FEASIBILITY STUDY

Eden

NC 14-87
From NC 700-770 (Meadow Road) in Eden
To the Virginia State Line

Rockingham County

Division 7

FS-9907C

Prepared by the
Programming and TIP Branch
Division of Highways
N. C. Department of Transportation

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2/14/2000
Date

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I. General Description

This feasibility study describes the recommended improvements to NC 14-87 in Rockingham County. It is recommended that NC 14-87 be widened from NC 700-770 (Meadow Road), in Eden, to the Virginia State Line. The recommended cross-section is a five-lane shoulder section with two 12-foot (3.6-m) travel lanes in each direction, a 12-foot (3.6 m) wide two-way-left-turn-lane, and 10-foot (3.0-m) wide shoulders of which 4-foot (1.2-m) is paved. The project location is shown in Figure 1.

Along with the proposed widening, this project also includes the following improvements:

1. Replace Bridge # 108 at the NC 700-770 interchange and convert the existing interchange into a diamond interchange.
2. Replace Bridge # 176 at the SR 1700 interchange and convert the existing interchange into a diamond interchange.
3. Relocate a segment of Virginia Street - Roosevelt Street from approximately 0.3 miles (0.5 km) south of SR 1714 (Aiken Road) to SR 1714.
4. Replace Bridge # 155 over the Carolina and Northwestern Railroad.
5. Replace Bridge # 168 over the Smith River.

A combination of symmetrical and asymmetrical widening should be utilized to improve the horizontal curvature of this facility. It is anticipated that the existing 150-foot (45.7-m) of right-of-way is sufficient to accommodate the proposed widening, but some additional right-of-way will be required for the utility adjustments and interchange modifications. It is estimated that there will be 12 residences and 1 business relocated due to this project. The total cost of the project, including construction and right-of-way, is estimated to be $25,900,000.00.

Construction	$ 23,900,000
Right-of-way	$ 1,900,000
Total Cost	$ 25,800,000

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 proposed project including costs, and to identify potential problems that may require consideration in the planning and design phases.

II. Need for Project

The purpose of this project is to improve the traffic carrying capacity of NC 14-87 from Eden to the Virginia State Line. This project was requested by the Rockingham County Economic Development Commission.

This segment of NC 14-87 is designated a principal arterial on the North Carolina Statewide Functional Classification System. It is designated a major thoroughfare on the City of Eden Thoroughfare Plan.

Between NC 700-770 to SR 1700, the development along NC 14-87 is primarily residential along both sides of the roadway with concentrations of commercial development around the intersections. North of SR 1700, NC 14-87 is generally undeveloped farmlands and woodlands intermixed with some residences. There is a public park located on the west side of the roadway immediately north of the Smith River.

NC 14-87 is currently a 2-lane rural shoulder section with 12-foot (3.6-m) wide travel lanes, 4-foot (1.2-m) wide paved shoulders, and 4-foot (1.2-m) wide soil shoulders.

There are four existing structures and two interchanges located along the studied segment of NC 14-87. The structures and interchanges are described as follows:

1. Bridge # 108 carries NC 700-770 over NC 14-87 and is an integral part of an interchange at this location. The interchange is a non-typical partial clover interchange with ramps in the southeast, northeast, and northwest quadrants. The bridge was built in 1957, is 159 feet (48.5 m) long and has a clear roadway width of 68.4 feet (20.8 m) under the bridge. It has a sufficiency rating of 48.6 out of 100 possible points.
2. Bridge # 155 is located approximately 0.4 mile (0.6 km) north of NC 700-770 and carries NC 14-87 over the Carolina and Northwestern Railroad. The bridge was built in 1966, is 149 feet (45.4 m) long, and has a clear deck width of 36 feet (11 m). It has a sufficiency ration of 81.7 out of 100 possible points.
3. Bridge # 168 carries NC 14-87 over the Smith River. It was built in 1966, is 525 feet (160.0 m) long, has a clear deck width of 34.2 feet (10.4 m), and has a sufficiency rating of 84.3 out of 100 possible points.

4. Bridge # 176 carries SR 1700 over NC 14-87 and is an integral part of an interchange at this location. The interchange is a one quad ramp interchange with a two-way ramp in the northeast quadrant. The bridge was built in 1966, is 137 feet (41.8 m) long, has a clear roadway width of 44.7 feet (13.6 m) under the bridge, and has a sufficiency rating of 73.3 out of 100 possible points.

In addition to the interchanges noted in items 1 and 4 above, there are also two at-grade intersections along the project route. The SR 1714 (Aiken Road) intersection is at grade and is controlled by a traffic signal. The Old NC 87 intersection is at grade and is stop sign controlled and traffic is channeled by way of raised islands.

The current year Average Daily Traffic (ADT), within the project limits, was estimated to range from approximately 12,300 vehicles per day (vpd) near NC 700-770 to approximately 9,500 vpd near the Virginia state line. The design year (2020) estimates are 21,600 vpd and 15,800 vpd respectively.

The current estimated Level of Service is Level E and it is anticipated that without improvements, this level will remain constant to the design year. With the recommended improvements, the Level of Service should improve to Level A, which should prevail through the design year.

During the period from October 1, 1995, through September 30, 1998, there were 88 accidents reported on NC 14 within the project terminals. This resulted in an accident rate of 169 accidents per 100 million vehicle miles (Acc/100MVM), compared to a statewide average of 221Acc/100 MVM for all rural NC routes during the period from 1995 through 1997. There was one fatality reported during the period, and 34 of the accidents resulted in non-fatal injuries. The most prevalent accident type was "rear end (32%)". The wider cross section with center turn lane will reduce the potential for these types of accidents.

III. Recommendations

It is recommended that NC 14-87 be widened from NC 700-770 (Meadow Road), in Eden, to the Virginia State Line. The recommended cross-section is a five-lane shoulder section with two 12-foot (3.6-m) travel lanes in each direction, a 12-foot (3.6-m) wide two-way-left-turn-lane, 4-foot (1.2-m) wide paved shoulders, and 6-foot (1.8-m) wide soil shoulders. The project location is shown in Figure 1.

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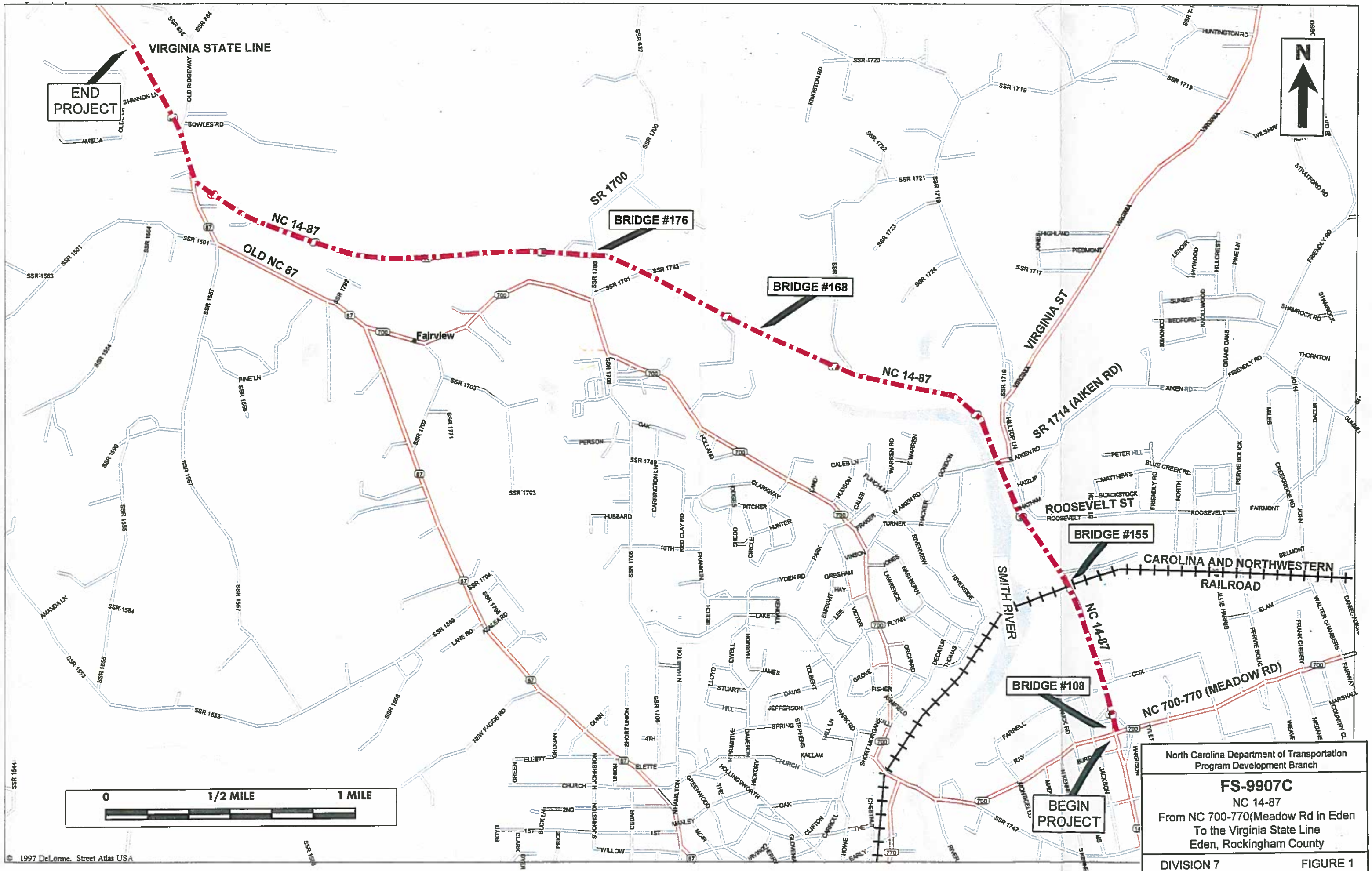
IV. Additional Comments

An environmental screening was not conducted for this study.

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

Due to the potential for construction in the area of the Smith River, wetland permits and mitigation may be required. The estimates included in this study do not include any costs for wetland mitigation.

A transportation benefit analysis was also completed for this project. For the period between the current year and the 2020 design year, it is estimated that the total transportation benefits for the project are $37,800,000, which is an average of $1,890,000.00 per year. The total benefits include accident cost savings, time cost savings, and operating cost savings.



North Carolina Department of Transportation
Program Development Branch

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DIVISION 7 FIGURE 1