

FEASIBILITY STUDY

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NC 127, from SR 1400 (Cloninger Road) in
Catawba County to NC 90 in Alexander County
R-2412

Prepared by
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I. DESCRIPTION

This report covers a preliminary study of the proposed upgrading of NC 127 in Alexander and Catawba Counties. As shown in Figure 1, this study extends from SR 1400 (Cloninger Road) in Hickory northward across the Catawba River and Alexander County to NC 90. The total project length is approximately 10.5 miles, and it is included in the 1988-1996 Transportation Improvement Program (T.I.P.) for feasibility study and/or right-of-way protection. It is not currently funded.

II. PURPOSE OF PROJECT

Existing Route Characteristics

NC 127 appears on the Hickory-Newton-Conover Urban Area Thoroughfare Plan (mutually adopted in 1986) as a major thoroughfare. It is one of the major Catawba River crossings in northern Hickory and serves major new residential development north of town. Outside the thoroughfare planning area, NC 127 is designated as a major rural collector in the County Functional Classification Plan.

The studied section of road was constructed in the late 1920's and has a basic pavement width of 20-feet, with a 2-mile section of 24-foot pavement in the Catawba River area. Shoulder widths vary from 4 to 6 feet.

The adjoining section of NC 127 to the south is proposed to be upgraded to a 5-lane, 64-foot curb and gutter section. This is covered by the T.I.P. project U-72 and is scheduled for construction in 1990.

Horizontal alignment throughout the project is fair for the most part. For about two miles south of NC 90, the alignment is poor due to rugged terrain. There are numerous curves, with 16 ranging from the 6° maximum limit for safe travel at 55 mph to 39° (20 mph). The vertical alignment is rolling with maximum grades up to 6%. The combination of curving and rolling alignments makes safe passing difficult.

Three bridges are located on the studied route. They are listed as follows with pertinent information:

<u>Bridge No.</u>	<u>Location</u>	<u>Length (Ft.)</u>	<u>Width (Ft.)</u>	<u>Age (Yrs.)</u>	<u>Rating (New Bridge=100)</u>
1	Middle Little River	160	26	41	74.3
5	Duck Creek	72	26	41	75.9
91	Catawba River	941	34	21	79.0

The existing facility traverses rolling terrain except for mountainous terrain along approximately two miles of NC 127 adjacent to NC 90. Except for the Hickory/Catawba County area, the adjacent land use is a mixture of residences, woodlands, pastures and light commercial development. Within Hickory, roadside development is much denser, requiring a speed limit of 35 mph on NC 127. Speed limits on NC 127 outside of the Hickory area are 45 and 55 MPH.

Traffic Volumes, Capacity, and Accident Record

As shown on Figure 1, current traffic volumes on NC 127 range from a low of 2,200 vehicles per day (vpd) near NC 90, to 4000 vpd north of Bethlehem, to 7100 vpd south of Bethlehem, and to a high of 13,400 vpd south of the Catawba River bridge. By the year 2010, it is estimated that these volumes will reach 6000, 10,000, 19,400, and 33,000 vehicles per day, respectively.

The existing predominantly 20-foot pavement on rolling terrain can carry approximately 4,200 vpd at a desirable level of service C. The 24-foot pavement in Catawba County can likewise carry approximately 5,000 vpd.

Accident data for the past 3 years reveals a total of 143 accidents. This yields an accident rate of 436 accidents per hundred million vehicle miles. This is well above the state average of 214 accidents per hundred million vehicle miles for similar rural, two-lane, NC routes. The predominant accident types were rear-end (26.6%), angle (18.2%), ran off road (16.1%), and left-turn (16.1%) conflicts.

Need for Project

The existing route has capacity deficiencies along the southern half presently, and by the year 2010 will be seriously over capacity along its entire length. The existing alignment also has undesirable features that severely limit passing opportunities, and adversely affect travel comfort and safety. Roadway and alignment upgrades are needed to accommodate the future capacity demands and bring the route up to modern standards.

III. RECOMMENDATIONS AND COSTS

The recommended upgrades to NC 127 stretch from SR 1400 (Cloninger Road) in Catawba County northward to NC 90 in Alexander County. The improvements are divided into two segments: (1) Segment A from SR 1400 to SR 1156 in Bethlehem; and (2) Segment B from SR 1156 in Bethlehem to NC 90.

The breakpoint at Bethlehem was determined to be optimal due to traffic and developmental concerns. As may be seen from existing and projected volumes, traffic on NC 127 drops significantly at SR 1156. This difference suggests a downgrading of the cross sectional width of the roadway above this point.

The land north of the Catawba River near NC 127 is developing rapidly as a major residential area serving the town of Hickory. This development is expected to reach the area along SR 1156 during the

planning period. There is presently a project to extend city water service to this region north of Hickory. This potential growth suggests a multi-lane facility would be appropriate for the southern project segment, and discussions with local planners defined Bethlehem as a suitable breakpoint.

Segment A is 3.5 miles in length. It is recommended improvements consist of symmetrical widening to a 5-lane curb and gutter section with a face-to-face of curb width of 64-feet. Additional right-of-way will be required to accommodate the recommended section. For cost estimate purposes, a total right-of-way width of 125 feet was used.

The use of a 5-lane curb and gutter section on Segment A will necessitate lowering of the existing 55 mph speed limit on this section to 45 mph. This reduction is to conform with the Federal Highway Administration's policy of allowing curb and gutter only on facilities with a 45 mph or lower speed limit for safety concerns. As this area is becoming increasingly urbanized, it is anticipated that a lower speed limit along the southern section of this project would be imposed soon regardless of this project's implementation.

Segment B is 7.0 miles in length. Recommended cross section for this segment is an improved 2-lane pavement, 24 feet in width, with 2-foot paved shoulders and 4-foot soil shoulders. Symmetrical widening is recommended with sufficient right-of-way width to accommodate an ultimate 5-lane section in the future. The estimated right of way width used for cost estimate purposes is also 125 feet.

In three locations on Segment A and 13 locations on Segment B there are adverse curves that are proposed to be realigned. These curve realignments are shown on an aerial photograph on file in the Planning and Research Branch. No major grade changes are anticipated throughout the project.

Existing bridges on the project are anticipated to be replaced with new and wider structures, except for the bridge over Catawba River. Because of its age and length, this bridge should be retained and rehabilitated as necessary, and a new parallel structure be constructed to provide the additional lanes.

The total estimated cost of the recommended improvements is \$23,900,000, including \$17,700,000 for roadway construction and \$6,200,000 for right-of-way. Cost estimates were prepared by the Preliminary Estimate Engineer and the Right-of-Way Branch.

IV. ALTERNATIVES

A studied alternative to the recommended upgrades is the use of a 5-lane shoulder cross section for Segment A described above. This would allow for a 55 mph speed limit throughout the project.

This alternative is not recommended, however, due to the additional right-of-way width required to accommodate such a section. This would result in the complete disruption of existing development along

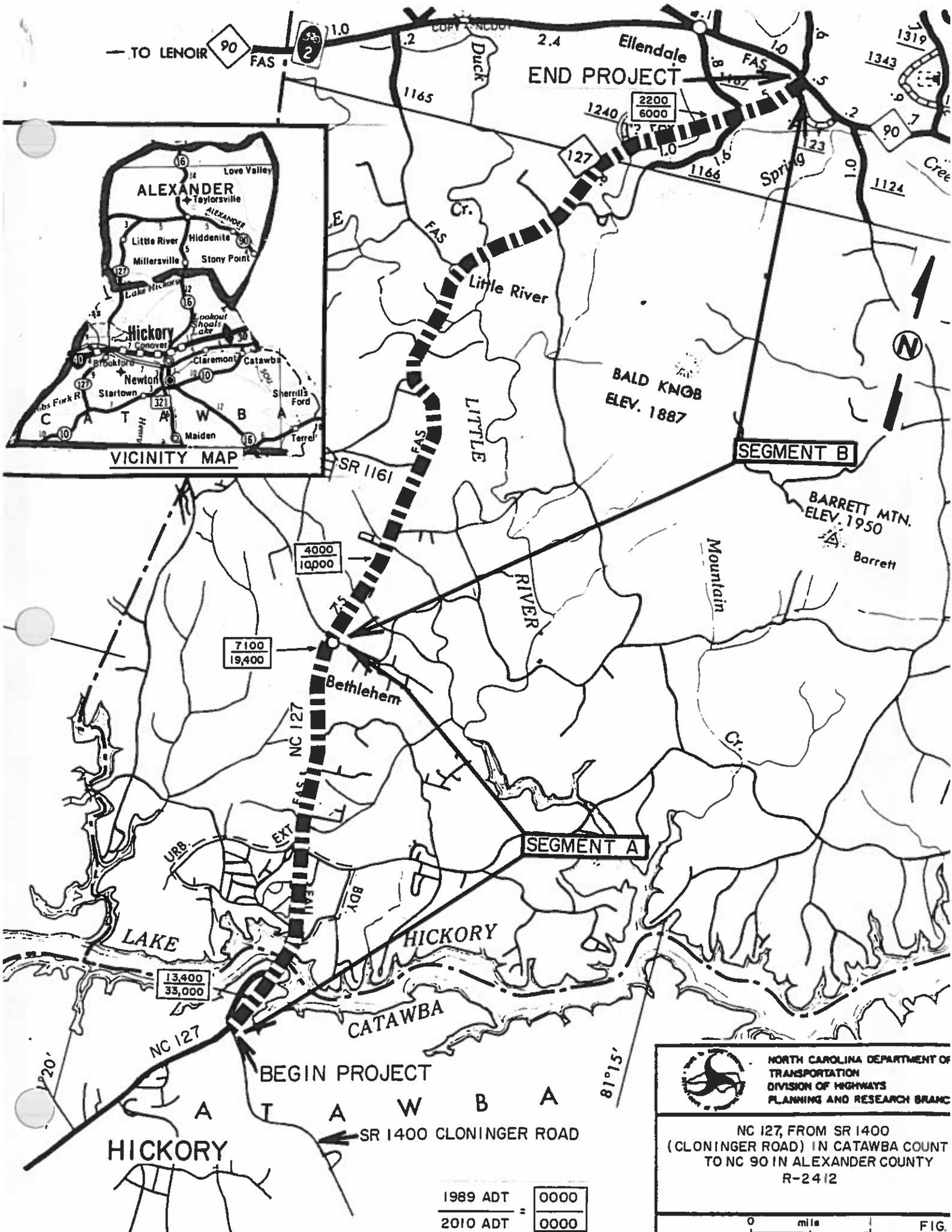
NC 127. The corresponding cost for right-of-way acquisition would be prohibitive.

V. OTHER COMMENTS

Negative environmental impacts of the project are: (1) loss of some farmland and woodland; (2) loss of some wetlands at stream crossings; and (3) relocation of approximately 46 residences and 8 businesses.

If this project is to be implemented at a future date, all feasible alternatives and their associated impacts will have to be evaluated in a planning and environmental document prior to that time, and a final decision made as to the most appropriate improvement.

MH/sdt



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND RESEARCH BRANCH

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