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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

1534 MAIL SERVICE CENTER, RALEIGH, N.C. 27699-1534

W. LYNDO TIPPETT
SECRETARY

January 8, 2002

MEMORANDUM TO: Ms. Nina Szlosberg, Member, Board of Transportation
Mr. Tyrone Y. Cox, Member, Board of Transportation
Mr. Jon G. Nance, P.E., Division Engineer, Division 5
Mr. David D. King
Mr. C. W. Leggett, P.E.
Mr. T. A. Peoples, P.E.(3) Attention: Jim Dunlop, P.E.
Mr. J. B. Williamson
Mr. Bill Gilmore, P.E. (2)
Ms. D. M. Barbour, P.E.
Mr. J. E. Alford, P.E.
Mr. Blake Norwood, P.E.
✓ Mr. A. L. Avant
✓ Mr. Ray McIntyre, P.E.
Mr. J. D. Lane
Mr. H. A. Tasaico, P.E., Attention: Omar S. Sultan

FROM: Derrick W. Lewis, P.E.
Feasibility Studies Unit

SUBJECT: Feasibility Study # FS-0105A, Timber Drive (SR 2812) Extension /
Greenfield Parkway Connector, Garner, Wake County.

Our staff has completed a feasibility study for the subject proposed project. This brief analysis suggests improvements that would be logical if the project were to be funded. A copy of our report is attached for your information.

DWL/dl

Attachment

cc: Mr. R. L. Hill, P.E.
Mr. L. A. Sanderson, P.E.
Mr. Brad Bass, Director of Planning, Town of Garner

FILE COPY
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FEASIBILITY STUDY

Garner

Timber Drive (SR 2812) Extension/Greenfield Parkway Connector

Wake County

Division 5

FS-0105A

U-4703

Prepared For:

N.C. Department of Transportation



Derrick W. Lewis

Derrick W. Lewis, P. E.
Feasibility Studies Engineer

12/6/07

Date



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B. Keith Skinner, P. E.
Project Manager

12/05/07

Date

Garner
Timber Drive (SR 2812) Extension/Greenfield Parkway Connector
Wake County
Division 5
FS-0105A

I. General Description

This feasibility study describes the extension of Timber Drive (SR 2812) from NC 50 eastward to existing Greenfield Parkway a distance of approximately 2.5 miles. Two alternatives were evaluated for this study. Alternative 1 is on new location for the entire length and Alternative 2 utilizes existing Hillandale Lane (SR 2876) for about 0.2 miles with the remainder being on new location. See Figure 1 for a vicinity map showing the project's location. We recommend that Alternative 1 be implemented in order to minimize the impacts to the residential area along Hillandale Road. The recommended cross section is a four-lane, curb and gutter roadway with a 20 ft. raised median on 150-foot right-of-way. Sidewalks were included on both sides of the roadway for estimating purposes.

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 to identify potential problems that may require consideration in the planning and design phases.

II. Need for Project

As documented in the Garner Transportation Plan, dated November 16, 1999, there is a need in the Garner community to provide the public with more travel lanes and better traffic signal timing to help relieve the growing congestion in the area. A key role in achieving this goal is to provide parallel routes to US 70. The Timber Drive/Greenfield Parkway Connector project, along with the existing Timber Drive facility, will provide such a route through the southern portion of the Town of Garner.

There are plans for future development within the currently undeveloped land along this project's corridor. This project could play a key role in this future development as well as the economic growth in the area. Also, the Timber Drive Extension/Greenfield Parkway Connector will provide the public with an alternative route to the Greenfield Industrial Park.

III. Alternatives Descriptions

Alternative No. 1 (Recommended)

Alternative No. 1 begins at the existing NC 50 / Timber Drive (SR 2812) intersection and continues to the east for approximately 1,200 feet where it curves to the north and then back to the east and continues in an easterly direction to the north of the Hillandale Subdivision and crosses White Oak Road (SR 2876) approximately 650 feet to the north of the intersection of Hillandale Lane (SR 2876) and White Oak Road. Alternative No. 1 then curves to the south and continues in a southeasterly direction towards the existing unpaved Salt Hill Road (SR 2708). The alignment then curves to the east prior to crossing Salt Hill Road, utilizing a small portion of that road, and continues in a northeasterly direction towards I-40. The alignment then crosses over I-40 with a grade separation and continues northeasterly before ending at existing Greenfield Parkway. The total length of this alignment is approximately 2.58 miles. This alternative is entirely on new location. The proposed typical section is a four lane, divided curb and gutter section, 76 ft. wide from face-to-face of curbs, with a 20 ft. wide raised median and

10 ft. wide berms. The cross section includes 14 ft. wide outside lanes to accommodate bicycle traffic and sidewalks on both sides of the roadway.

It is anticipated that the above-mentioned improvements will require the relocation of approximately one (1) residence and no businesses. This particular residence has been identified as a potential historic structure. A detailed historic analysis will likely be required during the later planning and design stages of this project. In addition, a commercial development is planned in the area north of the Hillandale Subdivision and in the White Oak Road area. As a result, the proposed alignment may need to be shifted in the planning and/or the design stages. Slight shifts in the proposed alignment should not greatly affect the overall cost of this alternative. The total cost of Alternative No. 1, including construction and right-of-way, is estimated to be \$19,000,000.

Construction	\$ 17,800,000
Right-of-way	\$ 1,200,000
Total Cost	\$ 19,000,000

Alternative No. 2

Alternative No. 2 begins where existing NC 50 / Timber Drive (SR 2812) intersection and continues to the east for approximately 3,100 ft. where it ties to and widens existing Hillandale Road (SR 2876) for approximately 0.7 miles. At this point, the alignment crosses Whiteoak Road (SR 2547) with an at-grade intersection and then curves to the south and continues in a southeasterly direction towards the existing unpaved Salt Hill Road (SR 2708). Alternative No. 2 then curves to the east prior to crossing Salt Hill Road, utilizing a small portion of that road, and continues in a northeasterly direction towards I-40. The alignment then crosses over I-40 with a grade separation and continues northeasterly before ending at existing Greenfield Parkway. The total length of this alignment is approximately 2.52 miles. This alternative consists of a roadway on new location as well as widening approximately 0.7 miles of the existing Hillandale Lane. The proposed typical section for the new location portion of this alternative is a four lane, divided curb and gutter section, 76 ft. wide from face-to-face of curbs, with a 20 ft. wide raised median and 10 ft. wide berms. The proposed typical section for the section of roadway along Hillandale Lane is a five lane, 68 ft. wide face-to-face curb and gutter section. Both cross sections include 14 ft. wide outside lanes to accommodate bicycle traffic, 10 ft. berms, and sidewalks on both sides of the roadway.

It is anticipated that the above-mentioned improvements will require the relocation of no residences and no businesses. However, right-of-way impacts to the homeowners along Hillandale Lane will be significant. Verification of septic system impacts along Hillandale Lane will be required in the later planning and/or design stages. The total cost of Alternative No. 2, including construction and right-of-way, is estimated to be \$18,600,000.

Construction	\$ 16,900,000
Right-of-way	\$ 1,700,000
Total Cost	\$ 18,600,000

In both Alternatives 1 and 2, we considered relocating New Rand Road to tie to NC 50, 1,200 feet north of the existing NC 50 / Timber Drive intersection. Existing New Rand Road will be cul-de-saced, eliminating the north approach to the existing New Rand Road / Timber Drive intersection. The south approach will remain, although restricted to right-in right-out movements. See Figure 2 for a vicinity map showing this option. The total cost of this relocation, including construction and right-of-way, is estimated to be \$1,300,000.

Construction	\$ 650,000
Right-of-way	\$ 650,000
Total Cost	\$1,300,000

The total cost for Alternative No.1 and Alternative No.2, including the New Rand Road Option, is \$20,300,000 and \$19,900,000 respectively.

IV. Traffic Operations

The purpose of this section is to explain the status of future traffic operations for this proposed facility and to recommend any additional measures needed to ensure that traffic will operate at acceptable levels of service. The decision to install new traffic signals at any location will be made by the Area Traffic Engineer based on final design plans. This study only makes recommendations based on the projected traffic volumes.

The estimated year 2005 Average Daily Traffic (ADT) volume for the Timber Drive Extension from New Rand Road to Greenfield Parkway ranges from 8,900 to 9,700 vehicles per day (vpd). The estimated year 2025 ADT volume ranges from 13,200 to 15,000 vpd.

Based on the projected traffic volumes and the proposed four-lane curb and gutter typical section, it is estimated that the mainline portion of this facility will operate at a Level of Service (LOS) A, based on both the base year (2005) and future year (2025) traffic volumes. These Levels of Service were determined using the "Multilane Module" of the HCS2000 software package. However, we anticipate that poor traffic operations will occur at some of the major intersections unless additional improvements are provided.

It should be noted that the Timber Drive / NC 50 intersection and the Timber Drive / New Rand Road intersections are located approximately 320 ft. apart (center to center). Therefore, it is highly likely that vehicular queues between the intersections will adversely impact traffic operations. In order to alleviate this problem, we considered the relocation of New Rand Road in order to form a new intersection with NC 50, approximately 1,200 feet north of the existing Timber Drive intersection. The existing Timber Drive / New Rand Road intersection would be restricted to right in / right out movements only. With these improvements, we anticipate that these intersections will operate at a "C" LOS or better in the 2025 design year, under signalized conditions.

At the Timber Drive / White Oak Road intersection, we recommend that an exclusive right and left turn lane be provided on both White Oak Road approaches. This new intersection will operate at a LOS C for base year traffic volumes and LOS E for the future year traffic volumes, under signalized conditions. These Levels of Service were determined using the "Signals Module" of the HCS2000 software package. In order to achieve a LOS D for the future year volumes, an additional thru lane on White Oak Road will be needed. This is considered well beyond the scope of the project.

The proposed roadway ends at the existing "T" intersection of Greenfield Parkway and Pergo Parkway creating a new "four legged" intersection. Traffic volumes were not provided for this intersection; therefore a signal capacity analysis has not been conducted at this location.

V. Other Alternates Considered

This feasibility study evaluates the two alternatives previously described. Any additional routes to the south of Hillandale Lane would not be desirable due to the existence of extensive wetlands, Town of Garner Parks property and existing residential development.

VI. Recommendations

Although alternative No. 2 utilizes 0.2 miles of existing right-of-way and roadway and costs less to build, it does place an additional 15,000 vpd, in the year 2025, into a residential neighborhood. This additional traffic will increase safety concerns and unnecessarily impact the

neighborhood atmosphere of Hillandale Road.. Therefore, we recommend that Alternative 1 be implemented under this project because it will not impact Hillandale Road.

VII. Additional Comments

An exhaustive environmental screening was not conducted for this study. However, the following items were identified as needing more detailed analyses during future planning and/or design phases:

- Based on the National Wetland Inventory Mapping, less than 1/3 acre of wetlands will be impacted by this project.
- Neuse River Buffer Rules will need to be considered. A new crossing of Mahler's Creek, which eventually runs into the Neuse River, will be required. Based on this study, approximately 250 linear feet of stream will be impacted.
- There is a house in the project study area (north of SR 2876) that may be an issue and should be reviewed for historical significance during later planning and design stages.
- Locations of septic field in the Hillandale Subdivision will have to be determined for possible impacts for Alternative No. 2.

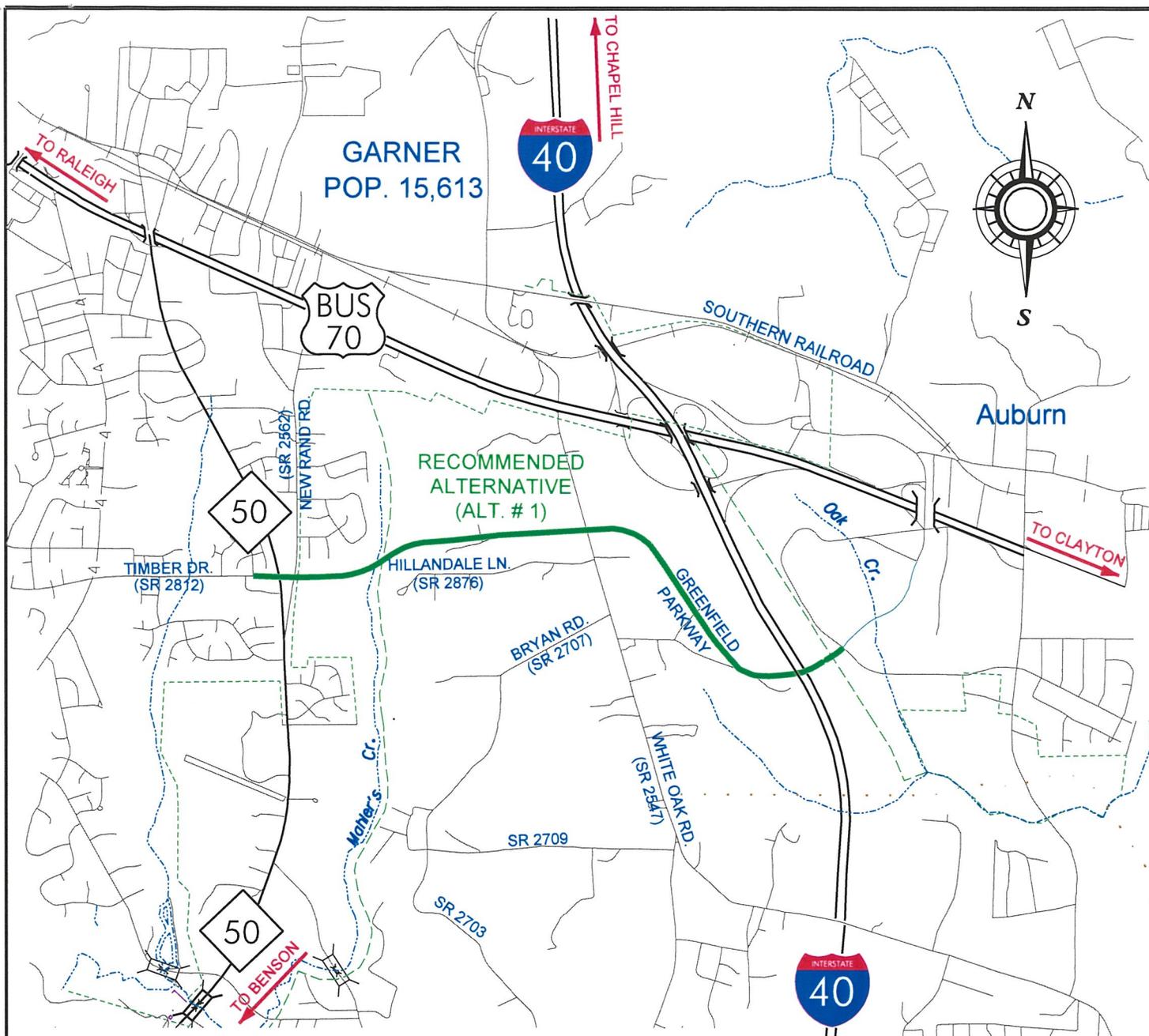
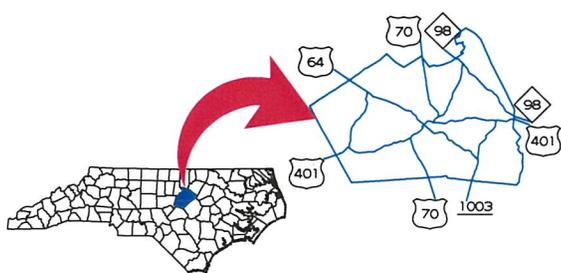


FIGURE 1



SCALE



**TIMBER DRIVE EXTENSION/
GREENFIELD PARKWAY
CONNECTOR
VICINITY MAP**

JUNE 2001



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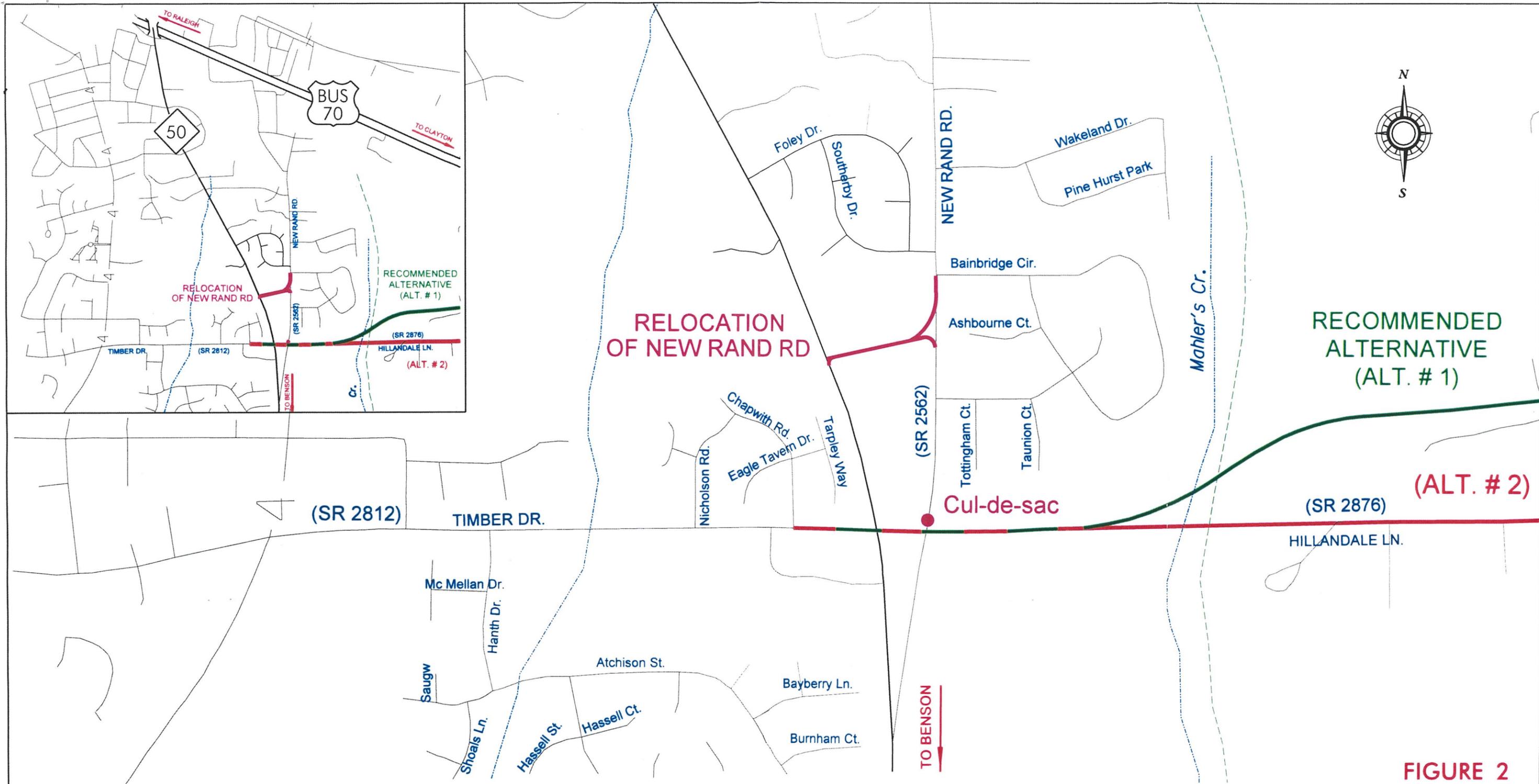
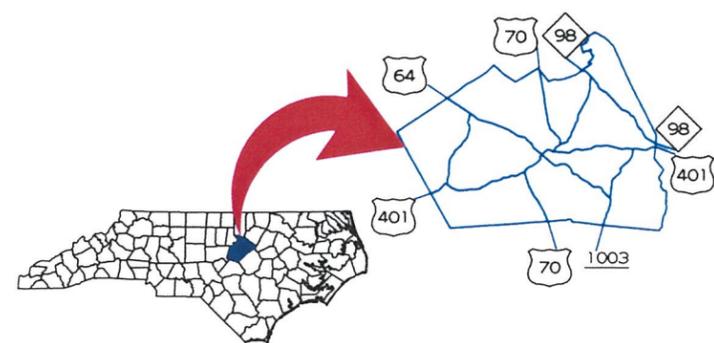


FIGURE 2



viB-4-01 rev. 10-10-01

**TIMBER DRIVE EXTENSION/
GREENFIELD PARKWAY
CONNECTOR**

RELOCATION OF NEW RAND ROAD

OCTOBER 2001

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