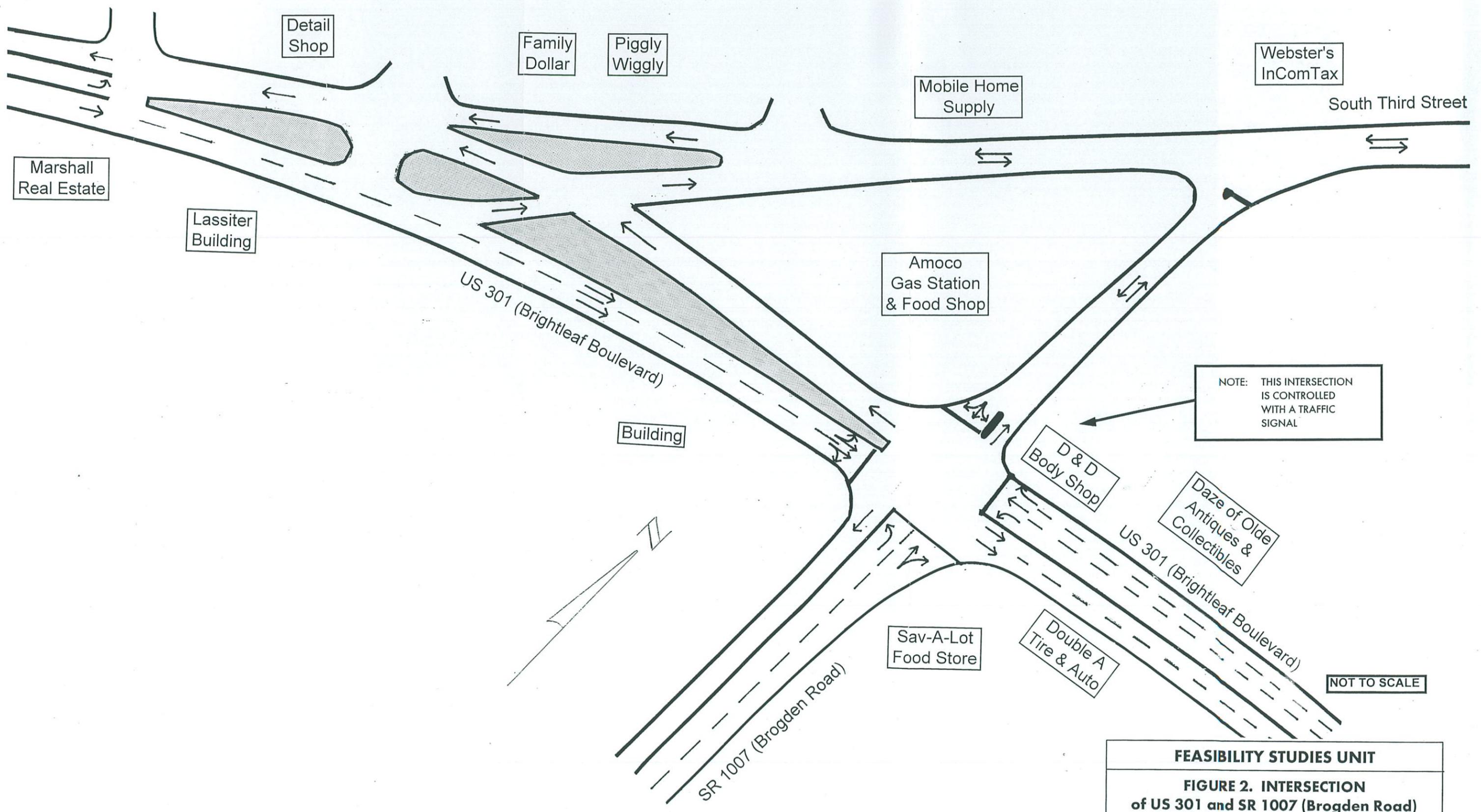
The total cost, including construction and right-of-way, is estimated to be \$16,000,000 as follows:

Construction.....	\$10,000,000
Right-of-Way.....	<u>6,000,000</u>
Total Cost.....	\$16,000,000

#### IV. OTHER COMMENTS

An environmental screening was not conducted for this study. This project will cross some wetlands. No historic properties or endangered species are anticipated.

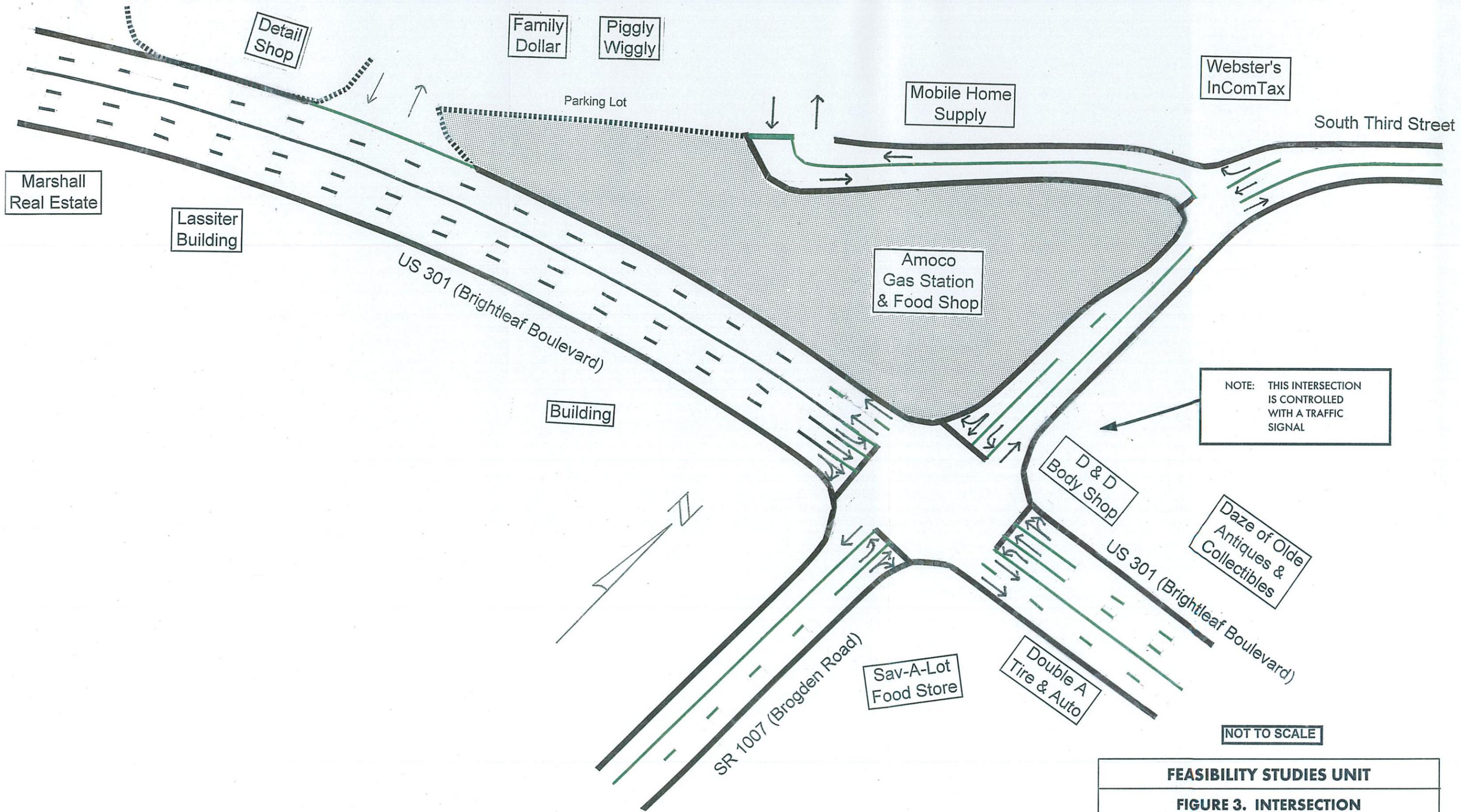




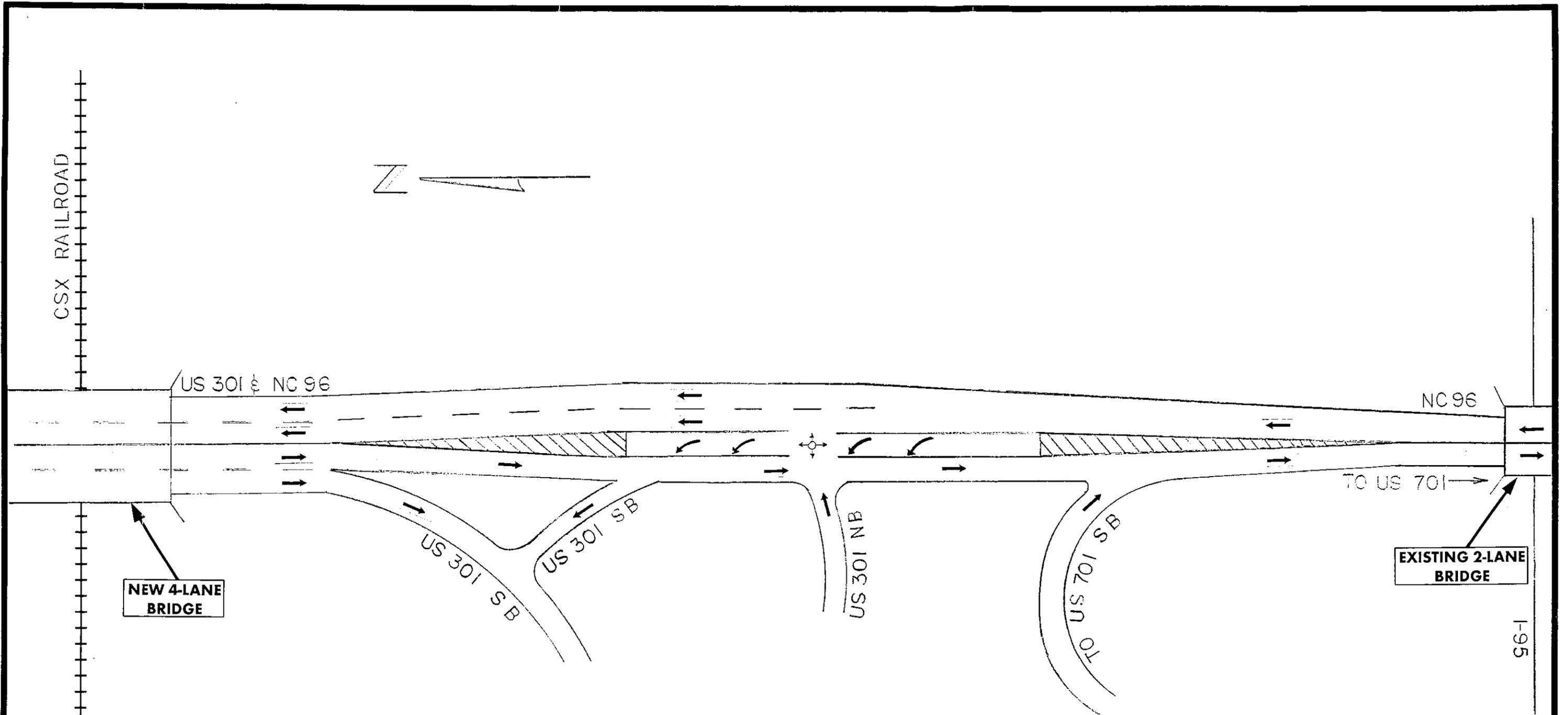
NOTE: THIS INTERSECTION IS CONTROLLED WITH A TRAFFIC SIGNAL

NOT TO SCALE

<b>FEASIBILITY STUDIES UNIT</b>		
<b>FIGURE 2. INTERSECTION of US 301 and SR 1007 (Brogden Road) EXISTING LANE CONFIGURATION Smithfield, Johnston County</b>		
U-3464	DIVISION 4	FIGURE 2



<b>FEASIBILITY STUDIES UNIT</b>		
<b>FIGURE 3. INTERSECTION of US 301 and SR 1007 (Brogden Road) PROPOSED DESIGN CONCEPT Smithfield, Johnston County</b>		
<b>U-3464</b>	<b>DIVISION 4</b>	<b>FIGURE 3</b>



**NOT TO SCALE**

<b>FEASIBILITY STUDIES UNIT</b>		
<b>FIGURE 4. WEST PROJECT TERMINAL</b>		
<b>US 301 - NC 96</b>		
<b>from NC 96 to SR 1007 (Brogden Road)</b>		
<b>Smithfield, Johnston County</b>		
<b>U-3464</b>	<b>DIVISION 4</b>	<b>FIGURE 4</b>