

FEASIBILITY STUDY

Henderson

Proposed Interchange Improvements  
I-85 and SR 1128 (Ruin Creek Road)

Vance County

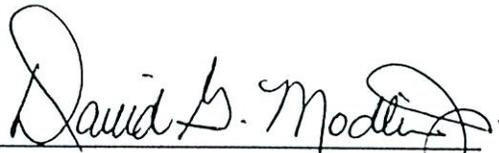
Division 5

I-3807

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



Kim L. So  
Highway Planning Engineer



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

2/26/98

Date

# FEASIBILITY STUDY

Henderson

## Proposed Interchange Improvements I-85 and SR 1128 (Ruin Creek Road)

Vance County

I-3807

### I. GENERAL DESCRIPTION

This feasibility study investigates the improvements to the existing diamond interchange at I-85 and SR 1128 (see Figure 1). Future traffic projections indicate that the traffic volumes at this interchange will increase significantly with the **completion** of the proposed Western Outer Loop, identified in the TIP as U-2527, which connects to SR 1128 (Ruin Creek Road) near the interchange. The studied improvements for the I-85/SR 1128 interchange area consist of widening Bridge Number 29 and all the ramps.

Improved Bridge Number 29 would have a clear deck width of 76 feet (23.2 m) with two 12-foot (3.7-m) wide through lanes in each direction and two 12-foot (3.7-m) wide center turn-lanes. There would be a 5-foot (1.5-m) wide sidewalk on both sides.

The two exit ramp terminals at Ruin Creek Road would be widened to accommodate an additional right-turn lane. The resulting cross section would have two 12-foot (3.7-m) wide right-turn lanes and one 12-foot (3.7-m) wide left-turn lane with 12-foot (3.7-m) inside shoulders and 14-foot (4.3-m) outside shoulders, 4 feet (1.2 m) of the shoulders would be paved. Both ramp terminals at Ruin Creek Road would be signalized.

The entrance ramps would be widened for two-lane operation; the travel lanes would be 27 feet (8.2 m) wide with 12-foot (3.7-m) inside shoulders and 14-foot (4.3-m) outside shoulders, 4 feet (1.2 m) of the shoulders would be paved.

It is anticipated the improvements to the interchange would be contained within the existing right-of-way. The estimated construction cost for improving the interchange is \$4,100,000.

This study is not a detailed planning/environmental investigation. A feasibility study presents studied cross-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.

## II. NEED FOR PROJECT

The interchange at I-85 and SR 1128 (Ruin Creek Road) is a standard diamond interchange. Bridge Number 29, a 2-lane bridge with a roadway width of 34 feet (10.4 m), carries Ruin Creek Road over I-85. Existing I-85 is a 4-lane median-divided, controlled access facility. Existing Ruin Creek Road is generally a 2-lane shoulder section.

I-85 is classified as an Interstate and Ruin Creek Road is classified as an urban collector on the North Carolina State Functional Classification System. On the Henderson Thoroughfare Plan, I-85 is classified a freeway and Ruin Creek Road is classified as major thoroughfare.

The existing land use in the project vicinity is commercial. A shopping center and a hospital are located just north of the interchange. South of the interchange, there are some restaurants and a hotel.

The proposed Western Outer Loop, identified in the 1998-2004 TIP as U-2527, connects to Ruin Creek Road just south of the interchange (see Figure 1). The Western Outer Loop is a proposed 2-lane roadway on multi-lane right-of-way. This Loop will cause a significant increase in the traffic volumes at this interchange.

Estimated 1997 Average Daily Traffic (ADT) on Ruin Creek Road in the vicinity of the interchange was 4,500 vehicles per day (vpd). The estimated traffic volumes for the design year 2020 is 28,000 vpd. Truck traffic is estimated to make up 12% of the daily traffic. Currently Ruin Creek Road in the project vicinity is operating at Level of Service (LOS) C and would operate at LOS F in the design year 2020.

There were 27 accidents reported between March, 1994, and February, 1997, in the vicinity of this interchange. The accident rate is 1,179 accidents per 100 million vehicle miles of travel. The most prevalent accident type was Rear-end Slow or Stop. Recommended improvements are expected to reduce the number of accidents.

## III. RECOMMENDATIONS

It is proposed to improve the existing diamond interchange at I-85 and SR 1128 (Ruin Creek Road) in Vance County. The studied improvements would consist of widening Bridge Number 29 and the ramps.

The widened bridge would have a deck width of 76 feet (23.2 m) with two 12-foot (3.7-m) wide travel lanes in each direction and two 12-foot (3.7-m) wide center turn-lanes. There would be a 5-foot (1.5-m) wide sidewalk on both sides.

The two exit ramp terminals at Ruin Creek Road would be widened to accommodate an additional right-turn lane. The resulting cross section would have two 12-foot (3.7-m) wide right-turn lanes and one 12-foot (3.7-m) wide left-turn lane with 12-foot (3.7-m) inside shoulders and 14-foot (4.3-m) outside shoulders, 4 feet (1.2 m) of the shoulders would be paved. The intersections at these terminals would be signalized. In the design year 2020, the intersections at these terminals would operate at LOS between C and D.

Both entrance ramps would be widened for two-lane operation; the travel lanes would be 27 feet (8.2 m) wide with 4-foot (1.2-m) wide left paved shoulders and 6-foot (1.8-m) wide right paved shoulders.

In order to avoid a bottleneck situation on Ruin Creek Road near the interchange, it is recommended that the improvements be extended beyond the interchange in both directions. The studied improvements on Ruin Creek Road in the vicinity of the interchange are described in following three segments (refer to Figure 1):

**Segment A.** Beginning at the ramp terminals south of the bridge, taper the pavement from 6 lanes, 76-foot (23.2-m) wide face-to-face, to 5 lane , 64-foot (19.5-m) wide face-to-face at SR 1218 (Graham Avenue). At the Graham Avenue intersection, there would be two 12-foot (3.7-m) wide through lanes in each direction and a 12-foot (3.7-m) wide center turn lane. The cost for improving this 550-foot (167.8-m) segment is \$270,000 ( \$20,000 for right-of-way, and \$250,000 for construction).

**Segment B.** Beginning at the ramp terminals north of the bridge, taper the pavement from 6-lane, 76-foot (23.2-m) wide face-to-face, to 5-lane, 64-foot (19.5-m) wide face-to-face at N. Cooper Drive. At the N. Cooper Drive intersection, there would be two 12-foot (3.7-m) wide through lanes in each direction and a 12-foot (3.7-m) wide center turn lane. The cost for improving this 650-foot (198.3-m) segment is \$390,000 (\$110,00 for right-of-way, and \$280,000 for construction).

**Segment C.** Based on estimated traffic volumes of 27,500 vpd in the design year 2020, Ruin Creek Road from N. Cooper Drive to US 158, a distance of approximately 0.5 miles (0.8 km), would need to be widened to multilanes. The recommended typical section is a 5-lane, 64-foot (19.5-m) wide face-to-face curb and gutter section with 10-foot (3.1-m) berms. There would be two 12-foot (3.7-m) wide through lanes in each direction and a 12-foot (3.7-m) wide center turn-lane. Even with the studied 5-lane section, the facility will operate at LOS E in the design year. The estimated costs for improving this section of roadway is \$1,520,000 ( \$370,00 for right-of-way, and \$1,150,000 for construction).

The estimated project costs are summarized as follows:

	Interchange Improvements	Ruin Creek Road Improvements		
		Segment A	Segment B	Segment C
Right-of-way	None	\$ 20,000	\$ 110,000	\$ 370,000
Construction	\$ 4,100,000	\$ 250,000	\$ 280,000	\$ 1,150,000
Total Costs	\$ 4,100,000	\$ 270,000	\$ 390,000	\$ 1,520,000

It is recommended that the improvements to Segments A and B be included in this project. Segment C may be improved under a separate project.

It is not anticipated that this project would require any residential or business relocations.

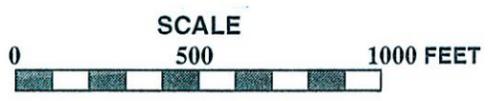
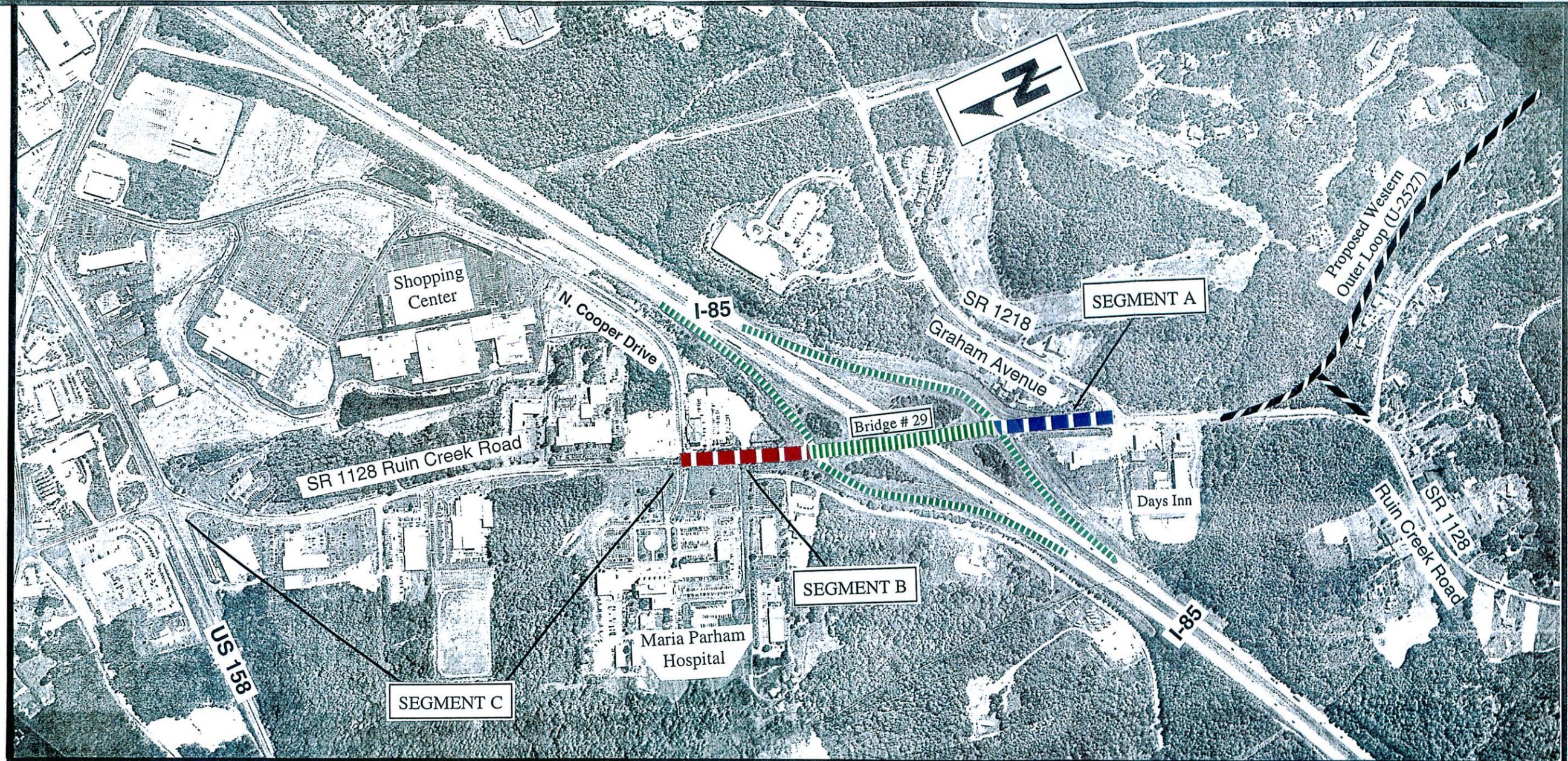
Medium utility conflicts are expected.

#### IV. OTHER COMMENTS AND CONCERNS

No historical or architecturally significant sites have been identified in the project corridor. It is not anticipated that this project will require any environmental permits.

Based on maps at the Department of Environment, Health & Natural Resources - Natural Heritage Section, no threatened or endangered species were identified in the project corridor.

No recommendation for bicycle accommodations was received from the NCDOT Office of Bicycle and Pedestrian Transportation.



NC DEPARTMENT OF TRANSPORTATION  
 FEASIBILITY STUDIES UNIT

**I-3807**

Interchange Improvements at  
 I-85 and SR 1128 (Ruin Creek Road)

Vance County

Division 5 Figure 1