# FEASIBILITY STUDY

Cary
US 1/64
From US 64 to SR 1313
Wake County
U-3101

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

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8/1/94
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Cary
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## I. GENERAL DESCRIPTION

This feasibility study describes proposed improvements to US 1/64 in Cary, Wake County. The improvements include addition of one northbound travel lane between Cary Parkway (a non-system street) and SR 1313 (Walnut Street), and addition of one southbound lane between US 64 and SR 1313. This will result in three through travel lanes, in each direction of travel, between US 64 and SR 1313. Three northbound lanes currently exist between US 64 and Cary Parkway.

Also, it is proposed to rehabilitate the existing pavement between US 64 and SR 1313. Construction of the additional through travel lanes will require minor revisions to several interchange ramps as identified below. The project location is shown on Figure 1. The total project length is approximately 2.6 miles (4.2 km). Some additional right-of-way will be required, however, no relocatees are expected. The total cost including construction and right-of-way is estimated to be $14,400,000.

This study 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 costs, and identify potential problems that may require consideration in the planning and design phases.

## II. NEED FOR PROJECT

The purpose of this project is to increase the traffic carrying capacity and safety of this section of roadway.

This facility is classified a Freeway in the Greater Raleigh Urban Area Thoroughfare Plan and is an Urban Freeway/Expressway in the North Carolina Functional Classification System.

The 1994 Average Daily Traffic (ADT) on this roadway is estimated to be 40,700 vehicles per day (vpd) and the ADT in the design year (2015) is estimated to be 55,700 vpd. Based on these traffic projections, this road is currently operating at Level Of Service (LOS) C; however, by the 2015 design year the LOS will become E. With the proposed

improvements, the LOS based on 1994 traffic will be Level B, and in 2015, Level C.

During the period from June 1, 1990, through May 31, 1993, there were 114 accidents reported on US 1/64 between the project limits. This resulted in an accident rate of 94 accidents per 100 million vehicle miles (Acc/100MVM), compared to a statewide average of 75 Acc/100 MVM for similar urban US routes during 1993. There were no fatalities reported during the period, but 35 of the accidents resulted in injuries. The most prevalent accident types were rearend (34%), and ran-off-road (26%). The increased capacity and rehabilitated pavement provided by the proposed improvements will reduce the potential for these types of accidents.

Land adjacent to this corridor is mostly developed. The development is both commercial and residential. Access to this facility is fully controlled.

This roadway, within the project limits, is a 4-lane, median divided, controlled access facility. The grass median is approximately 36 feet (11.0 m) wide. Within the median there are paved shoulders that vary in width from 2 feet (0.6 m) to 4 feet (1.2 m).

In the southbound travel direction there are two 12-foot (3.6-m) wide lanes, and a 12 foot (3.6 m) wide outside shoulder, including a paved shoulder 4 feet (1.2 m) wide.

In the northbound travel direction, between US 64 and Cary Parkway, there are three 12-foot (3.6-m) wide lanes and a 12-foot (3.6-m) wide outside shoulder, including a paved shoulder 4 feet (1.2 m) wide. The outside travel lane is discontinued at Cary Parkway, where it becomes an exit ramp.

From Cary Parkway to SR 1313, there are two northbound travel lanes. There is an outside shoulder approximately 12 feet (3.6 m) wide including a paved shoulder 4 feet (1.2 m) wide.

There are two structures within the project limits. Bridge #171 carries SR 1300 (Kildaire Farm Road ) over the project roadway and has a sufficiency rating of 88.9. Bridge #635 carries Cary Parkway over the project roadway and has a sufficiency rating of 97.9. At Cary Parkway there is a diamond interchange, and at SR 1300, a grade separation. Neither of these structures is expected to require alteration due to this project.

## III. RECOMMENDATIONS

It is recommended to rehabilitate the existing concrete pavement and widen US 1/64, from US 64 to south of SR 1313 in

Cary, Wake County. The total project length is approximately 2.6 miles (4.2 km). The project location is shown as Figure 1. The recommended improvements include the following:

1. Rubblize and resurface the concrete pavement between the southern gore of the collector/distributor lanes on the west side of US 1/64 (south of SR 1313) and the gore at the southbound exit ramp to US-64; a distance of approximately 2.6 miles (4.2 km).

2. Construct one additional northbound lane, from Cary Parkway to SR 1313, a distance of approximately 1.8 miles (2.9 km). This new lane will begin, just south of Cary Parkway as a continuation of the existing northbound lane that now ends as an exit ramp. The northbound exit ramp to Cary Parkway and the northbound entrance ramp from Cary Parkway will require revision. At SR 1313 the new lane will discontinue and tie into the existing exit ramp. Inside and outside paved shoulders, 10 feet (3.0 m) wide, will be provided, and will serve as breakdown lanes.

3. Construct one additional southbound lane, generally between the same construction limits as described in item 1 above. The entrance and exit ramps at Cary Parkway will require revision to accommodate the new lane. At US 64 the new lane will discontinue and tie into the existing exit ramp. The total construction length will be approximately 2.6 (4.2 km) miles. Inside and outside paved shoulders, 10 feet (3.0 m) wide, will be provided, and will serve as breakdown lanes.

The total estimated cost including construction and right-of-way is $ 14,400,000 as follows:

| | |
|---|---|
| Construction ..... | $ 13,300,000 |
| Right-of-Way ..... | 1,100,000 |
| Total Cost ..... | $ 14,400,000 |

## V. OTHER COMMENTS

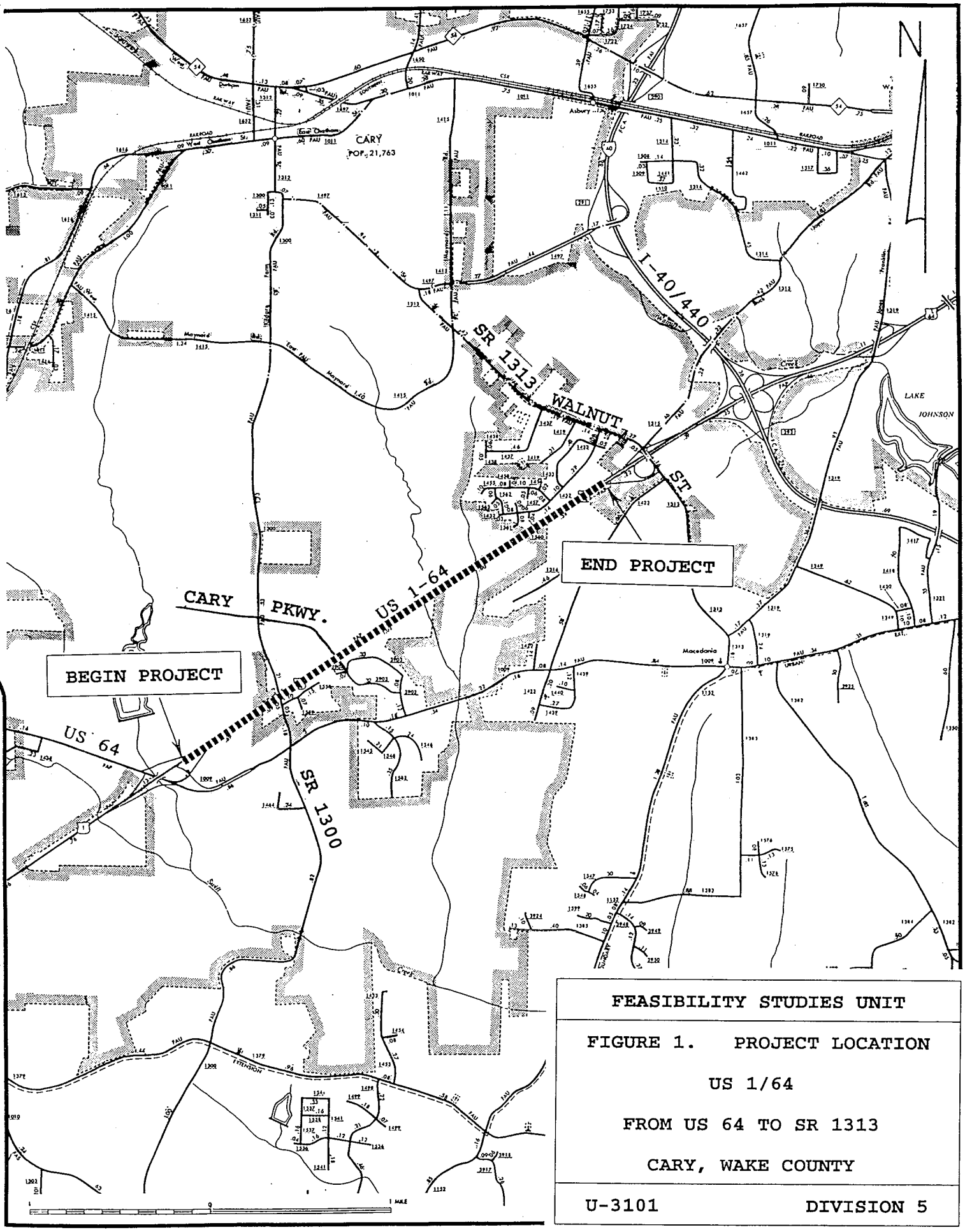
An environmental screening was not conducted for this study. A small area of wetlands will be encountered.

No special accommodation for bicycles is recommended on this project. No bicycles are allowed on full access controlled facilities.

The southbound entrance ramp from SR 1313, the northbound exit ramp to SR 1313, and all the ramps at Cary

Parkway, will require minor revision to accommodate the new through lanes.

The majority of the required new right-of-way is located adjacent to and on both sides of US 1/64, along segments extending approximately 1000 feet (304.9 m) from Cary Parkway measured from the approximate existing ramp gore points. Also, some new right-of-way will be required on the west side of US 1/64 for a distance of approximately 1000 feet (304.9 m) measured from the gore point of the southbound ramp from SR 1313.




| FEASIBILITY STUDIES UNIT |
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| FIGURE 1. PROJECT LOCATION |
| US 1/64 |
| FROM US 64 TO SR 1313 |
| CARY, WAKE COUNTY |
| U-3101 DIVISION 5 |

# FEASIBILITY STUDY

Burlington
Chapel Hill Road (NC 54)
From Church Street (US 70)
to
Maple Avenue (NC 49/NC 100)
Alamance County
U-2907

Prepared by
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6/25/93
Date

Burlington
Chapel Hill Road (NC 54)
From Church Street (US 70)
to
Maple Avenue (NC 49/NC 100)
Alamance County
U-2907

## I. GENERAL DESCRIPTION

This preliminary study describes proposed improvements to Chapel Hill Road (NC 54) in Burlington. Also, a short segment of O'Neal Avenue, a non system street, near the west project terminal will be improved. For a location map, please see Figure 1. It is proposed to widen O'Neal Avenue from Church Street (US 70) to Chapel Hill Road and widen Chapel Hill Road from O'Neal Avenue to Maple Avenue (NC 49/NC 100). The total project length is 3.6 miles.

A 5-lane curb and gutter section (64 feet face to face) with two travel lanes in each direction and a center turn lane, is proposed for the entire project length on a 100 foot wide right of way.

The widening will retain and utilize the existing alignment to the extent possible and will be generally symmetrical to the centerline of the existing O'Neal Avenue and Chapel Hill Road.

It is estimated that there will be no residences or businesses relocated as a result of this project.

The total cost for right of way, construction, and incident management is estimated to be $ 7,600,000.

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 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. NEED FOR PROJECT

The purpose of this project is to improve the traffic carrying capacity and accident experience of Chapel Hill Road in Burlington. The project was requested by the Alamance County Transportation Advisory Committee and has been endorsed by the City of Burlington and Alamance County.

Chapel Hill Road is designated a major thoroughfare on the Alamance County Urban Area Thoroughfare Plan and a major arterial in the North Carolina Statewide Functional Classification System.

Development on Chapel Hill Road is generally dense residential development between O'Neal Avenue and Mebane Street, dense commercial development from Mebane Street to Tucker Street and medium density mixed residential/commercial development between Tucker Street and Maple Avenue. Development on O'Neal Avenue is generally light density commercial development.

Chapel Hill Road is generally a 2-lane, 2-way, 24 foot wide, shoulder section with 4 foot wide soil shoulders. There is approximately 100 feet of curb and gutter section west of Mebane Street and 200 feet east.

O'Neal Avenue is a 3-lane, 2-way, curb and gutter section (39 feet wide from face to face of curbs).

The eastern project terminal is the signalized intersection at Maple Avenue. The north leg on Maple Avenue is 60 feet wide and the south leg is 64 feet wide (including a 4 foot median). Both the north and south legs consists of one combination thru-right lane, one thru lane, one left turn lane, and two exit lanes. The Chapel Hill Road leg is widened at this intersection and includes one right turn lane, one thru lane, one left turn lane, and two exit lanes.

The intersection of O'Neal Street and Church Street is signalized. Church Street at this location is a 5-lane curb and gutter, median divided section (68 feet face to face and 4 foot median). Each of the Church Street legs include one thru-right lane, one thru lane, one left turn lane, and two exit lanes. The O'Neal Street leg consists of one thru-right lane, one left turn lane, and one exit lane.

In addition to the project terminals, the intersections with SR 1363 (Mebane Street), SR 1154 (Tucker Street), and Corporation Parkway are signalized.

There is one culvert located on Chapel Hill Road located immediately west of SR 1154 (Tucker Street). The culvert is a quadruple 8 foot by 12 foot reinforced box culvert, was constructed in 1931, and has a sufficiency rating of 97.3.

The 1993 Average Daily Traffic (ADT) on Chapel Hill Road is estimated to be 12,300 vehicles per day (vpd). The design year (2015) volume on Chapel Hill Road is estimated to be 17,500 vpd.

The Level Of Service (LOS) is currently estimated to be a level E on Chapel Hill Road. With the proposed improvements the LOS is expected to improve to a level B which should prevail through the design year. Without these improvements it is estimated that a level F will be reached prior to the design year.

During the period from August 1, 1989 through July 31, 1992, there were 175 accidents reported on Chapel Hill Road between Church Street and Maple Avenue. This resulted in an accident rate of 640.1 accidents per 100 million vehicle miles (Acc/100MVM), compared to a statewide average of 266.5 Acc/100 MVM for all urban NC routes during 1992. There were no fatalities reported during the period, but 95 of the accidents resulted in injuries. The most prevalent accident types were rear-end (53.21%), angle (20.0%), and left turn (15.4%). The wider cross section with center turn lane proposed will reduce the potential for these types of accidents.

This project is strategically located along the I-40/I-85 corridor and has been suggested by the Division Engineer as a potential alternate route for incident management use.

## III. RECOMMENDATIONS

It is proposed to widen O'Neal Avenue from Church Street to Chapel Hill Road and widen Chapel Hill Road from O'Neal Avenue to Maple Avenue. The total project length is 3.6 miles. For a location map, please see Figure 1.

A 5-lane curb and gutter section (64 feet face to face) with two travel lanes in each direction and a center turn lane, is proposed for the entire project length on a 100 foot wide right of way.

The widening will retain and utilize the existing alignment to the extent possible and will be generally symmetrical to the centerline of the existing O'Neal Avenue and Chapel Hill Road.

Also, as shown on Figure 2, it is proposed to: (1) construct a cul-de-sac immediately southeast of the existing intersection of Church Street and Chapel Hill Road, (2) eliminate the existing connector between O'Neal Avenue and Chapel Hill Road located at Trail Two, and (3) remove a section of pavement on existing Chapel Hill Road immediately southeast of Highview Street. Construction of this project and project U-2906 will eliminate the need for the traffic signal at the existing intersection of Church Street, Chapel Hill Road, and NC 62.

Chapel Hill Road at the western project terminal, and Maple Avenue at the eastern project terminal, should each include the following lanes: one combination thru-right turn lane, one thru lane, one left turn lane, and two exit lanes. The traffic signals at the terminals and at Mebane Street, Tucker Street, and Corporation Parkway will require additional signal heads.

It is recommended that costs associated with traffic signal revisions to accommodate future incident management systems along the I-40/I-85 corridor be included in this project.

It is estimated that there will be no residences or businesses relocated as a result of this project.

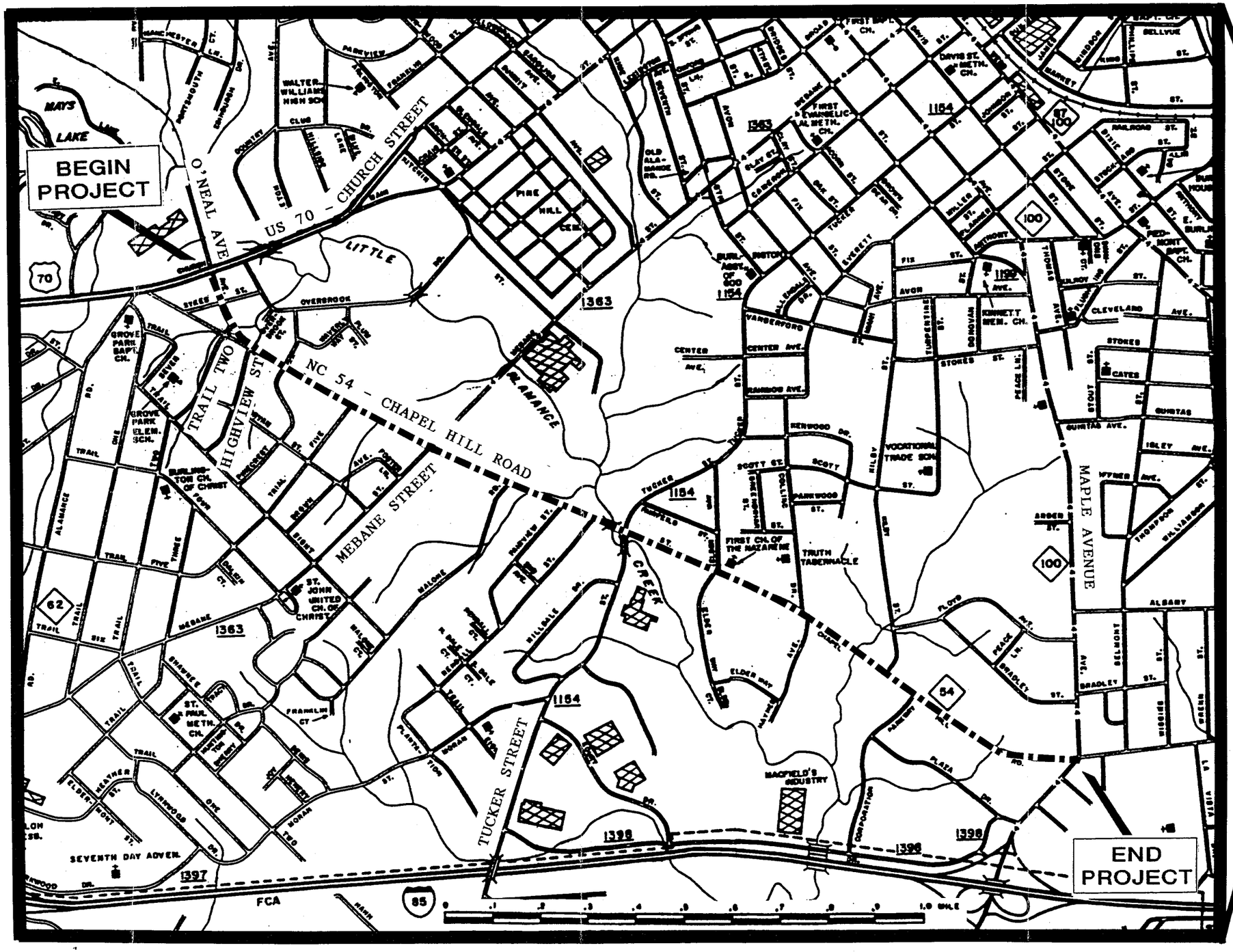
The total cost for right of way, construction, and incident management is estimated to be $ 7,600,000 as follows:

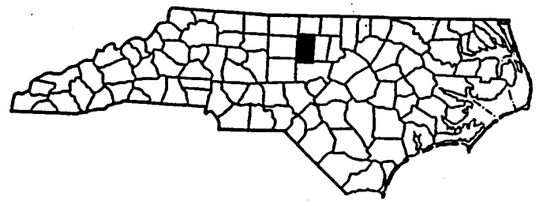
| | |
|---|---|
| Right of Way Cost | $ 2,800,000 |
| Construction Cost | 4,700,000 |
| Incident Management Cost | 100,000 |
| Total Cost | $ 7,600,000 |

## V. OTHER COMMENTS

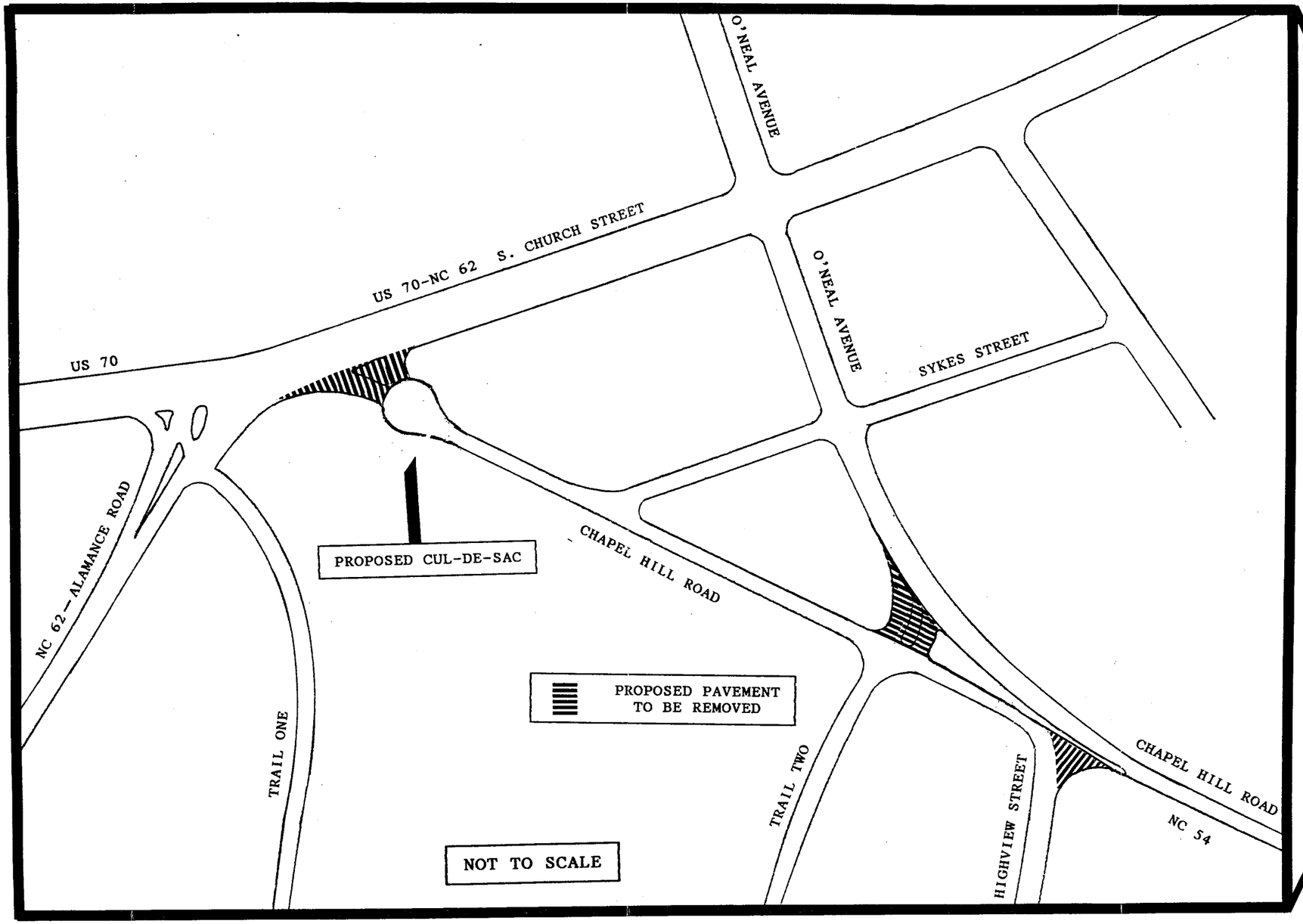
The NCDOT Bicycle Program has identified Chapel Hill Road as a roadway which does not have need for special accommodations for bicycles.

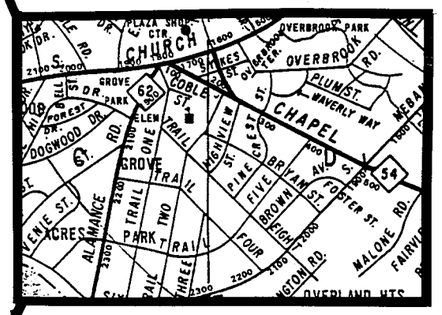
An environmental screening was not conducted for this study, however, no wetlands or historic properties were identified.




| FEASIBILITY STUDIES UNIT | | |
|---|---|---|
| FIGURE 1. PROJECT LOCATION<br>NC 54<br>FROM CHURCH STREET (US 70)<br>TO MAPLE AVENUE (NC 100)<br>BURLINGTON ALAMANCE COUNTY | | |
| U-2907 | DIV. 7 | FIGURE 1 |




| FEASIBILITY STUDIES UNIT |
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| FIGURE 2. STREET LAYOUT AT NW PROJECT TERMINAL<br><br>NC 54<br>FROM CHURCH STREET (US 70)<br>TO MAPLE AVENUE (NC 100)<br><br>BURLINGTON ALAMANCE COUNTY |
| U-2907 DIV. 7 FIGURE 2 |