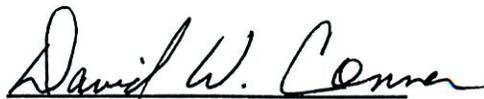


**FEASIBILITY STUDY  
(UPDATED)**

**NC 28  
From Franklin to Lauada  
Macon and Swain Counties**

**R-2408**

Prepared by  
Program Development Branch  
Division of Highways  
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### I. Purpose of Study

In June, 1989, a Feasibility Study was completed for the upgrading of NC 28 from US 441 Business in Franklin to US 19-74 in Lauada. Since completion of the original Feasibility Study, the recommendations of that study have become somewhat controversial in nature. Therefore, it is the purpose of this study to, (1) revisit and re-evaluate the recommendations included in the original study, (2) evaluate additional alternatives that may have surfaced since the original study was completed, and (3) determine possible interim short term solutions to the problems associated with the traffic carrying capacity and safety of existing NC 28.

### II. General Description

This feasibility study describes potential improvements to NC 28 from Franklin to Lauada. The studied improvements include:

1. Alternate A - Widen existing NC 28 from US 441 in Franklin to US 19-74 in Lauada. The roadway should be widened to 24-foot (7.3-m) paved roadway with 2-foot (0.6-m) paved shoulders and total 6-foot (1.8-m) useable shoulders.
2. Alternate B - Realignment of NC 28 along SR 1335, from US 23-441 to NC 28, along NC 28, from SR 1335 to just south of the Macon-Swain County Line, and along SR 1364, SR 1113, and SR 1114, from just south of the Macon-Swain County line to NC 28 west of Lauada. The roadways should be widened to 24-foot (7.3-m) paved roadways with 2-foot (0.6-m) paved shoulders and total 6-foot (1.8-m) useable shoulders.
3. Alternate C - Realignment of NC 28 along the programmed SR 1659 (U-2929 - Depot Street) extension and SR 1323 (Riverview Street), from US 441 Business to NC 28, along NC 28, from SR 1323 to just south of the Macon-Swain County Line, and along SR 1164, SR 1113, and SR 1114, from just south of the Macon-Swain County line to NC 28 west of Lauada. The roadways should be widened to 24-foot (7.3-m) paved roadways

with 2-foot (0.6-m) paved shoulders and total 6-foot (1.8-m) useable shoulders.

4. Alternate D - This interim alternate involves realignment of NC 28 along the programmed SR 1659 (U-2929 - Depot Street) extension and SR 1323 (Riverview Street), from US 441 Business to NC 28 and along NC 28, from SR 1323 to just south of the Macon-Swain County Line. These sections should be widened to 24-foot (7.3-m) paved roadways with 2-foot (0.6-m) paved shoulders and total 6-foot (1.8-m) useable shoulders. This alternate also includes spot safety type improvements north of the Little Tennessee River. These improvements consists of the installation of additional steel beam guard rail where deemed appropriate and removal or solidification of deteriorated rock face along existing NC 28.

The location of the studied improvements is shown on Figure 1.

The estimated costs of right-of-way and construction and the relocations associated with each of the studied improvements are shown below. These costs reflect updated costs from the June, 1989, study as well as costs for additional alternates.

Alternate	Length	Relocations		Estimated Costs (1996)		
		Residential	Business	Construction	Right-of-Way	Total
Alternate A	19.5 miles	55	8	\$37,300,000	\$8,480,000	\$45,780,000
Alternate B	18.6 miles	47	6	\$33,500,000	\$6,900,000	\$40,400,000
Alternate C	18.9 miles	41	6	\$35,500,000	\$7,370,000	\$42,870,000
Alternate D	18.5 miles	9	1	\$9,200,000	\$2,500,000	\$11,700,000

This study is the initial step in the planning and design process for this project and is not to be considered the product of exhaustive environmental or design investigations. The purpose of this study is to describe the alternative treatments including costs, and identify potential problem areas that deserve consideration in the planning and design phases.

### III. Existing Conditions

This project was initially included in the 1988 Transportation Improvement Program (TIP) for a Feasibility Study. The Feasibility Study was completed in June, 1989. The study generally recommended widening and realigning NC 28 from Franklin to Lauada to realize a route with less horizontal and vertical alignment problems and one which meets current roadway standards.

NC 28 serves as a radial route into the Town of Franklin. It is a Federal Aid Secondary Route and is classified as a Rural Major Collector in the North Carolina Statewide Functional Classification System. It is classified as a Minor Arterial in the Macon County and Swain County Thoroughfare Plans.

The studied section of NC 28 is a 2-lane shoulder section with 20-foot (6.1-m) to 22-foot (6.7-m) wide pavement and 2-foot (0.6-m) to 4-foot (1.2-m) wide soil shoulders. The horizontal and vertical alignment is fair from Franklin to the Macon-Swain County line. From the Macon-Swain County line to Lauada, the terrain is rugged and mountainous and the roadway includes 146 curves and grades to 6%. All intersections along the studied route are at grade and stop-sign controlled. The speed limit on NC 28 is 35 mph (56.5 km/h) in Franklin and increases to 55 mph (88.7 km/h) over the remainder of the project.

There are two bridges and two culverts located on NC 28 within the project limits and are described as follows:

1. Bridge #27 carries NC 28 over the Little Tennessee River and is located approximately 50 feet (15.2 m) south of SR 1335. The bridge is a reinforced concrete structure which has a clear deck width of 28 feet (8.5 m) and is 335 feet (102.2 m) long. It was constructed in 1940 and has a sufficiency rating of 57.8 out of a possible 100 points.
2. Structure #85 carries NC 28 over Cowee Creek and is located approximately 15 feet (4.6 m) south of SR 1350. The bridge is a reinforced concrete structure which has a clear deck width of 34 feet (10.4 m) and is 65 feet (19.8 m) long. It was constructed in 1921, and has a sufficiency rating of 92.8 out of a possible 100 points.
3. Structure #90 is a culvert that carries NC 28 over Lakey Creek and is located approximately 0.1 mile (0.2 km) north of SR 1355. The culvert is a double barrel corrugated metal structure. It was constructed in 1962, and has a sufficiency rating of 98.7 out of a possible 100 points.
4. Bridge #4 is a culvert that carries NC 28 over Brush Creek and is located approximately 50 feet (15.2 m) south of SR 1131. The culvert is a single barrel reinforced concrete structure. It was constructed in 1939, and has a sufficiency rating of 99.7 out of a possible 100 points.

At the southern project terminus, NC 28 ties into US 441 Business and at the northern project terminus, it ties into US 19-74. Both US 441 and US 19-74 are multilane roadways at their intersection with NC 28.

#### IV. Need For Project

During the period from May 1, 1992, through April 30, 1995, a total of 61 accidents were reported along the studied section of roadway. No fatalities were reported during this period; however, 31 of the accidents resulted in injuries. The most prevalent

accident types between Franklin and the Macon-Swain County line were ran-off-road (43%), rear-end (17%), and left-turn (15%). Between the Swain-Macon County line and Lauada, the most prevalent accident type was ran-off-road (86%). Widened roadways with useable shoulders and better alignment will offer the potential for reduction of these types of accidents.

It is estimated that the current traffic volumes on NC 28 range from a high of approximately 6,300 vehicles per day (vpd) just north of Franklin to approximately 900 vpd just south of Lauada. At these volumes, it is estimated that the roadway is currently operating at a Level of Service D near Franklin and improving to Levels C and B as you approach Lauada. The traffic volumes are projected to increase to approximately 11,300 vpd and 1,700 vpd, respectively by the year 2020. With the increase in traffic volumes, the Level of Service will deteriorate to a Level E near Franklin and Levels C and D north of SR 1340 if improvements are not made.

Widening and realigning should allow the roadway, just north of Franklin, to continue to operate at a Level of Service D until around the year 2015 and the remainder of the roadway to operate at least a Level C through the 2020 design year.

In addition to reduced accident potential and improved Level of Service, widening and realignment of the roadway should enhance the overall safety and driving comfort along the highway.

## V. Alternatives

From a totally transportation engineering perspective, there is need for a widened and realigned route from Franklin to Lauada and several alternatives were evaluated that would meet these needs. The alternatives are outlined below:

1. Alternate A - Widen existing NC 28 from US 441 in Franklin to US 19-74 in Lauada. The roadway should be widened to 24-foot (7.3-m) paved roadway with 2-foot (0.6-m) paved shoulders and total 6-foot (1.8-m) useable shoulders.
2. Alternate B - Realignment of NC 28 along SR 1335, from US 23-441 to NC 28, along NC 28, from SR 1335 to just south of the Macon-Swain County Line, and along SR 1364, SR 1113, and SR 1114, from just south of the Macon-Swain County line to NC 28 west of Lauada. The roadways should be widened to 24-foot (7.3-m) paved roadways with 2-foot (0.6-m) paved shoulders and total 6-foot (1.8-m) useable shoulders.
3. Alternate C - Realignment of NC 28 along the programmed SR 1659 (U-2929 - Depot Street) extension and SR 1323 (Riverview Street), from US 441 Business to NC 28, along NC 28, from

SR 1323 to just south of the Macon-Swain County Line, and along SR 1164, SR 1113, and SR 1114, from just south of the Macon-Swain County line to NC 28 west of Lauada. The roadways should be widened to 24-foot (7.3-m) paved roadways with 2-foot (0.6-m) paved shoulders and total 6-foot (1.8-m) useable shoulders.

In addition to the above, a fourth alternate (Alternate D) was evaluated which would meet the immediate capacity needs of the area just north of Franklin and would meet some of the spot safety needs of existing NC 28 north of Bridge #27 over the Little Tennessee River. This alternate involves realignment of NC 28 along the programmed SR 1659 (U-2929 - Depot Street) extension and SR 1323 (Riverview Street), from US 441 Business to NC 28 and along NC 28, from SR 1323 to just south of the Macon-Swain County Line. These sections should be widened to 24-foot (7.3-m) paved roadways with 2-foot (0.6-m) paved shoulders and total 6-foot (1.8-m) useable shoulders. The spot safety type improvements north of the Little Tennessee River consists of the installation of additional steel beam guard rail where deemed appropriate and removal or solidification of deteriorated rock face along existing NC 28.

The right-of-way width required for widening all roadways is 100 feet (30.5 m).

The location of the studied improvements is shown on Figure 1.

The estimated cost of right-of-way and construction and the relocations associated with each of the studied improvements is as follows:

Alternate	Length	Relocations		Estimated Costs (1996)		
		Residential	Business	Construction	Right-of-Way	Total
Alternate A	19.5 miles	55	8	\$37,300,000	\$8,480,000	\$45,780,000
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Alternate D	18.5 miles	9	1	\$9,200,000	\$2,500,000	\$11,700,000

## VI. Other Comments

An environmental screening was not conducted for this study. However, Corps of Engineers Permits and wetlands mitigation may be required due to stream crossings that would be a part of this project. The costs included in this report do not include any costs for wetlands mitigation.

