

FEASIBILITY STUDY

Salisbury

Grade Separation at SR 2541 (Klumac Road)  
and North Carolina Railroad

Rowan County

U-3459

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



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Date

## FEASIBILITY STUDY

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#### I. GENERAL DESCRIPTION

This is a feasibility study for the construction of a grade separation to carry SR 2541 (Klumac Road) over the North Carolina Railroad in Salisbury (See Figure 1). The project improvements involve a 0.4 mile (0.6 km) long section of SR 2541 (Klumac Road) and SR 1816 (Fulton Street), between Virginia Street and Maupin Avenue. It is recommended that a five-lane, 64-foot (19.5-m) face-to-face, curb and gutter section with sidewalks on both sides be built on a retaining wall structure approximately 75 feet (22.9-m) wide. The estimated cost of the project is \$9,300,000 (\$1,500,000 for right-of-way and \$7,800,000 for construction).

#### II. NEED FOR PROJECT

Hobbs, Upchurch and Associates, a consultant, prepared "Traffic Study and Railroad Crossing Analysis for the City of Salisbury, N.C. and North Carolina Department of Transportation" in June 1994. They found that Salisbury had the highest concentration of at-grade railroad crossings along the North Carolina Railroad (17 crossings in a 3-mile stretch). The results of the study recommended closing eleven at-grade railroad crossings and constructing grade separations at three crossings. The crossing at SR 2541 (Klumac Road) was recommended for construction of a grade separation.

The North Carolina Railroad has two main-line tracks and one spur line crossing the project corridor. These tracks carry a total of 24 trains per day at an average speed of 79 mile per hour (127.4 kmh). The exposure index, a product of the design year traffic and the number of trains per day, is 225,600 at this location. This exposure index greatly exceeds the threshold of 30,000 that warrants a grade separation.

SR 2541 and SR 1816 are classified as collectors on the Statewide Functional Classification System, and major thoroughfares on the Salisbury Thoroughfare Plan. From Virginia Street to Old Main Street, SR 2541 (Klumac Road) is a two-lane, 24-foot (7.3-m) wide roadway with 4 to 8-foot

(1.2 to 2.4-m) wide shoulders, including 1-foot (0.3-m) wide paved shoulders. From Old Main Street to Main Street, SR 2541 varies from a 28 to 34-foot (8.5 to 10.4-m) face-to-face, curb and gutter section. SR 1816 (Fulton Street) is a three-lane, 39-foot (11.9-m) face-to-face, curb and gutter section, from Main Street to approximately 200 feet (61.0 m) west of Main Street. Land use along the study corridor is industrial and commercial.

The Office of Bicycle and Pedestrian Transportation and the City of Salisbury have requested that sidewalks be provided along the studied project.

A water tower is located on the north side of SR 1861, approximately 0.1 mile (0.2 km) west of Main Street. It is anticipated that there will be no impacts to this tower.

Estimated 1995 average daily traffic (ADT) on SR 2541 is 6,400 vehicles per day (vpd). In the design year 2015, the traffic volume is expected to be 9,400 vpd. The existing SR 2541 is operating at a level of service (LOS) C, and is anticipated to operate at a LOS D in the design year 2015. With the recommended roadway widening, the traffic volumes along SR 2541 would operate at a LOS A through the design year.

During the period from May, 1992, through April, 1995, there were 15 accidents reported along the studied section of SR 2541. This resulted in an accident rate of 840.33 accidents per 100 million vehicle miles (acc/100mvm) compared to a statewide average of 317.3 acc/100mvm for this type of facility. No accidents involving trains were reported. No fatalities were reported. The recommended improvements are expected to reduce the accident rate.

### **III. ALTERNATES STUDIED**

Three alternates were evaluated during this study. A 120-foot (36.6-m) wide right-of-way with partial control of access was recommended for each alternate. Alternate A consisted of a three-lane, 40-foot (12.2-m) face-to-face, curb and gutter roadway section with sidewalks on both sides on a retaining wall structure approximately 51 feet (15.5 m) wide. Alternate B consisted of a five-lane, 64-foot (19.5-m) face-to-face, curb and gutter roadway section with sidewalks on both sides on a retaining wall structure approximately 75 feet (22.9 m) wide. Alternate C consisted of a phased three-lane, 40-foot (12.2-m) face-to-face, curb and gutter roadway section with sidewalks on both sides placed asymmetrically on a retaining wall structure approximately 75 feet (22.9 m) wide. Although each roadway section (three-lane and five-lane) would operate at an acceptable level of service (LOS) through the design year 2015, Alternates A and C were rejected. If Alternate A were implemented, at least one of the retaining walls would have to be reconstructed for the road to be widened

in the future. The cost of constructing the walls is approximately 50% of the total construction cost. Also, traffic would have to be rerouted to other grade-separations, impairing traffic operations throughout the city. Alternate C was rejected because there was no significant difference in the cost of the three-lane and five-lane roadway section.

#### Estimated Project Costs

	Alternate A	Alternate B	Alternate C
Right-of-Way	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000
Construction	\$ 7,000,000	\$ 7,800,000	\$ 7,600,000
Total	\$ 8,500,000	\$ 9,300,000	\$ 9,100,000

#### IV. RECOMMENDATIONS

Alternate B is recommended for the construction of the grade separation over North Carolina Railroad at SR 2541. Alternate B is a five-lane, 64-foot (19.5-m) face-to-face, curb and gutter roadway section with sidewalks on both sides, on a retaining wall structure approximately 75 feet (22.9 m) wide. Carolina Street and Old Main Street would become cul-de-sacs. The grade at the intersection of Klumac Street and Main Street would be raised. The structure will be approximately 1400 feet (426.8 m) in length. The five-lane typical section would end at the intersection of Klumac Road, Fulton Street, and Main Street. The three-lane typical would be reconstructed on Fulton Street. The five-lane section would taper down to the existing two-lane section at Virginia Street.

Moderate utility conflicts are expected.

Total project cost is estimated as follows:

Right-of-way	\$ 1,500,000
Construction	\$ 7,800,000
Total	\$ 9,300,000

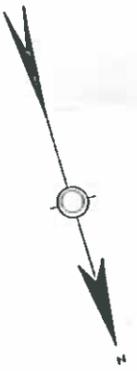
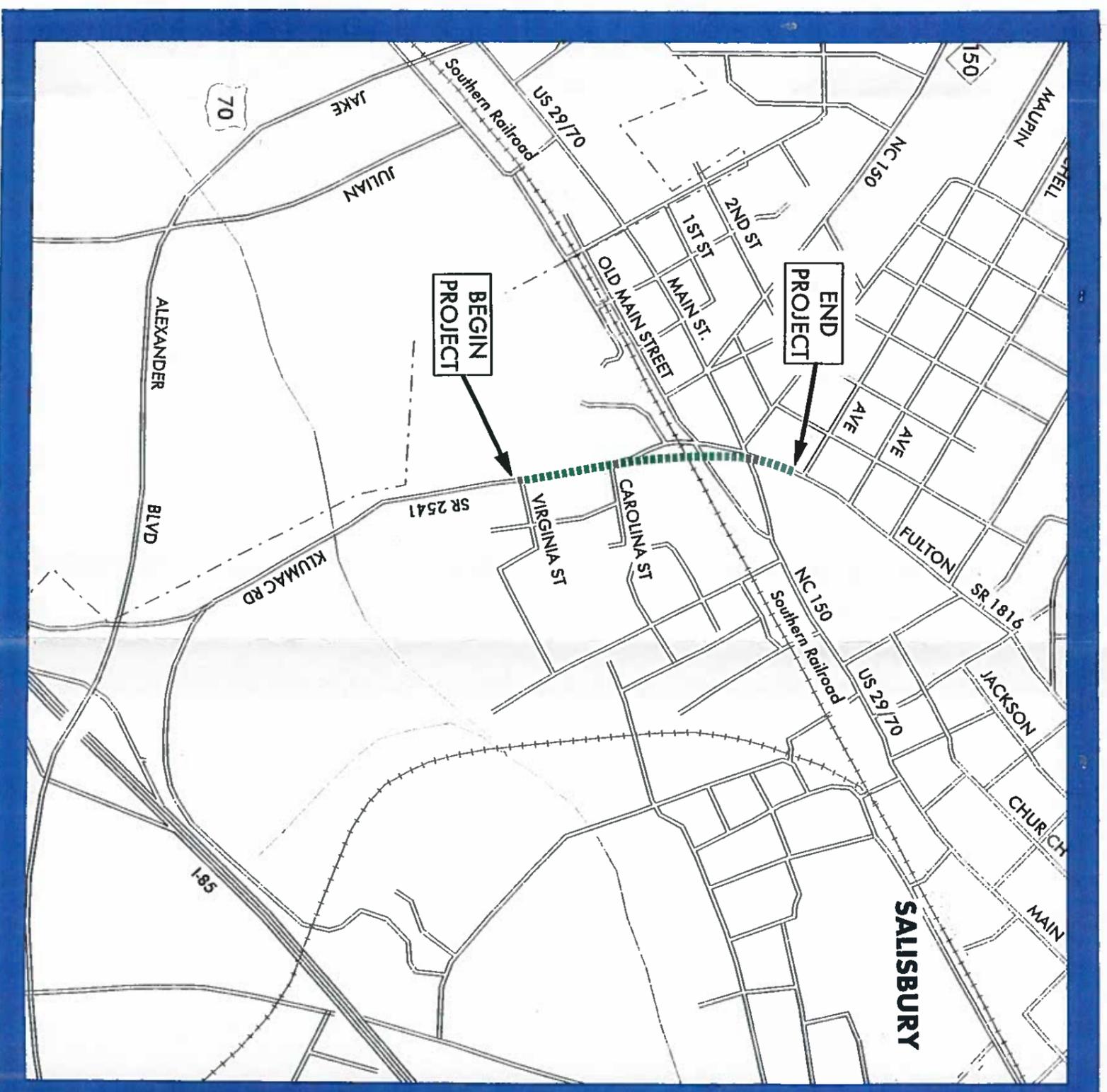
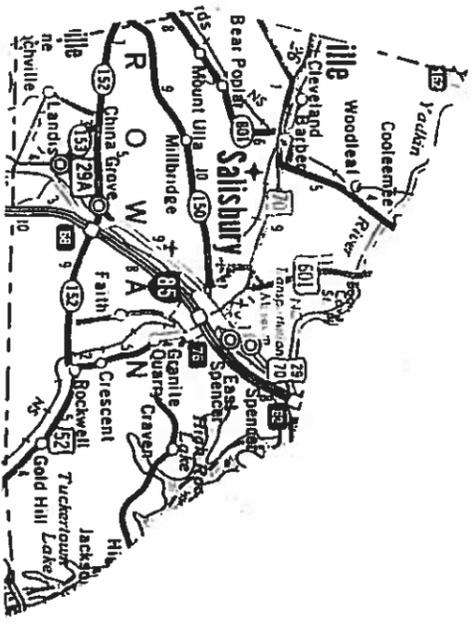
#### V. OTHER COMMENTS AND CONCERNS

It is estimated that this project would require the relocation of six residences and five businesses.

This study is not a detailed planning/environmental investigation. A feasibility study presents studied typical sections for improvements, general corridors of improvements, and estimated costs of construction and right-of-way. This study attempts to identify any potential environmental, permitting, or other

observed issues that deserve consideration in the planning and construction stages.

No historical or architecturally significant sites are known to be impacted.



North Carolina Department of Transportation  
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**U-3459**  
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 Grade Separation at  
 SR 2541 (Klumac Road) and Southern Railroad  
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 DIV. 9 **FIGURE 1**