

FEASIBILITY STUDY

**NC 86
from US 158
to the Virginia State Line
Caswell County**

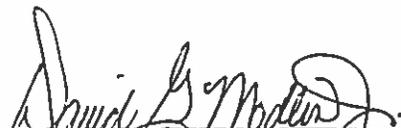
Division 7

R-3418

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



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Date

R-3418

NC 86
From US 158
To The Virginia State Line
Caswell County

Division 7

I. General Description

This preliminary study describes recommended improvements to NC 86 in Caswell County. It is recommended that NC 86 be widened from US 158 to the Virginia State Line, a distance of approximately 9.1 miles (14.7 km). For a location map, please see Figure 1.

Two alternatives were evaluated for the proposed widening. The alternates are as described below:

Alternate 1

The Alternate 1 cross section is a 5-lane rural shoulder section with 12-foot (3.6-m) wide travel lanes, a 12-foot (3.6-m) wide center turn lane, and 10-foot (3.0-m) wide shoulders of which 4 feet (1.2 m) are paved.

The 5-lane section can generally be constructed within the existing 150-foot (45.7-m) wide right-of-way.

It is estimated that there will be 2 residences and no businesses relocated as a result of this alternate.

The total cost for right-of-way and construction, for Alternate 1, is estimated to be \$30,900,000 as follows:

Right-of-Way	\$ 400,000
Construction	30,500,000
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Total Cost	\$30,900,000

Alternate 2

The Alternate 2 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.

The 4-lane, divided section will require a 250-foot (76.2-m) wide right-of-way and access should be limited to one access per parcel. It is estimated that this alternate will require the relocation of 28 residences and 7 businesses.

The total cost for right-of-way and construction, for Alternate 2, is estimated to be \$38,100,000 as follows:

Right-of-Way	\$ 5,400,000
Construction	32,700,000
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Total Cost	\$38,100,000

Alternate 2 (4-lane divided section) is recommended for implementation. Although Alternate 2 is more expensive and will create considerably more relocations than Alternate 1, it is felt that Alternate 2 will maintain the rural integrity of the area and allow traffic to flow freely. Alternate 1 will be more conducive to the development of driveway connections and development along the project route and will tend to slow traffic movement.

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 and accident experience of NC 86 between US 158, north of Yanceyville and the Virginia state line. The project was requested by Caswell County to relieve increasing congestion and develop a major north-south corridor through the county.

NC 86 is designated as a major arterial on the North Carolina Statewide Functional Classification System.

The project route is generally undeveloped and is characterized by woodlands and rolling terrain. There are a few residences scattered along the roadway and some commercial development at major intersections. There is an elementary school located on the east side of the roadway at approximately 1.0 miles (1.6 km) south of the Virginia state line.

Existing NC 86 is generally a 2-lane roadway with a 24-foot (7.3-m) wide pavement and 9-foot (2.7-m) wide soil shoulders. The roadway has been widened to 3 and 4 lanes at major intersections and in front of the above mentioned school to provide for turning movements. The north intersection with SR 1500 (Old NC 86) is channelized by traffic islands.

There are two structures located along the project route. Bridge #60, over Moon Creek, is located approximately 1.0 mile (1.6 km) north of SR 1609, and Bridge #61, over Hogan's Creek, is located approximately 1.0 mile (1.6 km) south of SR 1300. Bridge #60 is 199 feet (60.7 m) long and Bridge #61 is 280 feet (85.4 m) long. Both bridges were constructed in 1957 and have a clear deck width of 28 feet

(8.5 m). They have sufficiency ratings of 45.8 and 47.6 (out of a possible 100 points) respectively.

Immediately north of the project, on the Virginia side of the state line, the roadway is widened to a 5-lane shoulder section and is heavily developed commercially.

The 1995 Average Daily Traffic (ADT) estimates range from 5,200 vehicles per day (vpd) at the south project terminus to approximately 8,500 vpd near the north project terminus. The design year (2020) estimates are approximately 12,800 vpd and 17,600 vpd, respectively. Current and future truck volumes are estimated to total about 5% of the traffic volumes.

The current Level Of Service (LOS) is estimated to be Level C near the southern project terminus and Level D near the northern project terminus. Without improvements, it is estimated that the Level of Service will deteriorate to Level E, for the entire project length, prior to the design year. With the recommended improvements, the LOS is expected to improve to a Level A, for the entire project length, which should prevail through the design year.

During the period from March 1, 1993, through February 29, 1996, there were 135 accidents reported within the project termini. This resulted in an accident rate of 78.8 accidents per 100 million vehicle miles (Acc/100MVM), compared to a statewide average of 207.3 Acc/100 MVM for all rural NC routes during 1994. There were no fatalities reported during the period and 66 of the accidents resulted in non-fatal injuries. The most prevalent accident types were rear-end (29.6%), animal (17.8%), and left-turn (10.4%). The recommended improvements should reduce the potential for these types of accidents.

III. Detailed Description

It is recommended that NC 86, in Caswell County, be widened from US 158 to the Virginia State Line, a distance of approximately 9.1 miles (14.7 km). For a location map, please see Figure 1.

Two alternatives were evaluated for the proposed widening. A detailed description of the alternates is as follows:

Alternate 1

Alternate 1 is the widening of NC 86 to a 5-lane rural shoulder section with 12-foot (3.6-m) wide travel lanes, a 12-foot (3.6-m) wide center turn lane, and 10-foot (3.0-m) wide shoulders of which 4 feet (1.2 m) are paved. The widening should be done within the existing 150-foot (45.7-m) wide right-of-way.

In addition to widening NC 86, Alternate 1 includes the following:

1. Realign the south SR 1500 intersection, as shown on Figure 2, to relieve the existing skew and to improve sight distance.
2. Realign the north SR 1500 intersection, as shown on Figure 2, to remove the traffic islands, improve sight distance, and improve traffic flow.
3. Realign SR 1360 to intersect at SR 1503, as shown on Figure 2, to relieve the existing skew of SR 1360 and to improve sight distance.

4. Replace Bridge #60 and Bridge #61 with new bridges having a clear deck width of 80 feet (24.4 m).
5. Upgrade the existing traffic signal at US 158.

It is estimated that there will be 2 residences and no businesses relocated as a result of Alternate 1.

The total cost for right-of-way and construction, for Alternate 1, is estimated to be \$30,900,000 as follows:

Right-of-Way	\$ 400,000
Construction	30,500,000
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Total Cost	\$30,900,000

Alternate 2

Alternate 2 is the widening of NC 86 to 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 250-foot (76.2-m) wide right-of-way would be required and access should be limited to one access per parcel.

In addition to widening NC 86, Alternate 2 includes the following:

1. Realign the south SR 1500 intersection, as shown on Figure 2, to relieve the existing skew and to improve sight distance.
2. Realign the north SR 1500 intersection, as shown on Figure 2, to remove the traffic islands, improve sight distance, and improve traffic flow.
3. Realign SR 1360 to intersect at SR 1503, as shown on Figure 2, to relieve the existing skew of SR 1360 and to improve sight distance.
4. Replace Bridge #60 and Bridge #61 with new dual bridges having a clear deck width of 38 feet (11.6 m).
5. Construct median crossovers, with 200 foot (61-m) turn lanes, at the south and north SR 1500 intersections, and at the SR 1518, SR 1609, SR 1300, and the SR 1609/SR 1503 intersections.
6. Upgrade the existing traffic signal at US 158.

It is estimated that Alternate 2 (the recommended alternate) will require the relocation of 28 residences and 7 businesses.

The total cost for right-of-way and construction, for Alternate 2, is estimated to be \$38,100,000 as follows:

Right-of-Way	\$ 5,400,000
Construction	32,700,000
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Total Cost	\$38,100,000

Alternate 2 (4-lane divided section) is recommended for implementation. Although Alternate 2 is more expensive and will create considerably more relocations than Alternate 1, it is felt that Alternate 2 will maintain the rural integrity of the area and

allow traffic to flow freely. Alternate 1 will be more conducive to the development of driveway connections and development along the project route and will tend to slow traffic movement.

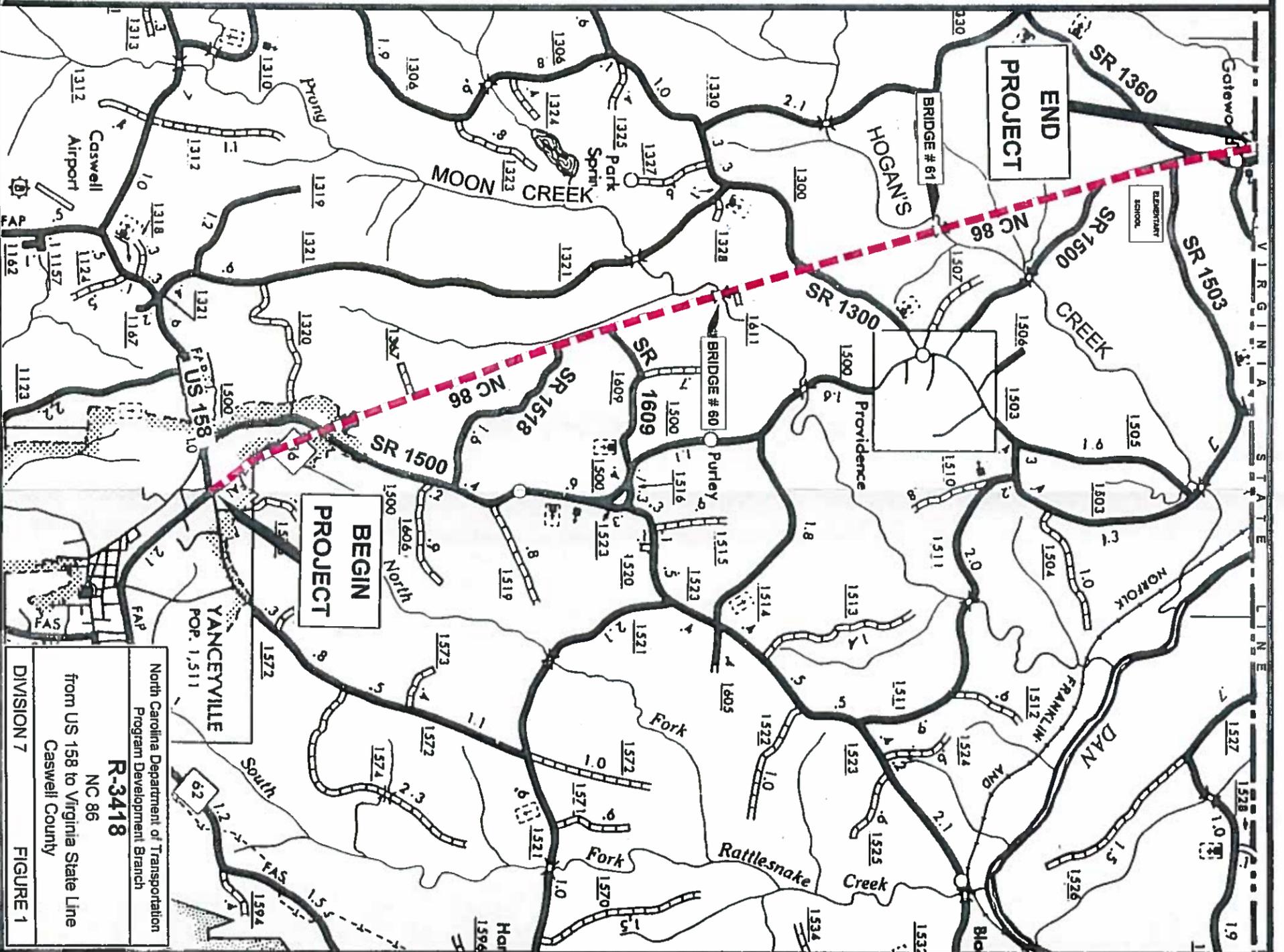
IV. Other Comments

An environmental screening was not conducted for this study; however, due to the construction potential in the area of Moon Creek and Hogan's Creek, Corps of Engineers permits and wetlands mitigation will be required. The costs for wetlands mitigation is not included as part of the above estimated project costs.

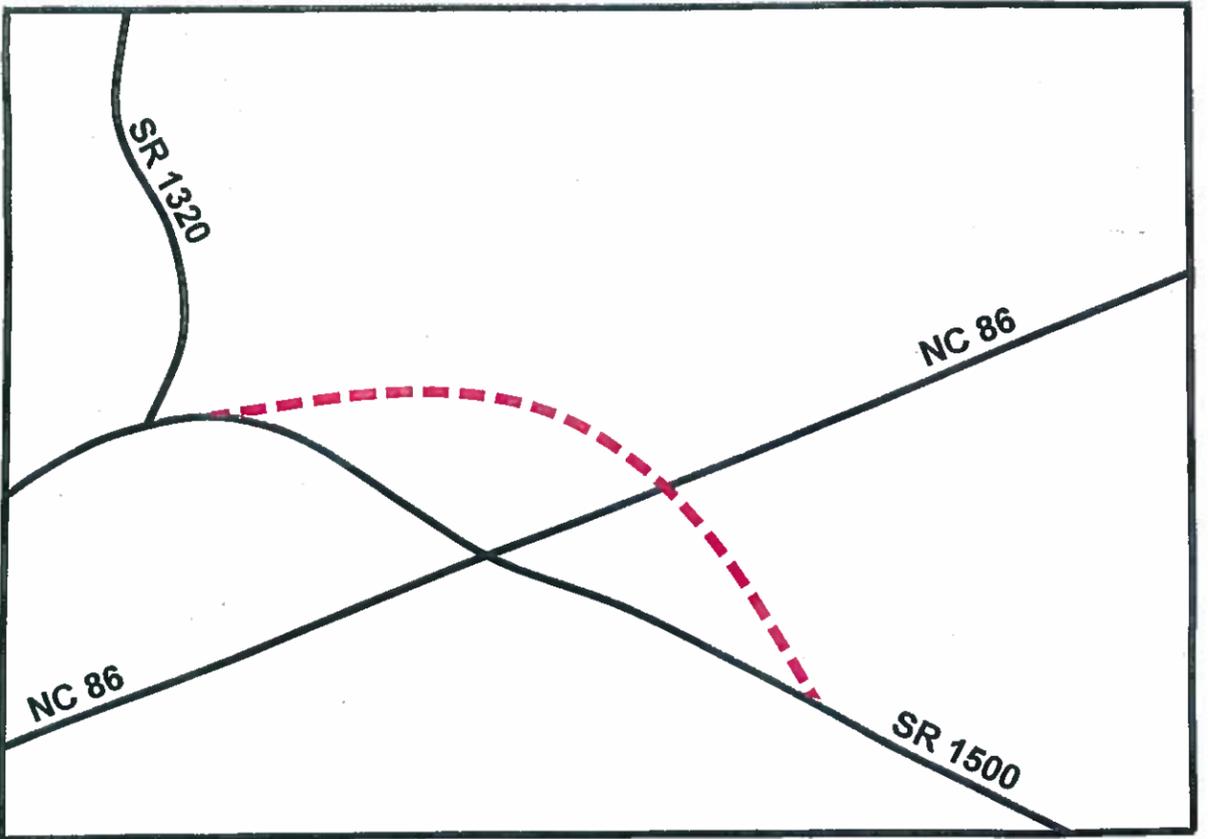
No provisions for bicycles have been included in this report.



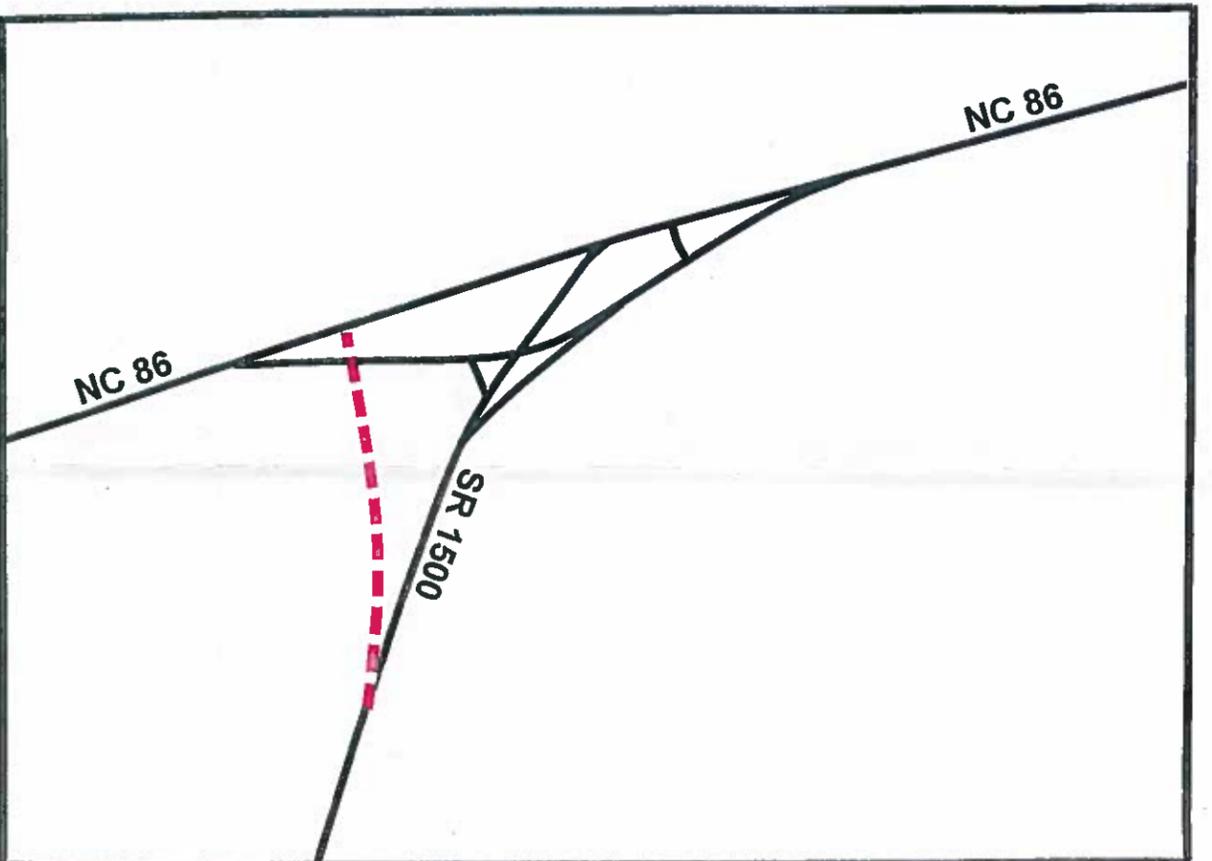
SCALE



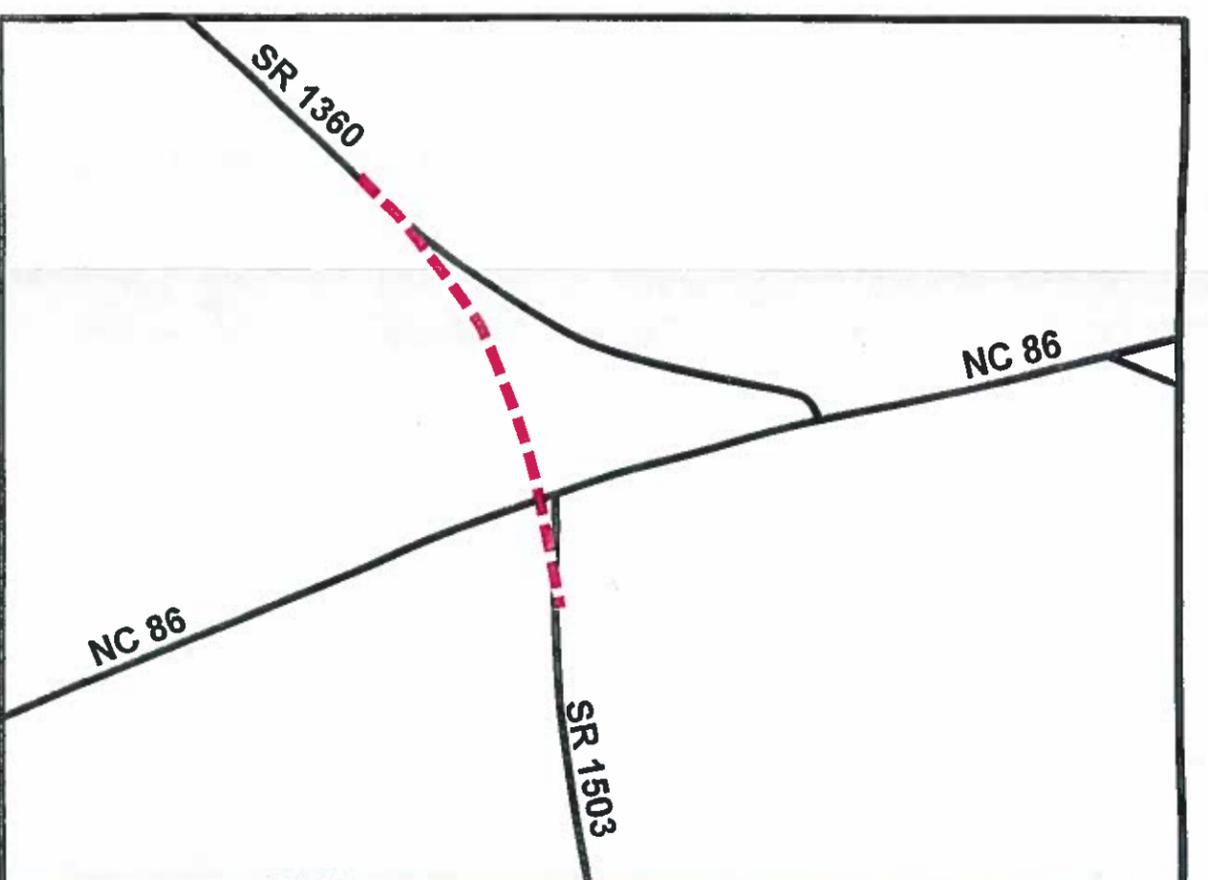
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 NC 86
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 FIGURE 1



INTERSECTION REALIGNMENT
NC 86 AT SR 1500 (SOUTH INTERSECTION)



INTERSECTION REALIGNMENT
NC 86 AT SR 1500 (NORTH INTERSECTION)



INTERSECTION REALIGNMENT
NC 86 AT SR 1503 AND SR 1360

NOTE: NOT TO SCALE



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NC 86 from US 158 to Virginia State Line Caswell County
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FIGURE 2

