

**Concurrence Point 1**  
**Purpose and Need and Study Area Defined**  
and  
**Concurrence Point 2**  
**Detailed Study Alternatives Carried Forward**

TIP Project No. U-5811  
WBS 44384.1.1

SR 1002 (Aviation Parkway) Widening  
From NC 54 to I-40  
Wake County



**March 2018**

**Purpose of Today's Meeting:**

The purpose of this meeting is to discuss Concurrence Points 1 and 2, identifying a purpose and need and study area, and selecting alternatives to study in detail.

# 1. Introduction and Project Overview

## 1.1 Proposed Action

NCDOT proposes to widen Aviation Parkway from NC 54 to I-40 in Wake County. The proposed project is included in the North Carolina Department of Transportation's (NCDOT) *2016-2025 State Transportation Improvement Program (STIP)* as Project U-5811.

## 1.2 Meeting Purpose

The purpose of today's meeting is to reach concurrence on Purpose and Need and Study Area (Concurrence Point 1) and Detailed Study Alternatives (Concurrence Point 2).

Since the External Scoping Meeting in December 2015, NCDOT has completed the traffic forecast and traffic capacity analysis along the corridor. Additionally, the Community Characteristics Report, Indirect Screening Report, Cumulative Effects Report, and Natural Resources Technical Report have been completed. Functional designs have been prepared for two alternatives. At today's meeting, NCDOT will:

- Present a project purpose and need based on current traffic data,
- Present a study area, and
- Propose a build alternative to carry forward for detailed study.

## 1.3 Study Area Description

Figure 1 shows the project vicinity, and Figure 2 shows the environmental and community features. The proposed study area is a 1,000-foot corridor (500 feet on either side of the Aviation Parkway centerline). The study area is enlarged around the NC 54 intersection to allow for consideration of multiple intersection solutions.

SR 1002 (Aviation Parkway) is a major east-west route through the Town of Cary and the Town of Morrisville in Wake County. Aviation Parkway connects I-40 with downtown Morrisville, becoming Morrisville Carpenter Road west of NC 54. Project U-5811 proposes to widen 2.4 miles of Aviation Parkway to a four-lane median-divided roadway with curb and gutter, including bicycle and pedestrian accommodations from NC 54 (Chapel Hill Road) to I-40 in Morrisville.

A locally funded project by the Town of Morrisville will widen Morrisville Carpenter Road from Davis Drive to the western North Carolina Railroad right of way, just west of NC 54. NCDOT Project I-5506 will modify the interchange of I-40 with Aviation Parkway, extending along Aviation Parkway to Gateway Centre Drive. Therefore, improvements as part of Project U-5811 are proposed to tie into the Morrisville Carpenter Road widening project just west of NC 54, and tie into the I-40 interchange project at Gateway Centre Drive.

Land uses surrounding the project corridor are primarily commercial and office, with a few residences and some park/open space. The project corridor is located less than a mile from the Raleigh-Durham International Airport, approximately 5 miles southeast of Research Triangle Park, and 11 miles northwest of downtown Raleigh.

Within the study area (500 feet on either side of Aviation Parkway), there are 14 streams and 9 wetlands. Two open water features are in the study area. Lake Crabtree is a jurisdictional flood control reservoir created by an impoundment of Stirrup Iron Creek, Crabtree Creek, and Brier Creek. Lake Crabtree has a PCB fish tissue advisory, and is listed on the 2016 Draft 303(d) list for poor benthic community. Pond PA is in the northern quadrant of the NC 54/Aviation Parkway intersection with no connection to jurisdictional waters.

There are four federally protected species listed for Wake County. Northern long-eared bat has habitat present with a biological conclusion of May Affect, Likely to Adversely Affect. Michaux's suman has habitat present with a biological conclusion of No Effect. Red-cockaded woodpecker does not have habitat present, and dwarf wedgemussel habitat is unknown. More detail on the natural environment is in the *Natural Resources Technical Report* (December 2016); the NRTR will be amended to include additional study area around the NC 54/Aviation Parkway intersection as needed as intersection concepts are investigated.

## 2. Merger Concurrence Point 1 – Purpose and Need and Study Area

### 2.1 Traffic Data and Analysis

#### Traffic Volumes

The project-level traffic forecast was completed in 2016. The projected future traffic volumes are summarized in Table 1.

**Table 1. Projected Traffic Volumes on Aviation Parkway**

Section	2015 No Build Projected Volume Range (vehicles per day)	2040 No Build Projected Volume Range (vehicles per day)	2040 Build Projected Volume Range (vehicles per day)
West of NC 54	15,600 to 20,200	16,400 to 21,800	17,600 to 23,000
Between NC 54 and Evans Road	13,000 to 15,600	13,400 to 16,000	17,300 to 20,000
Between Evans Road and Lake Crabtree Park	24,200 to 28,200	24,800 to 28,900	30,800 to 34,900
East of Lake Crabtree Park	29,600 to 35,100	30,300 to 41,800	36,300 to 43,800

#### Level of Service

Based on 2040 No Build traffic forecast volumes, the segment of Aviation Parkway between Dominion Drive and Gateway Centre Boulevard (south) is anticipated to operate at level of service (LOS) E in the PM peak hour, and the Aviation Parkway/NC 54 intersection is anticipated to operate at LOS F in the AM and PM peak hours.

The segment of Aviation Parkway between Dominion Drive and Gateway Centre Boulevard currently operates at LOS E in the PM peak hour, and the Aviation Parkway/NC 54 intersection operates at LOS D and F in the AM and PM peak hours respectively.

### 2.2 Summary of Need

*Congestion:* In the design year (2040), one segment on Aviation Parkway is anticipated to operate at LOS E, and one intersection is anticipated to operate at LOS F.

*Mobility (secondary need):* With adjacent planned projects, the Aviation Parkway/Morrisville Carpenter Road corridor will be a 4-lane median divided road from Davis Drive to NC 54 (west of U-5811 corridor), and from I-40 to Brier Creek (east of U-5811 corridor).

### 2.3 Summary of Purpose

*Congestion:* The primary purpose of this project is to reduce congestion on Aviation Parkway to improve the level of service in the design year (2040) peak hours along the corridor and at signalized intersections.

*Mobility (secondary benefit):* Another purpose of this project is to improve east-west mobility through Morrisville and to I-40 and I-540/NC 540.

## 2.4 Proposed Study Area

The proposed study area is a 1,000-foot corridor wide, 500 feet on either side of the Aviation Parkway centerline, with a wider area around the NC 54 intersection.

## 3. Merger Concurrence Point 2 – Alternatives Considered

### 3.1 Build Alternative to Carry Forward for Detailed Study

Conceptual designs for two alternatives were completed as described below. Both alternatives would meet the purpose of the project. One alternative (Build Alternative 1) is proposed to be carried forward for detailed study.

Both alternatives would widen Aviation Parkway to four lanes with a median between NC 54 and I-40. Turn lanes would be added/extended where needed. The median would be narrowed across the Lake Crabtree causeway. Multimodal accommodations are proposed, which currently are envisioned as a 5' sidewalk on the west side of Aviation Parkway, and a 10' multiuse path on the east side. Bicycles would be accommodated with 14' outside lanes. The two alternatives vary by median width:

#### Build Alternative 1:

Build Alternative 1 would add a 23' median. This alternative would minimize direct impacts compared with Build Alternative 2.

#### Build Alternative 2:

Build Alternative 2 would add a 30' median. The wider median allows for dual left-turn lanes.

As shown in Table 2, environmental impacts are anticipated with the crossing of Lake Crabtree. The project team has initiated coordination with regulatory associated agencies to discuss options to cross Lake Crabtree. As currently conceptualized, an Individual Permit may be needed based on other project impacts (without the Lake Crabtree wetland and open water impacts). Impacts will be minimized during future design phases.

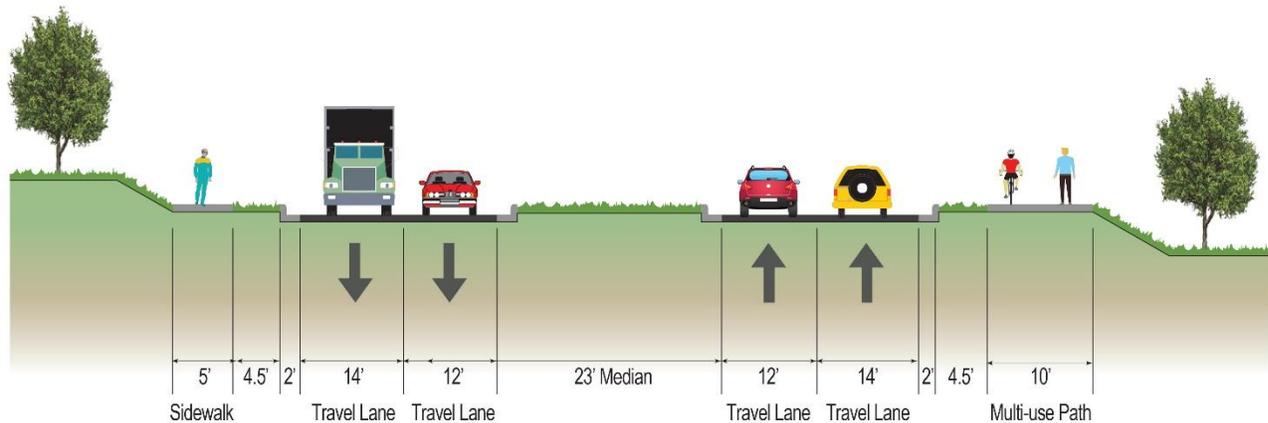
**Table 2. Preliminary Environmental Impacts**

Feature	Build Alternative 1 – 23' Median	Build Alternative 2 – 30' Median
Stream Impacts (linear feet, rounded to nearest 10 feet)		
SD	110	120
SB	310	310
SP	120	140
SQ	70	80
<b>Total Stream Impacts</b>	<b>610 feet</b>	<b>650 feet</b>
Wetland Impacts (acres, rounded to nearest 0.1 acres)		
WS	0.7	0.7
WT	<0.1	0.1
<b>Total Wetland Impacts</b>	<b>0.7 acres</b>	<b>0.8 acres</b>
Open Water Impacts (acres)		
Lake Crabtree	0.9	0.9
PA	0.5	0.5
<b>Total Open Water Impacts</b>	<b>1.4 acres</b>	<b>1.4 acres</b>

NOTE: Impacts to environmental resources were estimated using a 40' offset of the proposed edge of pavement.

Build Alternative 1 is recommended by NCDOT to be carried forward for detailed study due to its lesser impacts to the environment while still meeting the purpose of the project. The current typical section of the proposed alternative is shown below.

4 Lane Divided (23' Raised Median) with Curb and Gutter, Wide Outside Lanes, and Sidewalks  
Post Speed 45 MPH



### 3.2 No Build Alternative

The No Build Alternative is a baseline comparative alternative. The No Build Alternative would continue typical maintenance activities, but would not make any substantial improvements to the Aviation Parkway corridor. The No Build Alternative would not incur any right of way or construction costs. There would be no disruptions along existing roadways during construction. There would be no impacts to streams, wetlands, other natural and cultural resources, residences, or businesses. However, the No Build Alternative would not meet the purpose of the project. It would not reduce congestion issues or improve mobility through Morrisville. Although the No Build Alternative would not meet the project purpose, it is recommended to be retained for additional screening to provide a basis for comparing the adverse effects and benefits of the detailed study build alternative.

### 3.3 Other Alternatives Considered and Dismissed

#### New Location Alternative

It was determined that a new location alternative was not reasonable and feasible, nor would a new location alternative meet the purpose of the project.

#### Transportation System Management (TSM) Alternative

TSM Alternative improvements typically involve low-cost, minor transportation improvements to increase the capacity of an existing facility, such as intersection improvements (turning lanes, pavement striping, signage, and lighting), signal improvements (timing optimization, equipment upgrades, and detector repair/replacement), data collection to monitor system performance, and special events management strategies. A TSM Alternative is not recommended as a stand-alone detailed study alternative, since by itself it would provide little, if any, noticeable improvement to congestion on Aviation Parkway, and therefore would not meet the project purpose.

#### Transportation Demand Management (TDM) Alternative

TDM Alternative improvements typically involve strategies that increase the overall efficiency of the transportation system by changing traveler behavior, primarily through encouraging a shift from single-occupant vehicle trips to non-single-occupant vehicle trips, or by shifting auto trips out of peak periods.

This is done primarily by improving transportation options (biking, walking, transit, and ridesharing) and providing incentives for drivers to use alternate modes, reduce driving, or shift their schedule. Ridesharing and incentives can provide a feasible option for some travelers, but the ability of these programs to substantially reduce volumes on Aviation Parkway is unlikely. Bike and pedestrian facilities may be improved as part of this project, but those improvements alone would not provide any improvements in congestion on Aviation Parkway, and therefore would not meet the project purpose. Therefore, the TDM Alternative is not recommended as a detailed study alternative.

#### Mass Transit Alternative

The GoTriangle system has two bus routes along I-40 near the project. Neither of the routes operate along Aviation Parkway. Passenger rail service is not available in the county. Expanded bus service and new rail alignments would have a minimal effect on traffic volumes on Aviation Parkway. Increased transit service would have benefits because it would provide additional options for commuters, which may provide a minimal reduction in traffic volumes. But improved transit service, even if successful in attracting additional riders, would not be sufficient to reduce congestion on Aviation Parkway and therefore would not meet the project purpose. Therefore, the Mass Transit Alternative is not recommended as a detailed study alternative.

### **4. Schedule**

- Planning – State Environmental Assessment/State Finding of No Significant Impact (Summer 2019)
- Right of Way Acquisition – FY 2020
- Construction – FY 2023

### **5. Conclusion**

NCDOT recommends the following:

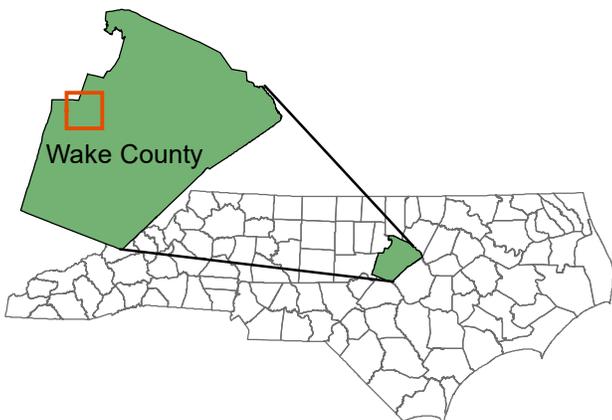
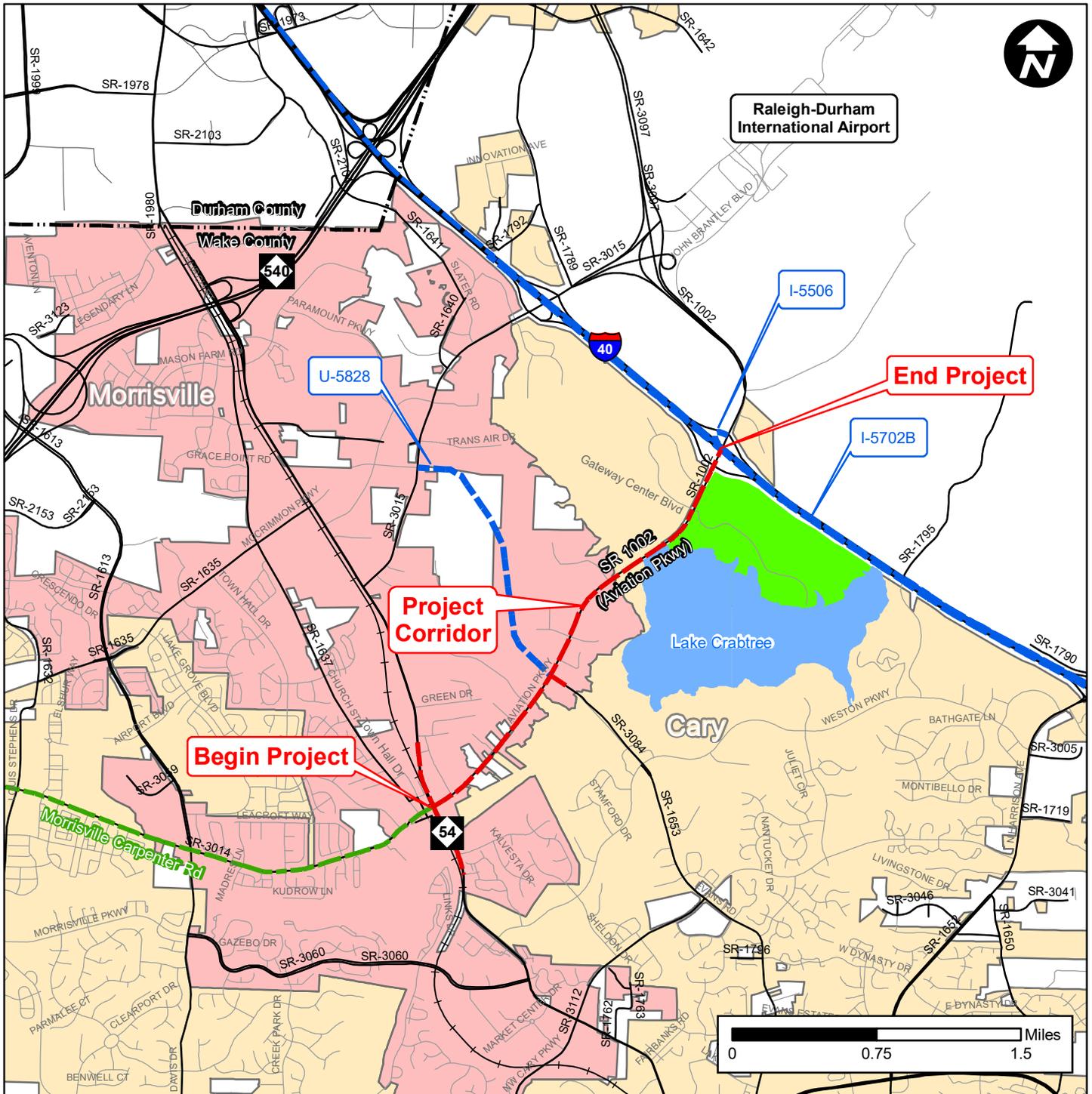
#### **5.1 C.P. 1**

- Purpose:
  - *Congestion*: The primary purpose of this project is to reduce congestion on Aviation Parkway to improve the level of service in the design year (2040) peak hours along the corridor and at signalized intersections.
  - *Mobility (secondary benefit)*: Another purpose of this project is to improve east-west mobility through Morrisville and to I-40 and I-540/NC 540.
- Study area: The proposed study area is a 1,000-foot corridor wide, 500 feet on either side of the Aviation Parkway centerline, with a wider area around the NC 54 intersection.

#### **5.2 C.P. 2**

- Build Alternative 1: Widen Aviation Parkway to a four-lane median divided section with a 23' median and multimodal accommodations.
- No Build Alternative: Although the No Build Alternative does not meet purpose and need, it is recommended to be carried forward for comparison.

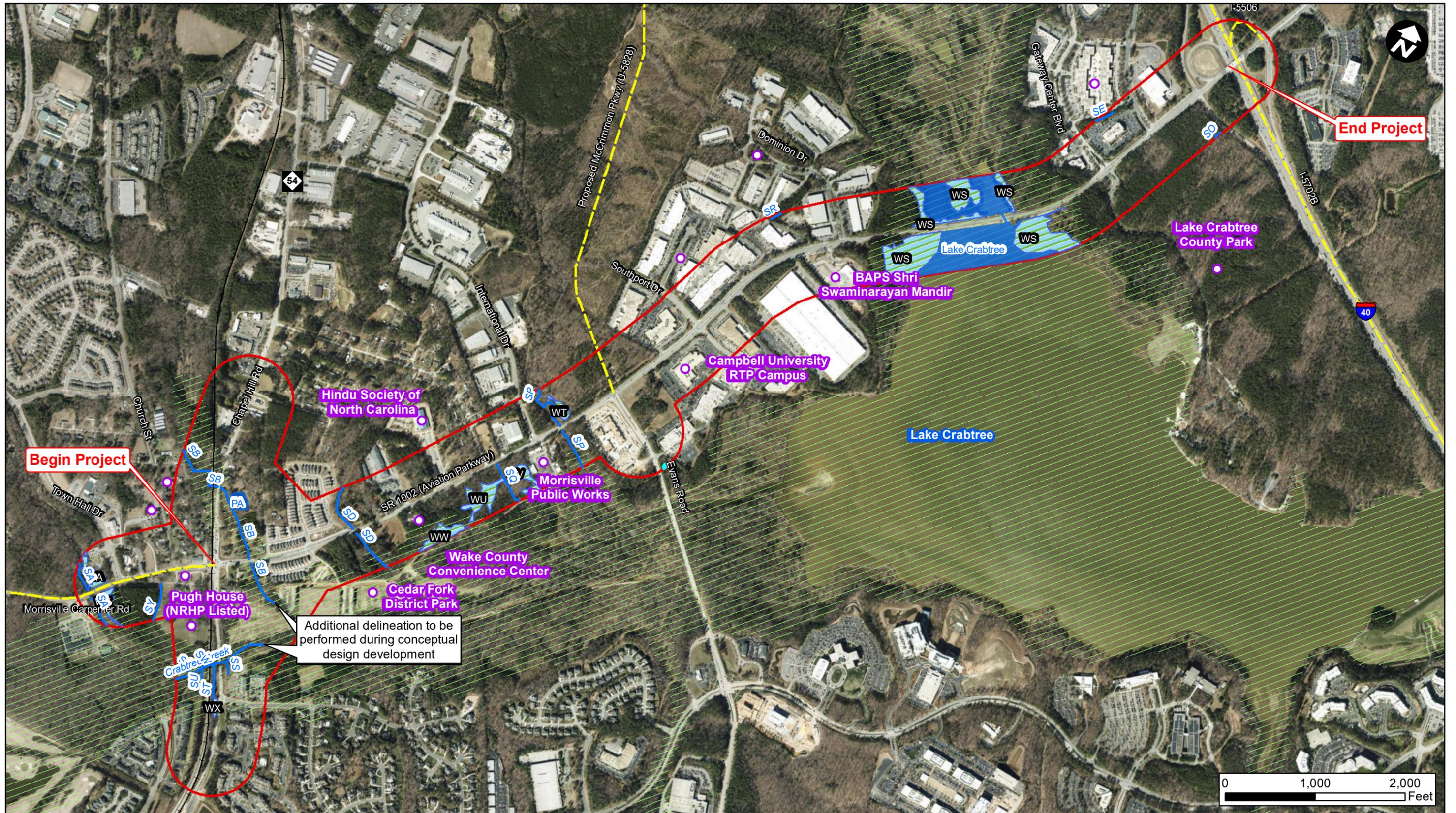
# Figures



- - - Project Limits
- - - Adjacent Local Project
- - - Adjacent STIP Project
- Lake Crabtree County Park



**Figure 1 - Project Vicinity**  
 Morrisville and Cary  
 SR 1002 From NC 54 to I-40  
 Wake County  
 TIP Project U-5811



- Surrounding Community Features
- Adjacent Project
- Railroad
- Delineated Stream
- Delineated Wetland
- Open Water
- FEMA Flood Zone

**Figure 2 - Environmental and Community Features**  
 Morrisville and Cary  
 SR 1002 From NC 54 to I-40  
 Wake County  
 TIP Project U-5811

# **Appendix**

## **Project U-5811 CP 1 & CP 2 Concurrence Forms**

**Section 404/NEPA Interagency Agreement**

**Concurrence Point 1  
Project Purpose and Need**

Project Title: SR 1002 (Aviation Parkway), Widening from NC 54 to I-40  
TIP Project No.: U-5811  
WBS No.: 44384.1.1

**Purpose and Need of the Proposed Action:**

*Congestion:* The primary purpose of this project is to reduce congestion on Aviation Parkway in order to improve the LOS in the design year (2040) peak hours along the corridor and at signalized intersections.

*Mobility:* A secondary benefit of this project is to improve east-west mobility through Morrisville and to I-40 and I-540/NC 540.

The proposed study area is a 1,000-foot wide corridor, 500 feet on either side of the Aviation Parkway centerline, with a wider area around the NC 54 intersection, as shown on the attached map.

The Project Team has concurred on the above mentioned purpose and need and the attached study area map for the proposed project.

<u>Name</u>	<u>Agency</u>	<u>Date</u>
	USACE	
	USFWS	
	NCDOT	
	NCWRC	
	NCDWR	
	NCSHPO	

**Section 404/NEPA Interagency Agreement**

**Concurrence Point 2  
Detailed Study Alternative Carried Forward**

Project Title: SR 1002 (Aviation Parkway), Widening from NC 54 to I-40  
TIP Project No.: U-5811  
WBS No.: 44384.1.1

**Alternative(s) to Study in Detail:**

- Build Alternative 1: Widen Aviation Parkway to a four-lane median divided section with a 23' median and multimodal accommodations.
- No Build Alternative

The Project Team has concurred with the above alternatives to be carried forward for the proposed project.

<u>Name</u>	<u>Agency</u>	<u>Date</u>
	USACE	
	USFWS	
	NCDOT	
	NCWRC	
	NCDWR	
	NCSHPO	