

FEASIBILITY STUDY

NC 42

Intersection with SR 1136 and SR 1158
Wilson County

R-3112

Prepared by
Program Development Branch
Division of Highways
N.C. Department of Transportation

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Feasibility Study

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I. GENERAL DESCRIPTION

This is a feasibility study for intersection improvements of NC 42 with SR 1136 and SR 1158 west of Wilson, Wilson County (see Figure 1). This study identifies two alternative construction configurations for the intersection as shown on Figures 2 and 2A. Estimated cost for either alternative is \$1,700,000 (\$800,000 for right-of-way, and \$900,000 for construction).

A feasibility study presents alternative typical cross-sections for improvements, general alignments of improvements, and estimated cost of construction and right-of-way. This study attempts to identify any potential environmental, permitting, or other observed issues which deserve consideration in the planning and construction stages. This study is not an exhaustive environmental investigation.

II. NEED FOR PROJECT

The intersection of NC 42 with SR 1136 and SR 1158 is located in a rural location approximately 2 miles (3.2 km) west of the Wilson city limits. NC 42 is classified as a rural minor arterial, SR 1136 is classified as a rural minor collector, and SR 1158 is classified as a rural major collector in the statewide functional classification system.

This study was requested by Division 4. The focus of the study was to identify construction alternatives that enhance safety and reduce the number of accidents at this intersection. The intersection is formed by (see Figures 1 & 2) NC 42 which curves at this location from a south-north to an east-west bearing and forms an arc in the southeast quadrant of the intersection of SR 1158 and SR 1136. This configuration presents motorists with three locations of potential traffic conflict spaced 400 feet (122 meters) apart. As can be seen on Figure 2, these areas are:

1. The intersection of SR 1158 and SR 1136.
2. SR 1136's merge into NC 42.
3. SR 1158's merge into NC 42.

The studied improvements would reduce the potential for accidents by reducing the number of traffic conflict locations. Currently, SR 1158 is stop-sign controlled at SR 1136, with yield signs on SR 1136 and SR 1158 where they merge with NC 42. NC 42 is a two-lane, 28-foot (8.5-meter) pavement with 8-foot (2.4-meter) usable shoulders. SR 1158 is a two-lane, 20-foot (6.1-meter) pavement with 6-foot (1.8-meter) usable shoulders. SR 1136 is a two-lane, 18-foot (5.5-meter) pavement with 4-foot (1.2-meter) usable shoulders.

Land development in the vicinity is low density rural residential and farmland. The northeast quadrant of the intersection is occupied by several homes. An agricultural supply and a convenience store are located in the southeast quadrant, between the intersection of SR 1158 and SR 1136, and the curve formed by NC 42. The southwest quadrant is occupied by a home and farmland. The northwest quadrant is farmland.

Two schools are located in the vicinity of the studied intersection. The James B. Hunt, Jr. High School is located on SR 1001, approximately 0.2-mile (0.3-km) southwest of the studied intersection. The second is the Wilson Christian Academy which is located on SR 1158, 1 mile (1.6 km) north of the studied intersection. Traffic generated by the two schools contributes a marked morning and afternoon peak to the traffic characteristics of the intersection.

The 1993 and 2013 estimated peak-hour traffic volumes are shown on Figures 3 and 4, respectively. Based on these volumes, the improved intersection would operate at a level-of-service (LOS) B by the design-year 2013. The existing unsignalized intersection of SR 1136 and SR 1158 is currently operating at a LOS A on its SR 1136 approaches, and LOS B on its SR 1158 approaches. By 2013, it is expected that the SR 1136 approaches will continue to operate at LOS A, while the SR 1158 approaches will operate at capacity.

During the period beginning on July 1, 1990, through June 30, 1993, a total of 20 accidents were reported at the studied intersection. None of the reported accidents involved fatalities. The most prevalent accident types were rear-end (35%) and angle (35%) collisions. The studied intersection is not included in the NCDOT 1994 Safety Program for hazardous locations. The Safety Program identifies hazardous locations based on their reported number, frequency and severity of accidents. The studied improvements are not warranted based on the current accident data. However, the studied improvements present two feasible alternatives for reconfiguring the intersection. Either studied improvement would enhance safety at this location, and involve reconstruction of the intersection.

III. STUDIED IMPROVEMENTS

Two alternative construction improvements were identified. Alternative 1 includes the elimination of the NC 42 curve, and routing NC 42 on SR 1136 and SR 1158 as shown on Figure 2. The resulting four-leg intersection would be signalized with the number of lanes per approach as shown on Figure 2.

Alternative 2 (see Figure 2A) would retain the NC 42 curve alignment, and convert it into a free-flowing right-turn lane (eastbound). The modified intersection would be signalized with the number of lanes per approach as shown on Figure 2A.

The studied alternative configurations are based on the predicted year 2013 traffic volumes. Either alternative would offer an improved intersection that is expected to operate at LOS B by 2013. All lanes would be 12 feet (3.6 meters) in width, and the approaches would be curb and gutter sections to minimize right-of-way width. The recommended right-of-way width is 100 feet (30.5 meters) without access control. No right-of-way would be acquired in the northeast quadrant of the intersection (see Figure 2) to avoid relocating the residences there. The new approaches would be offset to the south and west compared to the existing approaches.

It should be noted that introducing a new rural, signalized intersection and a right-angle turn on NC 42 is undesirable. However, these studied Alternatives represent construction improvements that would effectively reduce the number of traffic conflict points at this location. Furthermore, the studied improvements do not preclude a future realignment of NC 42 on a new location, if needed. The estimated cost of either studied improvement is:

| | |
|--------------|-------------|
| Right-of-way | \$ 800,000 |
| Construction | \$ 900,000 |
| Total | \$1,700,000 |

IV. OTHER COMMENTS AND CONCERNS

An ecological screening was not conducted for this study. The relocation of two businesses, and one residence are expected.

In lieu of implementing either studied construction alternative, enhanced warning signs could be used to mark the merge points of NC 42 with SR 1136 and SR 1158. The Traffic Engineering Branch should be consulted regarding this option. If signing proves ineffective, then implementation of a construction alternative might be pursued.