

# MEMORANDUM



**DRAFT**

**To**  
U-5768 Project File

**From**  
Tracy Roberts, AICP

**Cc**  
Lisa Feller, PE  
NCDOT – Project Development Engineer

**Subject**  
STIP Project U-5768, Logical Termini

**Date**  
March 10, 2016

---

The purpose of this memorandum is to document that the proposed project has logical termini, has independent utility and would not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Attachments to this memorandum are:

- Figure 1 – Environmental Features Map
- Figure 2 – Alternate Travel Routes
- Figure 3- Eastern Circumferential Alignment Study

## 1. Introduction

The North Carolina Department of Transportation, in cooperation with the City of Charlotte, proposes to widen NC 49 (University City Boulevard) from four lanes to a multi-lane, median-divided facility from John Kirk Drive (SR 2833) to I-485, approximately 1.0 mile, and realign Back Creek Church Road (SR 2827) on new location to the intersection of NC 49 and Mallard Creek Church Road (SR 5394), approximately 1.3 miles. In addition, the project would close the railroad crossing at Back Creek Church Road and NC 49, terminating Back Creek Church Road in advance of the railroad. **Figure 1** shows the proposed project and nearby environmental features. The design year is 2040.

The project, located in Mecklenburg County, is included in the 2016–2025 State Transportation Improvement Program (STIP) as Project U-5768. According to the STIP, right of way and utilities are funded for fiscal year (FY) 2019 and construction in FY 2021.

A state Environmental Assessment will be prepared. The project will be funded with state and local money. No federal funding is anticipated. Due to potential impacts to Waters of the United States, a Section 404 Permit from the U.S. Army Corps of Engineers and a Section 401 Water Quality Certification from the North Carolina Department of Environmental Quality – Division of Water Resources are anticipated. The project will follow the Section 404/NEPA Merger Process.

## 2. Preliminary Purpose and Need

The preliminary purpose of the U-5768 project is threefold: 1) to reduce traffic congestion, improve traffic flow and enhance traffic operations on NC 49 between John Kirk Drive and I-485; 2) to improve safety and enhance train and vehicle operations at the railroad crossing with Back Creek Church Road and NC 49; and 3) to maintain network connectivity between the Rock River area of east Charlotte and NC 49 once the railroad crossing is closed.

The preliminary needs for the project are:

- NC 49: NC 49 is currently operating at or close to congested levels. With anticipated growth in traffic out to 2040, congestion will worsen to a poor level of service if no improvements are made.
- Railroad Crossing: Since 2000, there have been six highway vehicle/train crashes; most involved vehicles running off the paved surface and becoming stuck on the tracks. Current typical train traffic as reported by Norfolk Southern is 38 trains per day. Train volumes are expected to double in the future. Track speeds through the project limits have been improved to 79 miles per hour for passenger trains and 60 miles per hour for freight trains. Vehicle traffic at the railroad crossing is currently 17,300 vehicles per day and this volume is projected to increase to 20,600 vehicles per day by 2040. Thus, the potential for vehicle/train collisions will grow. Closing the railroad crossing would eliminate the possibility for a collision between trains and vehicles. Removing the possibility for a collision would also improve rail operations because there would never again be a delay to investigate an incident at the crossing, clear the crash site, or replace the train crew. Also, with the crossing removed, the train would no longer need to blow the horn which would be a benefit to the public.
- Network Connectivity: With the closing of the railroad crossing, the existing network connectivity between the Rocky River area and NC 49 would be lost. The lack of other nearby travel routes to cross the railroad tracks to access NC 49 would result in a substantial amount of out-of-the-way travel. Travel distances would increase by 3.5 miles to 7.5 miles depending on the route chosen, compared to maintaining the existing railroad crossing (0.2 mile). **Figure 2** shows the alternate travel routes and their travel distances. Additionally, alternate travel routes 1 and 2 would send thoroughfare traffic on residential streets that have speed limits as low as 25 miles per hour and traffic calming devices. These roads were not designed to function as thoroughfares.

## 3. Principles for Selecting Termini

In order to ensure meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated, Federal Highway Administration (FHWA) guidelines (23 CFR 771.111[f]) require the proposed action evaluated in each environmental impact statement (EIS) or finding of no significant impact (FONSI) shall:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
2. Have independent utility or independent significance, i.e. be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made; and

3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The following sections address these three general principles.

### a) Connect Logical Termini

Logical termini are defined as 1) rational end points for a transportation improvement and 2) rational end points for a review of the environmental impacts. The most common termini are points of major traffic generation, especially intersecting roadways. This is because traffic generators typically determine the size and type of facility being proposed. Natural features such as creeks and municipal boundaries are not logical termini for most transportation projects.

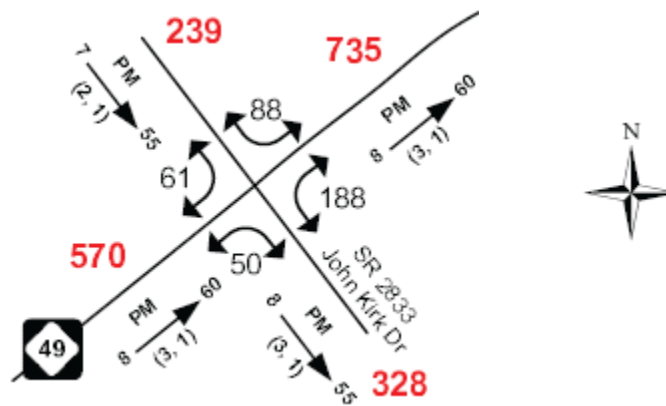
#### *Rational End Points for a Transportation Improvement*

##### NC 49

The eastern terminus of the NC 49 widening is I-485, an Interstate Highway loop encircling the City of Charlotte. NC 49 connects with I-485 via an interchange. NC 49 through the interchange is currently six lanes whereas the section of NC 49 west of the interchange is four lanes. Therefore, widening the existing four-lane NC 49 to the west of the interchange would provide a continuation of the existing six-lane facility.

The western terminus of the NC 49 widening is John Kirk Drive. The reasons are:

1. According to the U-5768 project traffic forecast, traffic volumes decrease approximately 30 percent as one moves west of this intersection. This is because traffic patterns make a notable shift in this location, with much of the traffic moving between NC 49 and John Kirk Drive south of NC 49 rather than continuing further west along NC 49. The figure below shows traffic volumes and directional splits for the 2040 (Build) design year.



2. The University of North Carolina at Charlotte (UNCC) and related multi-family housing are located at this intersection and serve as major traffic generators.

##### Back Creek Church Road Realignment

Back Creek Church Road would be terminated at the railroad crossing near NC 49. This road would then be realigned to connect with NC 49 at Mallard Creek Church Road, resulting in a four-legged intersection (it is a three-legged intersection today). The purpose of the realignment is to maintain network connectivity between the Rock River area of east Charlotte and NC 49. This connectivity

would be lost when the railroad crossing is closed, resulting in long travel routes as a result of poor network connectivity.

#### *Previous Consideration of Alternatives*

**Grade Separation Alternatives:** Under the STIP P-5208 Environmental Assessment <sup>1</sup>(October 2011), two grade separation options at the existing railroad crossing were considered but ultimately eliminated from further study due to topographic features, access requirements and numerous residential and business impacts. One option included building a railroad bridge and the other option was a road bridge. The Environmental Assessment (EA) found that grade separating the existing railroad crossing was not reasonable.

Therefore, the EA included construction of a railroad bridge to allow a realigned Back Creek Church Road (referred to as the “Eastern Circumferential” in the EA) to pass underneath the railroad and connect with NC 49 at Mallard Creek Church Road. As stated in the EA, this would allow the possible closure of the Back Creek Church Road at-grade crossing. The Preferred Alternative included the construction of “a railroad bridge to accommodate the future Eastern Circumferential, which is to be on new alignment connecting Mallard Creek Church Road (SR 2833) north of NC 49 to Back Creek Church Road (SR 2827) south of NC 49, allowing the closure of the Back Creek Church Road (SR 2827) at-grade crossing.” The Finding of No Significant Impact was approved by the Federal Railroad Administration – with the Federal Highway Administration acting as a cooperating agency – in June 2012. A USACE Nationwide 404 Permit was issued in March 2013. The railroad bridge, as well as the remainder of the double track project, is under construction.

**Alignment Alternatives:** The proposed location for the realignment of Back Creek Church Road was part of the Eastern Circumferential Alignment Study prepared by the City of Charlotte in 1989. The proposed Eastern Circumferential Road is an approximately 13 mile long road that is needed to provide adequate circumferential thoroughfare spacing in eastern Mecklenburg County. Four alternative alignments were evaluated. After considering factors such as alignment length, floodway crossings, residential/business/church/school impacts and impacts to parks and natural areas, a recommended alternative was identified. This alternative was then placed on the City’s thoroughfare plan. The proposed realignment of Back Creek Church Road under the U-5768 project is consistent with this recommendation. **Figure 3** shows the four alternative alignments through the U-5768 study area. As this figure shows, the other three alignments now have development in their paths.

Therefore, realigning Back Creek Church Road to intersect with NC 49 at Mallard Creek Church Road represents a logical terminus as it would be consistent with the P-5208 EA, consistent with the 1989 alternatives study and would be a safer location due to the elimination of conflicts between train, vehicular, and pedestrian traffic.

#### ***Rational End Points for Environmental Review***

Rational end points as they relate to environmental issues are points which would retain the ability to address environmental matters on a broad scope. This is to ensure that transportation improvements are not developed in such a manner as to force an environmental impact on a resource that is just outside the study area.

---

<sup>1</sup> The P-5208 project is the construction of 12 miles of second mainline track along the Norfolk Southern Mainline between Concord and Charlotte; specifically, from control point (CP) Haydock to CP Junker. The project also includes the closure of 11 at-grade railroad crossings and the construction of four grade separations. The purpose of the project is to improve passenger train schedule reliability, provide additional capacity to support the introduction of up to 12 daily (6 round trips) additional passenger trains to the North Carolina Railroad Piedmont Corridor, and enhance the safety of the railroad within the study area. The project is currently under construction.

### NC 49

NC 49 through the study area is largely urbanized with retail, commercial, residential and UNCC-related land uses. Due to the developed nature of the NC 49 corridor, the proposed one-mile widening would not force environmental impacts beyond either end of the project termini (i.e. John Kirk Drive and I-485). Regardless of the design options utilized on NC 49, consideration of alternatives for the future widening of NC 49 west of John Kirk Drive to US 29 (identified as a future unfunded project) would not be constrained by the U-5768 project should impacts to environmental resources along that two-mile length of the corridor need to be avoided or minimized.

### Back Creek Church Road Realignment

The one-mile realignment of Back Creek Church Road (Eastern Circumferential) would not force environmental impacts for any future projects.

## **b) Independent Utility**

The NC 49 widening from John Kirk Drive to I-485, the railroad crossing closing and the Back Creek Church Road realignment would have independent utility and would be usable without additional improvements and would be a reasonable expenditure of funds even if no additional transportation improvements in the area are made.

NC 49 experiences high levels of congestion today, and that congestion will worsen through the 2040 design year if no improvements are made. Providing improved traffic flow and reduced congestion between John Kirk Drive and I-485 would be a worthwhile investment even if no other transportation improvements were made.

Closing the railroad crossing at Back Creek Church Road and NC 49 would eliminate train conflicts with vehicles and pedestrians, and would result in improved traffic operations at the intersection due to the removal of multiple traffic movements with the closure. However, the resulting lost connectivity with NC 49 would need to be replaced as part of the closure. Realigning Back Creek Church Road would need to occur *in concert* with the closure to ensure this essential connection is maintained. The realignment would also force the lowering of the NC 49/Mallard Creek Church Road intersection by approximately 12 feet to allow the new road to achieve the needed profile to pass underneath the railroad bridge that is under construction. This would require improvements of approximately 1,500 feet along NC 49, as well as capacity enhancements that would be needed along NC 49 to accommodate the additional traffic that would be added to the intersection.

For these reasons, the three components of U-5768 are interrelated and should be implemented as a single project to achieve independent utility.

## **c) Consideration for Other Reasonably Foreseeable Transportation Improvements**

Reasonably foreseeable transportation improvements within the U-5768 study area include the continuation of NC 49 widening from west of John Kirk Drive to North Tryon Street (US 29), a distance of approximately 2.2 miles, and the widening of Old Concord Road from WT Harris Boulevard (NC 24) to NC 49, a distance of approximately 1.3 miles. Both projects are included in the Charlotte Regional Transportation Planning Organization's 2040 Metropolitan Improvement Program. Additionally, UNC Charlotte is proposing improvements along John Kirk Drive at NC 49 and at Cameron Boulevard and John Kirk Drive as part of the university's planned East Village Infrastructure projects. The U-5768 project would not restrict consideration of alternatives for any of these planned projects.

#### **4. Conclusion**

Based on the analysis and consideration of factors presented herein, the termini for the widening of NC 49 and the termini of the realignment of Back Creek Church Road are logical and, when combined with the closure of the railroad crossing at Back Creek Church Road, demonstrate independent utility and would be a reasonable expenditure of funds even if no additional transportation improvements were made.

# Figure 2. Environmental Features

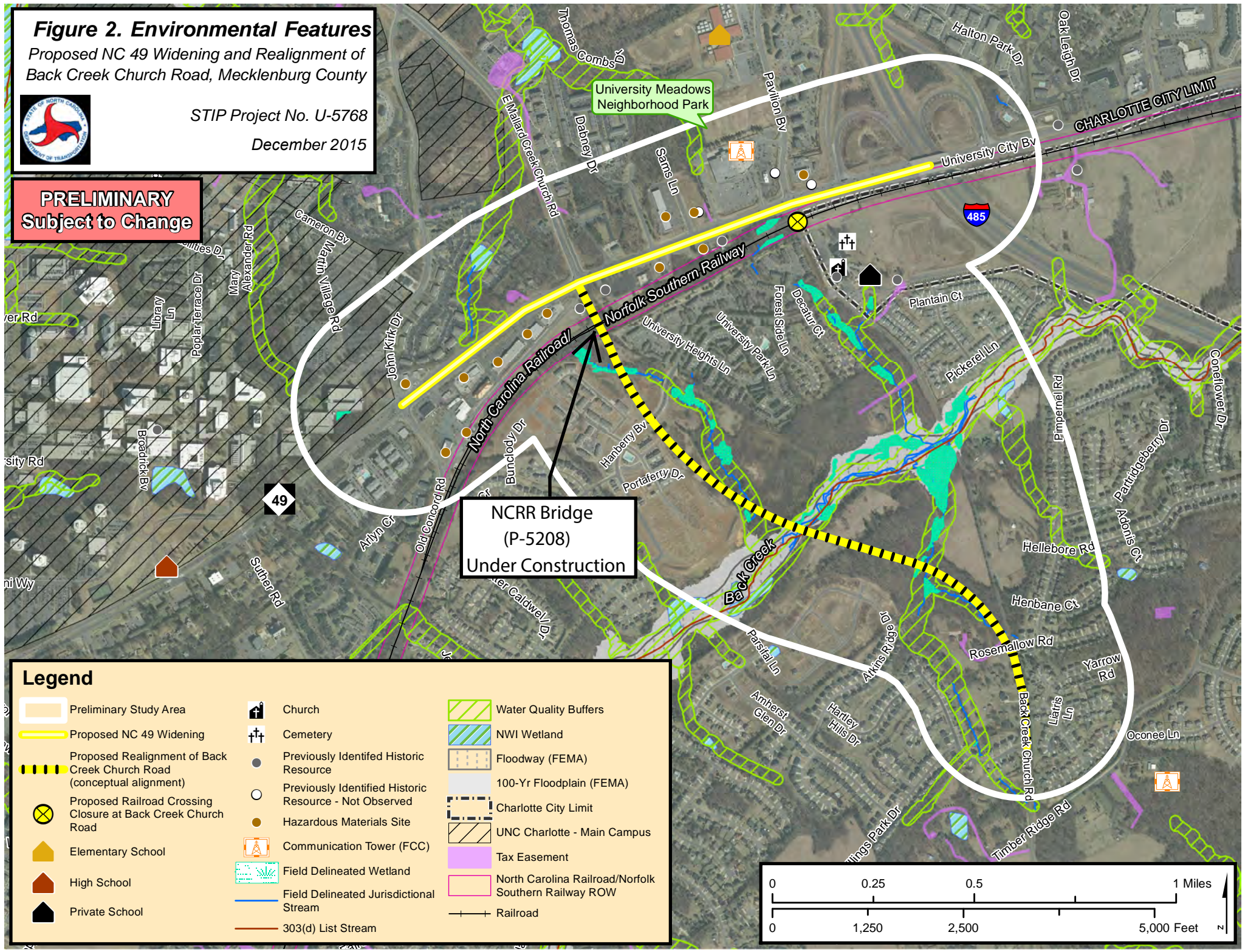
Proposed NC 49 Widening and Realignment of Back Creek Church Road, Mecklenburg County



STIP Project No. U-5768

December 2015

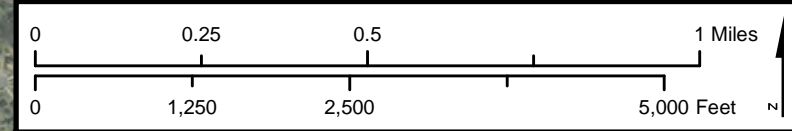
**PRELIMINARY**  
Subject to Change



**NCR Bridge  
(P-5208)  
Under Construction**

## Legend

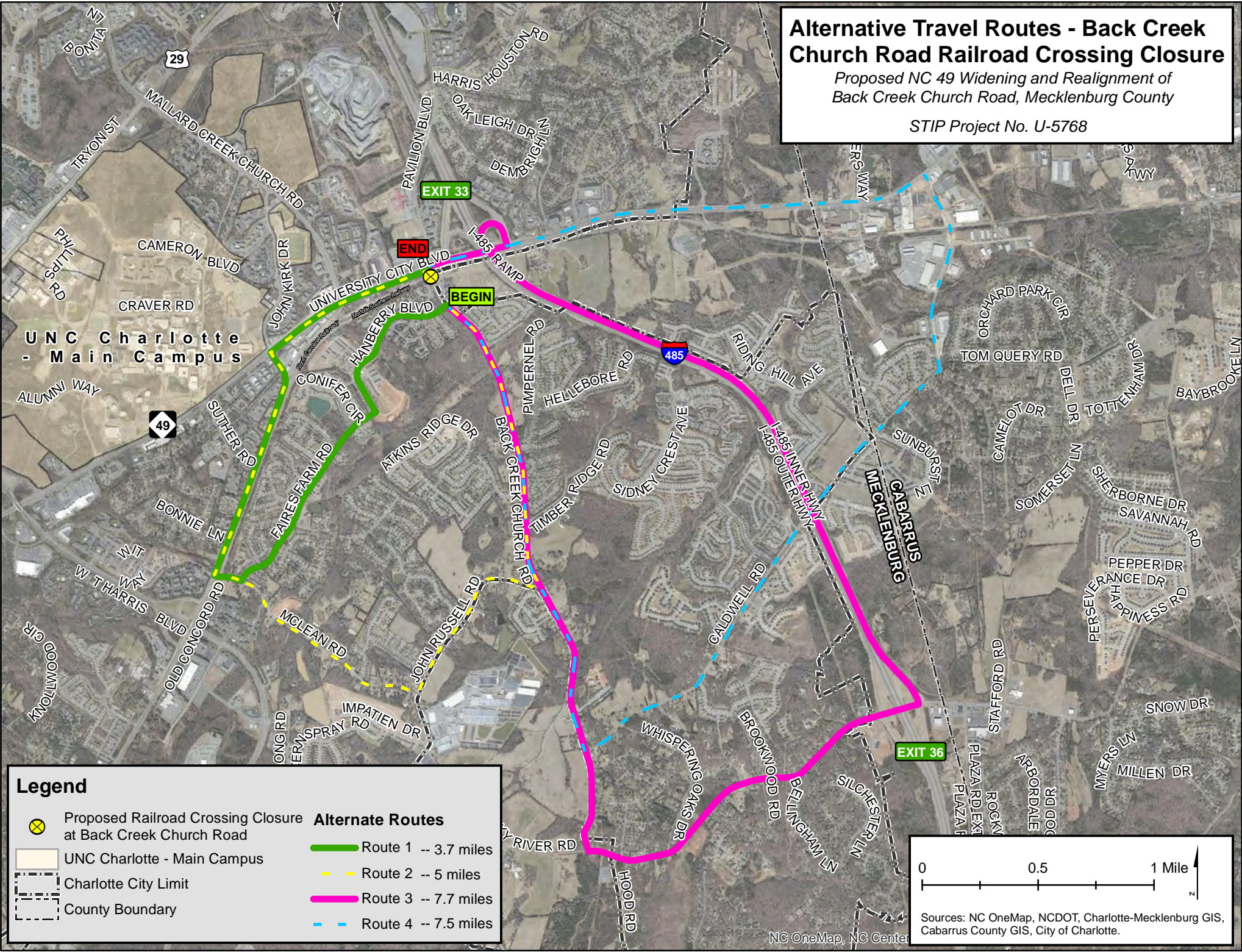
- |   |  |  |
|---|--|--|
| Preliminary Study Area  | Church   | Water Quality Buffers                                |
| Proposed NC 49 Widening   | Cemetery   | NWI Wetland  |
| Proposed Realignment of Back Creek Church Road (conceptual alignment) | Previously Identified Historic Resource                | Floodway (FEMA)                                      |
| Proposed Railroad Crossing Closure at Back Creek Church Road          | Previously Identified Historic Resource - Not Observed | 100-Yr Floodplain (FEMA)                             |
| Elementary School   | Hazardous Materials Site                               | Charlotte City Limit                                 |
| High School   | Communication Tower (FCC)                              | UNC Charlotte - Main Campus                          |
| Private School  | Field Delineated Wetland                               | Tax Easement   |
| Field Delineated Jurisdictional Stream                                | 303(d) List Stream                                     | North Carolina Railroad/Norfolk Southern Railway ROW |
|   |  | Railroad   |







# Alternative Travel Routes - Back Creek Church Road Railroad Crossing Closure

Proposed NC 49 Widening and Realignment of Back Creek Church Road, Mecklenburg County





STIP Project No. U-5768

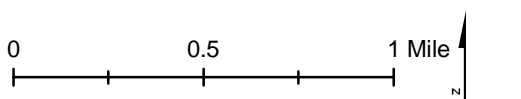


### Legend

-  Proposed Railroad Crossing Closure at Back Creek Church Road
-  UNC Charlotte - Main Campus
-  Charlotte City Limit
-  County Boundary

### Alternate Routes

-  Route 1 -- 3.7 miles
-  Route 2 -- 5 miles
-  Route 3 -- 7.7 miles
-  Route 4 -- 7.5 miles



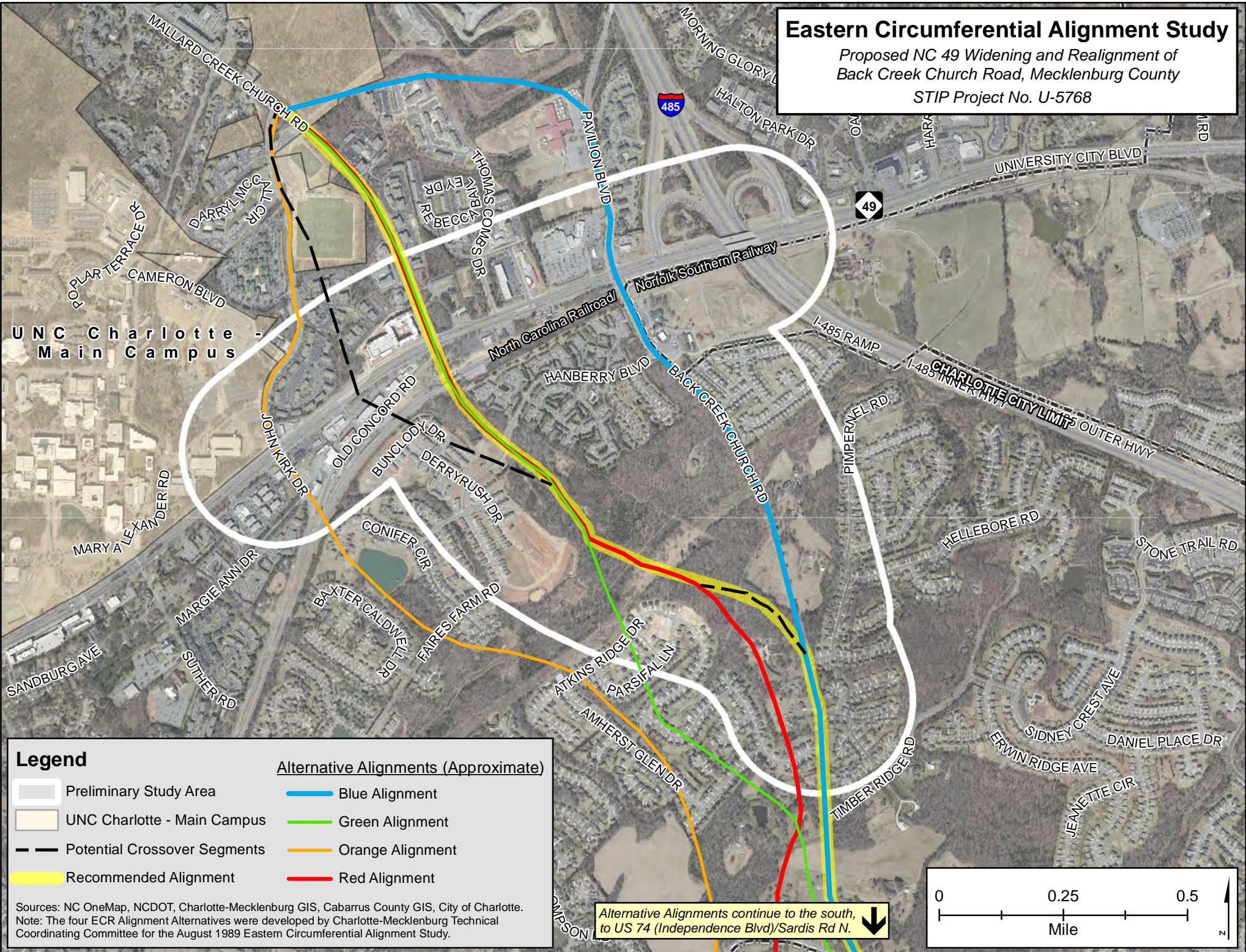
Sources: NC OneMap, NCDOT, Charlotte-Mecklenburg GIS, Cabarrus County GIS, City of Charlotte.











# Eastern Circumferential Alignment Study

Proposed NC 49 Widening and Realignment of  
Back Creek Church Road, Mecklenburg County

STIP Project No. U-5768



## Legend

- |   |  |
|---|--|
|  Preliminary Study Area       |  Blue Alignment   |
|  UNC Charlotte - Main Campus  |  Green Alignment  |
|  Potential Crossover Segments |  Orange Alignment |
|  Recommended Alignment        |  Red Alignment    |

## Alternative Alignments (Approximate)

Sources: NC OneMap, NCDOT, Charlotte-Mecklenburg GIS, Cabarrus County GIS, City of Charlotte.  
Note: The four ECR Alignment Alternatives were developed by Charlotte-Mecklenburg Technical Coordinating Committee for the August 1989 Eastern Circumferential Alignment Study.

Alternative Alignments continue to the south,  
to US 74 (Independence Blvd)/Sardis Rd N. ↓

