

FEASIBILITY STUDY

US 321, Caldwell County
From NC 268 to Blowing Rock
R-2237

Prepared by
Planning and Research Branch
Division of Highways
N. C. Department of Transportation

August, 1987

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I. DESCRIPTION

This report covers a preliminary study of the proposed widening of the subject highway to a multi-lane facility for a distance of approximately 13.8 miles (see Figure 1). This project is included in the 1987-1995 Transportation Program for feasibility study and/or right of way protection. It is not currently funded.

II. PURPOSE OF PROJECT

Existing Route

US 321 is designated as a principal arterial in the statewide highway network.

From the end of the existing four-lane divided roadway at NC 268 northward for approximately 7.5 miles to the first passing section, the existing road has a 20-foot pavement with narrow shoulders constructed generally on fair alignment. Surrounding terrain conditions vary from rolling to moderate mountainous.

On the remaining 6.3-mile section to US 321 Bypass in Blowing Rock, the pavement generally widens to 24 feet, striped as 22-foot travelway and 1-foot paved shoulder on each side. Within this segment of road are three isolated, four-lane passing sections. Each passing section has 48-foot pavement with 2-foot paved shoulders and 6-foot soil shoulders and is generally one-half mile in length. Due to rugged mountainous terrain, the existing road has extremely poor alignment. There are numerous sharp curves ranging up to 30 degrees (25 mph safe speed) and grades ranging up to 8 percent. From SR 1370 northward to Blowing Rock, the road is on a continuous upgrade with an average overall gradient of approximately 5 percent. Except for the passing sections, few locations along the entire project length are adequate for safe passing.

Roadside development is generally light to medium density residential with some commercial. In Blowing Rock, adjacent property is nearly fully developed with residences and other land uses including a golf course and resort inn. Speed limit is 55 MPH outside and 35 MPH inside Blowing Rock. Existing right of way is approximately 100 feet, except in Blowing Rock where the right of way width is approximately 30 feet.

Traffic Volumes, Capacity, and Accident Record

Current traffic volumes range from 4400 vehicles per day near SR 1379 to 5300 vpd at US 321 Bypass in Blowing Rock. Estimated traffic volumes in 20 years are 7000 and 8500 vpd, respectively. Approximately 8 percent of the traffic volumes are made up of heavy trucks.

Capacity of the two-lane road at level of service C varies from approximately 1500 vpd in areas of severe alignment to 3500 vpd in areas of good alignment. Thus, capacity is not sufficient to adequately accommodate the present traffic volumes along the entire studied section of US 321. In addition to the capacity problem, delay and congestion are encountered when heavy trucks use the road where steep grades severely reduce truck speed.

Accident records for a recent four-year period showed that approximately 280 accidents occurred on the 14-mile section of road. This produces an accident rate of 3.36 accidents per million vehicle miles, which is higher than the 1985 statewide average of 2.02 acc/mvm for two-lane US routes. Over half of the accidents involved ran off road type accidents. Most of the accidents occurred in the section where the existing pavement is 20 feet wide.

Need for Project

Purpose of the project is to provide additional lanes that would correct the capacity and safety deficiencies. The existing two-lane road is carrying more traffic than it can adequately and safely accommodate at an acceptable level of service.

III. RECOMMENDATIONS AND COSTS

Improvement of the subject road is justified on the basis of inadequate capacity and safety problems. Widening to a multi-lane facility is warranted immediately.

Recommended cross sections are as follows:

(a) NC 268 to vicinity of SR 1370 (4.5± miles of construction): Four-lane divided section (2 @ 24-foot pavement with 40-foot median and adequate shoulders, including 2-foot paved). This cross section is recommended to provide a continuation of an existing four-lane divided roadway in keeping with the desired function of the route. Moderate terrain conditions in this area would allow construction of this type section at reasonable costs. Exact location for placement of the additional lanes cannot be determined at this time but would likely shift from one side to the other side to minimize property damage and environmental impacts. Approximate right of way width used for cost estimate purposes is 240 feet with easements, offset 150 and 90 feet from the existing road centerline.

(b) Vicinity of SR 1370 to Blowing Rock Corporate Limits (6.8± miles of construction): Four-lane undivided shoulder section (48-foot pavement with 2-foot paved shoulders and minimum soil shoulders). This cross section is recommended to minimize high cost of construction through extremely heavy mountainous terrain and to be compatible with existing 4-lane passing sections. Widening would be unsymmetrical for the most part. The amount of right of way needed is not possible to estimate without detailed plans due to the steep cuts and fills required. The right of way estimate

obtained for this section of road is based on the best judgement of the appraiser on the amount of construction easements involved. No improvements would be necessary to the existing passing sections.

(c) Blowing Rock Corporate Limits to US 321 Bypass (1.0± mile of construction): Minimum 4-lane undivided curbed section (48 feet face to face of curbs). A minimum width urban cross section is recommended due to close proximity of existing development. Widening would also be unsymmetrical. A right of way width of 55 feet plus easements is estimated to be the minimum required to accommodate the construction limits.

The total estimated cost of the recommended improvements is as follows:

	<u>Construction</u>	<u>Right of Way</u>	<u>Total</u>
Section (a)	\$ 9,900,000	\$ 4,600,000	\$14,500,000
Section (b)	14,450,000	3,400,000	17,850,000
Section (c)	1,300,000	1,300,000	2,600,000
Total	<u>\$25,650,000</u>	<u>\$ 9,300,000</u>	<u>\$34,950,000</u>

Cost estimates were furnished by the Roadway Design Unit and Right of Way Branch.

If staging of the project is necessary due to funding restraints, Section (a) should be improved initially.

IV. ALTERNATIVES

The possibility of a complete or major relocation of this section of US 321 was considered. However, due to severe terrain conditions, no feasible or reasonable corridor was found.

Consideration was given to a less costly but less desirable alternative of widening Section (a). A five-lane, undivided section with shoulders could be provided in lieu of the recommended divided section. This improvement would produce a cost saving of approximately \$3,050,000, including \$2,250,000 for construction and \$800,000 for right of way.

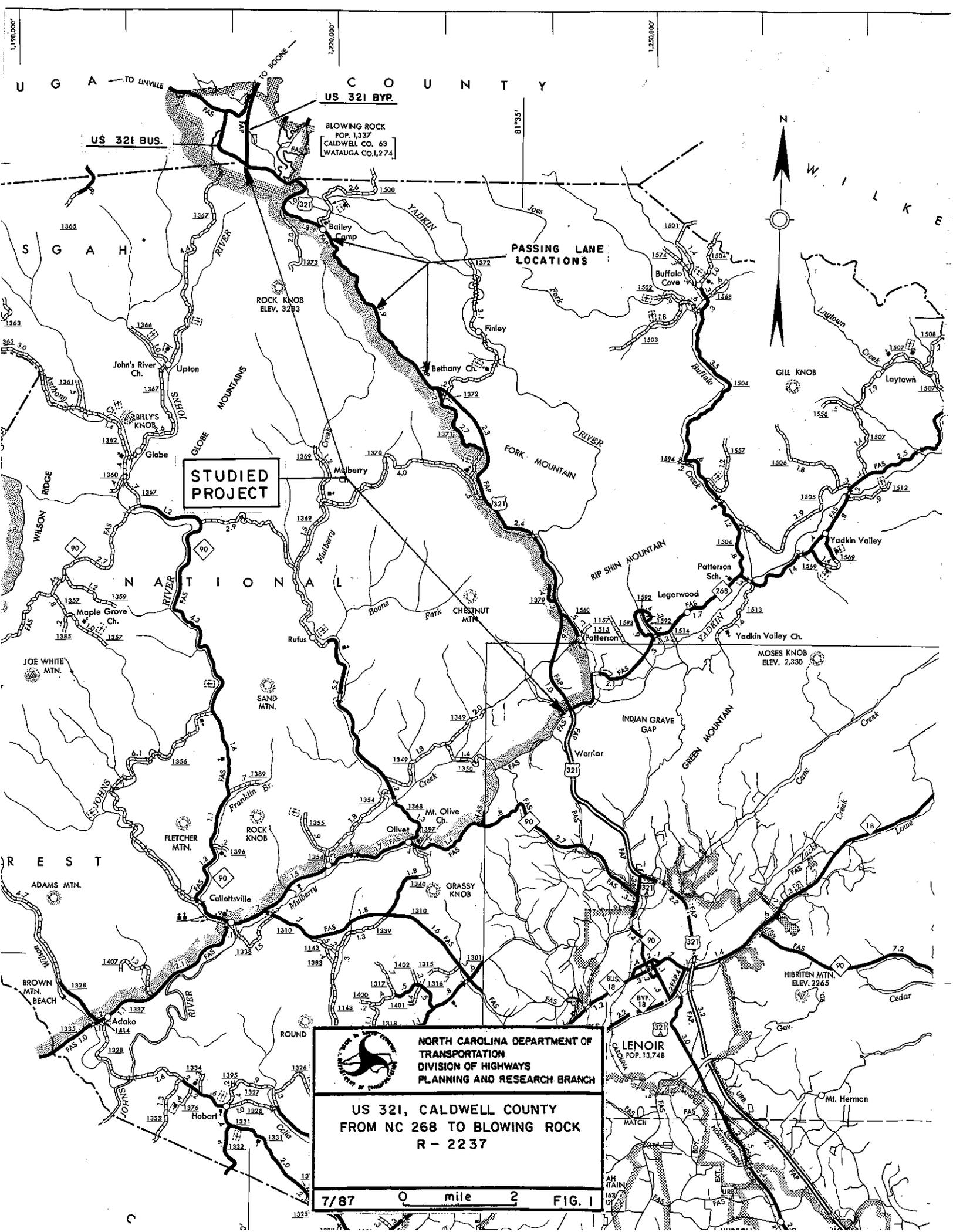
V. OTHER COMMENTS

Major negative impacts of the project would be the taking of land for additional right of way, loss of forested land and wildlife habitat, potential erosion and siltation due to heavy earthwork, displacement of approximately 69 residences and 13 businesses, possible channel changes, and effects on possible historic properties.

Although not part of the current state bicycle program, US 321 has potential significance for bike traffic because of its scenic location in the mountains. Consideration should be given to possible provision of paved shoulders to accommodate bike traffic.

Local government should be encouraged to ensure that any new development construction be sufficiently set back to allow widening of US 321.

RGD/rm



U G A C O U N T Y

US 321 BYP.

US 321 BUS.

BLOWING ROCK
POP. 1,337
CALDWELL CO. 63
WATAUGA CO. 1,274

PASSING LANE LOCATIONS

STUDIED PROJECT

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

US 321, CALDWELL COUNTY
FROM NC 268 TO BLOWING ROCK
R - 2237

7/87 0 mile 2 FIG. 1



S G A H

R E S T

LENOIR
POP. 13,748

Mt. Herman

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