

FEASIBILITY STUDY

**Replacement of Bridge No. 91
On US 29/74 over the Catawba River**

Gaston and Mecklenburg Counties

Divisions 10 and 12

FS-0812A



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

Lynnise M. Hawes

**Lynnise M. Hawes, P.E.
Feasibility Studies Engineer**

Derrick W. Lewis

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

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Date

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I. General Description

This feasibility study describes the replacement of Bridge No. 91, which crosses over the Catawba River and includes the widening of US 29/74 from NC 7/SR 2083 (Hazeleen Avenue) to SR 1191 (Old Dowd Road), a distance of approximately 1.1 miles. The project location is shown on Figure 1. As part of the study, several different cross-sections were investigated, the details of which are as follows:

- ◆ **ALTERNATIVE 1:** Six-lane divided curb and gutter section, with 14-foot outside travel lanes to accommodate bicycles.
- ◆ **ALTERNATIVE 2:** Six-lane divided curb and gutter section, with 4-foot bicycle lanes.
- ◆ **ALTERNATIVE 3:** Six-lane divided curb and gutter section, with 6-foot bicycle lanes.

This is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the proposed project including cost, and to identify potential problems that may require consideration in the planning and design phases.

II. Background

The purpose of this project is to replace Bridge No. 91, which currently has a low sufficiency rating, and to improve the traffic safety and operations along US 29/74. Mecklenburg County, Gaston County, the City of Belmont, the Mecklenburg-Union Metropolitan Organization (MPO), and the Gaston Urban Area MPO officials support this project.

US 29/74 is designated as a principal arterial in the North Carolina Statewide Functional Classification System and as a major thoroughfare in the 2004 Mecklenburg-Union MPO Thoroughfare Plan. US 29/74 is also designated as a six-lane roadway in 2004 Gaston Urban Area MPO Thoroughfare Plan. US 29/74 currently varies from a six-lane curb and gutter section west of NC 7 to a four-lane curb and gutter section east of SR 1191 (Old Dowd Road) with pavement widths varying from 40-70 feet, face to face of curb. The development along US 29/74 is predominantly commercial.

Bridge No. 91 is a four-lane bridge, 40 feet wide and 1,124 feet long which crosses over the Catawba River. Bridge No. 91 was built in 1933 and has a sufficiency rating of 65.4 out of 100.

III. Traffic and Safety

There are two existing traffic signals within the proposed project study area which may need to be modified to accommodate the proposed improvements. They are located at the following intersections:

- US 29/74 and NC 7/SR 2083 (Hazeleen Avenue)
- US 29/74 and SR 1191 (Old Dowd Road)

The current year Average Daily Traffic (ADT) along US 29/74 ranges from 18,000 vehicles per day (vpd) to 22,500 vpd. For the design year 2035, the traffic volume along US 29/74 is estimated to range between 27,300 vpd to 35,000 vpd. Truck traffic is estimated to make up approximately 6 percent of the daily traffic.

The existing segment of US 29/74 operates at a level of service (LOS) D under current traffic volumes. If no improvements are made in the 2035 design year, it is projected that US 29/74 will operate at a LOS E. With the proposed improvements, this segment of US 29/74 is projected to operate at a LOS D or better.

Between 2004 and 2007, 18 crashes were reported within the proposed project study area. The crash rate for US 29/74 is 194.31 crashes per 100 million vehicle miles (crashes/100MVM) traveled. This rate is lower than the statewide rate of 413.81 crashes/100MVM for four-lane divided with no control access urban United States routes. There were 5 non-fatal injury crashes, 13 property damage only crashes, and no fatal crashes. The most prevalent types of crashes were Rear End (50%), Angle (17%), and Ran Off Road (11%).

IV. Description of Alternatives

It is proposed to replace Bridge No. 91 and widen US 29/74 from NC 7/ SR 2083 (Hazeleen Avenue) to SR 1191 (Old Dowd Road), a distance of approximately 1.1 miles. The project alternatives are shown on Figure 1. For evaluation purposes, the project was divided into two segments. The details of each are below:

SECTION 1: This segment along US 29/74 is from NC 7/SR 2083 (Hazeleen Avenue) to SR 1600 (Moores Chapel Loop), a distance of approximately 0.7 miles.

Option A: Six-lane divided curb and gutter section, 103 feet from face to face of curb, with 12-foot travel lanes, 14-foot outside travel lanes to accommodate bicycles, a 23-foot raised grass median, 15-foot berms, and 6-foot sidewalks on 150 feet of right of way. The costs below include new dual bridges over the Catawba River.

With this proposed cross-section, it is anticipated that there will be zero (0) residences and one (1) business relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction is estimated to be \$33,500,000.

| | |
|--|---------------------|
| Right of Way..... | \$500,000 |
| Utility Relocation..... | \$200,000 |
| <u>Construction.....</u> | <u>\$32,800,000</u> |
| Total Cost (Section 1 – Option A)..... | \$33,500,000 |

Option B: Six-lane divided curb and gutter section, 107 feet from face to face of curb, with 12-foot travel lanes, 4-foot bicycle lanes, a 23-foot raised grass median, 15-foot berms, and 6-foot sidewalks on 150 feet of right of way. The costs below include new dual bridges over the Catawba River.

With this proposed cross-section, it is anticipated that there will be zero (0) residences and one (1) business relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction is estimated to be \$33,700,000.

| | |
|--|---------------------|
| Right of Way..... | \$500,000 |
| Utility Relocation..... | \$200,000 |
| <u>Construction.....</u> | <u>\$33,000,000</u> |
| Total Cost (Section 1 – Option B)..... | \$33,700,000 |

Option C: Six-lane divided curb and gutter section, 111 feet from face to face of curb, with 12-foot travel lanes, 6-foot bicycle lanes, a 23-foot raised grass median, 15-foot berms, and 8-foot sidewalks on 150 feet of right of way. The costs below include new dual bridges with decorative lighting and railings over the Catawba River.

With this proposed cross-section, it is anticipated that there will be zero (0) residences and one (1) business relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction is estimated to be \$37,300,000.

| | |
|--|---------------------|
| Right of Way..... | \$500,000 |
| Utility Relocation..... | \$200,000 |
| <u>Construction.....</u> | <u>\$36,600,000</u> |
| Total Cost (Section 1 – Option C)..... | \$37,300,000 |

The following intersection improvements are recommended and are included in the costs of all of the alternatives shown above:

- US 29/74 and NC 7
 - addition of dual westbound left turn lanes on US 29/74
 - addition of a southbound thru lane on NC 7

SECTION 2: This segment along US 29/74 is from SR 1600 (Moore's Chapel Loop) to SR 1191 (Old Dowd Road), a distance of approximately 0.4 miles.

Option A: Six-lane divided curb and gutter section, 103 feet from face to face of curb, with 12-foot travel lanes, 14-foot outside travel lanes to accommodate bicycles, a 23-foot raised grass median, 15-foot berms, and 6-foot sidewalks on 150 feet of right of way.

With this proposed cross-section, it is anticipated that there will be zero (0) residences and four (4) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction is estimated to be \$5,200,000.

| | |
|--|--------------------|
| Right of Way..... | \$900,000 |
| Utility Relocation..... | \$300,000 |
| <u>Construction.....</u> | <u>\$4,000,000</u> |
| Total Cost (Section 2 – Option A)..... | \$5,200,000 |

Option B: Six-lane divided curb and gutter section, 107 feet from face to face of curb, with 12-foot travel lanes, 4-foot bicycle lanes, a 23-foot raised grass median, 15-foot berms, and 6-foot sidewalks on 150 feet of right of way.

With this proposed cross-section, it is anticipated that there will be zero (0) residences and four (4) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction is estimated to be \$5,300,000.

| | |
|--|--------------------|
| Right of Way..... | \$900,000 |
| Utility Relocation..... | \$300,000 |
| <u>Construction.....</u> | <u>\$4,100,000</u> |
| Total Cost (Section 2 – Option B)..... | \$5,300,000 |

Option C: Six-lane divided curb and gutter section, 111 feet from face to face of curb, with 12-foot travel lanes, 6-foot bicycle lanes, a 23-foot raised grass median, 15-foot berms, and 8-foot sidewalks on 150 feet of right of way.

With this proposed cross-section, it is anticipated that there will be zero (0) residences and four (4) businesses relocated due to this project. The total cost of this alternative, including right of way, utility relocation, and construction is estimated to be \$5,600,000.

| | |
|--|--------------------|
| Right of Way..... | \$900,000 |
| Utility Relocation..... | \$300,000 |
| <u>Construction.....</u> | <u>\$4,400,000</u> |
| Total Cost (Section 2 – Option C)..... | \$5,600,000 |

An additional cost of \$220,000 will be added to the total project cost for Intelligent Transportation Systems (ITS) deployment.

US 29/74 is not a "State Bicycling Highway", however it is an important regional facility for bike, pedestrian, and greenway users. All alternative cross-sections include accommodations for bicycles.

V. Community Issues

A detailed investigation was not conducted for this feasibility study, however possible impacts to a state owned property are anticipated.

Maps at the Survey and Planning Branch of the North Carolina State Historic Preservation Office were used to determine if any historic properties on the National Register of Historic Places (NRHP) or state study lists exist within the proposed project study area. No properties within the proposed project study area were found to be a potential historic property.

VI. Natural Environment Issues

The following is a preliminary review of environmental issues that might impact this project. The information obtained for the environmental screening is from Geographic Information System (GIS) databases. The purpose of the environmental screening is to identify potential environmental issues early in the process.

Stream Classification

The proposed project study area is located in the Catawba River Basin. US 29/74 crosses the Catawba River, which has a stream classification of WS-IV B CA. This water body will likely need to be surveyed and have the appropriate coordination with the North Carolina Department of Environment and Natural Resources (NCDENR) and the U.S. Army Corps of Engineers (USACE) during any environmental document study. The project study area is also located in a water supply watershed.

Wetlands

US 29/74 crosses wetlands associated with the Catawba River. Permitting with the U.S. Army Corps of Engineers (USACE) will likely need to be obtained before construction of the project, and appropriate mitigation measures should be taken if deemed necessary.

Threatened and Endangered Species

There were no threatened and endangered species identified within the proposed project study area.

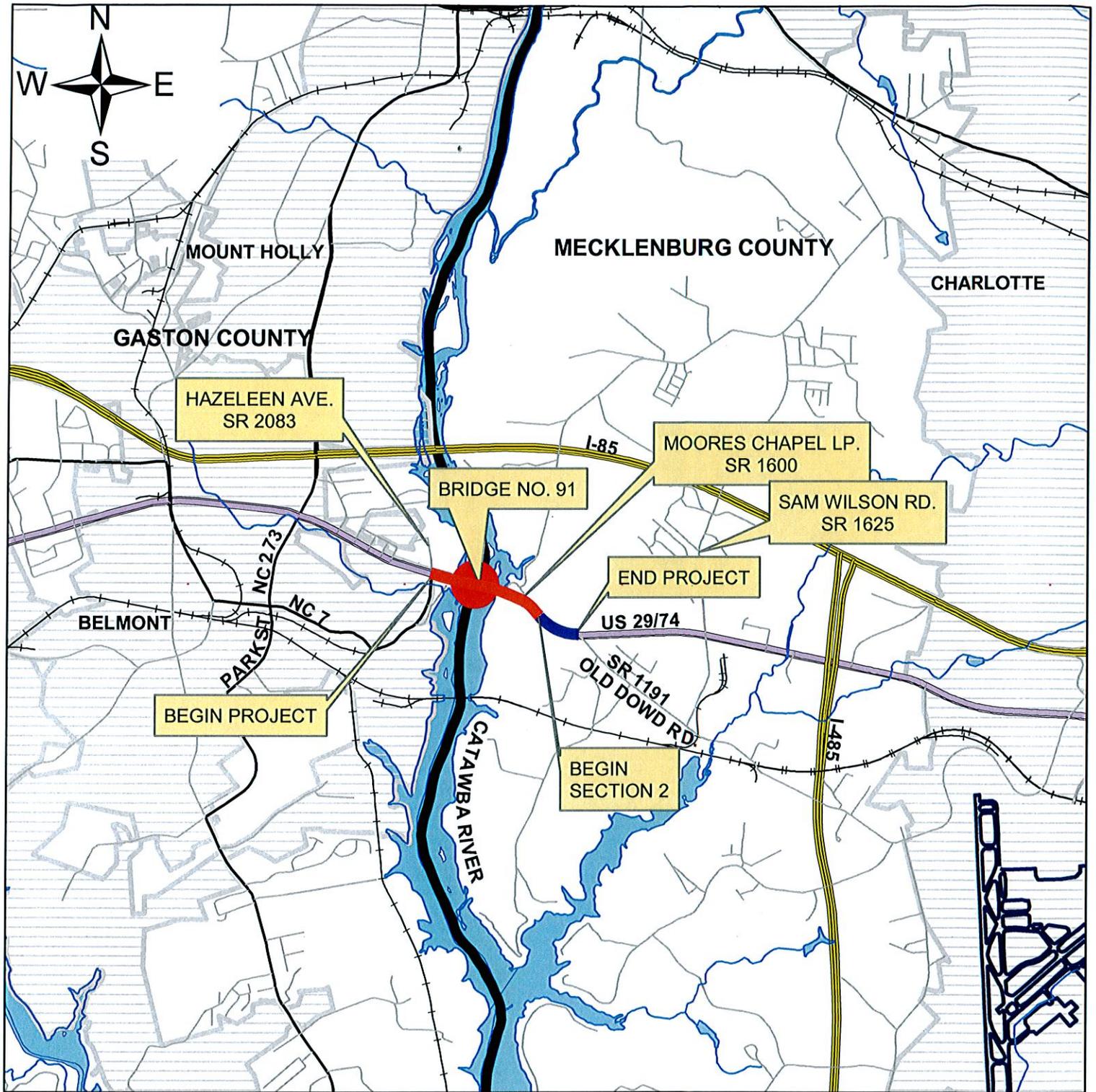
VII. Recommendations

SECTIONS 1 & 2 (OPTIONS A, B, & C): It was found that the six-lane divided curb and gutter section would be able to accommodate the projected 2035 design year traffic volumes with an acceptable level of service. Option A is the least expensive of all the alternatives, however, Option B provides dedicated bicycle lanes at a nominal cost. It should be noted that Option C is preferred by the local Metropolitan Planning Organizations because it includes additional amenities, such as wider sidewalks, decorative railings, and lighting, but has a significant higher cost. Therefore, Option B is the preferred alternative for Sections 1 and 2 because it accommodates bicycles and pedestrians effectively.

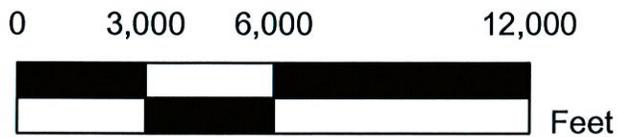
The total combined estimate for the preferred alternatives in Section 1 (Option B) and Section 2 (Option B), new dual bridges over the Catawba River, the recommended intersection improvements, and ITS deployment is \$39,220,000. It is anticipated that a total of zero (0) residences and five (5) businesses will be relocated along US 29/74. Please see Table 1 for a comprehensive breakdown of alternatives and costs.

| Section | Alternative | Right of way Cost | Utility Relocation Cost | Construction Cost | Total Cost | Residences Relocated | Businesses Relocated |
|--|-----------------|--------------------|-------------------------|---------------------|---------------------|----------------------|----------------------|
| 1 | Option A | \$500,000 | \$200,000 | \$32,800,000 | \$33,500,000 | 0 | 1 |
| | Option B | \$500,000 | \$200,000 | \$33,000,000 | \$33,700,000 | 0 | 1 |
| | Option C | \$500,000 | \$200,000 | \$36,600,000 | \$37,300,000 | 0 | 1 |
| 2 | Option A | \$900,000 | \$300,000 | \$4,000,000 | \$5,200,000 | 0 | 4 |
| | Option B | \$900,000 | \$300,000 | \$4,100,000 | \$5,300,000 | 0 | 4 |
| | Option C | \$900,000 | \$300,000 | \$4,400,000 | \$5,600,000 | 0 | 4 |
| ITS Deployment | | | | \$220,000 | \$220,000 | | |
| Total Project Cost Option A | | \$1,400,000 | \$500,000 | \$37,020,000 | \$38,920,000 | 0 | 5 |
| Total Project Cost (preferred alternative) Option B | | \$1,400,000 | \$500,000 | \$37,320,000 | \$39,220,000 | 0 | 5 |
| Total Project Cost Option C | | \$1,400,000 | \$500,000 | \$41,220,000 | \$43,120,000 | 0 | 5 |

Table 1: Project Costs



█ SECTION 1
█ SECTION 2



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 PROGRAM DEVELOPMENT

FS-0812A

REPLACE BRIDGE NO. 91

US 29/74
 FROM NC 7 TO SR 1191 (OLD DOWD RD.)

GASTON & MECKLENBURG COUNTIES

DIVISIONS 10 & 12

FIGURE 1