

**NC 49 & SR 1144 (MACK ROAD)  
INTERSECTION AND APPROACHES**

Operational/Geometric Improvements and  
Roadway Relocation/Realignment in Asheboro  
Randolph County, North Carolina

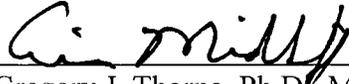
WBS ELEMENT -- 47025.1.1  
FEDERAL AID PROJECT NO. STPNHS-0049(30)  
**TIP PROJECT NO. U-5305**

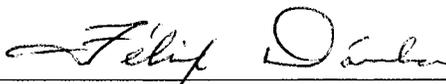
ADMINISTRATIVE ACTION  
**CATEGORICAL EXCLUSION**

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
AND  
N.C. DEPARTMENT OF TRANSPORTATION

submitted pursuant to the National Environmental Policy Act  
42 USC 4332(2)(c)

APPROVED:

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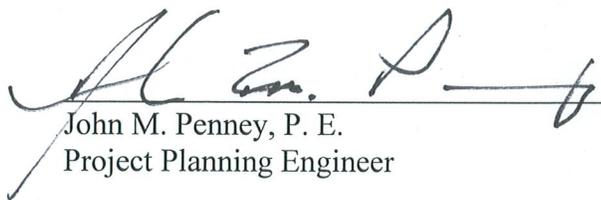
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**CATEGORICAL EXCLUSION**

**OCTOBER 2012**

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# PROJECT COMMITMENTS

## NC 49 & SR 1144 (MACK ROAD) INTERSECTION AND APPROACHES Operational/Geometric Improvements and Roadway Relocation/Realignment in Asheboro Randolph County, North Carolina

WBS ELEMENT – 47025.1.1  
FEDERAL AID PROJECT NO. STPNHS-0049(30)  
**TIP PROJECT NO. U-5305**

### Commitments Developed through Project Development and Design

#### Division 8 Construction/Resident Engineer's Office

- Prior to and during construction a minimum of four (4) week advance notice of construction activities, including anticipated construction phasing, in each direction of US 64, NC 49 and SR 1144 (Mack Road) will be provided to the following entities:
  - Asheboro City School System (in order to re-route buses);
  - Randolph County School System (in order to re-route buses), and;
  - Randolph County EMS;

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**NC 49 & SR 1144 (MACK ROAD)  
INTERSECTION AND APPROACHES  
OPERATIONAL/GEOMETRIC IMPROVEMENTS AND  
ROADWAY RELOCATION/REALIGNMENT IN ASHEBORO  
RANDOLPH COUNTY, NORTH CAROLINA**

FEDERAL AID PROJECT NO. STPNHS-0049(30)  
WBS ELEMENT – 47025.1.1  
**TIP PROJECT NO. U-5305**

This document is a Categorical Exclusion (CE) for the proposed improvements to NC 49 and SR 1144 (Mack Road) in Randolph County, North Carolina.

This CE has been prepared by the North Carolina Department of Transportation (NCDOT) in coordination with the Federal Highway Administration (FHWA). It is intended to satisfy the requirements of both the National Environmental Policy Act (NEPA) and the North Carolina Environmental Policy Act. The document conforms to the Council on Environmental Quality (CEQ) guidelines [40 CFR 1508.4], which implement the procedural provisions of NEPA, and the FHWA Guidance for Preparing and Processing Environmental and Section 4(f) Documents (Technical Advisory T6640.8A, 1987). The proposed project meets the criteria for a CE as denoted in 23 CFR 771.117(d) (2).

## **I. DESCRIPTION OF PROPOSED ACTION**

### **A. General Description**

The proposed project involves the closure of the existing Connector Road between NC 49 and US 64 and the extension of SR 1144 (Mack Road) across NC 49 to the eastern intersection of US 64 and Fisher Circle to include ancillary improvements to NC 49 and US 64, dedicated right turn lanes and extended left turn lanes, at the above referenced intersections. Approximately 100 foot of right of way plus easements will be required for the proposed facility. The project length is approximately one quarter (0.25) mile long. The location of the project is shown on Figure 1.

### **B. Cost Estimates**

The total cost of the proposed improvements as stated in the 2012-2020 State Transportation Improvement Program (STIP) is \$1,875,000 which includes \$375,000 for Right of Way and \$1,500,000 for construction.

## **II. PURPOSE AND NEED FOR PROJECT**

### **A. Purpose of Project**

The proposed project is intended to improve connectivity between NC 49 and US 64, relieve congestion at the intersection of NC 49 and SR 1144 (Mack Road), improve the Level of Service at the NC 49/ SR 1144 (Mack Road) and NC 49/ Connector Road intersections, improve travel time for local residents and provide operational improvements to NC 49, US 64 and SR 1144 (Mack Road).

### **B. Need for Project**

Currently, traffic traveling westbound on NC 49 west of US 220/I-73/I-74 must turn left on to Connector Road then right on to continue along NC 49. Of the current 15,100 Average Annual Daily Traffic (AADT) on US 64/NC 49 immediately east of the Connector Road approximately 20 percent is turning left. The US 64/NC 49/Connector Road intersection is an unsignalized T-intersection. Currently this intersection operates at a Level of Service (LOS) of F/F, i.e. F (failing) in the AM peak and F (failing) in the PM peak.

Right turns from the Connector Road and out of the Tank and Tummy fuel center add an additional 30 percent of traffic to NC 49 at the NC 49/ SR 1144 (Mack Road) intersection. The NC 49/ SR 1144 (Mack Road) intersection is an unsignalized T-intersection. Currently this intersection operates at a Level of Service (LOS) of F/F, i.e. F (failing) in the AM peak and F (failing) in the PM peak, see Figure 5A.

Crash rates on NC 49 between SR 1323 (Oakleaf Road) and Bridge Number 171 over US 64 exceed the statewide rate for total crashes. The predominant crash type was rear-end crashes due to vehicles slowing or stopping, 52 percent of all crashes. Due to the number and location of existing driveways, existing intersections (NC 49/ SR 1144 (Mack Road), NC 49/ Connector Road and NC 49 eastbound ramp) and the spacing between each, and lack of sufficient left turn lane storage there is insufficient distance to allow for safe stopping distance at the posted 35 MPH on NC 49.

Traffic on the roadways within the study area, US 64, NC 49, Connector Road and SR 1144 (Mack Road), is forecasted to increase in the design year, 2040.

### **C. Description of Existing Conditions**

The junction of NC 49 and US 64 is a partial interchange comprised of ramps and connector roads. This junction is west of the US 64/NC 49 - US 220/Future I-73/Future I-74 interchange and includes Bridge Number 171 over US 64/NC 49. Directly west of Bridge Number 171 is the US 64/NC 49/Connector Road intersection. At the US 64/NC 49/Connector Road intersection motorist either continue straight to travel west on US 64 or turn left on to Connector Road and then right onto NC 49 south. The length of the current Connector Road (from NC 49 to US 64) is approximately 475 feet. The distance between the intersection of NC 49/Connector Road and

NC 49/SR 1144 (Mack Road) is approximate 300 feet. The distance between the intersection of US 64/Connector Road and US 64/Fisher Circle is approximate 275 feet.

### 1. Functional Classification

Based on the North Carolina Functional Classification System, NC 49 and US 64 are classified as Principal Arterials and SR 1144 (Mack Road) is classified as a Minor Arterial in the project study area. Connector Road and Fisher Circle are classified as local roads.

### 2. Physical Description of Existing Facility

The project study area encompasses four unsignalized T-intersections (NC 49 and SR 1144 (Mack Road), NC 49 and Connector Road, eastern intersection of US 64 and Fisher Circle, and US 64 and Connector Road) and a free flow off ramp from north bound NC 49 to US 64/NC 49 (West Dixie Drive), as shown on Figure 2.

Left turn movements on to NC 49 from Mack Road and the Connector Road average 3-5 minutes of delay during off peak travel times.

Neighborhood shopping and services for west Asheboro is located on NC 49 west of the NC 49/SR 1144(Mack Road) intersection. Access to these services from Mack Road area requires a left turn on to NC 49 from Mack Road.

Mack Road provides access to numerous residential areas, Sherwood Place Senior Living Center, two churches and three schools (a high school, a middle school and an elementary school) from NC 49.

### 3. Right of Way and Access Control

The right-of-way widths vary for each roadway in the project limits, as noted in Table 1.

**Table 1. Existing Right of Way**

| Roadway               | Right of Way Width* | Comments                      |
|-----------------------|---------------------|-------------------------------|
| NC 49                 | 100 feet            | Asymmetrical about Centerline |
| SR 1144 (Mack Road)   | 60 feet             | Symmetrical about Centerline  |
| Connector Road        | 80 feet             | Symmetrical about Centerline  |
| US 64                 | 150 feet            | Asymmetrical about Centerline |
| Fisher Circle-Private | 40 feet             | Asymmetrical about Centerline |

#### **4. Speed Limit**

NC 49 is posted with a speed limit of 35MPH within the project limits. The Connector Road is not posted but is within the municipal limits of Asheboro therefore is restricted to a speed limit of 35MPH within the project limits. Fisher Circle, a private residential street, does not have a posted speed limit. US 64 and SR 1144 (Mack Road) are posted with a speed limit of 45MPH within the project limits.

#### **5. Interchange/Grade Separated Crossings**

There are no interchanges within the project limits.

One grade separated crossing, SR 1713 (Albemarle Road) over US 64, exists east of the project limits.

#### **6. Railroads**

There are no railroads within the project limits.

#### **7. Service Roads**

No service roads are located within the study area for the project. A service drive exists east of the project limits and is located midway on the eastbound ramp of NC 49 and connects to Shana Lane and Lambert Drive. This service drive provides access to a manufacturing/ light industrial facility, commercial businesses and one single family residence.

#### **8. Bicycle and Pedestrian Facility/Greenways**

No bicycle or pedestrian facility/greenways are located within the study area for the project.

#### **9. Utilities**

Utilities within the project area include telephone, power, cable television, water and sewer.

#### **10. School Bus Usage**

Both the Asheboro City School System and Randolph County School System have school buses traveling within the project study area. The Asheboro City School System has four (4) buses that travel through the NC 49/SR 1144 (Mack Road) intersection twice daily and four (4) buses that travel through the US 64/Fisher Circle intersection twice daily. The Randolph County School System has one (1) bus that travels through the NC 49/SR 1144 (Mack Road) intersection morning only.

## 11. Other Modes of Transportation

Other modes of transportation include transit, rail, motor freight service and non-motorized (pedestrian and bicycle). Currently, there are no transit, rail or non-motorized modes of transportation available in the project study area. Though there are no motor freight service providers within the project study area, large truck usage of the roadways average between five (5) and six (6) percent.

## 12. Airports

The Asheboro Municipal Airport is located approximately 4.2 miles west of the project off of NC 49, via SR 1163 (Tot Hill Farm Road).

## 13. Other Highway Projects in the Area

Currently, there are five projects included in the Draft 2013-2023 State Transportation Improvement Plan (STIP) located in or near the project study area.

TIP Project I-4407 - US 220/Future I-73/Future I-74 from south of NC 134-US 220 Business to north of SR 1462 in Asheboro, involves safety improvements to bring the facility to Interstate standards. Under Construction

TIP Project R-2536 - US 64, Asheboro Southern Bypass, from US 64 West of Asheboro to US 64 East of Asheboro, involves the construction of a four lane freeway on new location with interchanges at US 220, NC 49 and ZOO Access Road at NC 159. Schedule as noted below:

- Section AA - Asheboro Bypass, from existing US 64 west of Asheboro to north of NC 49. Right-of-Way and Construction are to begin in fiscal year 2014.
- Section AB - Asheboro Bypass, from north of NC 49 to west of US 220 Bypass. Right-of-Way and Construction are to begin in fiscal year 2014.
- Section B - Asheboro Bypass - from west of US 220 Bypass to north of SR 2834 (Old Cox Road). Right-of-Way and Construction are to begin in fiscal year 2014.
- Section C - Asheboro Bypass, from north of SR 2834 (Old Cox Road) to existing US 64 north of SR 2604 (Luck Road). Right-of-Way and Construction are to begin in fiscal year 2014.
- Section D - ZOO Access Road, from the proposed Asheboro Bypass to NC 159. Future Year Project (after 2023).

TIP Project I-5313 – US 220/Future I-73/Future I-74 from the Montgomery County Line to US 220 Business, involves pavement rehabilitation. Construction is to begin in fiscal year 2022.

TIP Project B-5363 - Replacement of Bridge Number 171 on SR 1713 (Albemarle Rd) over US 64 and NC 49. Construction is to begin in fiscal year 2019.

TIP Project R-2220 - US 64 from east of I-85 Business in Lexington to US 220 in Asheboro, involves widening to four lanes. Future Year Project (after 2023)

**D. Traffic Volumes**

Traffic volumes for the roadways within the project study area were developed for a base year of 2012 and design year 2040. The base year (2012) traffic volumes for each roadway are listed in Table 2.

**Table 2. 2012 Traffic Volumes (VPD)**

| Roadway               | Traffic Volume Ranges |
|-----------------------|-----------------------|
| NC 49                 | 16,100 – 20,600       |
| SR 1144 (Mack Road)   | 7,300                 |
| Connector Road        | 3,500                 |
| US 64                 | 12,500 – 15,100       |
| Fisher Circle-Private | 200                   |

The design year (2040), without the proposed project, traffic volumes for each roadway are listed in Table 3.

**Table 3. 2040 Traffic Volumes<sup>1</sup> - Without the Proposed Project (VPD)**

| Roadway               | Traffic Volume Ranges |
|-----------------------|-----------------------|
| NC 49                 | 15,800 – 21,300       |
| SR 1144 (Mack Road)   | 9,000                 |
| Connector Road        | 4,600                 |
| US 64                 | 15,000 – 18,500       |
| Fisher Circle-Private | 300                   |

<sup>1</sup>US 64 Bypass (R-2536) in place

The design year (2040), with the proposed project, traffic volumes for each roadway are listed in Table 4.

**Table 4. 2040 Traffic Volumes<sup>1</sup> - With the Proposed Project (VPD)**

| Roadway                                  | Traffic Volume Ranges |
|--|-----------------------|
| NC 49                                    | 14,100 – 18,000       |
| SR 1144 (Mack Road)                      | 9,000                 |
| Mack Road Extension (New Connector Road) | 4,700 – 5,600         |
| US 64                                    | 14,500 – 18,200       |
| Fisher Circle-Private                    | 1,100 <sup>2</sup>    |

<sup>1</sup>US 64 Bypass (R-2536) in place

<sup>2</sup>Left turns out of Citgo DW will be prohibited and will be routed to Fisher Circle along with a quarter of the right turns

Figures 2, 3 and 4 depict the base and design year daily traffic volumes for the proposed project limits.

**E. Crash Data**

A crash analysis was conducted for the project study area for a three year time period, from March 1, 2008 to February 28, 2011. There were 25 crashes on NC 49 between SR 1323 (Oakleaf Road) and Bridge Number 171 over US 64. The predominant crash type was rear-end crashes due to vehicles slowing or stopping, 52 percent of all crashes. Table 5 shows a comparison of the crash rates of the analyzed section versus statewide rates. The crash rate on the analyzed section exceeds the statewide rates for the Total, Non-Fatal and Wet Crash Rates and is approaching the critical rate for Total Crashes.

**Table 5. Crash Rate Comparison for NC 49**

| Rate             | Crashes | Crashes per 100MVM* | Statewide Rate** | Critical Rate |
|------------------|---------|---------------------|------------------|---------------|
| Total            | 25      | 317.10              | 224.99           | 319.23        |
| Fatal            | 0       | 0.00                | 0.68             | 11.86         |
| Non-Fatal Injury | 9       | 114.16              | 76.03            | 133.47        |
| Night            | 0       | 0.00                | 46.90            | 93.38         |
| Wet              | 5       | 63.42               | 36.53            | 78.29         |

\* Million Vehicle Miles Traveled (MVM)

\*\*2007-2009 Statewide rates for urban North Carolina Routes per MVM

**F. Transportation and Land Use Plans and Other Transportation Documents**

**1. Transportation Plans**

Randolph County Comprehensive Transportation Plan 2010 indicates that both NC 49 and US 64 are “in need of improvement” and identifies SR 1144 (Mack Road) as a Minor Thoroughfare.

**2. Other Transportation Documents**

NCDOT State Transportation Improvement Program (STIP) – The approved NCDOT 2012-2020 STIP provides funding for this project.

### III. ALTERNATIVES

#### A. Preliminary Study Alternatives Developed During Project Scoping

An internal prescoping meeting was held by North Carolina Department of Transportation (NCDOT) staff on November 10, 2010. During the meeting a project study area was developed and alternatives were discussed. As a result of the meeting the three (3) alternatives suggested were as follows:

- Alternative 1** - Extend SR 1144 (Mack Road) from NC 49 to US 64, convert the existing T intersections of NC 49/ SR 1144 (Mack Road) and the US 64/ eastern Fisher Circle to four-way intersections, and remove the existing Connector Road between NC 49 and US 64;
- Alternative 2** - Relocate SR 1144 (Mack Road), from SR 1204 (Sherwood Avenue), northeastward to line up with the existing Connector Road, making the existing NC 49/Connector Road T intersection a four-way intersection, and;
- Alternative 3** - Relocate SR 1144 (Mack Road), a.k.a. extension of SR 1204 (Sherwood Avenue), westward to SR 1323 (Oak Leaf Road) near its existing signalized intersection with NC 49. This alternative would include realigning SR 1323 (Oak Leaf Road), north of NC 49, to a new location west of existing US 64/ SR 1323 (Oak Leaf Road) intersection and adjustments to the ramp from US 64 – NC 49 (W. Dixie Drive) to SR 1713 (Albemarle Road) west of US 220 (I-73/74) was proposed to be studied as a means to relieve congestion in the area.

On February 24, 2011 a scoping meeting was held for the project. The alternatives developed during the November 10, 2010 meeting were discussed. The results of the discussion are as follows:

- Alternative 1** - The proposed improvements would solve the immediate issues of safety and connectivity. Extending SR 1144 (Mack Road) on new location between NC-49 and US 64 (W. Dixie Drive) should begin at existing Mack Road and terminate at Fisher Circle, avoiding offset intersections. Round-a-bouts would not be an option for proposed improvements. This alternative would eliminate two (2) T intersections. The proposed four-way intersections should be analyzed for signalization. The estimated amount of realignment is approximately 650 feet.

**This Alternative was carried forward for further study.**

- Alternative 2** - Concerns were discussed with the relocation of SR 1144 (Mack Road) northeastward to line up with the existing Connector Road. This alternative would move traffic nearer to existing congestion in the

vicinity of the interchange of US 220 (I-73/74) and US 64 – NC 49 (W. Dixie Drive). Additionally the relocation would create a five leg intersection with NC 49/ Connector Road/relocated SR 1144 (Mack Road) and SR 1713 (Albemarle Road). Concerns were also raised regarding the structure, Bridge Number 171, on SR 1713 (Albemarle Road) over US 64 – NC 49 (W. Dixie Drive) - TIP Project Number B-5363 since it is not scheduled to be replaced in the current STIP until 2020. This alternative would eliminate one (1) T intersection. The proposed five-way intersections should be analyzed for signalization. The estimated amount of realignment is approximately 900 feet.

**This Alternative was not carried forward for further study.**

**Alternative 3** - Concerns were discussed with the extension of SR 1204 (Sherwood Avenue) to SR 1323 (Oak Leaf Road) adding more traffic to the rapid developing portion of SR 1323 (Oak Leaf Road) south of NC 49. Currently, there are two new commercial developments at the southeast and southwest quadrants of the NC 49/SR 1323 (Oak Leaf Road) intersection which service western Asheboro and Randolph County citizens. This alternative would eliminate one (1) T intersection but create two (2) off-set T intersections SR 1323 (Oak Leaf Road)/US 64 and SR 1428 (Oakgrove Road)/US 64. This alternate would be the most extensive with the extension of SR 1204 (Sherwood Avenue) approximately 1100 feet and the realignment of SR 1323 (Oak Leaf Road) approximately 1400 feet.

**This Alternative was not carried forward for further study.**

No other alternatives were presented for consideration.

## **B. Alternatives Carried Forward for Consideration**

### **1. No Build Alternative**

A No Build Alternative can be either short term minor activities (related to safety and maintenance, etc.) or a “no action” activity.

#### **1.a. No Build Alternative - Short Term Minor Activity (Safety)**

Minor safety improvements typically include the addition of turn lanes, channelization of traffic, reduction of conflict points and signalization.

Left turn lanes currently exist on NC 49 at both the intersection of SR 1144 (Mack Road) and the intersection of the Connector Road, on SR 1144 (Mack Road) at the NC 49 intersection and on US 64 at the intersection with the Connector Road.

Channelization (addition of medians) on NC 49 and US 64 at the SR 1144 (Mack Road) and Connector Road intersections would assist in accommodating the left turns but would restrict access to the existing commercial properties.

Reduction of conflict points, closure of existing driveways to properties, would severely restrict access to existing businesses with in the project study area.

Signalizing the existing intersections of US 64/Connector Road, NC 49/Connector Road, and NC 49/SR 1144 (Mack Road) would assist in accommodating the left turns but would restrict access to the existing commercial properties. The spacing between the existing intersections, sight distance, current posted speed limits and directional splits of traffic are not favorable for signalization.

Separately or combined these items will not address the purpose and need for the project.

#### **1.b. No Build Alternative – No Action Activity**

A No Action alternative is not practicable since taking No Action will not improve the Level of Service (LOS) at the US 64/Connector Road and the NC 49/SR 1144 (Mack Road) intersection with the increase of traffic in the design year, 2040.

### **2. Alternative Modes of Transportation**

Alternative modes of transportation (bicycle, pedestrian accommodations and transit options) are not practicable since they will not improve the geometric conditions for the project.

### **3. Extension of SR 1144 (Mack Road) on new location between NC-49 and US 64 (W. Dixie Drive)**

This alternative consists of extending SR 1144 (Mack Road) from NC 49 to US 64, converting the existing T intersections of NC 49/ SR 1144 (Mack Road) and the US 64/ eastern Fisher Circle to four-way intersections, and removing the existing Connector Road between NC 49 and US 64. This alternative is analyzed in further detail in this document.

## **C. Traffic Operational Analysis**

A Traffic Operational Analysis was performed on the following nine locations:

- US 64 (West Dixie Drive) and Oak Leaf Road / Oakgrove Road;
- US 64 (West Dixie Drive) and Fisher Circle [eastern] / Thomas Tire Driveway;
- US 64 (West Dixie Drive) and Connector Road / CITGO Driveway;
- Merge on US 64(West Dixie Drive) from Albemarle Road;
- Weave on US 64/ NC 49 (West Dixie Drive) between ramp from NC 49 (Albemarle Road) and ramp to US 220 / I-73 / I-74;
- Diverge from NC 49 to US 64/NC 49 (West Dixie Drive);
- NC 49 (Albemarle Road) and Connector Road;

- NC 49 (Albemarle Road) and Mack Road / Auto Exchange Driveway, and;
- NC 49 (Albemarle Road) and Oak Leaf Road.

The purpose of the analysis was to describe the proposed action, evaluate traffic operations of the Existing and No-Build conditions, and to identify recommended improvements and evaluate the proposed Build condition.

The traffic capacity analysis was performed on four scenarios:

- Year 2012 Existing - The Year 2012 Existing Scenario was analyzed in order to provide an assessment of the current conditions. This scenario assumed no modifications to the existing roadway geometry and traffic control. The existing lane geometry is shown in Figure 5A. The signal timing data for the only signalized intersection, NC 49 and Oak Leaf Road, was obtained during the field visit from the signal controller.;
- Year 2040 No-Build - The Year 2040 No-Build Scenario was analyzed to provide an assessment of the anticipated conditions in the design year without modifications to the current intersection geometry. The No-Build Scenario did include optimization of the signal timing at the NC 49 and Oak Leaf Road intersection. The no-build lane geometry is shown in Figure 5B.;
- Year 2012 Build - The Year 2012 Build Scenario was analyzed to provide an assessment of the improved roadway network in the base year. Improvements analyzed in the 2012 Build Scenario were identified in the analysis of the 2040 Build Scenario. These improvements are discussed in the following paragraph. The year 2012 Build Scenario lane geometry is shown in Figure 5C., and;
- Year 2040 Build - The Year 2040 Build Scenario was analyzed to provide an assessment of the Mack Road extension and identify the necessary intersection improvements to provide acceptable operations in the design year. Improvements included the Mack Road extension from NC 49 to US 64, closure of the existing Connector Road, dedicated turn lanes, lengthening of turn bays, and signalization of intersections. The year 2040 Build Scenario lane geometry is shown in Figure 5D.

For the operations analysis methodology, the intersection LOS analysis was performed in accordance with NCDOT Congestion Management's Capacity Analysis Guidelines (January 2012). The traffic operations analysis results for the year 2012 Existing, 2040 No-Build, 2012 Build, and 2040 Build Scenarios are as follows:

### **Year 2012 Existing Scenario**

A base year 2012 traffic operations analysis of the existing conditions was performed for the nine study intersections. Existing intersection traffic operations results showing the intersection and lane group capacity, LOS, and corresponding delay or density based on year 2012 traffic are shown in Table 6. The analyzed existing intersection peak hour turning movement volumes, lane geometry, and LOS are presented in Figure 5A.

**Table 6. Capacity Analysis - 2012 Existing Conditions**

| Intersection  | MOE                | Overall         | Eastbound   |             |             | Westbound   |             |             | Northbound     |              |   | Southbound      |             |   |
|---|--------------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|--------------|---|-----------------|-------------|---|
|   |                    |                 | L           | T           | R           | L           | T           | R           | L              | T            | R | L               | T           | R |
| US 64 & Oak Leaf Road/<br>Oakgrove Road (Stop-Controlled)                 | LOS                | C (C)           | A (A)       | -           | -           | A (A)       | -           | -           | C (C)          | -            | - | C (C)           | -           | - |
|   | Delay (sec)        | 21.8 (20.3)     | 8.7 (9.7)   | -           | -           | 9.6 (8.9)   | -           | -           | 20.0 (17.6)    | -            | - | 21.8 (20.3)     | -           | - |
|   | v/c                | 0.48 (0.50)     | 0.01 (0.01) | 0.48 (0.35) | -           | -           | 0.02 (0.05) | 0.34 (0.50) | -              | 0.29 (0.13)  | - | -               | 0.20 (0.14) | - |
| US 64 & Fisher Circle/<br>Thomas Tire Driveway (Stop-Controlled)          | LOS                | C (C)           | A (A)       | -           | -           | A (A)       | -           | -           | C (C)          | -            | - | C (C)           | -           | - |
|   | Delay (sec)        | 19.8 (20.1)     | 8.7 (9.8)   | -           | -           | 10.0 (8.9)  | -           | -           | 19.8 (17.9)    | -            | - | 18.4 (20.1)     | -           | - |
|   | v/c                | 0.52 (0.51)     | 0.00 (0.01) | -           | -           | 0.04 (0.05) | 0.34 (0.51) | -           | 0.24 (0.17)    | -            | - | 0.05 (0.09)     | -           | - |
| US 64 & Connector Road/<br>CITGO Driveway (Stop-Controlled)               | LOS                | F (F)           | A (B)       | -           | -           | B (B)       | -           | -           | F (C)          | -            | - | F (F)           | -           | - |
|   | Delay (sec)        | >999.9 (82.0)   | 8.9 (10.0)  | -           | -           | 10.0 (10.4) | -           | -           | 56.1 (24.3)    | -            | - | >999.9 (82.0)   | -           | - |
|   | v/c                | 5.15 (0.67)     | 0.03 (0.02) | 0.52 (0.35) | -           | -           | 0.04 (0.31) | 0.35 (0.54) | -              | 0.89 (0.14)  | - | -               | 5.15 (0.67) | - |
| NC 49 & Connector Road (Stop-Controlled)                                  | LOS                | D (F)           | B (B)       | -           | -           | -           | -           | -           | -              | -            | - | D (F)           | -           | - |
|   | Delay (sec)        | 26.3 (172.8)    | 13.0 (11.3) | -           | -           | -           | -           | -           | -              | -            | - | 26.3 (172.8)    | -           | - |
|   | v/c                | 0.68 (1.24)     | 0.36 (0.05) | 0.68 (0.52) | -           | -           | 0.58 (0.68) | -           | -              | -            | - | 0.13 (1.24)     | -           | - |
| NC 49 & Mack Road / Auto Exchange Driveway (Stop-Controlled)              | LOS                | F (F)           | A (B)       | -           | -           | C (B)       | -           | -           | F (F)          | F (D)        | - | F (F)           | -           | - |
|   | Delay (sec)        | >999.9 (>999.9) | 9.2 (10.9)  | -           | -           | 17.6 (13.7) | -           | -           | 352.9 (>999.9) | 302.8 (28.3) | - | >999.9 (>999.9) | -           | - |
|   | v/c                | >9.99 (3.89)    | 0.01 (0.01) | 0.66 (0.43) | 0.06 (0.06) | 0.50 (0.48) | 0.43 (0.66) | -           | 1.43 (3.57)    | 1.55 (0.66)  | - | >9.99 (3.89)    | -           | - |
| NC 49 & Oak Leaf Road (Signalized)  | LOS                | C (C)           | B (B)       | C (C)       | B (B)       | B (B)       | A (B)       | -           | E (C)          | -            | - | C (C)           | -           | - |
|   | Delay (sec)        | 28.8 (21.4)     | 13.6 (16.9) | 31.8 (27.5) | 14.1 (17.3) | 14.7 (10.7) | 9.7 (15.9)  | -           | 58.9 (34.3)    | -            | - | 32.7 (24.2)     | -           | - |
|   | v/c                | 0.87 (0.71)     | 0.05 (0.03) | 0.84 (0.71) | 0.11 (0.11) | 0.54 (0.47) | 0.42 (0.70) | -           | 0.87 (0.66)    | -            | - | 0.09 (0.19)     | -           | - |
| Merge on US 64 from Albemarle Road (Stop-Controlled)                      | LOS                | B (E)           | -           | -           | -           | -           | -           | -           | -              | -            | - | B (E)           | -           | - |
|   | Delay (sec)        | 13.0 (43.4)     | -           | -           | -           | -           | -           | -           | -              | -            | - | 13.0 (43.4)     | -           | - |
|   | v/c                | 0.72 (0.71)     | -           | 0.72 (0.37) | -           | -           | 0.33 (0.60) | -           | -              | -            | - | 0.15 (0.71)     | -           | - |
| Weave on US 64 / NC 49 between ramp from NC 49 and ramp to US 220 (Weave) | LOS                | B (A)           | -           | -           | -           | -           | -           | -           | -              | -            | - | -               | -           | - |
|   | Density (pc/mi/ln) | 14.8 (11.0)     | -           | -           | -           | -           | -           | -           | -              | -            | - | -               | -           | - |
|   | v/c                | 0.31 (0.26)     | -           | -           | -           | -           | -           | -           | -              | -            | - | -               | -           | - |

**Table 6. (continued)**

| Intersection                                  | MOE                | Overall | Eastbound |   |   | Westbound |   |   | Northbound |   |   | Southbound |   |   |
|---|--------------------|---------|-----------|---|---|-----------|---|---|------------|---|---|------------|---|---|
|   |                    |         | L         | T | R | L         | T | R | L          | T | R | L          | T | R |
| Diverge from NC 49 to US 64 / NC 49 (Diverge) | LOS                | C       | -         | - | - | -         | - | - | -          | - | - | -          | - |   |
|   |                    | (C)     | -         | - | - | -         | - | - | -          | - | - | -          | - |   |
|   | Density (pc/mi/ln) | 21.5    | -         | - | - | -         | - | - | -          | - | - | -          | - |   |
|   |                    | (18.1)  | -         | - | - | -         | - | - | -          | - | - | -          | - |   |
| v/c   | 0.53               | -       | -         | - | - | -         | - | - | -          | - | - | -          |   |   |
|   | (0.44)             | -       | -         | - | - | -         | - | - | -          | - | - | -          |   |   |

Note: AM peak hour, (PM peak hour)

The existing conditions operations analysis indicates that the signalized NC 49 and Oak Leaf Road intersection currently operates at an acceptable LOS during both the AM and PM peak hours. Two ((US 64 & Oak Leaf Road/Oakgrove Road) and (US 64 & Fisher Circle/Thomas Tire Driveway)) of the six stop-controlled intersections operate at an acceptable LOS during both peak hours, two ((NC 49 & Connector Road) and (Merge on US 64 from Albemarle Road)) operate at acceptable LOS in one of the peak hours and unacceptable LOS in the other peak hour, and two ((US 64 & Connector Road/CITGO Driveway) and (NC 49 & Mack Road/Auto Exchange Driveway)) operate at unacceptable LOS in both peak hours. Both the weave on US 64-NC 49 and the diverge from NC 49 to US 64-NC 49 currently operate at acceptable LOS in both peak hours.

**Year 2040 No-Build Scenario**

A no-build traffic analysis was performed in order to assess how the network would operate in the year 2040 if no improvements were made to the project intersections. No-Build intersection traffic operations results showing the projected intersection and lane group capacity, LOS, and corresponding delay or density based on year 2040 traffic are shown in **Table 7**. The analyzed no-build intersection peak hour turning movement volumes, lane geometry, and LOS are presented in **Figure 5B**.

**Table 7. Capacity Analysis - 2040 No-Build Conditions**

| Intersection  | MOE         | Overall         | Eastbound   |             |             | Westbound   |             |              | Northbound   |   |   | Southbound      |   |   |
|---|-------------|-----------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|---|---|-----------------|---|---|
|   |             |                 | L           | T           | R           | L           | T           | R            | L            | T | R | L               | T | R |
| US 64 & Oak Leaf Road/ Oakgrove Road (Stop-Controlled)        | LOS         | D (D)           | A (B)       | -           | -           | B (A)       | -           | -            | D (C)        | - | - | D (D)           | - | - |
|   | Delay (sec) | 31.6 (26.6)     | 9.1 (10.4)  | -           | -           | 10.4 (9.4)  | -           | -            | 30.4 (24.1)  | - | - | 31.6 (26.6)     | - | - |
|   | v/c         | 0.58 (0.59)     | 0.01 (0.02) | 0.58 (0.42) | 0.03 (0.07) | 0.40 (0.59) | 0.48 (0.23) | 0.34 (0.23)  |              |   |   |                 |   |   |
| US 64 & Fisher Circle/ Thomas Tire Driveway (Stop-Controlled) | LOS         | D (D)           | A (B)       | -           | -           | B (A)       | -           | -            | D (C)        | - | - | D (D)           | - | - |
|   | Delay (sec) | 27.7 (26.6)     | 9.0 (10.5)  | -           | -           | 10.8 (9.4)  | -           | -            | 27.7 (22.8)  | - | - | 25.8 (26.6)     | - | - |
|   | v/c         | 0.62 (0.61)     | 0.00 (0.01) | 0.62 (0.41) | 0.05 (0.07) | 0.41 (0.61) | 0.38 (0.25) | 0.10 (0.16)  |              |   |   |                 |   |   |
| US 64 & Connector Road/ CITGO Driveway (Stop-Controlled)      | LOS         | F (F)           | A (B)       | -           | -           | B (B)       | -           | -            | F (F)        | - | - | F (F)           | - | - |
|   | Delay (sec) | >999.9 (>999.9) | 9.3 (10.9)  | -           | -           | 11.0 (12.5) | -           | -            | 340.3 (51.7) | - | - | >999.9 (>999.9) | - | - |
|   | v/c         | >9.99 (6.90)    | 0.04 (0.02) | 0.63 (0.42) | 0.07 (0.45) | 0.42 (0.65) | 1.65 (0.39) | >9.99 (6.90) |              |   |   |                 |   |   |

**Table 7. (continued)**

| Intersection  | MOE                | Overall         | Eastbound   |             |             | Westbound   |             |   | Northbound     |              |   | Southbound |   |                 |
|---|--------------------|-----------------|-------------|-------------|-------------|-------------|-------------|---|----------------|--------------|---|------------|---|-----------------|
|   |                    |                 | L           | T           | R           | L           | T           | R | L              | T            | R | L          | T | R               |
| NC 49 & Connector Road (Stop-Controlled)                                  | LOS                | D (F)           | B (B)       | -           | -           | -           | -           | - | -              | -            | - | -          | - | D (F)           |
|   | Delay (sec)        | 33.0 (357.1)    | 14.7 (11.2) | -           | -           | -           | -           | - | -              | -            | - | -          | - | 33.0 (357.1)    |
|   | v/c                | 0.65 (1.69)     | 0.48 (0.06) | 0.65 (0.51) | -           | -           | 0.58 (0.66) | - | -              | -            | - | -          | - | 0.23 (1.69)     |
| NC 49 & Mack Road / Auto Exchange Driveway (Stop-Controlled)              | LOS                | F (F)           | A (B)       | -           | -           | C (C)       | -           | - | F (F)          | F (E)        | - | -          | - | F (F)           |
|   | Delay (sec)        | >999.9 (>999.9) | 9.1 (10.7)  | -           | -           | 20.6 (15.8) | -           | - | 953.8 (>999.9) | 418.2 (37.1) | - | -          | - | >999.9 (>999.9) |
|   | v/c                | >9.99 (>9.99)   | 0.00 (0.01) | 0.63 (0.41) | 0.07 (0.07) | 0.61 (0.60) | 0.41 (0.64) | - | 2.68 (7.86)    | 1.83 (0.79)  | - | -          | - | >9.99 (>9.99)   |
| NC 49 & Oak Leaf Road (Signalized)  | LOS                | D (C)           | B (C)       | D (C)       | B (C)       | D (B)       | B (B)       | - | -              | D (C)        | - | -          | - | C (C)           |
|   | Delay (sec)        | 36.2 (25.1)     | 18.3 (21.6) | 42.2 (33.4) | 19.2 (22.9) | 45.7 (19.8) | 13.4 (17.8) | - | 49.8 (35.0)    | -            | - | -          | - | 20.7 (20.3)     |
|   | v/c                | 0.90 (0.77)     | 0.08 (0.05) | 0.89 (0.72) | 0.19 (0.20) | 0.85 (0.67) | 0.41 (0.65) | - | 0.90 (0.77)    | -            | - | -          | - | 0.10 (0.22)     |
| Merge on US 64 from Albemarle Road (Stop-Controlled)                      | LOS                | C (F)           | -           | -           | -           | -           | -           | - | -              | -            | - | -          | - | C (F)           |
|   | Delay (sec)        | 15.0 (214.4)    | -           | -           | -           | -           | -           | - | -              | -            | - | -          | - | 15.0 (214.4)    |
|   | v/c                | 0.88 (1.32)     | -           | 0.88 (0.45) | -           | -           | 0.39 (0.71) | - | -              | -            | - | -          | - | 0.22 (1.32)     |
| Weave on US 64 / NC 49 between ramp from NC 49 and ramp to US 220 (Weave) | LOS                | B (A)           | -           | -           | -           | -           | -           | - | -              | -            | - | -          | - | -               |
|   | Density (pc/mi/ln) | 15.1 (11.0)     | -           | -           | -           | -           | -           | - | -              | -            | - | -          | - | -               |
|   | v/c                | 0.31 (0.25)     | -           | -           | -           | -           | -           | - | -              | -            | - | -          | - | -               |
| Diverge from NC 49 to US 64 / NC 49 (Diverge)                             | LOS                | C (C)           | -           | -           | -           | -           | -           | - | -              | -            | - | -          | - | -               |
|   | Density (pc/mi/ln) | 20.6 (18.0)     | -           | -           | -           | -           | -           | - | -              | -            | - | -          | - | -               |
|   | v/c                | 0.50 (0.44)     | -           | -           | -           | -           | -           | - | -              | -            | - | -          | - | -               |

Note: AM peak hour, (PM peak hour)

The intersection operations analysis of the 2040 no-build conditions indicates that four of the nine intersections are projected to operate with an unacceptable LOS for either or both the AM and PM peak hours, as discussed below:

**US 64 at Connector Road/CITGO Driveway** is projected to continue to operate at an unacceptable LOS during both the AM and PM peak hours. The intersection currently (2012) operates at LOS F in both the AM and PM peak hours and, with no improvements to the intersection, is projected (2040) to continue to operate at LOS F during both the AM and PM peak hours.

**NC 49 at Connector Road** is projected to continue to operate at an unacceptable LOS during the PM peak hour. The intersection currently (2012) operates at LOS D in the AM peak hour and LOS F during the PM peak hour. With no improvements the intersection is projected (2040) to continue to operate at LOS D in the AM peak hour and LOS F during the PM peak hour.

**NC 49 at Mack Road/Auto Exchange Driveway** is projected to continue to operate at an unacceptable LOS during both the AM and PM peak hours. The intersection currently (2012) operates at LOS F in both the AM and PM peak hours and, with no improvements to the intersection, is projected (2040) to continue to operate at LOS F during both the AM and PM peak hours.

The **merge on US 64 from Albemarle Road** is projected to continue to operate at an unacceptable LOS during the PM peak hour. The intersection currently (2012) operates at LOS B in the AM peak hour and LOS E during the PM peak hour. With no improvements the intersection is projected (2040) to degrade to LOS C in the AM peak hour and LOS F during the PM peak hour.

The remaining five intersections operate at an acceptable LOS during both the AM and PM peak hours in the 2040 no-build conditions, as discussed below:

**US 64 at Oak Leaf Road/Oakgrove Road** is projected to continue to operate at an acceptable LOS during both the AM and PM peak hours. The intersection currently (2012) operates at LOS C in both the AM and PM peak hours. With no improvements the intersection is projected (2040) to degrade to LOS D in both the AM and PM peak hours.

**US 64 at Fisher Circle [eastern]/Thomas Tire Driveway** is projected to continue to operate at an acceptable LOS during both the AM and PM peak hours. The intersection currently (2012) operates at LOS C in both the AM and PM peak hours. With no improvements the intersection is projected (2040) to degrade to LOS D in both the AM and PM peak hours.

**NC 49 at Oak Leaf Road** is projected to continue to operate at an acceptable LOS during both the AM and PM peak hours. The intersection currently (2012) operates at LOS C in both the AM and PM peak hours. With no improvements the intersection is projected (2040) to continue to operate at LOS C during the AM peak hour and degrade to LOS D during the PM peak hour.

The **weave on US 64-NC 49 between ramp from NC 49 and ramp to US 220/I-73/I-74** is projected to continue to operate at an acceptable LOS during both the AM and PM peak hours. The weave currently (2012) operates at LOS B during the AM peak hour and LOS A during the PM peak hour. With no improvements the weave is projected (2040) to continue to operate at LOS B during the AM peak hour and LOS A during the PM peak hour.

The **diverge from NC 49 to US 64-NC 49** is projected to continue to operate at an acceptable LOS during both the AM and PM peak hours. The diverge currently (2012) operates at LOS C in both the AM and PM peak hours. With no improvements the diverge is projected (2040) to continue to operate LOS C in both the AM and PM peak hours.

### Year 2012 Build Scenario

The Year 2012 Build Scenario was analyzed to provide an assessment of the improved roadway network in the base year. Improvements analyzed in the 2012 Build Scenario were determined from the analysis of the 2040 Build Scenario, shown below. Build intersection traffic operations results showing the projected intersection and lane group capacity, LOS, and corresponding delay or density based on year 2012 traffic are shown in **Table 8**. The analyzed build intersection turning movement volumes, lane geometry, and LOS are presented in **Figure 5C**.

**Table 8.** Capacity Analysis - 2012 Build Conditions

| Intersection  | MOE         | Overall        | Eastbound      |                |                | Westbound      |                |                | Northbound     |                |                | Southbound     |                |   |
|---|-------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---|
|   |             |                | L              | T              | R              | L              | T              | R              | L              | T              | R              | L              | T              | R |
| US 64 & Oak Leaf Road/<br>Oakgrove Road (Stop-Controlled) | LOS         | C<br>(C)       | A<br>(B)       | -<br>-         | A<br>(A)       | -<br>-         | C<br>(C)       |                |                | C<br>(C)       |                |                |                |   |
|   | Delay (sec) | 21.1<br>(20.9) | 8.8<br>(10.0)  | -<br>-         | 9.5<br>(9.0)   | -<br>-         | 19.5<br>(18.0) |                |                | 21.1<br>(20.9) |                |                |                |   |
|   | v/c         | 0.47<br>(0.48) | 0.01<br>(0.01) | 0.47<br>(0.36) | 0.02<br>(0.05) | 0.35<br>(0.48) | 0.28<br>(0.14) |                |                | 0.19<br>(0.15) |                |                |                |   |
| US 64 & Mack Road Extension / Fisher Circle (Signalized)  | LOS         | C<br>(D)       | D<br>(D)       | C<br>(C)       | C<br>(C)       | A<br>(A)       | D<br>(D)       | D<br>(D)       | D<br>(B)       | D<br>(D)       |                |                |                |   |
|   | Delay (sec) | 23.2<br>(17.8) | 36.8<br>(35.2) | 26.1<br>(25.3) | 32.1<br>(30.1) | 5.0<br>(6.3)   | 41.0<br>(35.3) | 36.8<br>(35.2) | 40.3<br>(14.1) | 38.0<br>(35.8) |                |                |                |   |
|   | v/c         | 0.87<br>(0.77) | 0.02<br>(0.02) | 0.87<br>(0.77) | 0.13<br>(0.68) | 0.38<br>(0.53) | 0.27<br>(0.04) | 0.02<br>(0.02) | 0.80<br>(0.08) | 0.08<br>(0.11) |                |                |                |   |
| NC 49 & Mack Road Extension / Mack Road (Signalized)      | LOS         | D<br>(D)       | E<br>(D)       | C<br>(D)       | A<br>(B)       | E<br>(E)       | C<br>(D)       | E<br>(F)       | E<br>(D)       | D<br>(C)       | D<br>(D)       | D<br>(F)       | C<br>(E)       |   |
|   | Delay (sec) | 38.3<br>(44.8) | 63.9<br>(45.9) | 32.7<br>(36.4) | 5.9<br>(14.0)  | 66.3<br>(68.2) | 24.1<br>(35.5) | 72.1<br>(87.2) | 57.1<br>(51.2) | 38.5<br>(33.7) | 52.6<br>(52.8) | 53.5<br>(83.3) | 33.9<br>(58.5) |   |
|   | v/c         | 0.92<br>(0.90) | 0.79<br>(0.17) | 0.92<br>(0.77) | 0.11<br>(0.12) | 0.79<br>(0.86) | 0.67<br>(0.90) | 0.65<br>(0.79) | 0.47<br>(0.05) | 0.58<br>(0.43) | 0.05<br>(0.19) | 0.10<br>(0.73) | 0.08<br>(0.74) |   |
| NC 49 & Oak Leaf Road (Signalized)                        | LOS         | C<br>(C)       | B<br>(B)       | C<br>(C)       | B<br>(B)       | C<br>(A)       | B<br>(B)       | E<br>(E)       |                |                | C<br>(C)       |                |                |   |
|   | Delay (sec) | 31.4<br>(21.6) | 15.6<br>(19.3) | 31.2<br>(23.8) | 15.8<br>(18.2) | 28.4<br>(7.5)  | 14.6<br>(10.2) | 60.4<br>(55.0) |                |                | 32.1<br>(34.9) |                |                |   |
|   | v/c         | 0.85<br>(0.77) | 0.05<br>(0.02) | 0.78<br>(0.51) | 0.10<br>(0.08) | 0.58<br>(0.43) | 0.41<br>(0.62) | 0.85<br>(0.77) |                |                | 0.09<br>(0.22) |                |                |   |
| Merge on US 64 from Albemarle Road (Stop-Controlled)      | LOS         | B<br>(E)       | -              |                |                | -              |                |                | -              |                |                | B<br>(E)       |                |   |
|   | Delay (sec) | 13.0<br>(43.4) | -              |                |                | -              |                |                | -              |                |                | 13.0<br>(43.4) |                |   |
|   | v/c         | 0.72<br>(0.71) | 0.72<br>(0.37) |                |                | 0.33<br>(0.60) |                |                | -              |                |                | 0.15<br>(0.71) |                |   |

**Table 8. (continued)**

| Intersection  | MOE                | Overall     | Eastbound |   |   | Westbound |   |   | Northbound |   |   | Southbound |   |   |
|---|--------------------|-------------|-----------|---|---|-----------|---|---|------------|---|---|------------|---|---|
|   |                    |             | L         | T | R | L         | T | R | L          | T | R | L          | T | R |
| Weave on US 64 / NC 49 between ramp from NC 49 and ramp to US 220 (Weave) | LOS                | B (A)       | -         | - | - | -         | - | - | -          | - | - | -          | - |   |
|   | Density (pc/mi/ln) | 14.8 (11.0) | -         | - | - | -         | - | - | -          | - | - | -          | - |   |
|   | v/c                | 0.31 (0.26) | -         | - | - | -         | - | - | -          | - | - | -          | - |   |
| Diverge from NC 49 to US 64 / NC 49 (Diverge)                             | LOS                | C (C)       | -         | - | - | -         | - | - | -          | - | - | -          | - |   |
|   | Density (pc/mi/ln) | 21.5 (18.1) | -         | - | - | -         | - | - | -          | - | - | -          | - |   |
|   | v/c                | 0.53 (0.44) | -         | - | - | -         | - | - | -          | - | - | -          | - |   |

Note: AM peak hour, (PM peak hour)

The 2012 build conditions operations analysis indicates that all of the intersections, the US 64/NC 49 weave, and the NC 49 to US 64 diverge operate at acceptable LOS during both the AM and the PM peak hours except for the stop controlled merge on US 64 from Albemarle Road. This intersection operates at LOS B during the AM peak hour but LOS E during the PM peak hour.

### Year 2040 Build Scenario

The Year 2040 Build Scenario was analyzed to provide an assessment of the improved roadway network in the design year and determine the necessary storage bay lengths. Improvements included the Mack Road extension from NC 49 to US 64, closure of the existing Connector Road, dedicated turn lanes, lengthening of turn bays, and signalization of intersections.

Build intersection traffic operations results showing the projected intersection and lane group capacity, LOS, and corresponding delay or density based on year 2040 traffic are shown in **Table 9**. The analyzed build intersection turning movement volumes, lane geometry, and LOS are presented in **Figure 5D**.

**Table 9. Capacity Analysis - 2040 Build Conditions**

| Intersection   | MOE         | Overall     | Eastbound   |             |             | Westbound   |             |             | Northbound   |             |   | Southbound  |   |   |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|---|-------------|---|---|
|  |             |             | L           | T           | R           | L           | T           | R           | L            | T           | R | L           | T | R |
| US 64 & Oak Leaf Road/Oakgrove Road (Stop-Controlled)    | LOS         | D (D)       | A (B)       | -           | -           | B (A)       | -           | -           | D (D)        | -           | - | D (D)       | - |   |
|  | Delay (sec) | 30.2 (30.3) | 9.4 (11.5)  | -           | -           | 10.2 (9.5)  | -           | -           | 29.8 (27.3)  | -           | - | 30.2 (30.3) | - |   |
|  | v/c         | 0.56 (0.57) | 0.01 (0.02) | 0.56 (0.44) | 0.03 (0.07) | 0.42 (0.57) | 0.47 (0.26) | 0.32 (0.27) |              |             |   |             |   |   |
| US 64 & Mack Road Extension / Fisher Circle (Signalized) | LOS         | D (C)       | D (D)       | D (D)       | C (D)       | A (A)       | D (D)       | D (D)       | F (B)        | D (D)       |   |             |   |   |
|  | Delay (sec) | 42.5 (27.1) | 37.0 (37.0) | 39.0 (38.3) | 34.8 (46.8) | 6.3 (9.7)   | 47.2 (38.2) | 37.0 (37.0) | 100.8 (14.7) | 39.1 (40.3) |   |             |   |   |
|  | v/c         | 1.10 (0.90) | 0.02 (0.02) | 0.96 (0.90) | 0.22 (0.87) | 0.48 (0.67) | 0.40 (0.07) | 0.02 (0.02) | 1.10 (0.10)  | 0.12 (0.20) |   |             |   |   |

**Table 9. (continued)**

| Intersection  | MOE                | Overall      | Eastbound   |             |             | Westbound   |             |             | Northbound  |             |             | Southbound   |             |   |
|---|--------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|---|
|   |                    |              | L           | T           | R           | L           | T           | R           | L           | T           | R           | L            | T           | R |
| NC 49 & Mack Road Extension / Mack Road (Signalized)                      | LOS                | D (D)        | E (E)       | D (D)       | B (B)       | E (E)       | C (D)       | E (F)       | E (D)       | D (C)       | D (D)       | D (F)        | C (E)       |   |
|   | Delay (sec)        | 43.2 (47.4)  | 57.2 (61.4) | 43.5 (40.8) | 10.7 (12.9) | 66.9 (66.1) | 29.5 (39.8) | 65.1 (81.2) | 57.3 (47.5) | 35.7 (28.4) | 52.7 (52.4) | 54.5 (80.8)  | 30.8 (57.8) |   |
|   | v/c                | 0.92 (0.90)  | 0.83 (0.19) | 0.92 (0.85) | 0.14 (0.15) | 0.84 (0.88) | 0.70 (0.90) | 0.61 (0.78) | 0.55 (0.06) | 0.62 (0.45) | 0.05 (0.21) | 0.14 (0.78)  | 0.09 (0.79) |   |
| NC 49 & Oak Leaf Road (Signalized)  | LOS                | C (C)        | C (C)       | D (C)       | C (C)       | C (B)       | A (B)       | E (E)       |             |             | C (C)       |              |             |   |
|   | Delay (sec)        | 33.0 (28.9)  | 22.0 (27.0) | 38.8 (31.9) | 22.7 (26.3) | 25.5 (14.7) | 4.9 (18.0)  | 56.5 (55.2) |             |             | 25.9 (29.8) |              |             |   |
|   | v/c                | 0.89 (0.85)  | 0.08 (0.03) | 0.79 (0.52) | 0.17 (0.15) | 0.75 (0.57) | 0.39 (0.57) | 0.89 (0.85) |             |             | 0.10 (0.23) |              |             |   |
| Merge on US 64 from Albemarle Road (Stop-Controlled)                      | LOS                | C (F)        | -           |             |             | -           |             |             | -           |             |             | C (F)        |             |   |
|   | Delay (sec)        | 15.0 (214.4) | -           |             |             | -           |             |             | -           |             |             | 15.0 (214.4) |             |   |
|   | v/c                | 0.88 (1.32)  | 0.88 (0.45) |             |             | 0.39 (0.71) |             |             | -           |             |             | 0.22 (1.32)  |             |   |
| Weave on US 64 / NC 49 between ramp from NC 49 and ramp to US 220 (Weave) | LOS                | B (A)        | -           |             |             | -           |             |             | -           |             |             | -            |             |   |
|   | Density (pc/mi/ln) | 15.1 (11.0)  | -           |             |             | -           |             |             | -           |             |             | -            |             |   |
|   | v/c                | 0.31 (0.25)  | -           |             |             | -           |             |             | -           |             |             | -            |             |   |
| Diverge from NC 49 to US 64 / NC 49 (Diverge)                             | LOS                | C (C)        | -           |             |             | -           |             |             | -           |             |             | -            |             |   |
|   | Density (pc/mi/ln) | 20.6 (18.0)  | -           |             |             | -           |             |             | -           |             |             | -            |             |   |
|   | v/c                | 0.50 (0.44)  | -           |             |             | -           |             |             | -           |             |             | -            |             |   |

Note: AM peak hour, (PM peak hour)

The 2040 build conditions operations analysis indicates that all but one of the intersections, the US 64/NC 49 weave, and the NC 49 to US 64 diverge are projected to operate at acceptable LOS during both the AM and the PM peak hours, the exception being the stop-controlled merge on US 64 from Albemarle Road. This intersection is projected to operate at LOS C during the AM peak hour but LOS F during the PM peak hour.

**Conclusion**

No improvements are recommended for the intersection of **US 64 at Oak Leaf Road / Oakgrove Road**. The intersection is not projected to have high enough volumes or queuing issues to recommend additional turn lanes or signalization. No changes are recommended to the storage lengths of the left-turn lanes on US 64, which are two-way left-turn lanes.

The existing Connector Road will be removed, which eliminates the intersection of **US 64 at Connector Road / CITGO Driveway** and **NC 49 at Connector Road**.

Mack Road is proposed to be extended from NC 49 to US 64. A signal is proposed for the **NC 49 at Mack Road Extension / Mack Road** intersection. The southbound Mack Road Extension approach will consist of a left-turn lane, thru-lane, and right-turn lane. In addition, northbound Mack Road and Eastbound NC 49 will need a dedicated lane for each movement. The westbound NC 49 approach is proposed to have a shared thru-right lane and a dedicated left-turn lane.

The extension of Mack Road is proposed to align with the eastern intersection of Fisher Circle at US 64. A signal is proposed for the intersection of **US 64 at Mack Road Extension / Fisher Circle**. The northbound Mack Road Extension approach will consist of a left-turn lane, thru-lane, and right-turn lane. No additional turn-lanes are proposed for any of the other approaches.

No lane geometry improvements are recommended for the intersection of **NC 49 at Oak Leaf Road**. The signalized intersection is recommended to be coordinated with the proposed signal at the intersection of Mack Road / Mack Road Extension.

The **merge on US 64 from Albemarle Road** is projected to operate at an unacceptable LOS during the PM peak hour for both the No-Build and Build Scenarios. However, no improvements are recommended for this intersection as part of this project. In order to provide acceptable operations, US 64 would be required to be widened or have an acceleration lane.

Without any improvements, the **weave on US 64-NC 49 between ramp from NC 49 and ramp to US 220/I-73/I-74** and the **diverge from NC 49 to US 64-NC 49** are both projected to operate at acceptable LOS during both the AM and PM peak hours in the year 2040. No improvements are recommended at these locations.

#### **D. Recommended Alternative**

The “No Build Alternative - Short Term Minor Activity (Safety)” alternative is not feasible since minor safety improvements to the geometric conditions cannot be accommodated and signalization of the existing intersections are not feasible. This alternative does not meet the Purpose and Need for the proposed project.

A No Action alternative is not practicable since taking No Action will not improve the Level of Service (LOS) at the US 64/Connector Road and the NC 49/SR 1144 (Mack Road) intersection with the increase of traffic in the design year, 2040. This alternative does not meet the Purpose and Need for the proposed project.

The “Alternative Modes of Transportation” alternative does not address connectivity, relieve congestion at the intersection of NC 49 and SR 1144 (Mack Road), improve the Level of Service at the existing intersections, improve travel time for local residents and provide operational improvements. This alternative does not meet the Purpose and Need for the proposed project.

Extending SR 1144 (Mack Road) from NC 49 to US 64, converting the existing T intersections of NC 49/ SR 1144 (Mack Road) and the US 64/ eastern Fisher Circle to four-way signalized intersections, and removing the existing Connector Road between NC 49 and US 64 will improve connectivity between NC 49 and US 64, relieve congestion at the intersection of NC 49 and SR 1144 (Mack Road), improve travel time for local residents and provide operational

improvements to NC 49, US 64 and SR 1144 (Mack Road). The Level of Service at the proposed US 64/eastern Fisher Loop/Mack Road Extension and NC 49/Mack Road Extension/SR 1144 (Mack Road) intersections will improve to D (acceptable) in the AM peak and D (acceptable) in the PM peak. Therefore, the “Extension of SR 1144 (Mack Road) on new location between NC-49 and US 64 (W. Dixie Drive)” is the recommended alternative.

#### **IV. PROPOSED IMPROVEMENTS**

**A. Roadway Cross-section and Alignment**

A three-lane facility with curb and gutter is proposed for the extension of Mack Road. The proposed typical section includes one travel lane in each direction with a center turn lane. Twelve foot (12 ft.) travel lanes are proposed with a sixteen foot (16 ft.) center turn lane. Concrete Islands are proposed at the intersections of the extension of Mack Road and NC 49 and US 64 to improve traffic operations and to provide safer access into and out of surrounding properties

**B. Functional Classification**

The proposed extension of Mack Road will be recommended for classification as a Minor Arterial. All other roadways within the project study will retain their current functional classification.

**C. Right of Way and Access Control**

Approximately 100 foot of Right of Way plus easements will be required for the proposed Mack Road Extension. Minor additional Right of Way acquisitions at select locations may be required on Mack Road, NC 49 and US 64 and Fisher Circle. No residential or business relocations are required for the proposed improvements.

**D. Speed Limit**

The roadways within the proposed project will be posted with the following speed limits:

|                     |            |
|---------------------|------------|
| NC 49               | 35MPH,     |
| Mack Road Extension | 35MPH;     |
| US 64               | 45MPH and; |
| SR 1144 (Mack Road) | 45MPH.     |

**E. Design Speed**

A 40 MPH design speed is proposed for NC 49 within the project. A 35 MPH design speed is proposed for the Mack Road Extension within the project. Both design speeds (40 and 35 MPH) are consistent with a posted speed of 35 MPH. A 50 MPH design speed is proposed for US 64 and SR 1144 (Mack Road) within the project.

**F. Anticipated Design Exceptions**

If design exceptions are needed during design they will be submitted for approval prior to construction.

**G. Intersections/Interchanges**

The proposed project will entail the conversion of two existing unsignalized T-intersections (NC 49/SR 1144 (Mack Road) and US 64/Fisher Circle) to four-way signalized intersections and the elimination of two unsignalized T-intersections (NC 49/Connector Road and US 64/Connector Road).

The proposed NC 49/SR 1144 (Mack Road)/Mack Road Extension intersection will have the following configuration:

**NC 49 (both east and west bound directions)** - one left turn lane and one through/right turn lane;

**SR 1144 (Mack Road) (north bound direction)** - one left turn lane and one through lane and one right turn lane, and;

**Mack Road Extension (south bound direction)** - one left turn lane and one through lane and one right turn lane.

The proposed US 64/Fisher Circle/Mack Road Extension intersection will have the following configuration:

**US 64 (both east and west bound directions)** - one left turn lane and one through/right turn lane;

**Mack Road Extension (north bound direction)** - one left turn lane and one through/right turn lane, and;

**Fisher Circle (south bound direction)** - one left turn/through/right turn lane.

**H. Service Roads**

No service roads are proposed with the project.

**I. Structures**

No structures are proposed with the project.

**J. Bicycle and Pedestrian Facilities/Greenways**

No bicycle or pedestrian facilities and/or greenways are proposed with the project.

**K. Utilities**

The proposed project is expected to have minimal impacts on utilities. Required utility relocations along the project will occur prior to construction.

**L. Landscaping**

No special landscaping is proposed with the project. All disturbed areas within the project limits will be reseeded with grass

**M. Noise Barriers**

Noise abatement measures are not required for the project.

**N. Work Zone, Traffic Control and Construction Phasing**

Traffic will be maintained during construction of the proposed project. Temporary lane closures may be required during project construction. Work Zone, Traffic Control and Construction Phasing will be developed based on Final Plans.

**V. AFFECTED ENVIRONMENT**

**A. Natural Resources**

The project study area lies within the piedmont physiographic province of North Carolina (Figure 6). Within the project study area, elevations range between 820 and 950 FASL. Land use within the project vicinity primarily consists of commercial development.

**1. Physical Resources**

**1.a. Soils**

The Randolph County Soil Survey identifies five soil types within the study area (Table 10).

**Table 10. Soils in the study area**

| Soil Series   | Mapping Unit | Drainage Class          | Hydric Status |
|---|--------------|-------------------------|---------------|
| Callison – Lignum complex, 2 – 6 percent slopes         | CaB          | Moderately Well Drained | Hydric        |
| Georgeville silt loam, 2 – 8 percent slopes             | GaB          | Well Drained            | Non-hydric    |
| Georgeville silt loam, 8 – 15 percent slopes            | GaC          | Well Drained            | Non-hydric    |
| Georgeville – Urban land complex, 2 – 10 percent slopes | GmC          | Well Drained            | Non-hydric    |
| Udorthents, loamy                                       | Ud           | Well Drained            | Non-hydric    |

**1.b. Water Resources**

Water resources in the study area are part of the Yadkin-Pee Dee River Basin [U.S. Geological Survey (USGS) Hydrologic Unit Codes (HUC) 03040103 and 03040104]. One stream was identified within the project study area, as denoted in Table 11. The locations of this water resource is shown in Figure 6. The physical characteristics of this stream is provided in Table 12.

**Table 11. Water resources in the study area**

| Stream Name                           | Map ID | NCDWQ Index Number | Best Usage Classification |
|---------------------------------------|--------|--------------------|---------------------------|
| Unnamed Tributary of Cedar Fork Creek | SA     | 13-2-3-3-2         | C                         |

**Table 12. Physical characteristics of water resources in the study area**

| <b>Map ID</b> | <b>Bank Height (ft.)</b> | <b>Channel Width (ft.)</b> | <b>Water Depth (in.)</b> | <b>Channel Substrate*</b> | <b>Flow</b> | <b>Clarity</b> |
|---------------|--------------------------|----------------------------|--------------------------|---------------------------|-------------|----------------|
| <b>SA</b>     | <b>1-4</b>               | <b>1-3</b>                 | <b>1-4</b>               | Si, Sa, Gr                | Slow        | Clear          |

\* Si – Silt, Sa – Sand, Gr – Gravel

No Outstanding Resource Waters (ORW) or Water Supply I (WS-I) waters occur within 1.0 mile of the project study area. However, one Water Supply II, High Quality Water (WS-II HQW), an Unnamed Tributary (UT) of Cedar Fork Creek [North Carolina Division of Water Quality (NCDWQ) Index Number 13-2-3-3-2-2-(1)], is located within 1.0 mile of the study area. None of the streams located within the project study area support trout or anadromous fish and no Primary Nursery Areas are present within the study area boundaries. No streams within 1.0 mile are listed on the 2010 Final 303(d) List of Impaired Waters for North Carolina.

No benthic macroinvertebrate or fish sampling sites were identified within 1.0 mile of the project study area.

## **2. Biotic Resources**

### **2.a. Terrestrial Communities**

Two terrestrial communities were identified within the project study area: maintained/disturbed and mixed pine/hardwood forest. Figure 6 shows the location and extent of these terrestrial communities in the project study area. A brief description of each community type follows.

#### **1) Maintained/Disturbed**

The maintained/disturbed community type includes areas such as commercial developments, roadsides, natural community edges adjacent to roadsides, and open fields. The roadside habitat and commercial developments are either periodically mowed or otherwise maintained. A large portion of the study area is covered with impervious surfaces such as concrete and asphalt parking lots. Vegetation within this community included, but was not limited to the following species: red maple, Chinese privet, sawtooth blackberry, common mullein, broomsedge, fescue, common dandelion, wild onion, and crown vetch.

#### **2) Mixed Pine/Hardwood Forest**

The mixed pine/hardwood forest community is located at higher elevations within the project study area. Canopy species within this community included loblolly pine, white oak, red cedar, sweetgum, and red maple. Shrub/sub-canopy species within this community included sweetgum, red maple, and ironwood. Herbaceous and vine species included, but were not limited to the following: poison ivy, cat greenbrier, muscadine, and Japanese honeysuckle. Wetland WA is located along the transitional edge between this community type and the maintained/disturbed community.

### 3) Terrestrial Community Impacts

Terrestrial communities in the project study area may be impacted by project construction as a result of grading and paving of portions of the study area. At this time, decisions regarding the final location and design of the proposed project have not been made. Therefore, community data are presented in the context of total coverage of each type within the study area (Table 13).

**Table 13. Coverage of terrestrial communities in the study area**

| <b>Community</b>           | <b>Coverage (ac.)</b> |
|----------------------------|-----------------------|
| Maintained/Disturbed       | 12.5*                 |
| Mixed Pine/Hardwood Forest | 0.3                   |
| <b>Total</b>               | <b>12.8</b>           |

\* Roadways were included when calculating Maintained/Disturbed acreage.

#### 2.b. Terrestrial Wildlife

Terrestrial communities in the project study area are comprised of both natural and disturbed habitats that may support a diversity of wildlife species (those species either observed or identified by tracks, scat, call, or other means during field visits are indicated with an \*). Mammal species that commonly exploit communities within the study area include eastern cottontail, raccoon\*, gray squirrel, Virginia opossum, and white-tailed deer\*. Bird species that commonly use habitat types found within the project study area include, but are not limited to: red-tailed hawk, Carolina chickadee, blue jay\*, turkey vulture\*, northern mockingbird, northern cardinal, wood thrush, Carolina wren, eastern blue bird, and American crow\*.

Herpetofauna are also likely to utilize the terrestrial communities found within the study area. Reptile species that may be found in the communities described above include black rat snake, black racer, copperhead, eastern garter snake, rough green snake, and eastern box turtle. Amphibian species that may be observed include spring peeper, and American toad.

#### 2.c. Aquatic Communities

Aquatic communities present within the project study area include one intermittent stream and one jurisdictional wetland. These water resources may provide breeding, shelter, and feeding opportunities for many amphibians. Common amphibians that inhabit these resources may include northern dusky salamander, green frog, bullfrog, and northern cricket frog. Stream SA may also provide habitat for fish species such as eastern mosquitofish. Streams within the study area may also likely support a variety of benthic macroinvertebrates including beetles, chironomid midges, crane flies, amphipods, isopods, and crayfish.

#### 2.d. Invasive Species

Three species from the NCDOT Invasive Exotic Plant List for North Carolina were found to occur in the project study area. The species identified were Chinese privet (Threat), Japanese onenessuckle (Moderate Threat), and crown vetch (Watch List). NCDOT will manage invasive plant species as appropriate.

### 3. Jurisdictional Issues

#### 3.a. Clean Water Act Waters of the U.S.

One jurisdictional stream was identified within the study area (Table 14 and Figure 6). The physical characteristics and water quality designation of these features are detailed in Section V.A.1.b [*Water Resources*]. The jurisdictional stream has been designated as a warm water stream for the purposes of stream mitigation.

**Table 14. Jurisdictional characteristics of water resources in the study area**

| Map ID       | Length (ft.) | Classification | Compensatory Mitigation Required | River Basin Buffer |
|--------------|--------------|----------------|----------------------------------|--------------------|
| SA           | 76           | Intermittent   | Yes                              | Not Subject        |
| <b>Total</b> | <b>76</b>    |                |                                  |                    |

One jurisdictional wetland was identified within the study area (Figure 6). Wetland classification and quality rating data are presented in Table 15. This wetland is located within the Yadkin-Pee Dee River Basin (USGS HUC 03040103). U.S. Army Corps of Engineers (USACE) Wetland Determination Data Forms and an NCDWQ Wetland Rating Worksheet were completed for the wetland in the study area. A description of the natural community surrounding the wetland site is presented in Section V.A.2.a [*Terrestrial Communities*]. Wetland WA is primarily located within the mixed pine/hardwood forest community type.

**Table 15. Jurisdictional characteristics of wetlands within the study area**

| Map ID | NCWAM Classification | Hydrologic Classification | NCDWQ Wetland Rating | Area (ac.)   |
|--------|----------------------|---------------------------|----------------------|--------------|
| WA     | Headwater Forest     | Riparian                  | 27                   | 0.003        |
|        |                      |                           | <b>Total</b>         | <b>0.003</b> |

#### 3.b. Clean Water Act Permits

The proposed project has been designated as a CE for the purposes of National Environmental Policy Act (NEPA) documentation. As a result, a Section 404 Nationwide Permit (NWP) No. 23 will likely be applicable. A NWP No. 33 may also apply for temporary construction activities such as stream dewatering or temporary work pads. The USACE holds the final discretion as to what permit will be required to authorize project construction. If a Section 404 permit is required, then a Section 401 Water Quality Certification (WQC) from the NCDWQ will also be required.

#### 3.c. Coastal Area Management Act Areas of Environmental Concern

No Coastal Area Management Act (CAMA) Areas of Environmental Concern are located within the project study area.

#### 3.d. Construction Moratoria

No waters within the project study area have been identified by the North Carolina Wildlife Resource Commission (NCWRC) as trout waters or by the National Marine

Fisheries Service (NMFS) as habitat for anadromous fish. Therefore, no moratoria are anticipated for this project.

**3.e. North Carolina River Basin Buffer Rules**

Streamside riparian zones within the study area are not protected under provisions of Buffer Rules administered by NCDWQ.

**3.f. Rivers and Harbors Act Section 10 Navigable Waters**

No surface waters within the project study area have been designated as Navigable Waters under Section 10 of the Rivers and Harbors Act.

**3.g. Summary of Anticipated Effects**

Based on preliminary hydraulic review of the existing facility and the proposed improvements the anticipated impacts to jurisdictional surface waters is no (0) linear feet and no (0.00) acres of wetlands. Anticipated impact to each stream and wetland are listed in Table 16.

**Table 16. Anticipated Stream and Wetland Impacts**

| <b>Map ID</b>                | <b>Impacts</b>    |
|------------------------------|-------------------|
| SA                           | 0 feet            |
| WH                           | 0.00 acres        |
| <b>Total Stream Impacts</b>  | <b>0 feet</b>     |
| <b>Total Wetland Impacts</b> | <b>0.00 acres</b> |

**3.h. Wetland and Stream Mitigation**

**1) Avoidance and Minimization of Impacts**

The NCDOT will attempt to avoid and minimize impacts to streams and wetlands to the greatest extent practicable in choosing a preferred alternative and during project design.

**2) Compensatory Mitigation of Impacts**

The NCDOT will investigate potential on-site stream and wetland mitigation opportunities once a final decision has been rendered with regard to the location of the preferred alternative. If on-site mitigation is not feasible, mitigation will be provided by the North Carolina Department of Environment and Natural Resources (NCDENR), Ecosystem Enhancement Program (EEP).

**3.i. Endangered Species Act Protected Species**

As of September 22, 2010, the U.S. Fish and Wildlife Service (USFWS) lists two federally protected species for Randolph County (Table 17). A brief description of each species' habitat requirements follows, along with its Biological Conclusion rendered based on survey results in the study area. Habitat requirements for these species are based

on the current best available information from referenced literature and/or USFWS correspondence.

**Table 17. Federally protected species listed for Randolph County**

| Common Name            | Scientific Name                | Federal Status | Habitat Present | Biological Conclusion |
|------------------------|--------------------------------|----------------|-----------------|-----------------------|
| Cape Fear shiner       | <i>Notropis mekistocholas</i>  | E*             | No              | No Effect             |
| Schweinitz's sunflower | <i>Helianthus schweinitzii</i> | E              | Yes             | No Effect             |

\* E – Endangered

**Cape Fear shiner**

USFWS optimal survey window: April-June (tributaries); year round (large rivers)

Habitat Description: The Cape Fear shiner is known only from the Cape Fear River watershed. In general, habitat occurs in streams with clean gravel, cobble, or boulder substrates. It is most often observed inhabiting slow pools, riffles, and slow runs associated with water willow (*Justicia americana*) beds, which it uses for cover. Juveniles can be found inhabiting slackwater, among large rock outcrops, and in flooded side channels and pools. Spawning occurs May through June, when water temperatures reach 66 degrees Fahrenheit.

Biological Conclusion: **No Effect**

A survey was not performed by NCDOT staff members due to the absence of habitat. The streams located within the study area did not provide appropriate habitat for the Cape Fear shiner.

**Schweinitz's sunflower**

USFWS optimal survey window: late August through October

Habitat Description: Schweinitz's sunflower is a rhizomatous perennial herb endemic to the Piedmont of North and South Carolina. The few sites where this species occurs in relatively natural vegetation are found in Xeric Hardpan Forests. The species is also found along roadside rights-of-way, maintained power lines and other utility rights-of-way, edges of thickets and old pastures, clearings and edges of upland oak-pine-hickory woods and Piedmont longleaf pine forests, and other sunny or semi-sunny habitats where disturbances (*e.g.*, mowing, clearing, grazing, blow downs, storms, frequent fire) help create open or partially open areas for sunlight. It is intolerant of full shade and excessive competition from other vegetation. Schweinitz's sunflower occurs in a variety of soil series, including Badin, Cecil, Cid, Enon, Gaston, Georgeville, Iredell, Mecklenburg, Misenheimer, Secrest, Tatum, Uwharrie, and Zion, among others. It is generally found growing on shallow sandy soils with high gravel content; shallow, poor, clayey hardpans; or shallow rocky soils, especially those derived from mafic rocks.

Biological Conclusion: **No Effect**

On August 30, 2011, NCDOT biologists surveyed for Schweinitz's sunflower within the project area. Habitat is located within the project area along the sides of NC 49 and US

64. No specimens were observed during the survey. A review of the North Carolina Natural Heritage Program (NCNHP) database revealed no occurrences within 1.0 mile of the project area.

**3.j. Bald and Golden Eagle Protection Act**

Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large, dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.

A desktop-GIS assessment of the project study area, as well as the area within a 1.13-mile radius (1.0 mile plus 660 feet) of the project limits, was performed on April 11, 2011 using 2005 color aerials and 1998 color infrared (color IR) aerials. No water bodies large enough or sufficiently open to be considered potential feeding sources were identified within the review area. Since no foraging habitat was identified within the review area, surveys within the study area and the area within 660 feet of the project limits were not required. A review of the NCNHP database on April 11, 2011 revealed no known occurrences of this species within 1.0 mile of the project study area. Due to the lack of sufficient nesting or foraging habitat, known occurrences, and minimal impact anticipated for this project, it has been determined that this project will not affect this species.

**3.k. Endangered Species Act Candidate Species**

As of September 22, 2010, the USFWS lists one Candidate species for Randolph County (Table 18). A review of the NCNHP database on September 20, 2011 revealed no known occurrences of Georgia aster within 1.0 mile of the project study area.

**Table 18. Candidate species listed for Randolph County**

| Common Name   | Scientific Name                  | Habitat Present |
|---------------|----------------------------------|-----------------|
| Georgia aster | <i>Symphyotrichum georgianum</i> | Yes             |

**3.l. Essential Fish Habitat**

No jurisdictional waters within the project study area have been designated as Essential Fish Habitat by the NMFS.

**B. Cultural Resources**

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implemented by the Advisory Council on Historic Preservation’s Regulations for Compliance with Section 106, codified at Title 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally funded, licensed, or permitted) on properties included in or eligible for inclusion in the National Register of Historic Places and afford the Advisory Council a reasonable opportunity to comment on such undertakings.

The review of minor transportation projects was transferred to the North Carolina Department of Transportation’s (NCDOT) cultural resource groups: Archaeology and Historic Architecture and

Landscapes in the Human Environment Section (HES) per a Programmatic Agreement (PA) between Federal Highway Administration (FHWA), NCDOT, North Carolina State Historic Preservation Office (HPO), North Carolina Office of State Archaeology (OSA), and Advisory Council on Historic Preservation effective July 1, 2009. The PA is limited to minor transportation projects that qualify as Categorical Exclusions (CE) or the state equivalent and do not individually or cumulatively have a significant impact on the environment.

### **1. Historic Architecture**

NCDOT – Human Environment Section, under the provisions of a Programmatic Agreement with FHWA, NCDOT, HPO, OSA and the Advisory Council on Historic Preservation (effective July 1, 2009), reviewed the proposed project and determined that there were no historic properties present or affected by the project, see attached form in Appendix A - dated May 27, 2011.

### **2. Archaeology**

NCDOT – Human Environment Section, under the provisions of a Programmatic Agreement with FHWA, NCDOT, HPO, OSA and the Advisory Council on Historic Preservation (effective July 1, 2009), reviewed the proposed project and determined that no surveys are required, see attached form in Appendix A - dated August 2, 2011.

## **C. Community Impacts**

There are no Section 4(f)/6(f) Resources within the proposed project limits.

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland of all land acquisition and construction projects. There are no soils classified as prime, unique, or having state or local importance in the vicinity of the project. Therefore, the project will not involve the direct conversion of farmland acreage within these classifications.

No adverse impacts on families or communities are anticipated by the construction of the proposed project. Right-of-Way acquisition will be limited. The proposed project will not involve any residential or business relocation.

There are no populations meeting the census-based criteria for environmental justice in the project study area. There are no populations meeting the census-based Department of Justice Safe Harbor threshold for Limited English Proficiency requiring written translation within the project study area.

No adverse effect on public facilities or services is expected. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

The project is not in conflict with any plan, existing land use, or zoning regulation. All affected properties are currently zoned Business/Commercial. No change in land use is expected to result from the construction of the project.

Randolph County is a participant in the National Flood Insurance Program, administered by The Federal Emergency Management Agency (FEMA). Based on the most current information available from the NC Floodplain Mapping Program (FMP), there are no streams in the project study area designated as flood hazard zones.

The project will not have a disproportionately high and adverse human health and environmental effect on any minority or low-income population.

#### **D. Noise & Air Quality**

##### **1. Traffic Noise Analysis**

In accordance with Title 23 Code of Federal Regulations Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise (Title 23 CFR 772) and the North Carolina Department of Transportation Traffic Noise Abatement Policy, each Type I highway project must be analyzed for predicted traffic noise impacts. In general, Type I projects are proposed Federal or Federal-aid highway projects for construction of a highway or interchange on new location, improvements of an existing highway that significantly changes the horizontal or vertical alignment or increases the vehicle capacity, or projects that involve new construction or substantial alteration of transportation facilities such as weigh stations, rest stops, ride-share lots or toll plazas.

Traffic noise impacts are determined through implementing the current Traffic Noise Model (TNM®) approved by the Federal Highway Administration and by following procedures detailed in Title 23 CFR 772 and the NCDOT Traffic Noise Analysis and Abatement Manual. When traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures must be considered for reducing or eliminating these impacts. Temporary and localized noise impacts will likely occur as a result of project construction activities. Construction noise control measures will be incorporated into the project plans and specifications.

A copy of the unabridged version of the full technical report entitled Mack Road (SR 1144) Extension from NC 49 to US 64 can be viewed in the Project Development & Environmental Analysis Unit, Century Center Building A, 1010 Birch Ridge Drive, Raleigh.

##### **Traffic Noise Impacts and Noise Contours**

The maximum number of receptors in each project alternative predicted to become impacted by future traffic noise is shown in the Table 19. The table includes those receptors expected to experience traffic noise impacts by either approaching or exceeding the FHWA Noise Abatement Criteria or by a substantial increase in exterior noise levels as defined in the NCDOT Traffic Noise Abatement Policy.

The maximum extents of the 71- and 66- dB(A) noise level contours measured from the center of the proposed roadway are 26 feet and 180 feet, respectively.

**Table 19. Predicted Traffic Noise Impacts by Alternative\***

| Alternative | Traffic Noise          |                                       |                       | Impacts |
|-------------|------------------------|---------------------------------------|-----------------------|---------|
|             | Residential<br>(NAC B) | Churches/Schools, etc.<br>(NAC C & D) | Businesses<br>(NAC E) |         |
| Build       | 10                     | 0                                     | 0                     | 10      |
| No Build    | 10                     | 0                                     | 0                     | 10      |

\*Per TNM@2.5 and in accordance with 23 CFR Part 772

### **No-Build Alternative**

The Traffic Noise Analysis also considered traffic noise impacts for the “no-build” alternative. If the proposed project does not occur, 10 receptors are predicted to experience traffic noise impacts and the future traffic noise levels will increase by approximately 1 dBA. Based upon research, humans barely detect noise level changes of 2-3 dBA. A 5-dBA change is more readily noticeable. Therefore, most people working and living near the roadway will not notice this predicted increase.

### **Traffic Noise Abatement Measures**

Measures for reducing or eliminating the traffic noise impacts were considered for all impacted receptors in the Build alternative. The primary noise abatement measures evaluated for highway projects include highway alignment changes, traffic system management measures, establishment of buffer zones, noise barriers and noise insulation (NAC D only). For each of these measures, benefits versus allowable abatement measure quantity (reasonableness), engineering feasibility, effectiveness and practicability and other factors were included in the noise abatement considerations.

Substantially changing the highway alignment to minimize noise impacts is not considered to be a viable option for this project due to engineering and/or environmental factors. Traffic system management measures are not considered viable for noise abatement due to the negative impact they would have on the capacity and level of service of the proposed roadway. Costs to acquire buffer zones for impacted receptors will exceed the NCDOT base quantity value of \$37,500 per benefited receptor, causing this abatement measure to be unreasonable.

### **Noise Barriers**

Noise barriers include two basic types: earthen berms and noise walls. These structures act to diffract, absorb, and reflect highway traffic noise.

This project will maintain uncontrolled right of way access, meaning that most noise-sensitive land uses will have direct access connections to the proposed project, and most

intersections will adjoin the project at grade. The Traffic Noise Analysis for this project confirmed that the physical breaks in potential noise barriers that would occur due to the uncontrolled right of way access would prohibit any noise barrier from providing the minimum required traffic noise level reductions at all predicted traffic noise impacts, as defined by the noise abatement measure feasibility criteria of the NCDOT Traffic Noise Abatement Policy.

## **Summary**

Based on this preliminary study, traffic noise abatement is not recommended and no noise abatement measures are proposed. This evaluation completes the highway traffic noise requirements of Title 23 CFR Part 772. No additional noise analysis will be performed for this project unless warranted by a significant change in the project scope, vehicle capacity or alignment.

In accordance with NCDOT Traffic Noise Abatement Policy, the Federal/State governments are not responsible for providing noise abatement measures for new development for which building permits are issued after the Date of Public Knowledge. The Date of Public Knowledge of the proposed highway project will be the approval date of the Categorical Exclusion (CE), Finding of No Significant Impact (FONSI), or Record of Decision (ROD). For development occurring after this date, local governing bodies are responsible to insure that noise compatible designs are utilized along the proposed facility.

## **2. Air Quality Analysis**

Air pollution originates from various sources. Emissions from industry and internal combustion engines are the most prevalent sources. The impact resulting from highway construction ranges from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. Motor vehicles emit carbon monoxide (CO), nitrogen oxide (NO), hydrocarbons (HC), particulate matter, sulfur dioxide (SO<sub>2</sub>), and lead (Pb) (listed in order of decreasing emission rate).

The Federal Clean Air Act of 1970 established the NAAQS. These were established in order to protect public health, safety, and welfare from known or anticipated effects of air pollutants. The primary pollutants from motor vehicles are unburned hydrocarbons, NO<sub>x</sub>, CO, and particulates. Hydrocarbons (HC) and Nitrogen oxides (NO<sub>x</sub>) can combine in a complex series of reactions catalyzed by sunlight to produce photochemical oxidants such as ozone and NO<sub>2</sub>. Because these reactions take place over a period of several hours, maximum concentrations of photochemical oxidants are often found far downwind of the precursor sources and, therefore are more regional than local.

The project is located in Randolph County, which has been determined to comply with the National Ambient Air Quality Standards. The proposed project is located in an attainment

area; therefore, 40 CFR Parts 51 and 93 are not applicable. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

### **Mobile Source Air Toxics (MSATs)**

Recently, concerns for air toxics impacts are more frequent on transportation projects during the NEPA process. Transportation agencies are increasingly expected by the public and other agencies to address MSAT impacts in their environmental documents as the science emerges. Mobile Source Air Toxics (MSATs) analysis is a continuing area of research where, while much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health impacts from MSATs are limited. These limitations impede FHWA's ability to evaluate how mobile source health risks should factor into project-level decision-making under the National Environmental Policy Act (NEPA).

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in our environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

Also, EPA has not established regulatory concentration targets for the six relevant MSAT pollutants appropriate for use in the project development process. FHWA has several research projects underway to more clearly define potential risks from MSAT emissions associated with transportation projects. While this research is ongoing, FHWA requires each NEPA document to qualitatively address MSATs and their relationship to the specific highway project through a tiered approach, depending on specific project circumstances. What we know about mobile source air toxics is still evolving. As the science progresses FHWA will continue to revise and update this guidance. To that end, we expect that a number of significant improvements in model forecasting and air pollution analysis guidance with the MOVES model and the issuance of the PM 2.5 Hot Spot Modeling Guidance.

A qualitative analysis of MSATs for this project appears in its entirety in the project Air Quality Analysis, dated June 28, 2012. A copy of this report may be viewed in the Project Development & Environmental Analysis Unit office, Century Center Building B, 1000 Birch Ridge Drive, Raleigh.

### **E. Impacts on Hazardous Materials**

Based on a search of the GIS databases within the project study area, seven possible underground storage tank were identified within the project area. Preliminary site assessments will be conducted for all potentially contaminated sites within the proposed right of way prior to right of

way acquisition. Potentially contaminated properties within the project area are presented on Figure 7 and Table 20 below.

**Table 20. Potentially Hazardous Materials Sites Within Project Area**

| Site No. | Site Name                   | Facility ID#    | Location          |
|----------|-----------------------------|-----------------|-------------------|
| 1        | D&G Motorsports             | None Identified | 217 NC Hwy 49 S   |
| 2        | Harvey’s Tank and Tummy #14 | 0-019705 18249  | 176 NC Hwy 49 S   |
| 3        | Thomas Tire                 | None Identified | 1191 US Hwy 64 W  |
| 4        | Citgo                       | 0-018606 13629  | 1140 US Hwy 64 W  |
| 5        | Wiley Miniute Market        | 0-018101 3771   | 1065 Albemarle Rd |
| 6        | G&G Motors                  | 10216           | 1350 W Dixie Dr   |
| 7        | Master BP                   | 0-019073        | 925 Albemarle Rd  |

## VI. COORDINATION & AGENCY COMMENTS

NCDOT has sought input from the following agencies as a part of project development: U.S. Army Corps of Engineers, U.S. Fish & Wildlife Service, U.S. Department of Transportation - Federal Highway Administration, N.C. Department of Natural Resources – Division of Water Quality, N.C. Department of Cultural Resources – Division of Archives and History, N.C. Department of Public Instruction and the City of Asheboro.

The U.S. Army Corps of Engineers submitted a response to the request for comments, see Appendix A.

**Response:** NCDOT will address all comments before or during permitting.

The N.C. Department of Natural Resources – Division of Water Quality submitted a response to the request for comments, see Appendix A. One **Project Specific Comment** and twenty-two **General Project Comments** were noted.

**Response:** The **Project Specific Comment** pertains to High Quality Waters of the State

*“Review of the project reveals the presence of surface waters classified as WS-II;HQW. High Quality Waters of the State in the project study area. This is one of the highest classifications for water quality. Pursuant to 15A NCAC 2H.1006 and 15A NCAC 2B.0224, NCDOT will be required to obtain State Stormwater Permit prior to construction except in North Carolina’s twenty coastal counties.”*

Since the initial request for input was received the project study area has been narrowed. The reference High Quality Waters of the State will not be affected, directly or indirectly, by the proposed project thus this comment is no longer applicable to this project. All **General Project Comments** were noted and were addressed in this document or will be addressed in the development of Final Plans, in permitting and/or during construction.

## **VII. PUBLIC INVOLVEMENT**

A newsletter, see Appendix B, has been sent to all those living within the project study area prior to the Citizen's Informational Workshop on July 21, 2011. No comments have been received regarding the newsletter to date.

A Citizen's Informational Workshop was held on September 23, 2011 at the Randolph Community College – Foundation Conference Center, see Appendix B for the workshop handout. The meeting was well attended with 54 members of the community present. The vast majority of those in attendance were in favor of the project. Several concerns were voiced regarding access to the local businesses. All written comments received were in support of the project.

Small group meetings were held with the effected businesses (American Classic Motorcycles, Econo Mart – Citgo, Tank & Tummy, Thomas Tire Company, Select Homes and Lyda's Towing) to discuss the proposed project and the issue of access to their individual parcels.

A follow up Public Meeting was held on August 23, 2012 at the Randolph Community College – Foundation Conference Center, see Appendix B for the meeting handout. The meeting was well attended with 29 members of the community present. All in attendance were in favor of the project. Several concerns were voiced regarding access to the local businesses. All written comments received were in support of the project.

## **VIII. CONCLUSION**

The project is expected to have an overall positive impact. The closure of the existing Connector Road and the proposed extension of Mack Road from NC 49 to US 64 will result in improved traffic operations.

The proposed project will not have an adverse effect on the quality of the human or natural environment with the use of the current North Carolina Department of Transportation standards and specifications.

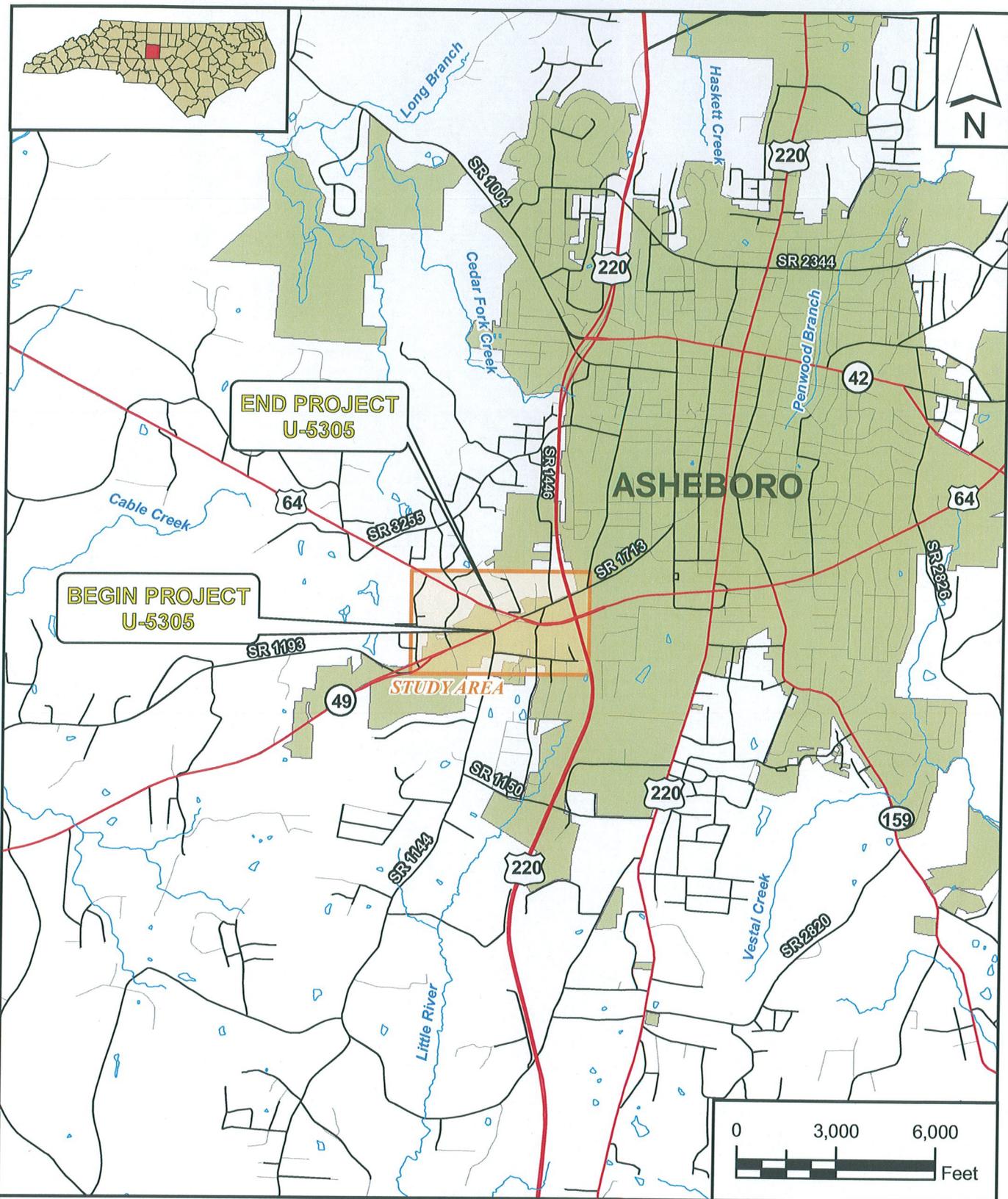
The proposed project will not require right-of-way acquisition or easement from any land protected under Section 4(f) of the Department of Transportation Act of 1966.

On the basis of the above discussion, it is concluded that no substantial adverse environmental impacts will result from implementation of the project. The project is therefore considered to be a federal "Categorical Exclusion" due to its limited scope and lack of substantial environmental consequences. The proposed project meets the criteria for a CE as denoted in 23 CFR 771.117.

## **REFERENCES**

US DOT, Federal Highway Administration memorandum, “Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents”, September 30, 2009.

## **FIGURES**



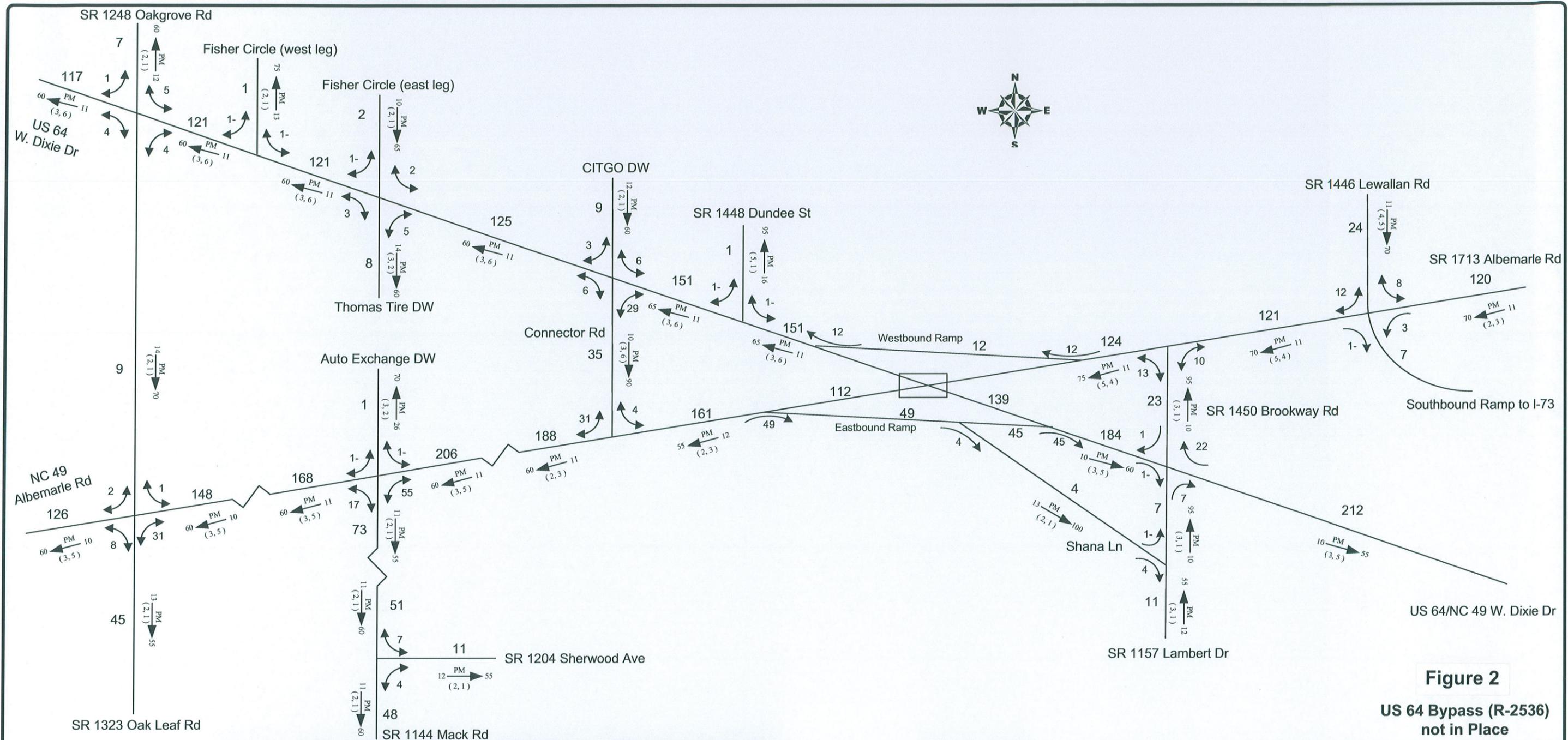
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

**VICINITY MAP**  
**NC 49 INTERSECTION WITH SR 1144 (MACK RD) REALIGN**  
**INTERSECTION WITH US 64 W**

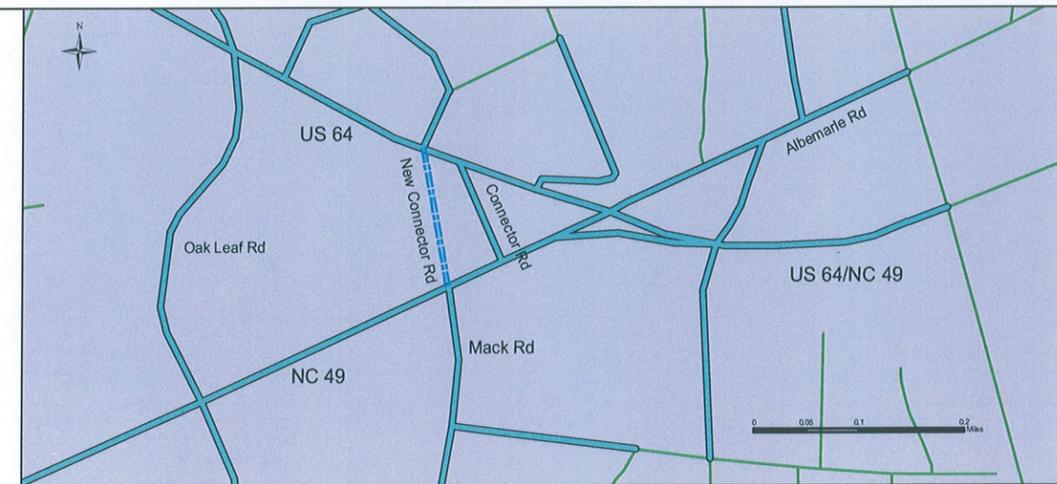
RANDOLPH COUNTY  
 TIP PROJECT U-5305

|         |           |
|---------|-----------|
| County: | RANDOLPH  |
| Div:    | 8         |
| TIP#    | U-5305    |
| WBS:    | 47025.1.1 |
| Date:   | DEC. 2010 |

**Figure**  
**1**



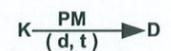
**Figure 2**  
**US 64 Bypass (R-2536)**  
**not in Place**



**2012**

**LEGEND**

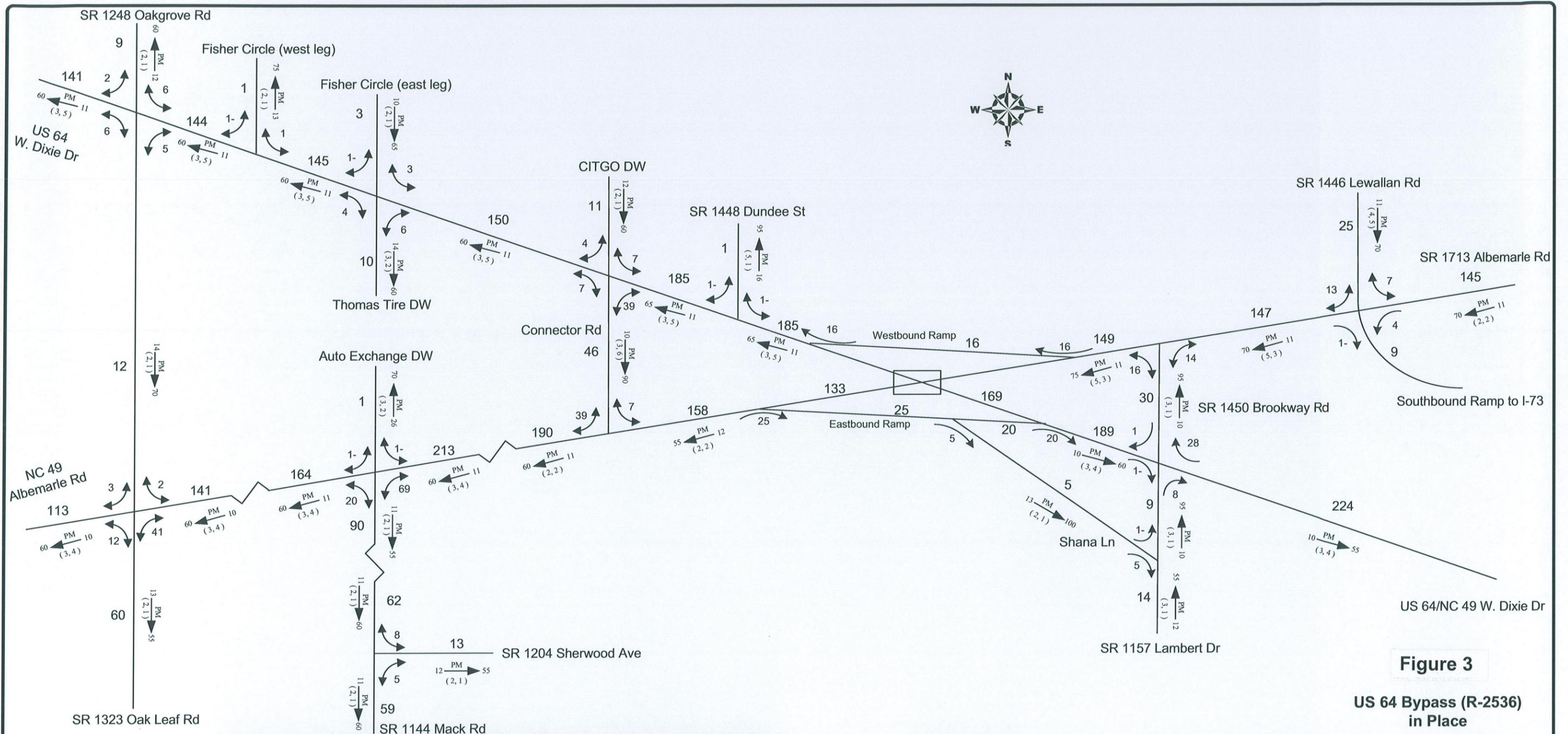
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- Proposed Roadway
- K Design Hour Factor (%)
- PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d, t) Duals, TT-STs (%)



AVERAGE ANNUAL  
DAILY TRAFFIC

**No Build**  
**Sheet 1 - 1**

|  |                |
|--|----------------|
| TIP: U-5305  | WBS: 47025.1.1 |
| COUNTY: Randolph   | DIVISION: 8    |
| DATE: March 27, 2012   |                |
| PREPARED BY: Paul Schroeder, PhD, PE                                 |                |
| LOCATION: US 64 W. Dixie Drive & NC 49<br>Albemarle Road in Asheboro |                |
| PROJECT: Realignment of Connector Road from<br>US 64 to NC 49        |                |



**Figure 3**

**US 64 Bypass (R-2536)  
in Place**



# 2040

## LEGEND

- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- ..... Proposed Roadway
- K Design Hour Factor (%)
- PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d, t) Duals, TT-STs (%)

AVERAGE ANNUAL  
DAILY TRAFFIC

**No Build  
Sheet 1 - 1**

TIP: U-5305

WBS: 47025.1.1

COUNTY: Randolph

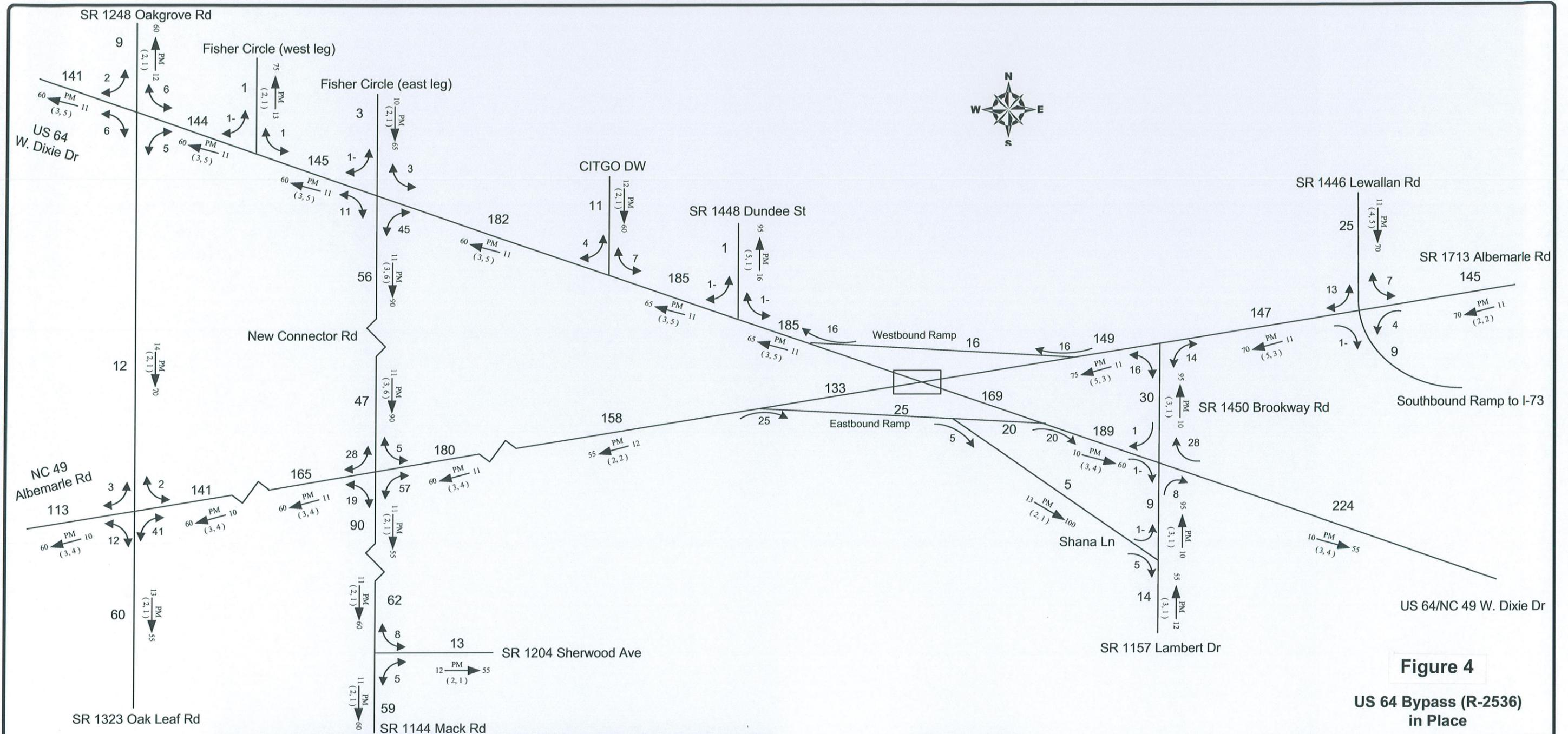
DIVISION: 8

DATE: June 7, 2012

PREPARED BY: Paul Schroeder, PhD, PE

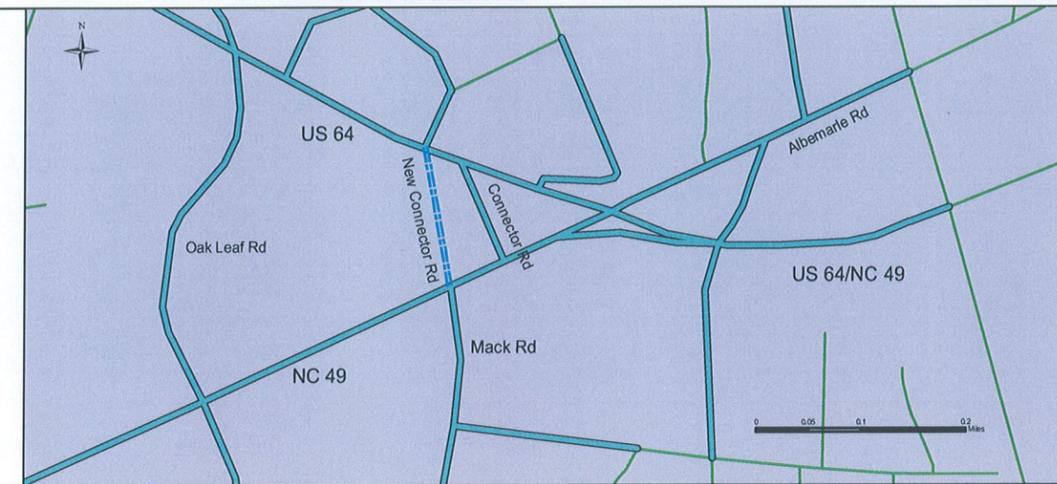
LOCATION: US 64 W. Dixie Drive & NC 49  
Albemarle Road in Asheboro

PROJECT: Realignment of Connector Road from  
US 64 to NC 49



**Figure 4**

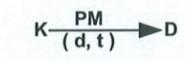
**US 64 Bypass (R-2536)  
in Place**



# 2040

## LEGEND

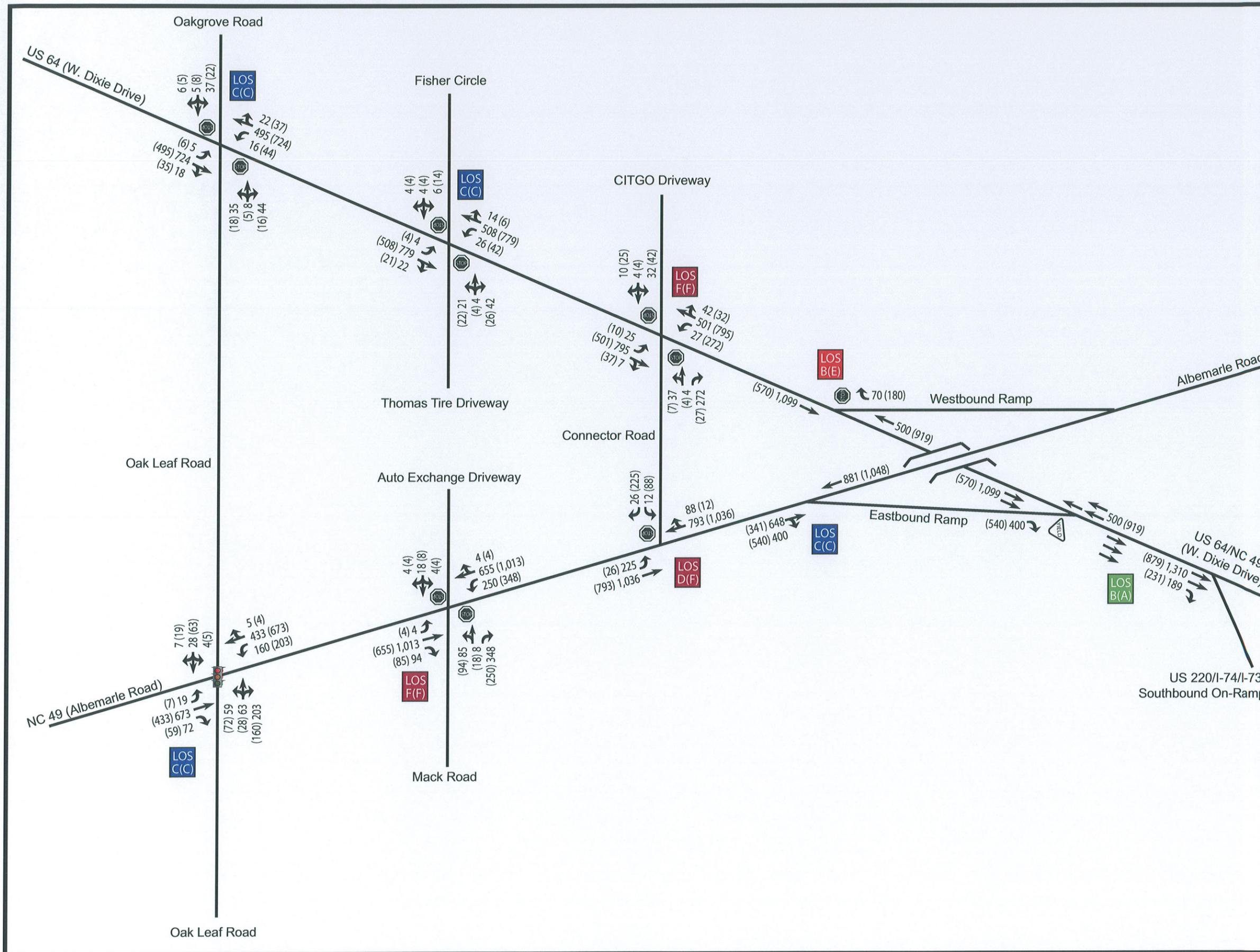
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- ..... Proposed Roadway
- K Design Hour Factor (%)
- PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d, t) Duals, TT-STs (%)



AVERAGE ANNUAL  
DAILY TRAFFIC

**Build  
Sheet 1 - 1**

|   |                       |
|---|-----------------------|
| <b>TIP:</b> U-5305  | <b>WBS:</b> 47025.1.1 |
| <b>COUNTY:</b> Randolph   | <b>DIVISION:</b> 8    |
| <b>DATE:</b> March 27, 2012   |                       |
| <b>PREPARED BY:</b> Paul Schroeder, PhD, PE                                 |                       |
| <b>LOCATION:</b> US 64 W. Dixie Drive & NC 49<br>Albemarle Road in Asheboro |                       |
| <b>PROJECT:</b> Realignment of Connector Road from<br>US 64 to NC 49        |                       |



- LEGEND**
- Signalized Intersection
  - Stop Controlled Movement
  - Yield Controlled Movement
  - XX (XX) AM (PM) Peak Hour Volumes
  - Lane Geometry
  - LOS X (X) Intersection AM (PM) Peak Hour Level of Service
  - Level of Service A or B
  - Level of Service C
  - Level of Service D
  - Level of Service E
  - Level of Service F

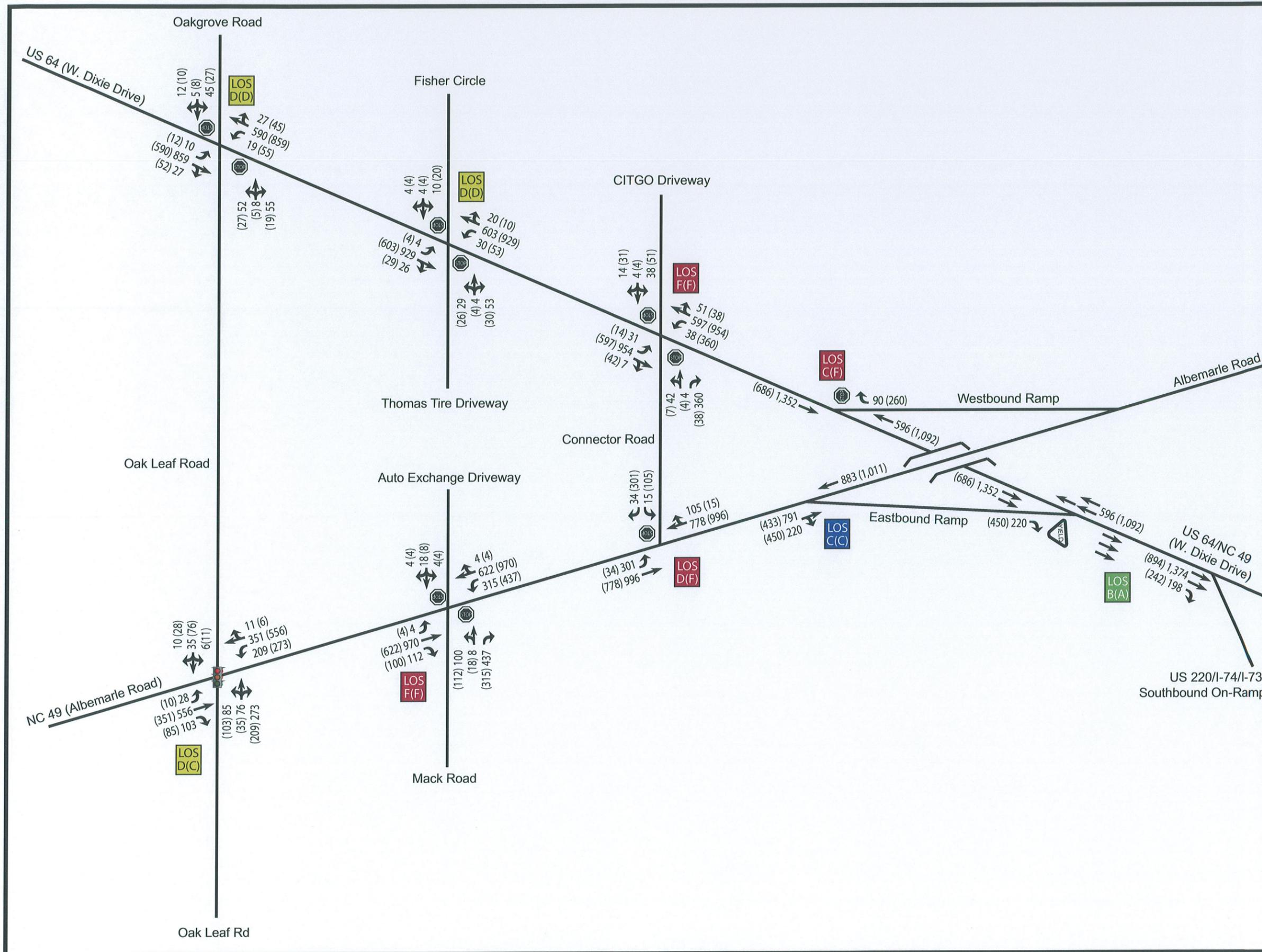


**MACK ROAD EXTENSION FROM NC 49 TO US 64**  
 STIP Project No. U-5305  
 Randolph County, NC



**YEAR 2012 EXISTING CONDITIONS**

**FIGURE 5A**



- LEGEND**
- Signalized Intersection
  - Stop Controlled Movement
  - Yield Controlled Movement
  - XX (XX) AM (PM) Peak Hour Volumes
  - Lane Geometry
  - LOS X (X) Intersection AM (PM) Peak Hour Level of Service
  - Level of Service A or B
  - Level of Service C
  - Level of Service D
  - Level of Service E
  - Level of Service F

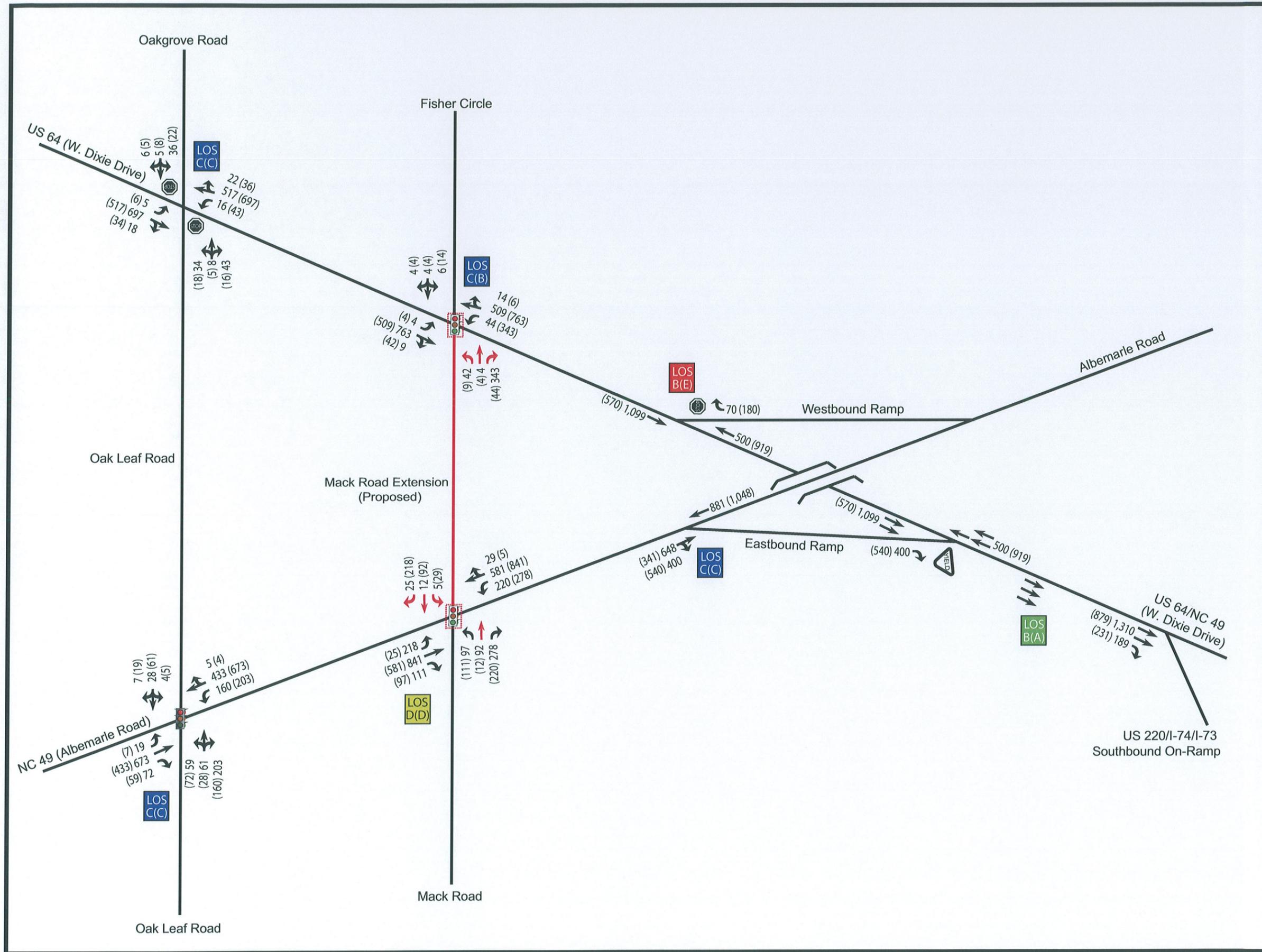


**MACK ROAD EXTENSION FROM NC 49 TO US 64**  
 STIP Project No. U-5305  
 Randolph County, NC



**YEAR 2040 NO-BUILD CONDITIONS**

**FIGURE 5B**



- LEGEND**
- Signalized Intersection
  - Proposed Signalized Intersection
  - Stop Controlled Movement
  - Yield Controlled Movement
  - XX (XX) AM (PM) Peak Hour Volumes
  - Lane Geometry
  - Proposed Lane Geometry
  - Intersection AM (PM) Peak Hour Level of Service
  - Level of Service A or B
  - Level of Service C
  - Level of Service D
  - Level of Service E
  - Level of Service F

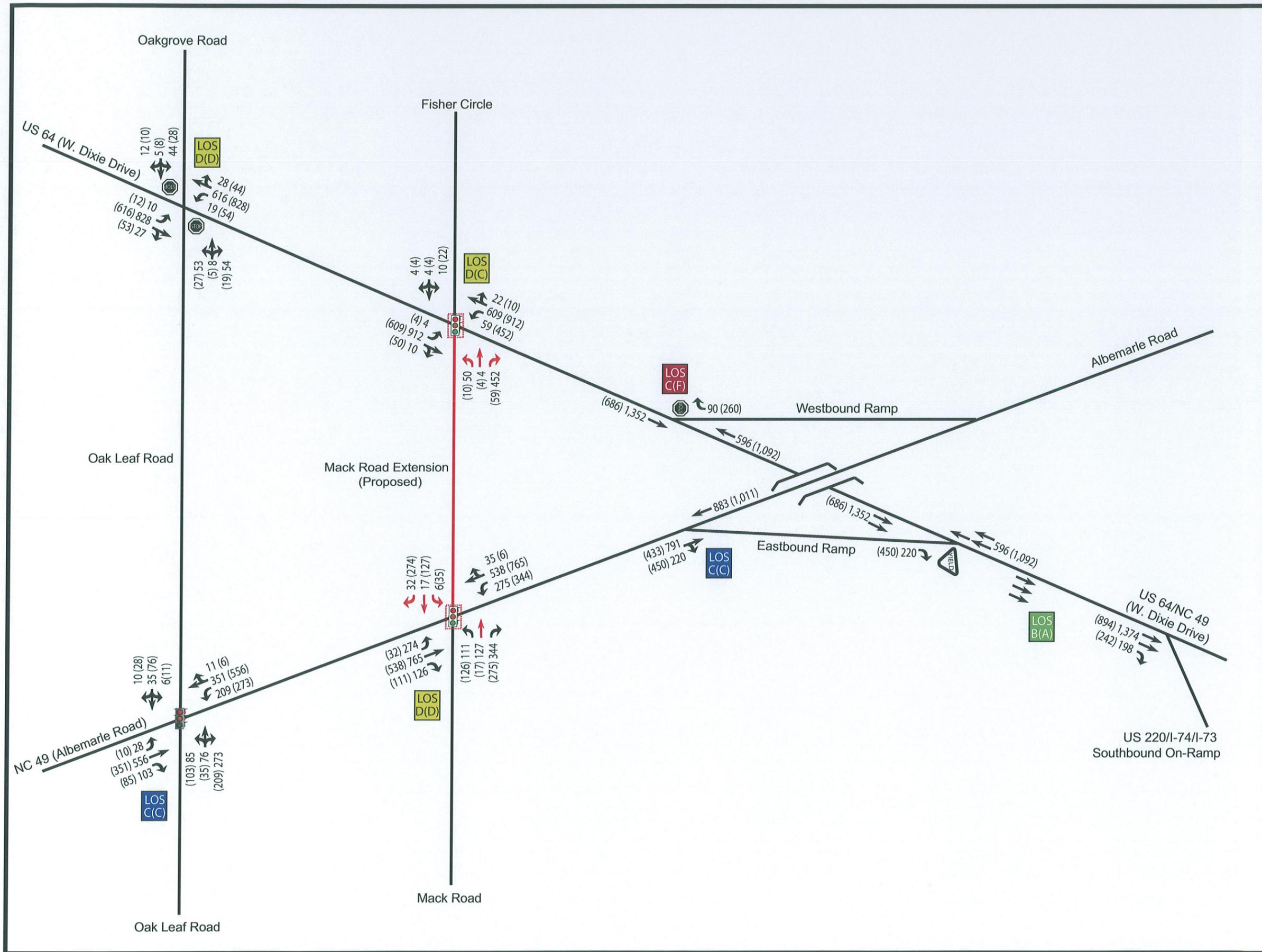


**MACK ROAD EXTENSION  
FROM NC 49 TO US 64**  
STIP Project No. U-5305  
Randolph County, NC



**YEAR 2012 BUILD  
CONDITIONS**

**FIGURE 5C**



- LEGEND**
- Signalized Intersection
  - Proposed Signalized Intersection
  - Stop Controlled Movement
  - Yield Controlled Movement
  - XX (XX) AM (PM) Peak Hour Volumes
  - Lane Geometry
  - Proposed Lane Geometry
  - Intersection AM (PM) Peak Hour Level of Service
  - Level of Service A or B
  - Level of Service C
  - Level of Service D
  - Level of Service E
  - Level of Service F

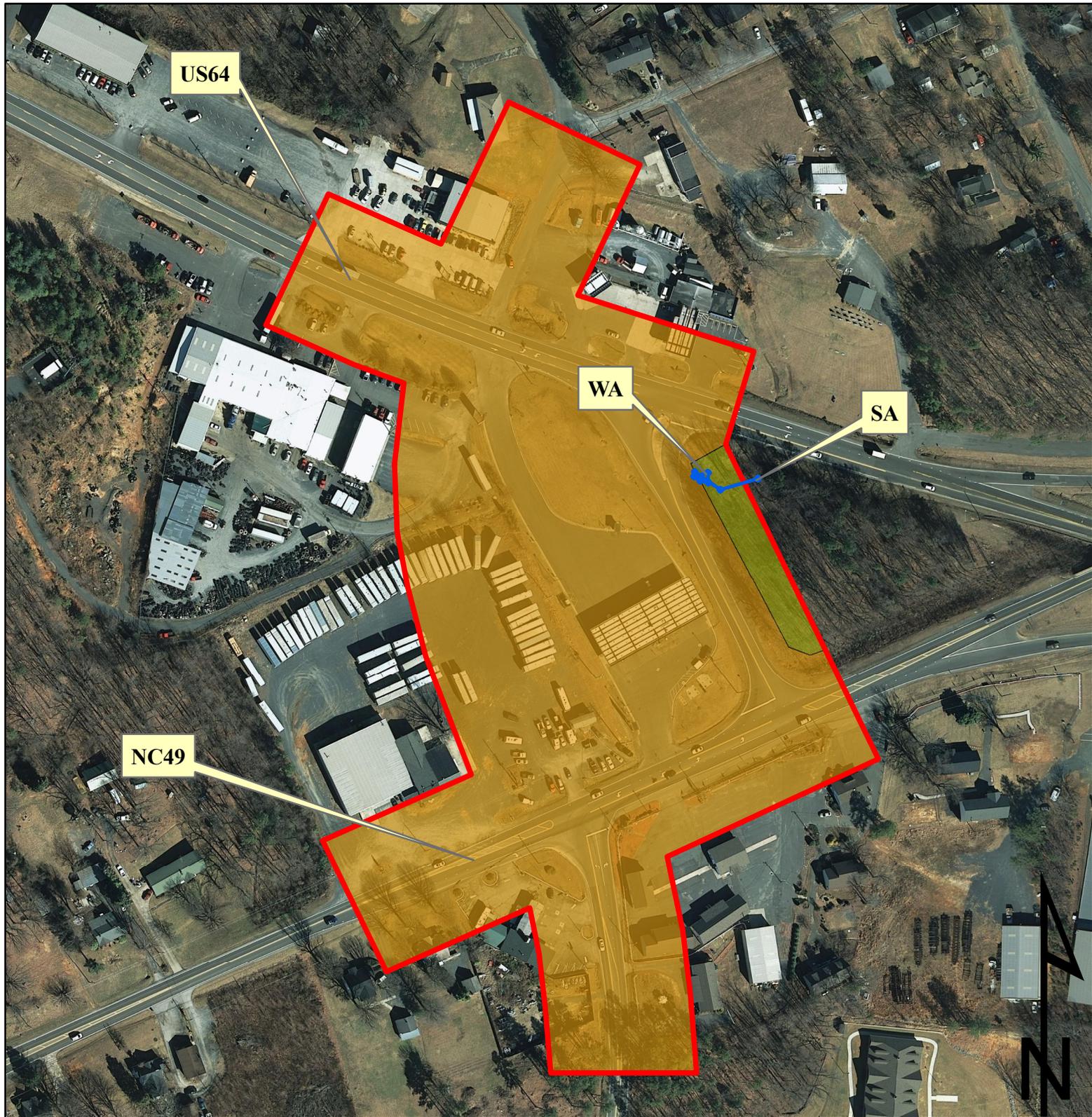


**MACK ROAD EXTENSION  
FROM NC 49 TO US 64**  
STIP Project No. U-5305  
Randolph County, NC



**YEAR 2040 BUILD  
CONDITIONS**

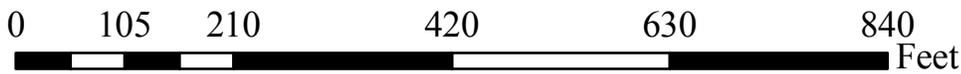
**FIGURE 5D**



**Legend**

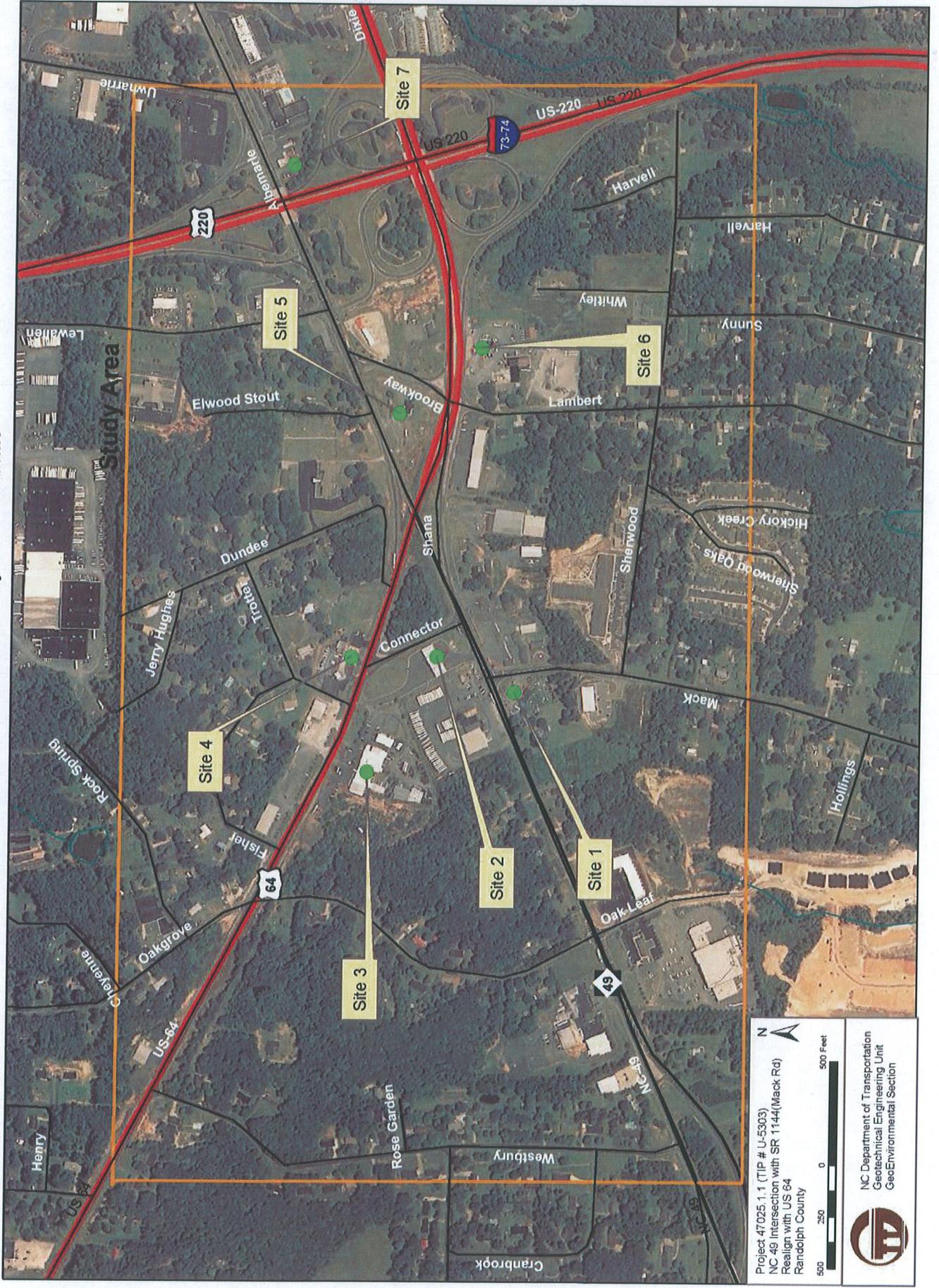
-  Jurisdictional Features
-  Project Study Area
-  Maintained/Disturbed
-  Mixed Pine/Hardwood

**Figure 6**  
**Terrestrial Community and**  
**Jurisdictional Features Map**  
**NC49 Intersection with SR1144 (Mack Road)**  
**Realign Intersection with US 64 West**



**FIGURE 7**

**Location of USTs, Landfills, & Other Potentially Contaminated Sites**



**APPENDIX A**  
**COMMENTS RECEIVED**



REPLY TO  
ATTENTION OF:

DEPARTMENT OF THE ARMY  
WILMINGTON DISTRICT, CORPS OF ENGINEERS  
69 DARLINGTON AVENUE  
WILMINGTON, NORTH CAROLINA 28403-1343

F:12

February 7, 2011

Regulatory Division

Action ID. No. SAW-2011-00260; U-5305, Randolph County

Dr. Gregory J. Thorpe, Ph.D.  
Environmental Management Director  
North Carolina Department of Transportation  
Project Development & Environmental Analysis  
1598 Mail Service Center  
Raleigh, N.C. 27699-1598

Dear Dr. Thorpe:

Reference is made to your letter of January 26, 2011 regarding the proposed intersection improvements with SR 1144 (Mack Road), US 64 and NC 49, in Asheboro, Randolph County, North Carolina. The letter requested information and comments to assist in evaluating potential environmental impacts.

We have reviewed the subject documents and determined that, based upon a review of the information provided and available maps, the construction of this project may impact streams and/or wetlands within the work corridor. Please be aware that impacts associated with the discharge of fill into jurisdictional waters of the United States are subject to our regulatory authority pursuant to Section 404 of the Clean Water Act. Any discharge of excavated or fill material into waters of the United States and/or any adjacent wetlands would require Department of the Army (DA) permit authorization. The type of DA authorization required (i.e., general or individual permit) will be determined by the location, type, and extent of jurisdictional area impacted by the project, and by the project design and construction limits.

Until additional data is furnished which details the extent of the construction limits of the proposed project, and an onsite inspection is completed with regard to determinations of the presence of jurisdictional waters in the project area, we are unable to verify that the project will not have jurisdictional impacts, or to provide specific comments concerning DA permit requirements or a recommendation of alternatives. To assist you with determining permitting requirements, we recommend that you perform a detailed delineation of the streams and/or wetlands present on the project site. When this information becomes available, it should be forwarded to our office for review and comment, as well as a determination of DA permit eligibility.

Should you have any further questions related to DA permits for this project, please contact me at (910) 251-4829.

Sincerely,



Ronnie Smith  
NCDOT, Project Manager  
Wilmington Regulatory Field Office

Copies Furnished:

Mr. Richard Helms

✓ North Carolina Department of Transportation  
Project Development & Environmental Analysis  
1548 Mail Service Center  
Raleigh, N.C. 27699-1598

Mr. Mason Herndon

NCDENR-DWQ  
225 Green Street, Suite 214  
Fayetteville, North Carolina 28301-5094

Mr. Tim Johnson, P.E.

Division Engineer, Division 8  
North Carolina Department of Transportation  
Post Office Box 1057  
Aberdeen, North Carolina 28315

Mr. Art King

Division Environmental Officer, Division 8  
North Carolina Department of Transportation  
Post Office Box 1057  
Aberdeen, North Carolina 28315



North Carolina Department of Environment and Natural Resources

Division of Water Quality  
Coleen H. Sullins  
Director

RECEIVED  
Division of Highways

FEB 23 2011

Dee Freeman  
Secretary

Beverly Eaves Perdue  
Governor

February 17, 2010

Preconstruction  
Project Development and  
Environmental Analysis Branch

**MEMORANDUM**

To: Dr. Gregory Thorpe, PhD, NCDOT

From: Belinda Henson, NC Division of Water Quality, Fayetteville Regional Office *Belinda S. Henson*

Subject: Scoping comments on proposed improvements to NC 49 intersection with SR 1144 (Mack Rd), realign intersection with US 64 West to NC 49 West access ramp in Randolph County, Federal Aid Project No. NHS-70, WBS No. 47025, TIP U-5305.

Reference your correspondence dated January 26, 2011 in which you requested comments for the referenced project. Preliminary analysis of the project reveals the potential for multiple impacts to streams and jurisdictional wetlands in the project area. More specifically, impacts to:

| Stream Name        | River Basin    | Stream Classification(s) | Stream Index Number | 303(d) Listing |
|--------------------|----------------|--------------------------|---------------------|----------------|
| Little River       | Yadkin-Pee Dee | C                        | 13-25-(1)           | N/A            |
| UT Cedar Fork Ck   | Yadkin-Pee Dee | WS-II;HQW                | 13-2-3-3-2-2-(1)    | N/A            |
| UT's Cedar Fork Ck | Yadkin-Pee Dee | C                        | N/A                 | N/A            |

Further investigations at a higher resolution should be undertaken to verify the presence of other streams and/or jurisdictional wetlands in the area. In the event that any jurisdictional areas are identified, the Division of Water Quality requests that NCDOT consider the following environmental issues for the proposed project:

**Project Specific Comments:**

1. Review of the project reveals the presence of surface waters classified as WS-II;HQW. High Quality Waters of the State in the project study area. This is one of the highest classifications for water quality. Pursuant to 15A NCAC 2H .1006 and 15A NCAC 2B .0224, NCDOT will be required to obtain a State Stormwater Permit prior to construction except in North Carolina's twenty coastal counties.

**General Project Comments:**

2. The environmental document shall provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping. If mitigation is necessary as required by 15A NCAC 2H.0506(h), it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. Appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.

3. Environmental assessment alternatives shall consider design criteria that reduce the impacts to streams and wetlands from storm water runoff. These alternatives shall include road designs that allow for treatment of the storm water runoff through best management practices as detailed in the most recent version of NCDWQ *Stormwater Best Management Practices*, such as grassed swales, buffer areas, preformed scour holes, retention basins, etc.
4. After the selection of the preferred alternative and prior to an issuance of the 401 Water Quality Certification, NCDOT is respectfully reminded that they will need to demonstrate the avoidance and minimization of impacts to wetlands (and streams) to the maximum extent practical. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(h)}, mitigation will be required for impacts of greater than 1 acre to wetlands. In the event that mitigation is required, the mitigation plan shall be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as wetland mitigation.
5. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(h)}, mitigation will be required for impacts of greater than 150 linear feet to any single stream. In the event that mitigation is required, the mitigation plan shall be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as stream mitigation.
6. NCDWQ is very concerned with sediment and erosion impacts that could result from this project. NCDOT shall address these concerns by describing the potential impacts that may occur to the aquatic environments and any mitigating factors that would reduce the impacts.
7. If a bridge is being replaced with a hydraulic conveyance other than another bridge, NCDWQ believes the use of a Nationwide Permit may be required. Please contact the US Army Corp of Engineers to determine the required permit(s).
8. If the old bridge is removed, no discharge of bridge material into surface waters is allowed unless otherwise authorized by the US ACOE. Strict adherence to the Corps of Engineers guidelines for bridge demolition will be a condition of the 401 Water Quality Certification.
9. Whenever possible, NCDWQ prefers spanning structures. Spanning structures usually do not require work within the stream or grubbing of the streambanks and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges shall allow for human and wildlife passage beneath the structure. Fish passage and navigation by canoeists and boaters shall not be blocked. Bridge supports (bents) shall not be placed in the stream when possible.
10. Bridge deck drains shall not discharge directly into the stream. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to the most current version of NCDWQ's *Stormwater Best Management Practices*.
11. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.
12. If temporary access roads or detours are constructed, the site shall be graded to its preconstruction contours and elevations. Disturbed areas shall be seeded or mulched to stabilize the soil and appropriate native woody species should be planted. When using temporary structures the area

shall be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact allows the area to re-vegetate naturally and minimizes soil disturbance.

13. Placement of culverts and other structures in waters, streams, and wetlands shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and down stream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWQ. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWQ for guidance on how to proceed and to determine whether or not a permit modification will be required.
14. If multiple pipes or barrels are required, they shall be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation, floodplain benches, and/or sills may be required where appropriate. Widening the stream channel shall be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.
15. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3624/Nationwide Permit No. 6 for Survey Activities.
16. Sediment and erosion control measures sufficient to protect water resources must be implemented and maintained in accordance with the most recent version of North Carolina Sediment and Erosion Control Planning and Design Manual and the most recent version of NCS000250.
17. All work in or adjacent to stream waters shall be conducted in a dry work area unless otherwise approved by NCDWQ. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures should be used to prevent excavation in flowing water.
18. Sediment and erosion control measures shall not be placed in wetlands and streams.
19. Borrow/waste areas shall avoid wetlands to the maximum extent practical. Impacts to wetlands in borrow/waste areas could precipitate compensatory mitigation.
20. While the use of National Wetland Inventory (NWI) maps, NC Coastal Region Evaluation of Wetland Significance (NC-CREWS) maps and soil survey maps are useful tools, their inherent inaccuracies require that qualified personnel perform onsite wetland delineations prior to permit approval.
21. Heavy equipment shall be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams. This equipment shall be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

22. In most cases, NCDWQ prefers the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure shall be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed and restored to the natural ground elevation. The area shall be stabilized with grass and planted with native tree species. Tall fescue shall not be used in riparian areas.
23. Riprap shall not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed.

Thank you for requesting our input at this time. NCDOT is reminded that issuance of a 401 Water Quality Certification requires that appropriate measures be instituted to ensure that water quality standards are met and designated uses are not degraded or lost. If you have any questions or require additional information, please contact Mason Herndon at (910) 308-4021.

cc: Ronnie Smith, US Army Corps of Engineers, Wilmington Field Office  
Clarence Coleman, Federal Highway Administration  
Tim Johnson, PE, Division 8 Engineer  
Art King, Division 8 Environmental Officer  
Chris Militscher, Environmental Protection Agency (electronic copy only)  
Travis Wilson, NC Wildlife Resources Commission  
William D Gilmore, PE, Ecosystem Enhancement Program  
Sonia Carrillo, NCDWQ Central Regional Office  
File Copy

11-05-0027

**NO SURVEY REQUIRED FORM****PROJECT INFORMATION**

*Project No:* U-5305 SR 1144 Mack Rd    *County:* Randolph  
*WBS No:* 47025.1.1    *Document:* CE  
*F.A. No:* STP-NHS-0049(30)    *Funding:*  State     Federal

*Federal (USACE) Permit Required?*     Yes     No    *Permit Type:*

*Project Description:* Improve intersection with NC 49 and SR 1144 (Mack Road). Roadway realignment and relocation will make operational improvements. The project length is 1000 ft, much on new location. The Area of Potential Effects is a ROW of ~ 100 ft for the length of the project.

**SUMMARY OF CULTURAL RESOURCES REVIEW**

*Brief description of review activities, results of review, and conclusions:*

Aerial mapping and topography was examined. An online GoogleMaps-based virtual driveby was conducted. Records at the Office of State Archaeology were reviewed. USGS quadrangle mapping depicting previously reviewed areas and site locations was copied – no surveys were on record nor are there sites in the vicinity of this project. The location was visited on June 15, 2011. Based on these reviews for the proposed realignment of a connecting road at an existing intersection, expectations that an intact or otherwise significant archaeological resource might be impacted is low.

*Brief Explanation of why the available information provides a reliable basis for reasonably predicting that there are no unidentified historic properties in the APE:*

The undertaking involves relocating an existing connecting road/intersection. The APE for the project is 100 ft. wide with a length of 1000 ft.. This intersection is fully developed and the proposed alignment passes through commercial (gas station, transportation) lots. These have been modified in ways that compromise soil stratigraphy. No previously recorded archaeological sites were noted during investigations at the Office of State Archaeology. Combined, these factors suggest that undocumented, significant archaeological sites are unlikely to be located within the APE.

**SUPPORT DOCUMENTATION**

See attached: USGS quadrangle (Asheboro), aerial photography w/ alternative

**FINDING BY NCDOT CULTURAL RESOURCES PROFESSIONAL**

ARCHAEOLOGY

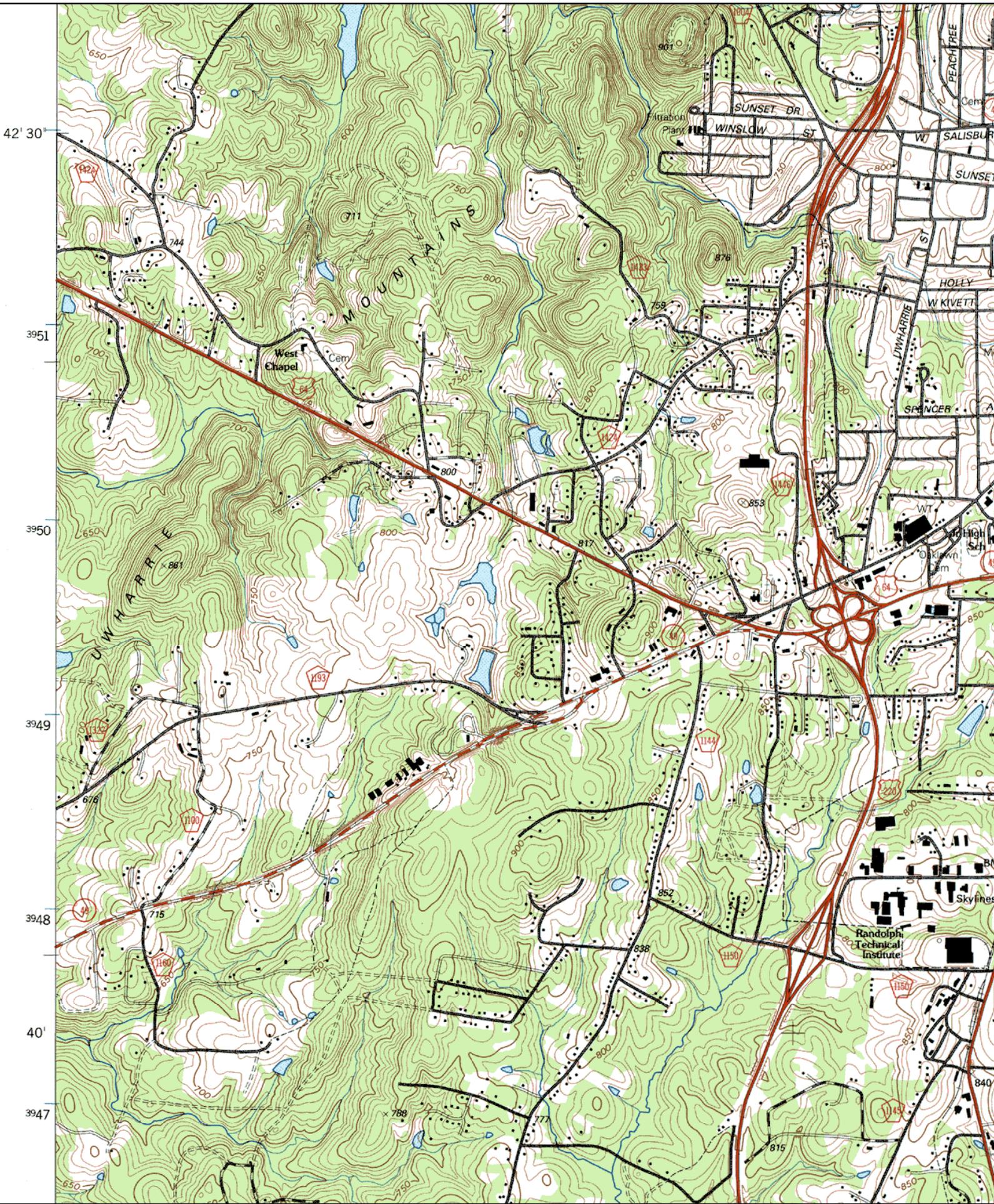
HISTORIC ARCHITECTURE

(CIRCLE ONE)

  
 NCDOT Cultural Resources Specialist

8/2/2011

Date



Name: ASHEBORO  
Date: 8/2/2011  
Scale: 1 inch equals 2000 feet

Location: 17 0604029 E 3949592 N NAD 27



NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

**ENVIRONMENTAL FEATURES MAP  
NC 49 INTERSECTION WITH  
SR 1144 (MACK RD) REALIGN  
INTERSECTION WITH US 64 W**

RANDOLPH COUNTY  
TIP PROJECT U-5305



|               |            |
|---------------|------------|
| County:       | RANDOLPH   |
| Div:          | 8          |
| TIP#:         | U-5305     |
| WBS:          | 47025.1.1  |
| Date:         | March 2011 |
| <b>Figure</b> | <b>3</b>   |



**Legend**

- Study Area
- Alt. 1
- Creeks, Streams, Rivers
- DOT Secondary Roads
- Study Area

By: J. TORTORELLA

|   |
|---|
| <b>NO HISTORIC PROPERTIES PRESENT/AFFECTED FORM</b> |
|---|

**PROJECT INFORMATION**

*Project No:* U-5305 *County:* Randolph  
*WBS No:* 47025.1.1 *Document:*  
*F.A. No:* *Funding:*  State  Federal  
*Federal (USACE) Permit Required?*  Yes  No *Permit Type:* Unknown

*Project Description:*

Realign intersection of NC 49 and SR 1144 (Mack Rd)

**SUMMARY OF FINDINGS**

*The North Carolina Department of Transportation (NCDOT) reviewed the subject project and determined:*

- There are no properties over fifty years old within the project's area of potential effects.
- There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- All properties greater than 50 years of age located in the APE have been considered and all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- There are no historic properties present or affected by this project. (*Attach any notes or documents as needed*)

## SUMMARY OF CULTURAL RESOURCES REVIEW

*Brief description of review activities, results of review, and conclusions:*

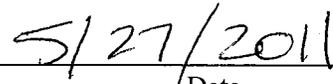
Review of HPO quad maps, historic designations roster, and indexes was undertaken on May 23, 2011. Based on this review, no existing NR, SL, LD, or DE properties in the Area of Potential Effects (APE) were identified. On May 25, 2011 the APE was surveyed by car and no National Register-eligible properties were identified.

## SUPPORT DOCUMENTATION

See attached: Maps

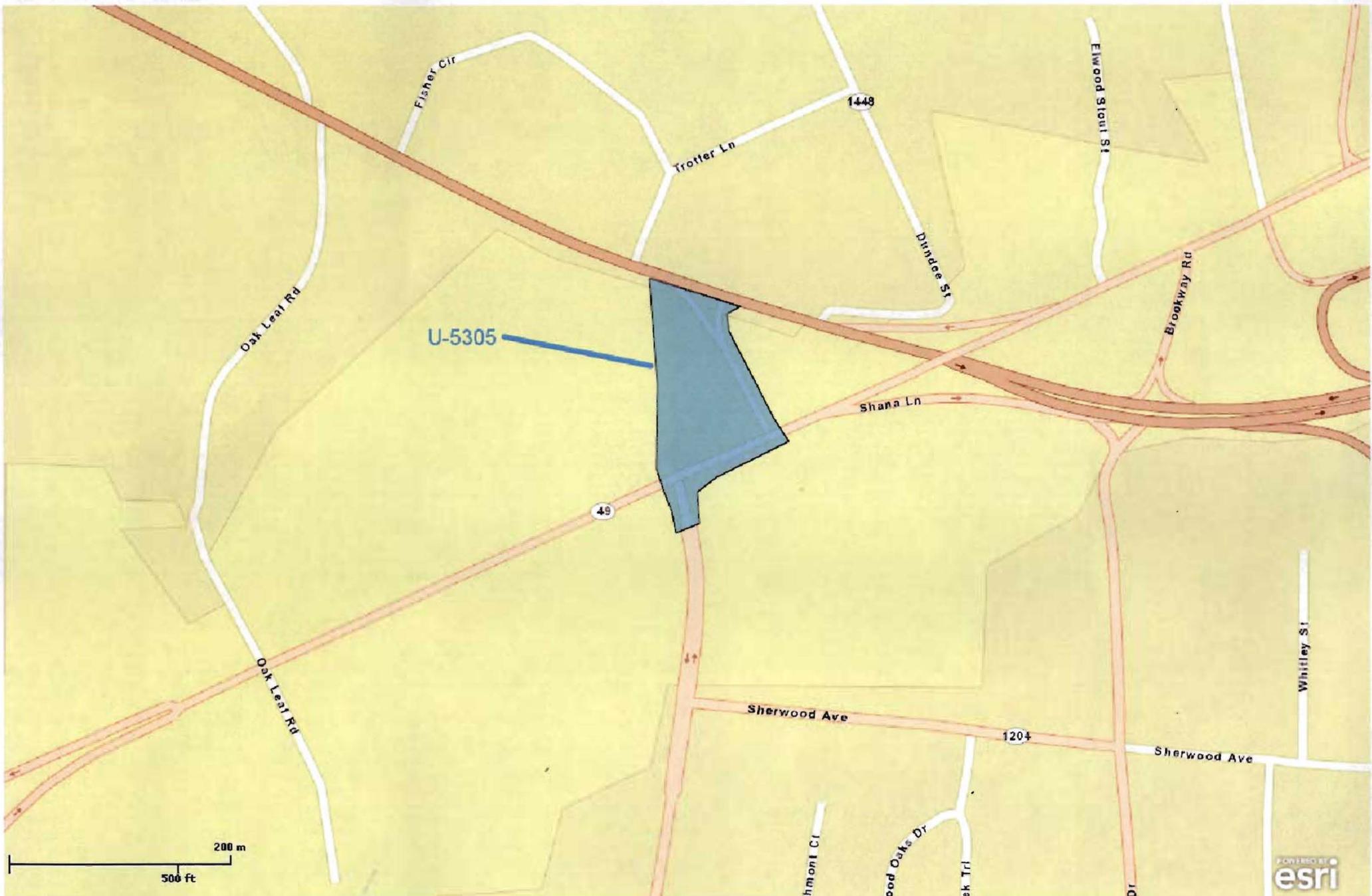
Signed:

  
Cultural Resources Specialist, NCDOT

  
Date

# HPO GIS

Randolph County



## **APPENDIX B**

### **PUBLIC MEETING NOTICE AND HANDOUTS**



# Workshop for Mack Road Improvements

State Transportation Improvement Program (STIP)  
Project No. U-5305

NEWSLETTER



## Meeting Information

**What?** - Citizens Informational Workshop (Informal drop-in)

**When?** - 4:00PM to 7:00PM  
Tuesday, August 23

**Where?** - Randolph County Community College (Foundation Conf. Center)  
629 Industrial Park Avenue  
Asheboro, N.C.

## U-5305 Project Schedule

Right of Way.....2013  
Construction.....2014

### Project Development

Scoping.....2011  
Citizens Workshop.....2011  
Complete Document...2012

## Project Assistance

For questions about this project, please contact the Project Development Engineer:

**Michael Penney, P.E.**

**Phone:**

(919) 707-6006

**Email:**

[mpenney@ncdot.gov](mailto:mpenney@ncdot.gov)

## This is your chance to comment. Your input is essential.

Please come join us to discuss the proposed realignment of the Connector Road between US 64 and NC 49 and the extension of Mack Road from NC 49 to Fisher Circle at US 64. This open house meeting will be held between 4:00 and 7:00 PM and will provide an opportunity for you to talk to the North Carolina Department of Transportation (NCDOT) about your transportation need as it relates to the proposed project.

### Overview of the Project

The North Carolina Department of Transportation (NCDOT) proposes to extend Mack Road from NC 49 to US 64 and signalize both the proposed new intersection and the current Mack Road intersection with NC 49.

### Purpose of the Projects

The purpose of this project is to improve traffic flow, safety, relieve congestion and increase the ability to carry projected traffic volumes on US 64, NC 49 and Mack Road.

### Reason for Workshop

The North Carolina Department of Transportation (NCDOT) has information regarding the proposed improvements that we want to share with you. You can share your thoughts and concerns regarding the proposed project.

### Special Accommodations

In compliance with the Americans with Disabilities Act, NCDOT will provide auxiliary aids and services for people with special needs or disabilities that wish to participate. Please contact Michael Penney for any special accommodations.





# Mack Road Improvements

North Carolina Department of Transportation  
Project Development & Environmental Analysis Branch  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548  
Attn: Michael Penney, P.E.

Industrial Park Avenue

Parking

Parking

Parking

Foundation Community Center

Parking

Parking

Parking

McDowell Road

Parking

Faculty/Staff Parking

Visitors Parking

Learning Resource Center (LRC)

Student Center (SSC)

Vocational/Technical Center (VTC)

Date and Time

Meeting Place

Agenda

Join us Tuesday, August 23rd, from 4:00 PM until 7:00 PM

Randolph Community College Foundation Conference Center  
629 Industrial Park Avenue  
Asheboro, N.C.

Open House!  
No formal presentations.

## Proposed Project Schedule

### Citizens Informational Workshop

Environmental Document (Categorical Exclusion) 2012

Land Acquisition 2013

Construction 2014

*Schedules are based on the Draft State Transportation Improvement Program (STIP) and are subject to change.*

**Contact Us:** Comments and questions are always welcomed.

**By Mail:** North Carolina Department of Transportation  
Project Development and Environmental Analysis Branch  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548  
Attn: Michael Penney, P.E.

**By Phone:** Michael Penney's number is (919) 707-6006

**By Email:** Michael Penney's email address is [mpenney@ncdot.gov](mailto:mpenney@ncdot.gov)

NOTICE OF A CITIZENS' INFORMATIONAL WORKSHOP FOR  
PROPOSED IMPROVEMENTS TO THE INTERSECTION OF N.C. 49  
AND MACK ROAD (STATE ROAD 1144) AND THE REALIGNMENT OF  
THE INTERSECTION OF U.S. 64 AND MACK ROAD IN ASHEBORO

TIP Project No. U-5305

Randolph County

The North Carolina Department of Transportation (NCDOT) will hold a citizens' informational workshop on Tuesday, August 23, 2011, from 4 p.m. to 7 p.m. at Randolph Community College (Foundation Conference Center), located at 629 Industrial Park Avenue in Asheboro.

NCDOT representatives will be available in an informal, open house-style setting to answer questions and gather public input regarding the proposed project. The opportunity to submit written comments or questions will be provided and is encouraged. Citizens may attend at any time during the meeting. There will not be a formal presentation.

NCDOT proposes to improve the intersection of N.C. 49 and Mack Road (State Road 1144) by realigning and relocating the N.C. 49 west access ramp to create a safer intersection with Mack Road and the U.S. 64 intersection. The purpose of the project is to improve traffic flow, relieve congestion and increase the ability to carry projected traffic volumes on U.S. 64, N.C. 49 and Mack Road. Additional right-of-way acquisition will be required for this project. The project is currently scheduled for construction in 2014, with right-of-way acquisition scheduled to begin in 2013.

For more information, contact Michael Penney, NCDOT Project Development and Environmental Analysis, at (919) 707-6006 or via email at [mpenney@ncdot.gov](mailto:mpenney@ncdot.gov).

NCDOT will provide auxiliary aids and services under the Americans with Disabilities Act for disabled persons who want to participate in this workshop. Anyone requiring special services should contact Penney as early as possible so that arrangements can be made.

# North Carolina Department of Transportation

Project Development and Environmental Analysis Branch



**MACK ROAD IMPROVEMENTS**

**RANDOLPH COUNTY**

**TIP PROJECT # U-5305**

**CITIZENS INFORMATIONAL WORKSHOP**

**AUGUST 23, 2011**

# CITIZENS INFORMATIONAL WORKSHOP

NC 49 Intersection with SR 1144 (Mack Road).  
Operational /Geometric Improvements and  
Roadway Relocation / Realignment.  
Asheboro, Randolph County  
TIP Project U-5305

## PURPOSE OF THE CITIZENS INFORMATIONAL WORKSHOP

The purpose of this workshop is to involve the public in the project development process for the Mack Road improvement project. If you have comments or suggestions about the proposed improvements described in this handout, please inform a representative of the North Carolina Department of Transportation (NCDOT). Please use the enclosed comment sheet to express your concerns or suggestions.

NCDOT realizes individuals living close to a proposed project want to be informed of the possible effects of the project on their homes and businesses. However, exact information is not available at this stage of the project development process. For example, design work is necessary before the actual right of way limits can be established. The purpose of this workshop is to receive your comments and suggestions *before* final design decisions are made.

Written comments on this project may be left with NCDOT representatives at the workshop or mailed to NCDOT. If additional information is needed or you would like to submit comments after the workshop, please address requests and comments to:

**Write:**           **Michael Penney, PE**, Project Planning Engineer  
NCDOT - PDEA  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

**Call:**             **Michael Penney, PE**, Project Planning Engineer  
(919) 707-6006

**Email:**           **Michael Penney, PE**, Project Planning Engineer  
[mpenney@ncdot.gov](mailto:mpenney@ncdot.gov)

## PROJECT DESCRIPTION

**Proposed Improvements** - The North Carolina Department of Transportation (NCDOT) is proposing the following improvements within the project:

- Closing or Cul-de-sacing of the existing Connector Road between US 64 (West Dixie Drive) and NC 49 (Albemarle Road);
- Development of a new connection between US 64 (West Dixie Drive) at Fisher Circle and NC 49 (Albemarle Road) at SR 1144 (Mack Road);
- Signalization of US 64 (West Dixie Drive) at Fisher Circle, and NC 49 (Albemarle Road) at SR 1144 (Mack Road).

The proposed improvements are intended to improve traffic flow, relieve congestion, minimize conflicts, improve connectivity, and minimize the effects of increasing traffic volumes.

**Anticipated Right of Way Impacts** - Right of Way (R/W) for the location of the Mack Road extension and proposed intersections will be necessary. The maps at this meeting show the proposed study area width. NCDOT will develop a best fit alignment which is safe, cost effective, and which minimizes impacts to existing development and historic and natural resources. A form is available from NCDOT if you feel you have or know of a structure which has historical significance.

## PROJECT SCHEDULE AND COSTS

Currently, NCDOT is developing a Categorical Exclusion (CE) environmental document for the project which is due for completion by the Fall of 2012. An Informal Public Hearing may be scheduled after completion of this document. Detailed Design Plans will be available at the Public Hearing.

This proposed project is funded for Right of Way (R/W) acquisition and Construction. The current project schedule and estimated costs are as follows:

| Project Number | R/W Acquisition Begins | Construction Begins | R/W Cost     | Construction Cost | Total Project Cost |
|----------------|------------------------|---------------------|--------------|-------------------|--------------------|
| U-5305         | 2013                   | 2014                | \$375,000.00 | \$925,000.00      | \$1,200,000.00     |

No final decisions have been made regarding this project. Therefore, the cost and schedule shown are preliminary and subject to change. As planning for the project continues, we will include all comments and suggestions to the extent possible.

## THE PROJECT DEVELOPMENT PROCESS

Project development and environmental studies for federally-funded highway projects are conducted in order to comply with the National Environmental Policy Act (NEPA). NCDOT is preparing a Categorical Exclusion (CE) for this project.

The Categorical Exclusion will discuss the purpose and need for the proposed improvements, evaluate alternatives, and analyze the project's impact on both the human and natural environment.

The document will address the many areas of concern including, but not limited to, the following:

|                                    |                                |                         |
|------------------------------------|--------------------------------|-------------------------|
| Efficiency and safety of travel    | Historic properties            | Floodplains and streams |
| Neighborhoods and communities      | Archaeological sites           | Wetlands                |
| Relocation of homes and businesses | Endangered species             | Farmland                |
| Land use plans                     | Wildlife and plant communities | Hazardous materials     |
| Economy of project area            | Water quality                  | Traffic noise           |
|                                    |                                | Air quality             |

Over the next few months, you can expect to see different project team members visit the area. Team members may take photographs, make notes, take measurements or mark important locations. However, these markers are only surveying and documentation guides and they do not necessarily indicate that your property will be impacted by the project.

As representatives of the State of North Carolina, we strive to treat you and your land, home or business with respect and courtesy. NCDOT kindly asks that you allow our staff on your property to conduct the necessary studies. If the highest standards of customer service are not observed, or if you have questions, please contact Michael Penney.

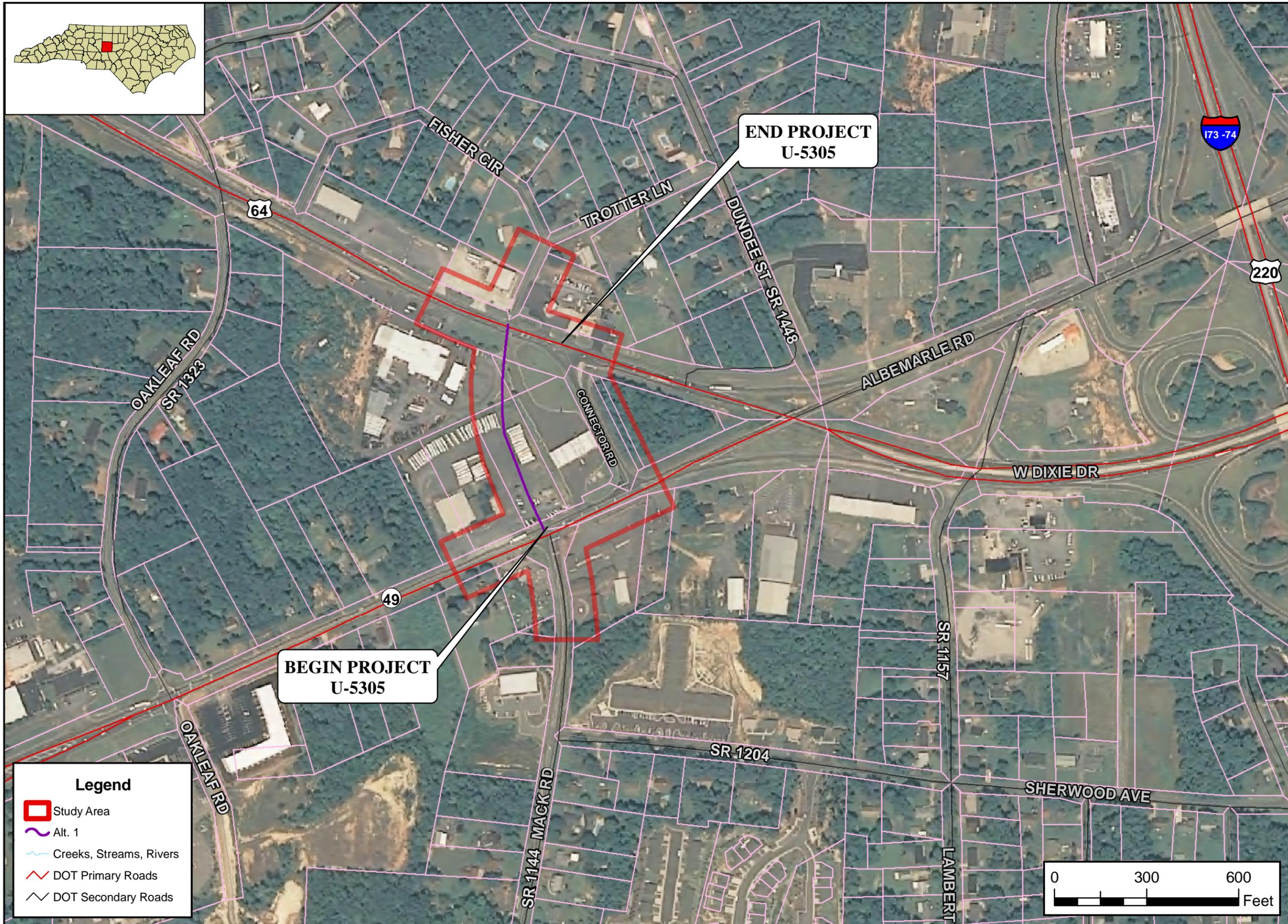
## OPPORTUNITIES FOR PUBLIC INVOLVEMENT / AWARENESS

**CITIZENS INFORMATIONAL WORKSHOP** – Informal meeting with the public. NCDOT staff conducts these workshops to speak one-on-one with citizens about projects. Comment sheets are provided for citizens to write down their questions, comments, and concerns. The number of workshops scheduled for a project depends on the scope and anticipated impact of the project.

**INFORMAL PUBLIC HEARING** – Informal meeting with the public. NCDOT staff conducts these hearings to speak one-on-one with citizens about projects. Proposed plans are displayed for comment. Comment sheets are provided for citizens to write down their questions, comments, and concerns.

**DOCUMENT DISTRIBUTION** – Copies of environmental documents are submitted to the State Clearinghouse for distribution and a notice is published in the NC Environmental Bulletin. Upon request, NCDOT will provide copies of the document to the public. Copies are available for public viewing at NCDOT Raleigh and Division offices, the State Clearinghouse office, local government offices, including the local council of government office, and local public libraries.

**CITIZEN LETTER** – Citizens are encouraged to write NCDOT, provide information and express concerns regarding proposed improvements at anytime during the process. Correspondence from citizens and interest groups is considered during the course of planning study and is included in the project file.



**Legend**

- Study Area
- Alt. 1
- Creeks, Streams, Rivers
- DOT Primary Roads
- DOT Secondary Roads

By: J.TORTORELLA



NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PROJECT DEVELOPMENT AND  
ENVIRONMENTAL ANALYSIS BRANCH

**ENVIRONMENTAL FEATURES MAP**  
NC 49 INTERSECTION WITH  
SR 1144 (MACK RD) REALIGN  
INTERSECTION WITH US 64 W



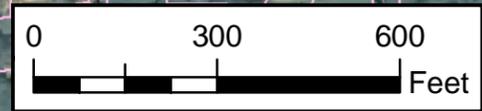
County:  
RANDOLPH

Div: 8      TIP#  
                  U-5305

WBS:  
47025.1.1

Date:  
August 2011

**Figure**  
**1**



RANDOLPH COUNTY  
TIP PROJECT U-5305

## Comment Sheet

Proposed Improvement to NC 49 Intersection with SR 1144 (Mack Road).  
Operational / Geometric Improvements and Roadway Relocation / Realignment.

TIP Project No. U-5305

Asheboro, Randolph County

### **Citizens Informational Workshop - August 23, 2011**

Please take a few minutes to share your thoughts about the information discussed at today's meeting.  
Please complete the comment sheet and return it to the comment table or by mail.

NAME:(Please print)\_\_\_\_\_

ADDRESS:(Please print)\_\_\_\_\_

Phone/Email address\_\_\_\_\_

**COMMENTS and/or QUESTIONS** \_\_\_\_\_

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Please mail comments by September 23, 2011 to:  
Michael Penney, PE, Project Planning Engineer  
NCDOT – Project Development and Environmental Analysis Branch  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

**THANK YOU FOR ATTENDING THE WORKSHOP.  
YOUR COMMENTS ARE VERY IMPORTANT IN THE PROJECT DEVELOPMENT PROCESS.**

# TITLE VI PUBLIC INVOLVEMENT FORM

Completing this form is **completely** voluntary. You are not required to provide the information requested in order to participate in this meeting.

|   |                       |
|---|-----------------------|
| <b>Meeting Type:</b> Citizens' Informational Workshop   | <b>Date:</b> 08/23/11 |
| <b>Location:</b> Randolph Community College, Asheboro, Randolph County  |                       |
| <b>TIP No.:</b> U-5305  |                       |
| <b>Project Description:</b> Improvements to the NC 49 / Mack Road intersection; Realignment of US 64 / Mack Road intersection |                       |

In accordance with Title VI of the Civil Rights Act of 1964 and related authorities, the North Carolina Department of Transportation (NCDOT) assures that no person(s) shall be excluded from participation in, denied the benefits of, or subjected to discrimination under any of the Department's programs, policies, or activities, based on their race, color, national origin, disability, age, income, or gender.

**Completing this form helps meet our data collection and public involvement obligations under Title VI and NEPA, and will improve how we serve the public.** Please place the completed form in the designated box on the sign-in table, hand it to an NCDOT official or mail it to the NCDOT Office of Civil Rights, Title VI Section at 1511 Mail Service Center, Raleigh, NC 27699-1511.

All forms will remain on file at the NCDOT as part of the public record.

|   |   |
|---|---|
| <b>Zip Code:</b> _____  | <b>Gender:</b> <input type="checkbox"/> Male <input type="checkbox"/> Female  |
| <b>Street Name:</b><br>(i.e. Main Street) _____   | <b>Age:</b><br><input type="checkbox"/> Less than 18 <input type="checkbox"/> 45-64<br><input type="checkbox"/> 18-29 <input type="checkbox"/> 65 and older<br><input type="checkbox"/> 30-44   |
| <b>Total Household Income:</b><br><input type="checkbox"/> Less than \$12,000 <input type="checkbox"/> \$47,000 – \$69,999<br><input type="checkbox"/> \$12,000 – \$19,999 <input type="checkbox"/> \$70,000 – \$93,999<br><input type="checkbox"/> \$20,000 – \$30,999 <input type="checkbox"/> \$94,000 – \$117,999<br><input type="checkbox"/> \$31,000 – \$46,999 <input type="checkbox"/> \$118,000 or greater | <b>Have a Disability:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No  |
| <b>Race/Ethnicity:</b><br><input type="checkbox"/> White<br><input type="checkbox"/> Black/African American<br><input type="checkbox"/> Asian<br><input type="checkbox"/> American Indian/Alaskan Native<br><input type="checkbox"/> Native Hawaiian/Pacific Islander<br><input type="checkbox"/> Hispanic/Latino<br><input type="checkbox"/> Other (please specify): _____   | <b>National Origin:</b> (if born outside the U.S.)<br><input type="checkbox"/> Mexican<br><input type="checkbox"/> Central American: _____<br><input type="checkbox"/> South American: _____<br><input type="checkbox"/> Puerto Rican<br><input type="checkbox"/> Chinese<br><input type="checkbox"/> Vietnamese<br><input type="checkbox"/> Korean<br><input type="checkbox"/> Other (please specify): _____ |

How did you hear about this meeting? (newspaper advertisement, flyer, and/or mailing) \_\_\_\_\_

For more information regarding Title VI or this request, please contact the NCDOT Title VI Section at (919) 508-1808 or toll free at 1-800-522-0453, or by email at [slipscomb@ncdot.gov](mailto:slipscomb@ncdot.gov).

Thank you for your participation!



**NCDOT Office of Civil Rights  
Title VI Section  
1511 Mail Service Center  
Raleigh, NC 27699-1511**

NOTICE OF A PROJECT UPDATE MEETING FOR PROPOSED  
IMPROVEMENTS TO THE INTERSECTION OF N.C. 49 AND MACK ROAD  
(STATE ROAD 1144) AND THE RELOCATION OF THE CONNECTOR  
ROAD BETWEEN N.C. 49 AND U.S. 64 WEST  
IN ASHEBORO

TIP Project No. U-5305

Randolph County

The North Carolina Department of Transportation (NCDOT) will hold a project update meeting for the public on Thursday, August 23, 2012, from 4–7 p.m. at Randolph Community College (Foundation Conference Center), located at 629 Industrial Park Avenue, Asheboro.

NCDOT proposes to improve the intersection of N.C. 49 and Mack Road (State Road 1144) and to relocate the Connector Road between N.C. 49 and U.S. 64, west of Asheboro.

The purpose of the project is to improve traffic flow, relieve congestion and increase the ability to carry projected traffic volumes on U.S. 64, N.C. 49 and Mack Road. Additional right-of-way acquisition will be required for this project. The project is currently scheduled to begin right of way acquisition in August 2013 with construction beginning in August 2014.

NCDOT representatives will be available in an informal, open house-style setting to answer questions and provide the public with updates regarding the proposed project, since a citizens' informational workshop was held one year ago. Citizens may attend at any time during the above-mentioned hours. There will not be a formal presentation.

For more information, contact Michael Penney, NCDOT Project Development and Environmental Analysis, at (919) 707-6006 or via email at [mpenney@ncdot.gov](mailto:mpenney@ncdot.gov).

NCDOT will provide auxiliary aids and services under the Americans with Disabilities Act for disabled persons who want to participate in this workshop. Anyone requiring special services should contact Mr. Penney as early as possible so that arrangements can be made.

For persons who speak Spanish and do not speak English, or have a limited ability to read, speak or understand English, interpretive services will be available at the meeting upon request. For more information, please call 1-800-481-6494 prior to the meeting.

# **PUBLIC MEETING**

Mack Road Extension Project - TIP Project U-5305  
Asheboro, Randolph County  
August 23, 2012

## **PURPOSE OF THE PUBLIC MEETING**

The North Carolina Department of Transportation (NCDOT) is holding this meeting to provide the public updated information about the Mack Road Extension project.

NCDOT realizes individuals living close to a proposed project want to be informed of the possible effects of the project on their homes and businesses. Preliminary design is being presented at this meeting; exact information will not be available until final designs are complete. The purpose of this meeting is to receive your comments and suggestions *before* final design decisions are made.

## **PROJECT DESCRIPTION**

**Proposed Improvements** - The proposed project involves the closure of the existing Connector Road between NC 49 and US 64 and the extension of SR 1144 (Mack Road) across NC 49 to the eastern intersection of US 64 and Fisher Circle to include ancillary improvements to NC 49 and US 64, dedicated right turn lanes and extended left turn lanes, at the above referenced intersections. Both the NC 49/Mack Road/Mack Road Extension and the US 64/Mack Road Extension/Eastern Fisher Circle intersections will be signalized.

**Anticipated Right of Way Impacts** - Approximately 100 foot of Right of Way plus easements will be required for the proposed facility.

## **PROJECT SCHEDULE AND COSTS**

Currently, NCDOT is developing a Categorical Exclusion (CE) environmental document for the project which is due for completion by the Fall of 2012. This proposed project is funded for Right of Way (R/W) acquisition and Construction. The current project schedule and estimated costs are as follows:

| Project Number | R/W Acquisition Begins | Construction Begins | R/W Cost     | Construction Cost | Total Project Cost |
|----------------|------------------------|---------------------|--------------|-------------------|--------------------|
| U-5305         | 2013                   | 2014                | \$375,000.00 | \$1,500,000.00    | \$1,875,000.00     |

## **COMMENTS**

If you have comments or suggestions about the proposed improvements described in this handout, please inform an NCDOT representative. Please use the attached comment sheet to express your concerns or suggestions.

Written comments on these projects may be left with NCDOT representatives at the meeting or mailed to NCDOT. If additional information is needed or you would like to submit comments after the workshop, please address requests and comments to:

**Write:** Michael Penney, PE, Project Planning Engineer  
NCDOT - PDEA  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

**Call:** (919) 707-6006

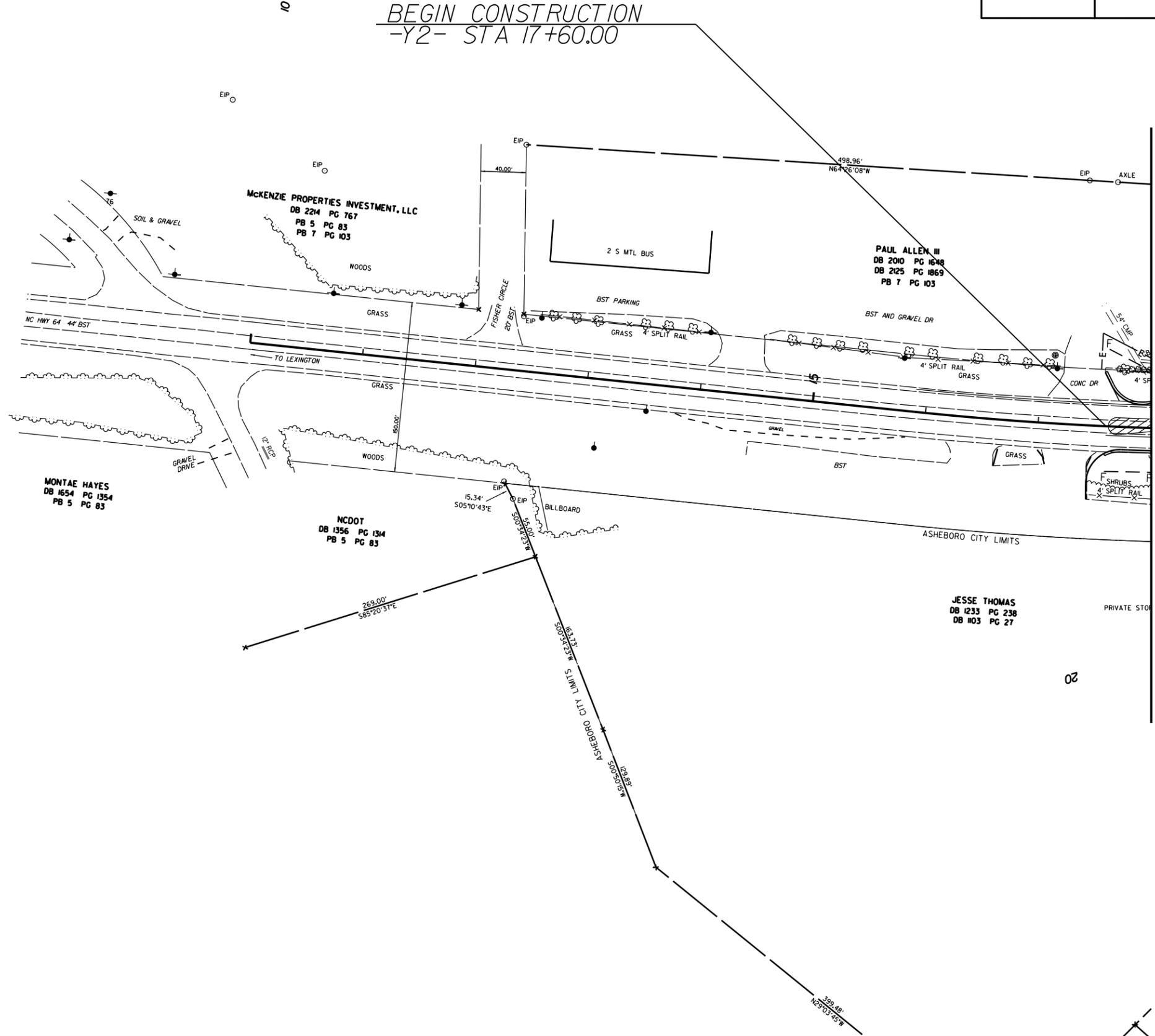
**Email:** [mpenney@ncdot.gov](mailto:mpenney@ncdot.gov)





|   |                       |
|---|-----------------------|
| PROJECT REFERENCE NO.<br><b>U-5305</b>                    | SHEET NO.<br><b>6</b> |
| RW SHEET NO.  |                       |
| ROADWAY DESIGN ENGINEER                                   | HYDRAULICS ENGINEER   |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR A/W ACQUISITION |                       |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION   |                       |

**BEGIN CONSTRUCTION**  
-Y2- STA 17+60.00



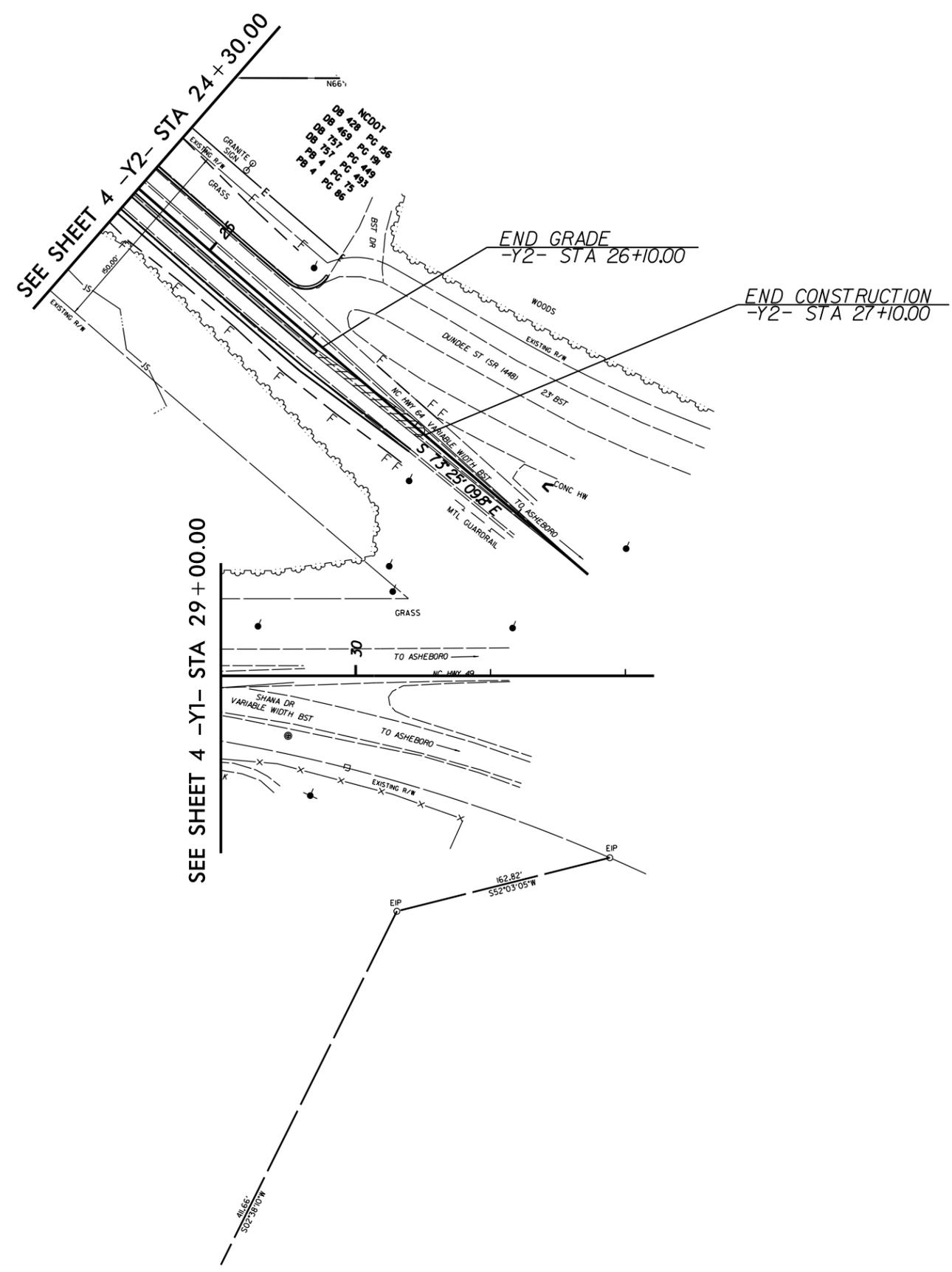
**SEE SHEET 4 -Y2- STA 18+00.00**

REVISIONS

8/17/99

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|  |                       |
|--|-----------------------|
| PROJECT REFERENCE NO.<br><b>U-5305</b>   | SHEET NO.<br><b>7</b> |
| RW SHEET NO.   |                       |
| ROADWAY DESIGN ENGINEER  | HYDRAULICS ENGINEER   |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION<br><b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |                       |



NCDOT  
 DB 429 PC 156  
 DB 469 PC 156  
 DB 151 PC 156  
 PB 4 PC 156  
 DB 429 PC 156  
 DB 469 PC 156  
 DB 151 PC 156  
 PB 4 PC 156

REVISIONS

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# Comment Sheet

Mack Road Extension Project

TIP Project No. U-5305

Asheboro, Randolph County

## **Public Meeting - August 23, 2012**

Please take a few minutes to share your thoughts about the information discussed at today's meeting. Please complete the comment sheet and return it to the comment table or by mail.

NAME:(Please print)\_\_\_\_\_

ADDRESS:(Please print)\_\_\_\_\_

Phone/Email address\_\_\_\_\_

**COMMENTS and/or QUESTIONS** \_\_\_\_\_

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Please mail comments by September 21, 2012 to:  
Michael Penney, PE, Project Planning Engineer  
NCDOT – Project Development and Environmental Analysis Branch  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

**THANK YOU FOR ATTENDING THE WORKSHOP.  
YOUR COMMENTS ARE VERY IMPORTANT IN THE PROJECT DEVELOPMENT PROCESS.**

# TITLE VI PUBLIC INVOLVEMENT FORM

Completing this form is **completely** voluntary. You are not required to provide the information requested in order to participate in this meeting.

|  |                              |
|--|------------------------------|
| <b>Meeting Type:</b> Public Meeting  | <b>Date:</b> August 23, 2012 |
| <b>Location:</b> RCC- Foundation Conference Center, Asheboro   |                              |
| <b>TIP No.:</b> U-5305   |                              |
| <b>Project Description:</b> Proposed Improvements to the intersection of NC 49 & Mack Road; relocation of connector road between NC 49 & US 64 West in Asheboro, Randolph County |                              |

In accordance with Title VI of the Civil Rights Act of 1964 and other civil rights provisions of Federal statutory law, the North Carolina Department of Transportation (NCDOT) assures that no person(s) affected by its programs, policies, or activities shall be excluded from participation in, denied the benefits of, or subjected to discrimination on the grounds of race, color, national origin, disability, age, income, or gender.

This form helps the State DOT meet its statutory obligations for data collection and public involvement under Title VI and NEPA. Please place completed forms in the designated box on the registration table or mail it to the NC Department of Transportation, PDEA-Human Environment Section, 1598 Mail Service Center, Raleigh, NC 27699-1598. Completed forms will be held on file at the NCDOT as part of the public record.

|   |   |
|---|---|
| <b>Zip Code:</b> _____  | <b>Gender:</b> <input type="checkbox"/> Male <input type="checkbox"/> Female  |
| <b>Street Name:</b><br>(i.e. Main Street) _____   | <b>Age:</b><br><input type="checkbox"/> Less than 18 <input type="checkbox"/> 45-64<br><input type="checkbox"/> 18-29 <input type="checkbox"/> 65 and older<br><input type="checkbox"/> 30-44   |
| <b>Total Household Income:</b><br><input type="checkbox"/> Less than \$12,000 <input type="checkbox"/> \$47,000 – \$69,999<br><input type="checkbox"/> \$12,000 – \$19,999 <input type="checkbox"/> \$70,000 – \$93,999<br><input type="checkbox"/> \$20,000 – \$30,999 <input type="checkbox"/> \$94,000 – \$117,999<br><input type="checkbox"/> \$31,000 – \$46,999 <input type="checkbox"/> \$118,000 or greater | <b>Have a Disability:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No  |
| <b>Race/Ethnicity:</b><br><input type="checkbox"/> White<br><input type="checkbox"/> Black/African American<br><input type="checkbox"/> Asian<br><input type="checkbox"/> American Indian/Alaskan Native<br><input type="checkbox"/> Native Hawaiian/Pacific Islander<br><input type="checkbox"/> Hispanic/Latino<br><input type="checkbox"/> Other (please specify): _____   | <b>National Origin:</b> (if born outside the U.S.)<br><input type="checkbox"/> Mexican<br><input type="checkbox"/> Central American: _____<br><input type="checkbox"/> South American: _____<br><input type="checkbox"/> Puerto Rican<br><input type="checkbox"/> Chinese<br><input type="checkbox"/> Vietnamese<br><input type="checkbox"/> Korean<br><input type="checkbox"/> Other (please specify): _____ |

For more information regarding Title VI or this request, please contact the NCDOT Title VI Section at (919) 508-1808 or toll free at 1-800-522-0453, or by email at [slipscomb@ncdot.gov](mailto:slipscomb@ncdot.gov).

Thank you for your cooperation!

**Ed Lewis  
NC Department of Transportation  
PDEA – Human Environment Section  
1598 Mail Service Center  
Raleigh, NC 27699–1598**

