

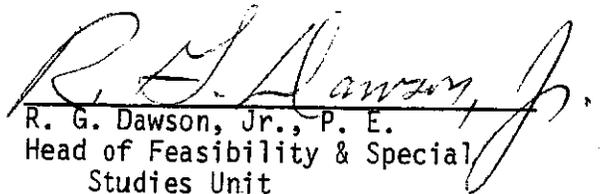
FEASIBILITY STUDY

US 21-221  
From Twin Oaks  
To Virginia State Line  
Alleghany County, R-2523

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

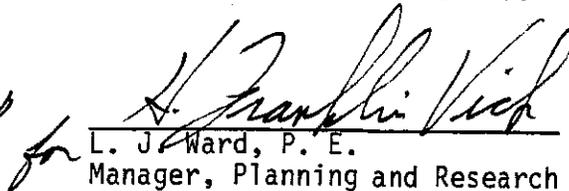


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US 21-221  
From Twin Oaks to Virginia State Line  
Alleghany County, R-2523

I. DESCRIPTION

This report covers a preliminary study of the proposed widening of the 3.1-mile portion of US 21-221 from Twin Oaks to the Virginia state line in Alleghany County. The location of the project is shown on Figures 1 and 2. This project is included in the 1990-1996 Transportation Improvement Program for feasibility and/or right-of-way protection but is not currently funded for design, right-of-way acquisition, or construction.

II. PURPOSE OF PROJECT

Existing Route Characteristics

US 21-221 is designated a rural minor arterial in the North Carolina Functional Classification System. It provides an important routing from north-central Alleghany County and all of the northwestern North Carolina area into the Grayson County area of southwestern Virginia.

The studied section of road generally has an 18-foot pavement with variable shoulder widths of up to 4 feet. The existing right-of-way width is 36 feet. The existing horizontal alignment is generally good with the exception of three 22-degree curves. The vertical alignment is good throughout the project length. Terrain conditions adjacent to the road are rolling to mountainous. The present speed limit is 55 mph from the Virginia state line to a point 0.8 mile north of the US 21 - US 221 intersection, where it reduces to 45 mph for the remainder of the project.

Beginning approximately 0.5 mile north of the state line, the state of Virginia has widened US 21-221 to 24 feet with 8-foot paved shoulders within total usable 10-foot shoulders. The improvement includes a new bridge over the New River, but only extends a few miles into Virginia.

At the south end of the project, US 21-221 is to be improved to a 24-foot paved roadway with 2-foot paved shoulders and a total usable shoulder width of 6 feet as part of project R-2302 (see Figure 2). This improvement extends to a point approximately 500 feet north of SR 1405. This project will also realign US 21-221 at its intersection with US 21 and US 221 to provide an improved alignment and better intersection geometry. Project R-2302 is scheduled for right-of-way acquisition in fiscal year 1993 and construction in fiscal year 1994.

Traffic Volumes, Capacity, and Accident Record

The current traffic volume of 2000 vehicles per day (vpd) is expected to increase to an estimated traffic volume of 3500 vpd by the year 2010. These volumes include 2 percent TTST and 10 percent dual tired trucks. With the present traffic volumes, US 21-221 is operating at Level of Service C. However, with the current level of traffic growth,

US 21-221 will soon be operating at Level of Service D. By the end of the planning period, traffic service will deteriorate to an undesirable level if no improvements are made.

During the period from January 1, 1986 to September 30, 1989, 20 accidents were reported on the subject portion of US 21-221 resulting in an accident rate of 124.6 accidents per 100 million vehicle miles. This compares favorably with the 1986-1988 statewide average of 188.0 acc/100mvm for two-lane rural US routes. The primary accident type involved vehicles running off the roadway. The proposed widening and minor realignment of the roadway should reduce the potential for this type of accident.

#### Need for Project

The purpose of the project is to upgrade the existing road to a wider and safer two-lane facility. Traffic operation is hindered by several adverse curves and narrow roadway.

### III. RECOMMENDATIONS AND COSTS

Widening, resurfacing, and minor realignment of the studied 3.1-mile section of US 21-221 to an adequate two-lane facility are justified and immediately warranted. The recommended cross section for the improvement is a 24-foot paved roadway with 8-foot usable shoulders, including 2-foot paved and 6-foot graded shoulders. The improvement should extend from the Virginia line to a point 500 feet north of SR 1405 where it will tie into project R-2302. Widening to the inside of the curves should be utilized, where practical, to improve the curvature and sight distance along the highway. Furthermore, the three 22-degree curves should be improved as much as practical by realigning the roadway in these areas.

Total estimated costs of the recommended improvements are as follows:

Construction	\$2,550,000
Right of Way	<u>1,210,000</u>
Total	\$3,760,000

The construction cost includes engineering and contingencies, and the right-of-way cost includes acquisition, relocation, and utility costs.

### IV. ENVIRONMENTAL EFFECTS

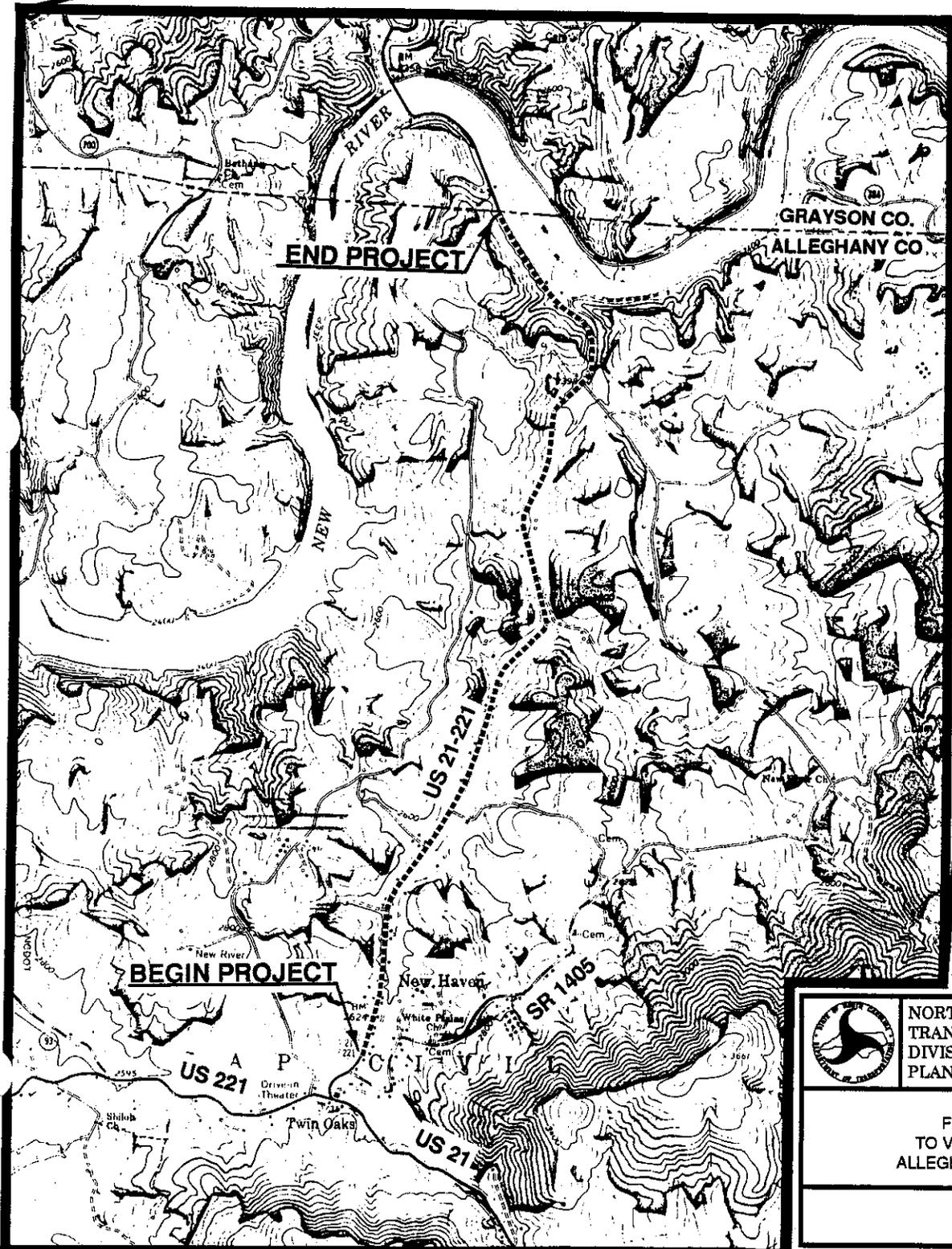
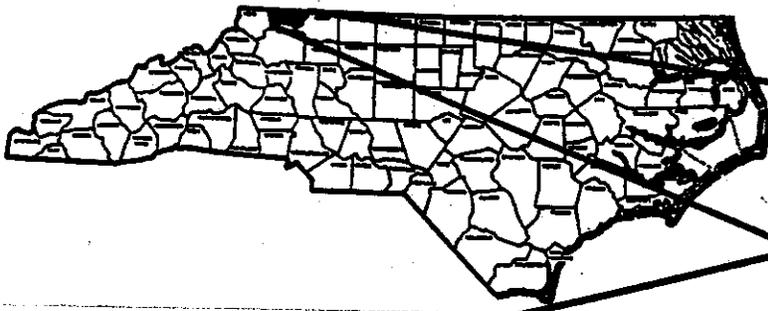
The implementation of the recommended improvements is not expected to have any significant adverse impact on the environment. Noticeable negative impacts would be limited to displacement of 5 residences and 1 business, some minor siltation of a creek that parallels the road, and increased noise levels for remaining development.

#### V. FUTURE ACTIVITIES

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

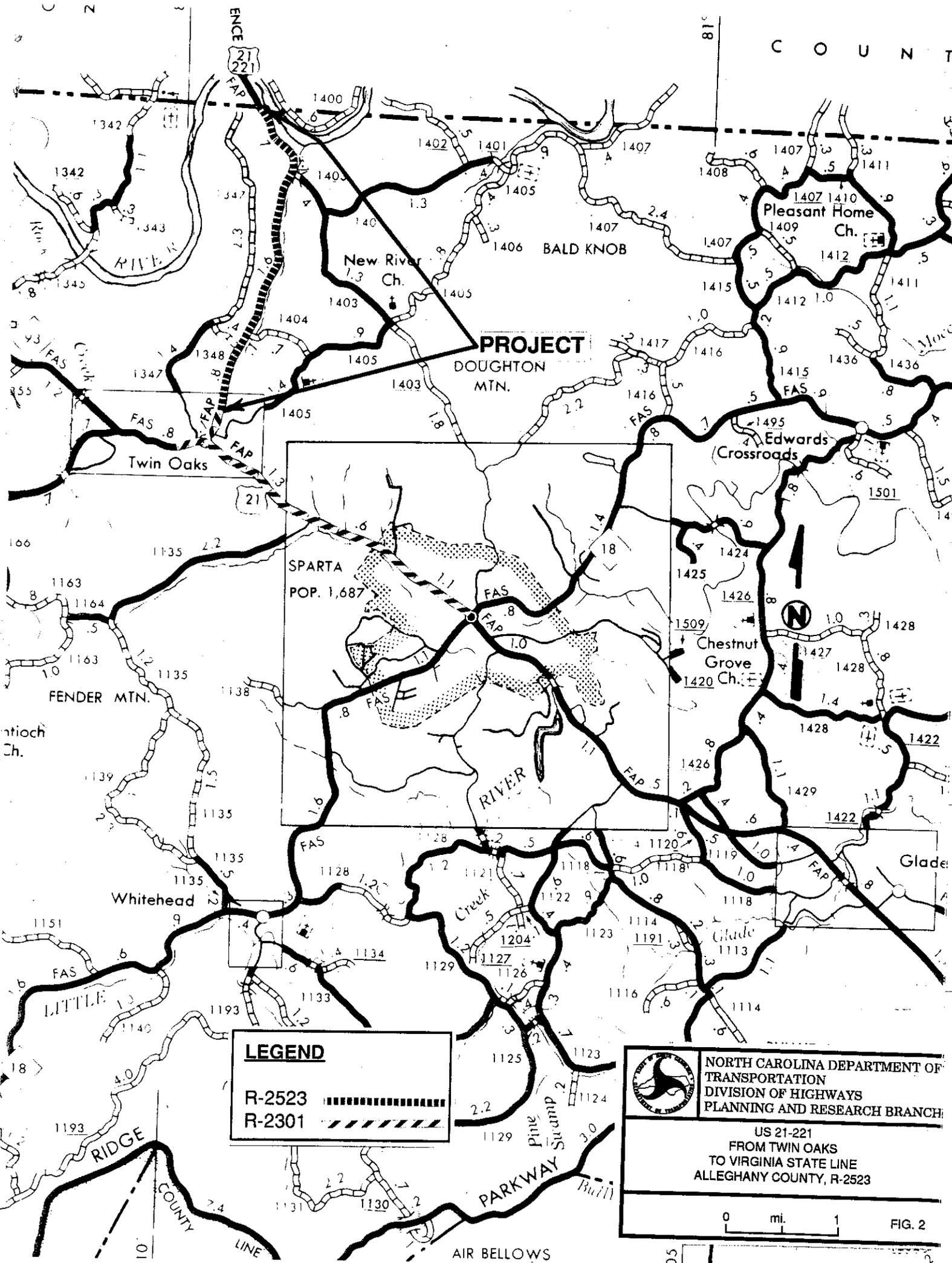
When the project is scheduled, an effort should be made to coordinate it with the state of Virginia to eliminate the short section of unimproved roadway just north of the state line.

RBD/plr



	<b>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PLANNING AND RESEARCH BRANCH</b>
	<b>US 21-221 FROM TWIN OAKS TO VIRGINIA STATE LINE ALLEGHANY COUNTY, R-2523</b>

FIG. 1



**PROJECT**  
DOUGHTON  
MTN.

SPARTA  
POP. 1,687



**LEGEND**

R-2523 

R-2301 

 NORTH CAROLINA DEPARTMENT OF  
TRANSPORTATION  
DIVISION OF HIGHWAYS  
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0 mi. 1

FIG. 2