

FEASIBILITY STUDY

FS-0212D

Widening of SR 1005 (Startown Road) from US 70 to NC 10

Catawba County

Division 12



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

Henry U. Esealuka
Feasibility Studies Engineer

Derrick W. Lewis, P.E.
Feasibility Studies Unit Head

2/19/08
Date

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I. General Description

This feasibility study describes the widening of SR 1005 (Startown Road) from US 70 to NC 10. This portion of the roadway is 5.0 miles. The proposed widening will help Startown Road which is experiencing traffic congestion, delays and high accident levels. The project location is shown on Figures 1 and 2. As part of this study, four different cross sections were investigated and the associated costs are described below:

- * **ALTERNATE 1.** Four-lane divided shoulder section, 79-foot wide edge to edge of pavement, with a 23-foot raised grass median, 4-foot wide paved shoulders on 150-foot of right-of-way. The proposed widening is symmetrical along existing Startown Road for majority of the project with some slight realignment at a few locations. The length of this alternative is approximately 5.0 miles.

- * **ALTERNATE 2.** Five-lane shoulder section, 68-foot wide with 4-foot paved shoulders on 150-foot of right-of-way. The proposed widening is symmetrical along existing Startown Road for majority of the project length with some slight realignment at a few locations. The length of this alternative is approximately 5.0 miles.

- * **ALTERNATE 3.** Four-lane divided curb and gutter section, 79-foot wide face to face of curbs with a 23-foot raised grass median and 15-foot berms on 130-feet of right-of-way. The proposed widening is symmetrical along existing Startown Road for the majority of the project with some slight realignment at a few locations in order to achieve better sight distances. The length of this alternative is approximately 5.0 miles.

- * **ALTERNATE 4.** Five-lane curb and gutter section, 68-foot wide face to face of curbs with 15-foot berms, on 130-feet of right-of-way. The proposed widening is symmetrical along existing Startown Road for the majority of the project with some slight realignment at a few locations. The length of this alternative is approximately 5.0 miles.

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 the traffic carrying capacity and to maximize safety on Startown Road from US 70 to NC 10.

The proposed widening will help Startown Road which is experiencing traffic congestion, delays and high accident levels. A multi-lane facility is recommended along this corridor given the projected future traffic volume and the fact that Startown Road will serve as a connector between US 70 and NC 10.

The proposed improvements along Startown Road do have a strong support from the local governments and is ranked 3rd in the priority list of the Greater Hickory Urban Area MPO.

In the 2001 Hickory-Newton-Conover Thoroughfare Plan, US 70, Startown Road and NC 10 are designated as major thoroughfares. Also, in the North Carolina Statewide Functional Classification System, US 70, Startown Road and NC 10 are designated as minor arterials.

As it exists now, this section of Startown Road is primarily a two-lane shoulder section with a pavement width of 26-feet. Additional widening at the US 70, Catawba Valley Blvd and NC 10 intersections with Startown Road exists in order to accommodate auxiliary left turn lanes.

The land immediately surrounding the project area at the northern end is mostly undeveloped agricultural property with mix of woodlands and some single-family homes. The southern end of the project is predominantly undeveloped woodlands mix with several single-family residences and few scattered businesses.

III). Traffic and Safety

The current year (2007) Average Daily Traffic (ADT) within the project limits ranges from 15,000 vehicles per day (vpd) to 9,700 vpd. For the design year 2035, the projected traffic volumes within the project limits ranges from 26,300 vehicles per day (vpd) to 19,100 vpd. Truck traffic is estimated to make up 6% of the ADT traffic.

During the three-year period from April 2004 through March 2007, there were 152 accidents reported within the project limits. 104 of these crashes were property damage only accidents, 48 were injury crashes with no fatalities as a result of these accidents. The accident rate for this 5.0 mile portion of roadway was 261.28 accidents per 100 million vehicle miles of travel (acc/100mvm), which was considerably lower than the 2004-2007 statewide rate of 396.74 accidents/100 mvm for two-lane undivided primary routes.

The most prevalent accident types along this corridor are as follows: approximately 37 percent of accidents were rear end; slow or stop, 14 percent were with left turn and 21 percent were angle accidents. Individually, all other accident types are approximately twenty-eight (28) percent or less of total accidents. Improvements to upgrade this section of roadway to a multilane facility should reduce the likelihood of these types of accidents in the future.

There are five existing signals within the project limits. They are located at US 70, Catawba Valley Blvd, Robinwood Road, Conover Startown Road and at the intersection of NC 10.

Currently, all existing signals are operating at an acceptable LOS “C” or better, except at NC 10/Startown Road which is operating at LOS “F”. Based on the projected volume for the design year 2035, these intersections including NC 10/Startown Road intersection will be operating at LOS “F” without additional improvements. However, with the proposed upgrade of the facility, all intersections are expected to operate at an acceptable LOS “D” and better.

IV). Description of Alternatives

ALTERNATE 1. Construct four-lane divided shoulder section, 79-foot wide edge to edge of pavement with a 23-foot raised grass median, 4-foot paved shoulders and 15-foot berms on 150-foot right-of-way. Alternative #1 proposes widening symmetrically along existing Startown Road with some minor realignment aimed at improving few existing curves. The length of this alternative is approximately 5.0 miles. See Figures 1 and 2.

With this alternative, it is anticipated there will be zero business and zero residences relocated due to this project. The total cost of the alternative, including construction and right-of-way is estimated to be \$38,700,000.

Construction.....	\$32,900,000
Right-of-Way.....	\$5,800,000
Total Project Cost (Alternative #1).....	\$38,700,000

ALTERNATE 2. Construct five-lane shoulder sections, approximately 68-feet of pavement including 4-foot paved shoulder with 15-foot berms on 150-feet of right-of-way. This alternative also proposes widening along existing Startown Road with some minor realignment aimed at improving few existing curves. The length of this alternative is approximately 5.0 miles. See Figures 1 and 2.

With this alternative, zero resident relocation and zero business relocations are expected. The total cost of the alternative, including construction and right-of-way is estimated to be \$33,600,000.

Construction.....	\$27,900,000
Right-of-Way.....	\$5,700,000
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Total Project Cost (Alternative #2).....	\$33,600,000

ALTERNATE 3. Construct four-lane divided curb and gutter section, 79-foot wide face to face of curbs with a 23-foot raised grass median and 15-foot berms on 130-feet of right-of-way. Alternative #3 proposes widening along existing Startown Road with some minor realignment aimed at improving few existing curves. The length of this alternative is approximately 5.0 miles. See Figures 1 and 2.

With this alternative, it is anticipated there will be zero business relocation and zero resident relocations due to this project. The construction cost estimate shown below includes the installation of a five-foot sidewalk to be constructed along Startown Road on both side, between US 70 and NC 10.

This sidewalk is estimated to cost an additional \$1,100,000. The total cost of this alternative, including construction and right-of-way is estimated to be \$40,100,000.

Construction.....	\$35,100,000
Right-of-Way.....	\$5,000,000
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Total Project Cost (Alternative #3).....	\$40,100,000

ALTERNATE 4. Construct five-lane curb and gutter section, 68-feet wide face to face of curbs with 15-foot berms on 130-feet of right-of-way. This alternative also proposes widening along existing Startown Road with some minor realignments aimed at improving few existing curves between US 70 and NC 10. The length of this alternative is approximately 5.0 miles. See Figures 1 and 2.

With this alternative, it is anticipated there will be zero business relocation and zero resident relocations due to this project. The construction cost estimate shown below includes the installation of a five-foot sidewalk to be constructed along Startown Road on both sides between US 70 and NC 10.

This sidewalk is estimated to cost an additional \$1,100,000. The total cost of this alternative, including construction and right-of-way is estimated to be \$34,400,000.

Construction.....	\$29,400,000
Right-of-Way.....	\$5,000,000
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Total Project Cost (Alternative #4).....	\$34,400,000

V). Recommendations

It is recommended to improve Startown Road to a multilane facility from US 70 to NC 10, a distance of approximately 5.0 miles.

Four different cross sections were investigated and the associated costs with the breakdowns are described in Section IV above. The analysis indicates that all four alternatives would accommodate the projected 2035 design year volumes with an acceptable level of service.

The proposed right-of-way for each alternative varies between 130-feet to 150-feet and the cost difference between four-lane section and the five-lane section ranges between \$5.1 million and \$6.1 million; in favor of the five-lane cross-sections. However, five-lane sections tend to promote strip development and indiscriminate left turn movements; while four-lane divided sections minimize strip development, prevent indiscriminate left turn movements, significantly improve traffic safety and operations and provide refuge for pedestrians. Therefore, the four-lane cross-sections (Alternatives #1 and #3) are preferred over the five-lane alternatives.

Further analysis shows that four-lane divided with shoulder section (Alternative #1) has some advantages over the four-lane divided curb and gutter section (Alternative #3) because it fits the existing development patterns of the area, easily accommodates future widening, has a lower initial costs and will likely have lower long term maintenance cost. Given these reasons, we recommend that the four-lane divided shoulder section (Alternative #1) be provided under this project.

The total cost of the alternative, including construction and right-of-way is estimated to be \$38,700,000.

Construction.....	\$32,900,000
Right-of-Way.....	\$5,800,000
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Total Project Cost (Alternative #1).....	\$38,700,000

VI). Community Issues

An exhaustive environmental screening was not conducted for this study. However, the following information summarizes conclusions about the project study area based on existing data.

It should be noted that Wilson House, a landmark site on the National Register of Historic Structures, is located within the immediate vicinity of the proposed improvements. St Paul Reformed Church, also a landmark site on the National Register of Historic Structures; is located along Startown

Road. However, minimal impacts to St Paul Reformed Church is anticipated and no direct impacts to the Wilson House is expected as a result of this project. There are also no known archaeological sites within the project study area.

VII). Natural Environment Issues

According to a GIS screening of the National Wetlands Inventory (NWI), there are no wetland areas in the immediate vicinity of the project.

According to the National Heritage Program GIS database, there is one Threatened or Endangered species that may potentially exist in the immediate project area; this species is a Dwarf-Flowered Heart Leaf (*Hexastlis Naniflora*), this area is considered a critical area for protection.

VIII). Additional Comments

It should also be noted that our analysis indicates the need to widen NC 10 from the existing two-lane to a four-lane divided shoulder section between Startown Road and US 321 in order to fully utilize the operational and safety benefits at the NC 10/Startown Road intersection.

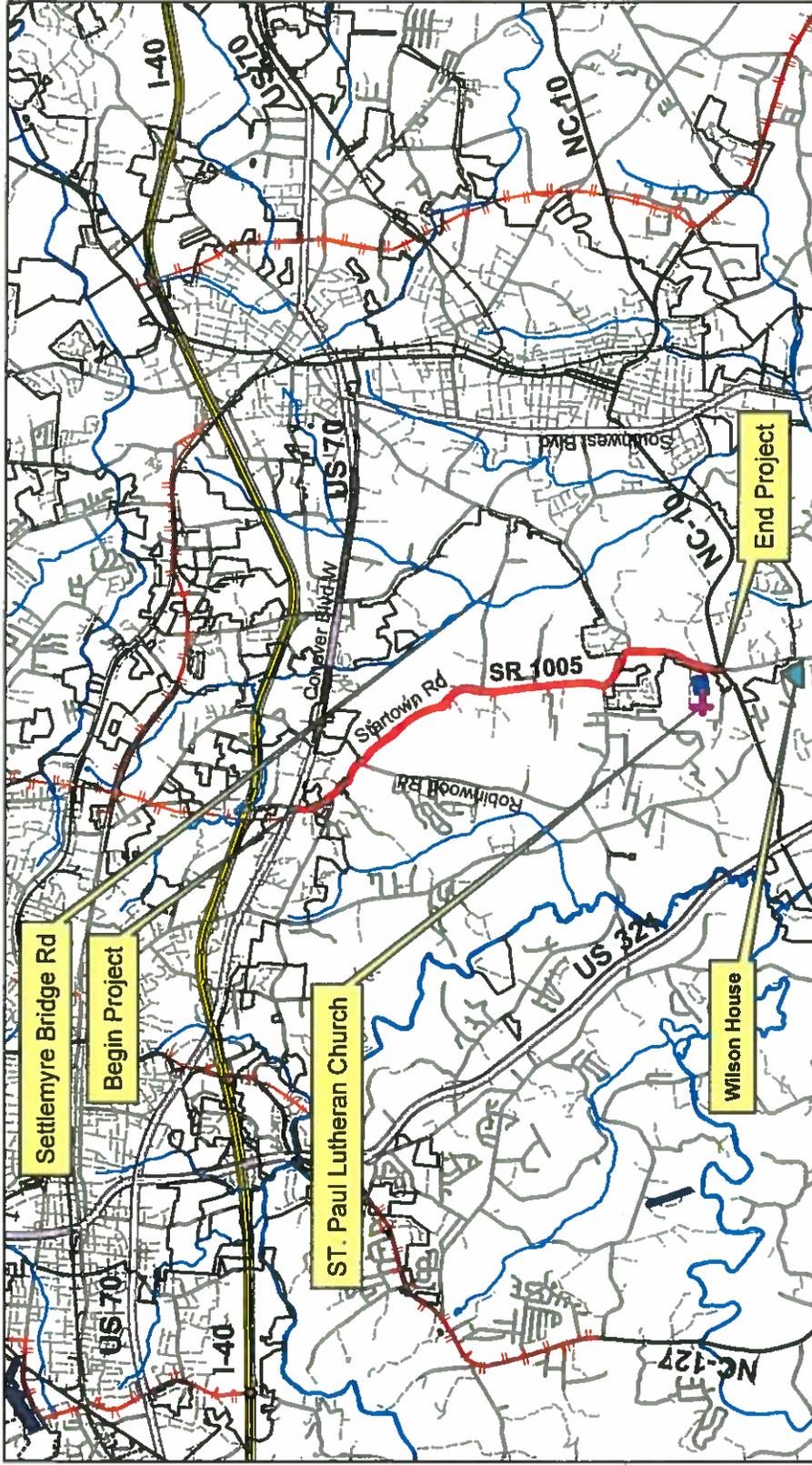
The proposed widening is symmetrical along existing NC 10, a distance of approximately 1.42 miles. However, due to right-of-way constraints at the US 321 overpass, this four-lane divided shoulder section would need to be transitioned to a five-lane curb and gutter section. The total cost for this portion is estimated to be \$7,400,000. Widening this section of NC 10 is considered beyond the scope of this project and the costs is not included in the project alternatives See Figures 1 and 2.

In addition, further analysis indicates that the Benefit-Cost Ratio for this project is 2.67.

Startown Road is a designated bike route and special accommodations for bicycles are included in the recommended improvements in this report.

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Figure 1



Project Limits
Alt 1, 2, 3 & 4

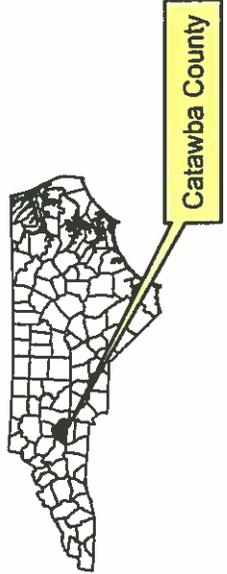


FIGURE - 2



- Existing Startown Rd/NC 10 Alignment
 - Proposed Startown Rd Realignment
 - Proposed NC 10 Improvement
 - Proposed RWV varies between 130' - 150'
- Scale = 600m : 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FS-0212D
Description: Widening of SR 1005 Startown Road from US 70 to NC 10
City: Startown
County: Catawba
Division: 2

NO.	BY	DATE	NO.	DATE	SHEET
1		3			
2		4			