

FEASIBILITY STUDY

FS-0209A

Convert Grade Separation at US 52/SR 1102 (Trinity Church Road) Into an Interchange

Town of King
Stokes County

Division 9



Prepared by the
Program Development Branch
N. C. Department of Transportation

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11/17/08
Date

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I. General Description

This feasibility study describes converting the existing grade separation at US 52/SR 1102 (Trinity Church Road) at King into an interchange. The project location is shown on Figure 1. Two cross section alternatives were investigated and the associated costs with the breakdowns are described below:

ALTERNATE 1. Proposes to construct a diamond interchange at the US 52/SR 1102 (Trinity Church Road) junction with a three-lane shoulder section on SR 1102 from approximately 0.5 miles Southwest of US 52 to a point 0.5 miles Northeast of US 52.

ALTERNATE 2. Proposes to construct a diamond interchange at the US 52/SR 1102 (Trinity Church Road) junction with a three-lane shoulder section on SR 1102 between the ramp terminals. Outside the ramps, SR 1102 transitions to an improved two-lane shoulder section with 12-foot travel lanes and 2-foot paved shoulders for approximately 0.5 miles in each direction.

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 the study is to describe the problem, recommend a treatment including costs, and identify potential problem areas that deserve consideration in the planning and design phases.

II. Background

The primary purpose of this project is to improve access for the Town of King by providing a new interchange on US 52 at SR 1102.

In the 1996 Stokes County Thoroughfare Plan, this section of SR 1102 is designated as minor collector while US 52 portion of the project area is designated as principal arterial. In the North Carolina Statewide Functional Classification System, SR 1102 is not designated, however, US 52 portion of the project area is also designated as principal arterial.

The land immediately surrounding the project area is mostly undeveloped property with a mix of agricultural fields surrounded by woodlands. There are some single-family residences in the project area.

Currently, SR 1102 is a two-lane shoulder section with 22-feet of pavement and a posted speed of 45 MPH.

An adjacent TIP project in the area, R-2201 (Tobaccoville Rd./Main St.) from RJR entrance in Forsyth County to SR 1115 (Kirby Rd.) in Stokes County, proposes to upgrade SR 1611/SR 1112 to a multilane facility.

There is one existing structure along the project route carrying SR 1102 over US 52. This structure is 26.5 feet wide, 226 feet long and was constructed in 1960. Structure #23 currently has a sufficiency rating of 67.4.

This project is supported by the Town of King and Stokes County.

III. Traffic and Safety

Under the existing conditions, the average daily traffic (ADT) volumes along SR 1102 are 2100 vehicles per day (vpd) in the year 2008 and projected to be 5000 vpd in the 2035 design year. In addition, the ADT along US 52 is 43,400 vpd in the year 2008 and projected to be 74,600 vpd in the 2035 design year. Truck traffic along SR 1102 is estimated to be 3% of the ADT traffic, while the truck traffic along US 52 is 11%. Based

upon existing conditions, SR 1102 is anticipated to function at a 'C' Level of Service (LOS) through the 2035 design year, while US 52 is anticipated to function at a LOS 'C' in the year 2008 and a LOS 'E' in the 2035 design year. In order to accommodate the 2035 design year traffic volumes, US 52 will ultimately need to be widened to a six lane freeway.

With the proposed interchange in place, the current year (2008) ADT along SR 1102 is between 2,900 vehicles per day (vpd) at the west end of the project to 6,300 vehicles per day at the east end. For the design year 2035, the estimated traffic volumes along SR 1102 range from 8000 vpd at the west end of the project to 11,400 vpd at the east end. In addition, the ADT along US 52 is anticipated to range from 36,900 vpd to 43,500 vpd in the year 2008 and projected to be 71,500 vpd to 77,300 vpd in the 2035 design year. Truck traffic along SR 1102 is estimated to makeup 3% of the ADT traffic, while the truck traffic along US 52 is 11%.

With the new interchange in place, SR 1102 is anticipated to function at a 'C' Level of Service (LOS) through the 2035 design year, while the existing US 52 is anticipated to function at a LOS 'C' in the year 2008 and a LOS 'E' in the 2035 design year. In order to accommodate the 2035 design year traffic volumes, US 52 will ultimately need to be widened to a six lane freeway.

IV. Description of Alternatives

ALTERNATE 1 proposes to convert the existing grade separation at US 52/SR 1102 into a diamond interchange with room for future loops and includes the replacement of bridge #23 over US 52. In addition, this alternative proposes to widen SR 1102 approximately 0.5 miles each side of the proposed interchange. The proposed cross section of SR 1102 is a three-lane shoulder section with 12-foot travel lanes and 2-foot paved shoulders on 120-foot of right-of-way. The proposed widening is symmetrical along existing SR 1102 and the length is approximately 1.0 mile.

With this alternative, it is anticipated there will be one (1) business and twenty one (21) residences relocated due to this project. The total cost of the alternative, including construction, right-of-way and utility relocation is estimated to be \$19,200,000.

Construction.....	\$11,200,000
Right-of-Way.....	\$7,500,000
Utility Relocation.....	\$500,000
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Total Project Cost (Alternative #1).....	\$19,200,000

ALTERNATE #2 proposes to convert the existing grade separation at US 52/SR 1102 into a diamond interchange with room for future loops and includes the replacement of bridge #23 over US 52. Under this alternative, SR 1102 will be widened to a three lane shoulder section with 12-foot travel lanes and 2-foot paved shoulders between the ramp terminals.

In addition, this alternative proposes to widen SR 1102 to an improved two-lane shoulder section for approximately 0.5 miles each side of the proposed interchange. The proposed cross section of SR 1102 outside the ramp terminals is a two-lane shoulder section with 12-foot travel lanes and 2-foot paved shoulders on 120-feet of right-of-way. The proposed widening is symmetrical along existing SR 1102 and the length is approximately 1.0 mile.

With this alternative, it is anticipated there will be one (1) business and twenty one (21) residences relocated due to this project. The total cost of the alternative, including construction, right-of-way and utility relocation is estimated to be \$17,000,000.

Construction.....	\$9,000,000
Right-of-Way.....	\$7,500,000
Utility Relocation.....	\$500,000
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Total Project Cost (Alternative #2).....	\$17,000,000

VI. Natural Environment Issues

According to the National Heritage Program GIS data base, there is no indication of Threatened or Endangered species or impacts to historic properties in the immediate project area.

Due to the anticipated construction across Crooked Run Creek, wetland impacts are expected and permits from the US Army Corps of Engineers will likely be necessary.

VII. Recommendations

Alternative #1 proposes to construct a diamond interchange with room for future loops at the US 52/SR 1102 junction and upgrades a short section of SR 1102 from the existing narrowed two-lane roadway to a three lane with shoulder section. Alternative #2 also proposes to construct a diamond interchange with room for future loops. However, this alternative upgrades the existing narrowed two-lane roadway outside the proposed interchange to an improved two lane shoulder section while providing a three lane shoulder section on SR 1102 between the ramp terminals. Under all alternatives, the proposed cross sections on SR 1102 contain 12-foot travel lanes and 2-foot paved shoulders. In addition, the proposed new structure over US 52 should have sufficient length to accommodate the future widening to a six lane freeway.

With a \$2.2 million difference in cost in favor of Alternative #2 and the fact that both alternatives will perform at similar capacity in the design year 2035, Alternate #2 is recommended.

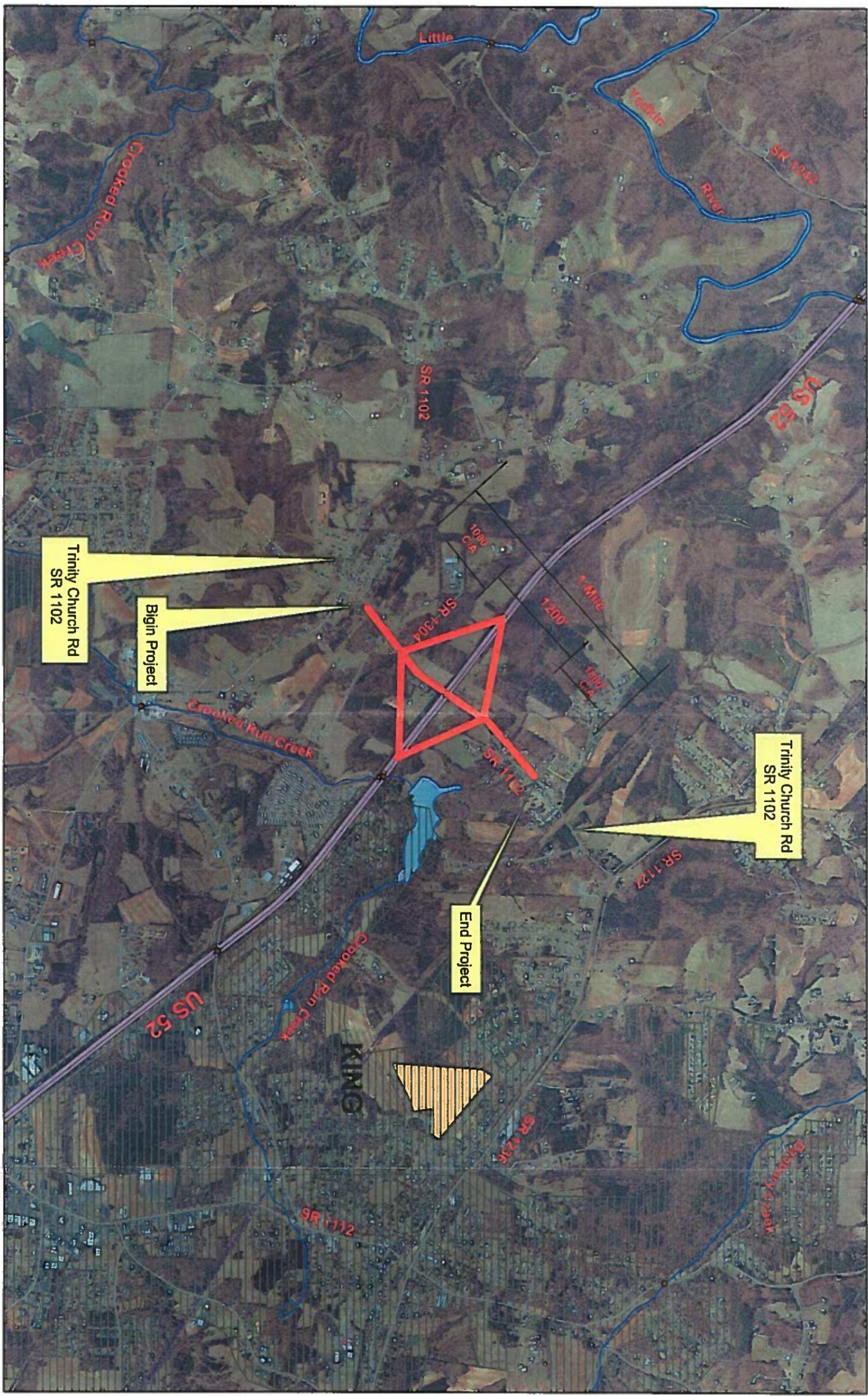
The total cost of the recommended Alternative #2 is \$17 million with \$7.5 million for right of way, \$9 million for construction and \$0.5 million for utility relocation. It should be noted that a significant portion of the right-of-way costs is associated with providing full control of access on SR 1102 outside the interchange ramp terminals. Service road studies should be undertaken during later planning and design phases in order to mitigate these costs.

VIII. Additional Comments

No special accommodation for sidewalks and/or bicycles is recommended on this project.

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Figure 1



C/A = Control of Access

Project Limits



