



Merger Team Meeting

STIP No. I-5870

I-440/US 1 at US 70 (Glenwood Avenue)

North Carolina Department of Transportation

Project Management Unit

July 11, 2018

SUBMITTED BY:

Dewberry
2610 Wycliff Road, Suite 410
Raleigh, NC 27607
919.424.3771

1. Introduction

1.1 Meeting Purpose

The North Carolina Department of Transportation (NCDOT) proposes improvements at the existing interchange of I-440/US 1 and US 70 (Glenwood Avenue) in Wake County (**Figure 1**). The project is included in NCDOT's current State Transportation Improvement Program (STIP) as project I-5870. In accordance with the National Environmental Policy Act (NEPA)/Section 404 Merger Process, NCDOT is seeking consensus from the NEPA/Section 404 Merger Team (Merger Team) on the following:

- Concurrence Point 1 – Purpose and Need

This report summarizes the existing project area conditions, the study area, and the proposed purpose and need.

1.2 Project Description

The STIP description of project I-5870 includes the following components:

- Construct a new interchange at Ridge Road to connect with Crabtree Valley Avenue
- Improve traffic operations at the I-440/US 1 interchange with US 70 (Glenwood Avenue)
- Realign and widen Crabtree Valley Avenue between SR 3009 (Edwards Mill Road) and Ridge Road

In addition, the project includes the following:

- Replace Bridge No. 494 on SR 1670 (Blue Ridge Road) over Crabtree Creek, which is identified as STIP Project B-5676
- Improvements at the intersection of US 70 (Glenwood Avenue) and SR 1670 (Blue Ridge Road)/SR 1820 (Lead Mine Road)

The estimated project cost is \$222,700,000. The project is to be constructed with state funds, but a federal NEPA document (Categorical Exclusion) will be prepared because the project involves improvements to an interchange on a federal facility.

1.3 Project History

The project was the focus of a 2011 City of Raleigh report entitled "Vision for the Valley: Crabtree Valley Transportation Study," which was a comprehensive review of the land uses and associated transportation needs within the Crabtree Valley area. The report included an assessment of projected land uses, an analysis of existing and future-year travel demand, and recommendations on a series of transportation improvements to address these conditions.

The 2011 City study recommended a series of near-, mid-, and long-term improvements to address both vehicle congestion and mobility concerns and safety issues for bicyclists and pedestrians. The recommended mid-term improvements included replacement of the existing Ridge Road bridge over

I-440/US 1 and the creation of a new interchange that would direct traffic from I-440/US 1 to Crabtree Valley Avenue; these improvements also included the widening and partial realignment of Crabtree Valley Avenue. Crabtree Valley Mall traffic would be re-directed off of Glenwood Avenue to the upgraded Crabtree Valley Avenue. Recommendations pertaining to bicycle and pedestrian facilities included installation of pedestrian refuge islands at key crosswalks on Glenwood Avenue, construction of additional sidewalk, and I-440/US 1 ramp modifications to slow vehicular traffic at pedestrian crossings.

The project is included in the Capital Area Metropolitan Planning Organization (CAMPO) 2045 Metropolitan Transportation Plan as Project A79a (Crabtree Valley Avenue/I-440 Connector) and A79b (Crabtree Valley Avenue Widening/Replacement).

1.4 Public Involvement

NCDOT conducted a series of small group stakeholder meetings in the spring of 2018 to introduce the project and to solicit initial comments about project area needs from residents and business owners within the study area. To date, meetings have been held with the following stakeholders:

- Neighborhoods: Glenwood CAC and Northwest CAC
- Business Owners: Crabtree Valley Mall, Summit Hospitality Group (hotel management), BP, McDonalds, Homewood Suites, America's Best Value Inn
- Apartment Complex Management: Creekside at Crabtree, Marshall Park Apartments, Pinnacle Apartments

Additional small group meetings will be conducted through the community impact assessment/environmental justice outreach process.

In order to facilitate continued engagement with the public and project stakeholders, NCDOT developed a public input (formerly CITYZEN) website with information about the project and survey questions. The survey is intended to generate feedback about the project area and users' travel patterns. The survey will be updated regularly to ask new questions as needed. The site can be accessed at:

https://ncdot.publicinput.com/I440_GlenwoodRidge

Public meetings to present alternatives for public comment will be held in the fall of 2018.

2.0 Existing Conditions

The I-440/US 1 "Raleigh Beltline" is a primary loop route around the City of Raleigh that serves a rapidly growing metropolitan area. It is a regional link for commuters traveling to points within Wake County and beyond via I-40, US 1, and US 70 (Glenwood Avenue). US 70 (Glenwood Avenue) connects downtown Raleigh to western Wake County and points west, including Durham, Burlington, and Greensboro.

2.1 Transportation Features

I-440/US 1 is an Interstate facility that has between six and eight lanes within the project study area. The US 1 corridor is designated as a Strategic Highway Corridor. US 70 (Glenwood Avenue) is classified as

an Other Principal Arterial, with six to eight lanes within the study area. Blue Ridge Road (SR 1670), Lead Mine Road (SR 1820), and Ridge Roads are designated as Major Collectors. Edwards Mill Road is designated as a Minor Arterial, while Crabtree Valley Avenue is a Local road.

NCDOT maintains nine bridges within the project study area:

- Bridge No. 494 (Blue Ridge Road over Crabtree Creek) – *STIP Project B-5676*
- Bridge Nos. 084 and 091 (Glenwood Avenue over Crabtree Creek)
- Bridge No. 260 (I-440/US 1 over Glenwood Avenue)
- Bridge No. 252 (Ridge Road over I-440/ US 1)
- Bridge Nos. 263 and 264 (I-440/US 1 over Crabtree Creek)
- Bridge Nos. 267 and 268 (I-440/US 1 over Yadkin Drive)

In addition, there are two local roadway bridges that provide mall access across Crabtree Valley Avenue, and a pedestrian bridge over Crabtree Creek.

GoRaleigh operates bus routes 4, 6, 16, and 23L within the project study area, which includes 25 bus stops. The City operates a bus transfer center within Crabtree Valley Mall property.

Three Capital Area Greenway trails are located within the project study area, including the Crabtree Creek Trail that runs adjacent to the south side of Crabtree Creek and crosses underneath US 70 (Glenwood Avenue). The House Creek Trail connects to the Crabtree Creek Trail and extends south along House Creek. A short portion of the Mine Creek Trail extends north from the Crabtree Creek Trail within the study area. These greenways are part of an overall corridor that extends north of downtown Raleigh and east to the Neuse River Trail.

In addition to STIP Project B-5676 noted previously, the City of Raleigh currently has a project to widen Blue Ridge Road from Duraleigh Road to Crabtree Valley Avenue to a three-lane facility that includes sidewalks and bicycle lanes. The project is currently in the design phase; a construction contract is scheduled to be awarded in early 2020.

2.2 Environmental Features

2.2.1 Natural Resources

A Natural Resources Technical Report (NRTR) was completed in May 2018 for the study area. The following summarizes the findings of this report.

Though the majority of the study area is classified as Maintained/Disturbed community, it also includes Piedmont Bottomland Forest, Piedmont Levee Forest (Beech and Typic subtypes), Mesic Mixed Hardwood Forest, and Basic Mesic Forest communities. There are 21 jurisdictional streams, 19 jurisdictional wetlands, and one pond within the study area. Three streams within the study area are listed on the 2016 Final 303(d) list of impaired streams: Hare Snipe Creek (benthos poor); Mine Creek (benthos fair); and Crabtree Creek (benthos fair and PCB Fish Tissue Advisory). NCWRC confirmed in May 2018 that there will be no construction moratoria for this project.

As of April 3, 2018, the USFWS lists six federally protected species for Wake County; these are listed in Table 1.

Table 1. ESA federally protected species listed for Wake County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
<i>Notropis mekistocholas</i>	Cape Fear shiner	E	No	No Effect
<i>Picoides borealis</i>	red-cockaded woodpecker	E	Yes	Unresolved
<i>Alasmidonta heterodon</i>	dwarf wedgemussel	E	Yes	Unresolved
<i>Parvaspina steinstansana</i>	Tar River spiny mussel	E	Yes	Unresolved
<i>Rhus michauxii</i>	Michaux's sumac	E	Yes	Unresolved
<i>Elliptio lanceolate</i>	yellow lance	T	Yes	Unresolved

Surveys for those species with “Unresolved” biological conclusions are underway.

2.2.2 Historic Properties

There are two properties listed on the National Register of Historic Places located just outside of the project study area: the Henry L. Kamphoefner House and the Fadum House. A survey for potentially-eligible properties within the study area is currently underway.

2.2.3 Community Facilities

Community facilities in and around the project study area are shown on **Figure 2**. In addition to the greenways noted previously, the study area includes a state-owned but City of Raleigh-maintained park/basketball court on Varnell Avenue and the southern portion of North Hills Park. There is a church located on Lead Mine Road within the study area, and the Sunrise of Raleigh senior living community is located on Edwards Mill Road south of Crabtree Valley Avenue. Stough Elementary School and several City of Raleigh parks are located south of the study area. In addition, there are several churches and two schools located just outside of the study area within the Ridge Road neighborhood.

2.3 Land Use

Land use within the project study area consists of both commercial development and residential communities, including new apartment construction and single-family residential neighborhoods. Major retailers within the study area include Crabtree Valley Mall and its associated tenants as well as the shopping center in the northwest quadrant of the US 70 (Glenwood Avenue)/ NC 50 (Creedmoor Road) intersection, which includes The Container Store, Jos. A. Bank, and other stores on and directly north of the property. The study area includes a dozen hotels, many of which rely on convenient access to Crabtree Valley Mall and the study area greenways to attract guests. The commercial areas are located mostly west of I-440/US 1, with additional office buildings located along US 70 (Glenwood Avenue) east of I-440/US 1. Medical facilities within the study area include a dental office on Lead Mine Road.

The Ridge Road neighborhood is located in the southwest quadrant of the US 70 (Glenwood Avenue) interchange between I-440/US 1 to the west and US 70 (Glenwood Avenue) to the east. Access to Ridge

Road is currently provided from I-440/US 1 at exit 6, immediately south of the US 70 (Glenwood Avenue) exit. This area is an established neighborhood within the City, with many single-family homes over 40 and 50 years old. Bicycle and pedestrian use is common within the neighborhood, and residents have voiced concerns that the project will increase vehicle traffic and create safety pressures for pedestrians, especially for children walking to nearby Lacy Elementary School and Martin Middle School (outside of the project study area).

3.0 Study Area

STIP Project I-5870 is located in Wake County within the City of Raleigh municipal limits. The project study area is shown in **Figure 2**. The study area encompasses the extent of potential interchange options on I-440/US 1 and US 70 (Glenwood Avenue), the realignment and widening of Crabtree Valley Avenue (as included in the STIP description) as well as the scope of options for the intersection of US 70 (Glenwood Avenue) and Blue Ridge/Lead Mine Roads.

The 2011 City of Raleigh study assessed design options that extended Crabtree Valley Avenue west of Creedmoor Road to a separate intersection with US 70 (Glenwood Avenue). The study area was extended northwest of Creedmoor Road along US 70 (Glenwood Avenue) to account for these options; however, per the STIP description, the scope of the proposed improvements does not extend west of Creedmoor Road.

4.0 Merger Concurrence Point 1 – Purpose and Need

4.1 Need for Proposed Action

The project's need is demonstrated by the following conditions:

- US 70 (Glenwood Avenue) currently experiences congested conditions as indicated by high traffic volumes and crash rates above the statewide average. These transportation demands are expected to continue as both commercial and residential development continues within the project study area.
 - Current year (2017) average annual daily traffic (AADT) volumes on US 70 (Glenwood Avenue) peak at 95,600 vehicles per day (vpd) between the intersection with Blue Ridge Road/Lead Mine Road and the I-440/US 1 interchange. These volumes steadily decrease on US 70 (Glenwood Avenue) moving west through the study area, declining to 49,800 vpd immediately northwest of the NC 50 (Creedmoor Road) intersection. (See **Figure 3** for an illustration of traffic volumes in the project study area.)
 - Projected growth rates used for traffic forecasting are generally 1.5% or less within the study area, with some exceptions. Growth rates along US 70 (Glenwood Avenue) between NC 50 (Creedmoor Road) and I-440/US 1 are estimated at 0.60% but increase to over 1.55% east of I-440/US 1. Growth rates along Blue Ridge Road/Lead Mine Road are highest south of US 70 (Glenwood Avenue) at 2.64% but gradually decrease to 1.11% on Lead Mine Road.
 - Crash rates along US 70 (Glenwood Avenue) and the surrounding roadway network are consistently higher than the statewide averages for similar facilities. Segment crash data is provided in **Table 2**.
 - The majority (70%) of crashes on US 70 (Glenwood Avenue) within the project study area were rear-end (slow or stop) crashes, with the next highest type being sideswipe (same

direction) crashes. The crash rate is highest between the Blue Ridge Road/Lead Mine Road intersection and the I-440/US 1 WB ramps.

Table 2. Crash Rate Comparison (March 2013 – February 2018)

	Crashes	Crashes per 100MVM	Statewide Rate ¹	Critical Crash Rate
US 70 (Glenwood Avenue)²				
Total	1634	1025.03	247.78	268.60
Fatal	1	0.63	0.93	2.5
Non-Fatal Injury	324	203.25	71.27	82.58
Night	333	208.9	52.58	62.34
Wet	264	165.61	39.66	48.18
SR 1670 (Blue Ridge Road)³				
Total	188	1352.71	289.12	367.74
Fatal	0	0	1.53	10.58
Non-Fatal Injury	30	215.86	85.72	130.17
Night	41	295.01	82.26	125.87
Wet	31	223.05	46.39	80.04
SR 1820 (Lead Mine Road)⁴				
Total	209	1846.09	289.12	376.67
Fatal	0	0	1.53	11.99
Non-Fatal Injury	26	229.66	85.72	135.40
Night	39	344.49	82.26	131.02
Wet	25	220.82	46.39	84.11

¹ Average (2015-2017) for urban US Routes (US 70) and urban secondary roads (Blue Ridge/Lead Mine Roads).

² Section between Tribute Apartments Crossover (west of Creedmoor Road) to 1000 feet east of I-440 EB Ramp Signal.

³ Blue Ridge Road between US 70 (Glenwood Avenue)/Lead Mine Road and SR 1669 (Homewood Banks Drive)

⁴ Lead Mine Road between US 70 (Glenwood Avenue)/Blue Ridge Road and Southern Charles Drive

- A capacity analysis of the I-440/US 1 and US 70 (Glenwood Avenue) corridors within the project study area indicates the following:
 - For I-440/US 1 in the 2017 Base Year No-Build scenario:
 - *I-440 Eastbound* - All eastbound segments operate at LOS D or better, except for one weaving segment between the Ridge Road EB On-Ramp and the US 70 (Glenwood Avenue) EB Off-Ramp. This segment operates at LOS E for one 15-minute period between 5:30 and 5:45 PM.
 - *I-440 Westbound* - All westbound segments operate at LOS D or better, except for the US 70 (Glenwood Avenue) EB On-Ramp merge. This segment operates at LOS E for one 15-minute period between 7:45 and 8:00 AM.
 - For US 70 (Glenwood Avenue) in the 2017 Base Year No-Build scenario:
 - All intersections operate at an overall LOS D or better, with the following exceptions:

- US 70 (Glenwood Avenue) at Blue Ridge Road/Lead Mine Road operates at LOS E in the AM and PM peaks; 7 (AM)/8 (PM) lane groups operate at LOS E or F.
- US 70 (Glenwood Avenue) at NC 50 (Creedmoor Road) operates at LOS F in the AM and PM peaks; 7 (AM)/7 (PM) lane groups operate at LOS E or F.
- For I-440/US 1 in the 2021 Design Year No-Build scenario:
 - *I-440 Eastbound* - All eastbound segments in the 2021 Design Year No-Build operate at LOS D or better in the AM peak period. The PM peak has multiple segments that operate at LOS E for multiple 15-minute time periods. The weaving segment between the Ridge Road EB On-Ramp and the US 70 (Glenwood Avenue) EB Off-Ramp operates at LOS E for all 15-minute periods between 4:00 to 5:45 PM. The basic freeway segment between Lake Boone Trail EB On-Ramp and the Ridge Road EB Off-Ramp and the Ridge Road EB Off-Ramp diverge operate at LOS E for one 15-minute period from 5:30 to 5:45 PM.
 - *I-440 Westbound* - All westbound segments in the 2021 Design Year No-Build operate at LOS D or better in the AM peak period. The PM peak period has one segment that operates at LOS E for multiple 15-minute time periods. The US 70 (Glenwood Avenue) WB On-ramp merge operates at LOS E from 7:30 to 8:15 AM. The basic freeway segment between US 70 (Glenwood Avenue) and Lake Boone Trail operates at LOS E for one 15-minute time period.
- For US 70 (Glenwood Avenue) in the 2021 Design Year No-Build scenario:
 - All intersections operate at an overall LOS D or better, with the following exceptions:
 - US 70 (Glenwood Avenue) at Blue Ridge Road/Lead Mine Road operates at LOS F in the AM peak and LOS E in the PM peak; 7 (AM)/8 (PM) lane groups operate at LOS E or F.
 - US 70 (Glenwood Avenue) at NC 50 (Creedmoor Road) operates at LOS F in the AM and PM peaks; 8 (AM)/7 (PM) lane groups operate at LOS E or F.
- US 70 (Glenwood Avenue) serves regional and local traffic, contributing to poor traffic flow along US 70 (Glenwood Avenue) between NC 50 (Creedmoor Road) and the I-440/US 1 interchange.
 - US 70 (Glenwood Avenue) serves as a regional artery, providing access between employment centers and recreational destinations in downtown Raleigh and residential areas west of the study area, both within the Wake County limits and in neighboring Durham County. US 70 (Glenwood Avenue) also provides access to the Raleigh-Durham International Airport, located approximately 12 miles northwest of the study area.
 - The same facility also provides access to business along the roadway, including Crabtree Valley Mall, adjacent shopping centers, and nearby hotels. The Crabtree Valley Mall property has three access points on US 70 (Glenwood Avenue), with an additional entrance on Blue Ridge Road south of the US 70 (Glenwood Avenue) intersection. In addition, Marriott Drive, Lead Mine Road, Crabtree View Place, and Arrow Drive provide access to hotels and other commercial properties from US 70 (Glenwood Avenue).
- Other Needs/ Secondary Benefits
 - Bridge No. 494 on SR 1670 (Blue Ridge Road) over Crabtree Creek was constructed in 1967; it is currently posted with a weight restriction of 41 tons. Most recent bridge inspection reports identified priority repair needs associated with several steel superstructure

components and the concrete substructure. NCDOT had previously identified the project in the STIP (B-5676) as a bridge requiring replacement.

- The project study area is served by a series of bicycle and pedestrian facilities, including the popular Crabtree Creek and House Creek greenways and sidewalks on US 70 (Glenwood Avenue) and Blue Ridge Road. Bicycle and pedestrian connectivity northwest of I-440/US 1, as well as safety within the entire study area, has been identified by the City and project stakeholders as a concern for the area.

4.2 Purpose of Proposed Action

The purpose of the project is to address congestion and safety concerns on US 70 (Glenwood Avenue) by improving operations at the I-440/US 1 interchange and at the intersection with SR 1670 (Blue Ridge Road)/SR 1820 (Lead Mine Road).

Additional considerations include the replacement of Bridge No. 494 on SR 1670 (Blue Ridge Road) over Crabtree Creek, improvements to bicycle and pedestrian connections within the project study area, and improvements to local traffic operations in the Crabtree Valley area.

5.0 Project Schedule

Design-Build Advertisement:	November 2018
CE Completion:	March 2019
IAR Completion:	April 2019
Design-Build Let:	May 2019

6.0 Conclusion

NCDOT recommends the following:

Concurrence Point 1:

The purpose of the project is to address congestion and safety concerns on US 70 (Glenwood Avenue) by improving operations at the I-440/US 1 interchange and at the intersection with SR 1670 (Blue Ridge Road)/SR 1820 (Lead Mine Road).

Additional considerations include the replacement of Bridge No. 494 on SR 1670 (Blue Ridge Road) over Crabtree Creek, improvements to bicycle and pedestrian connections within the project study area, and improvements to local traffic operations in the Crabtree Valley area.

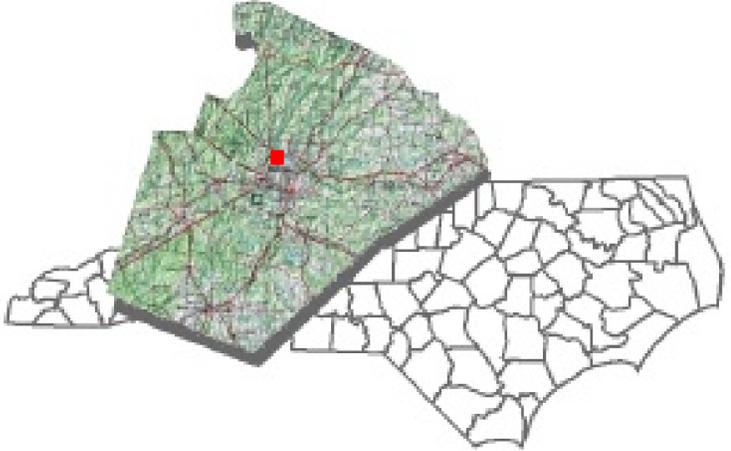
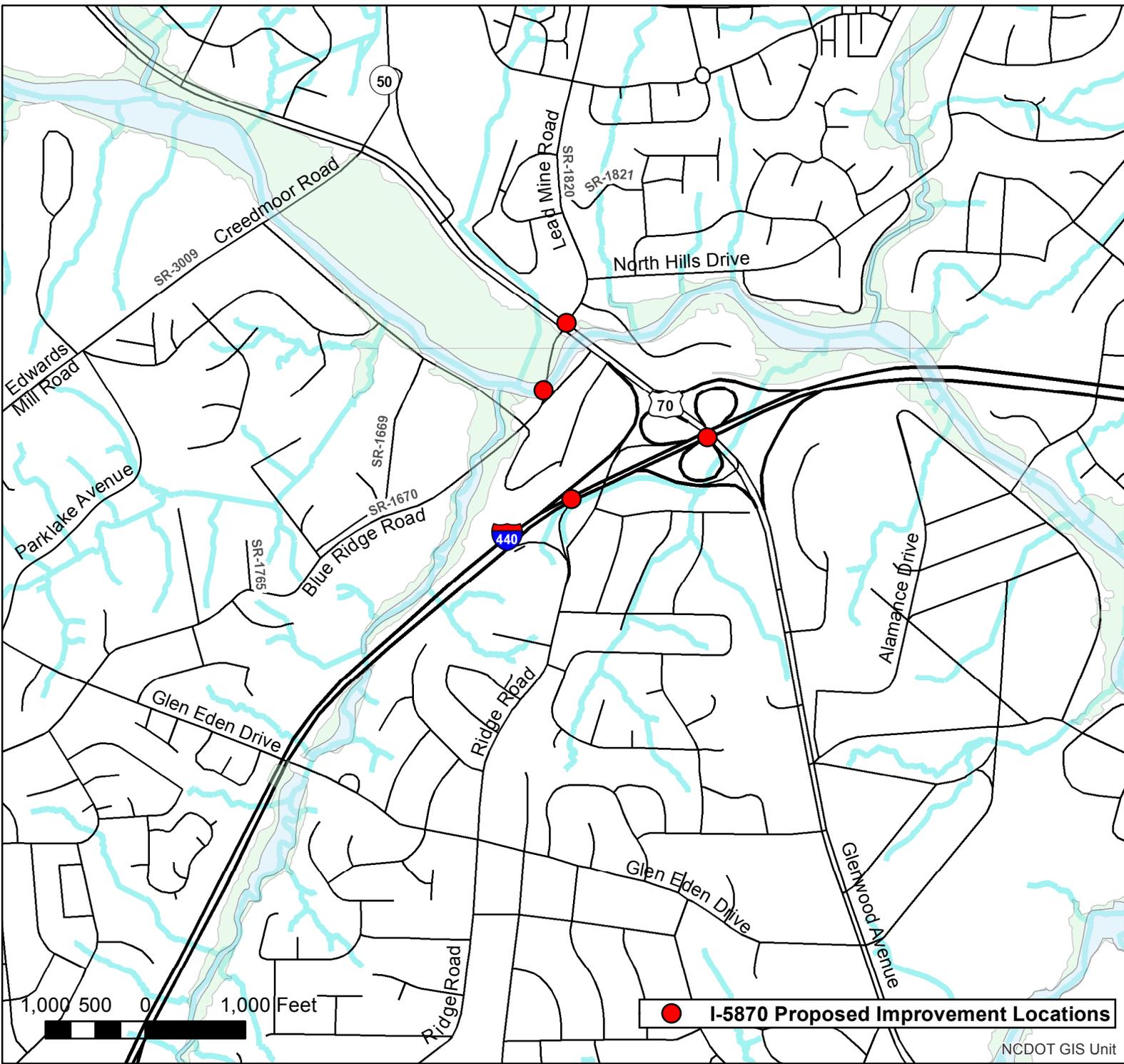
Attachments

Figure 1 – Project Vicinity Map

Figure 2 – Project Study Area/Environmental Features Map

Figure 3 – Traffic Volumes

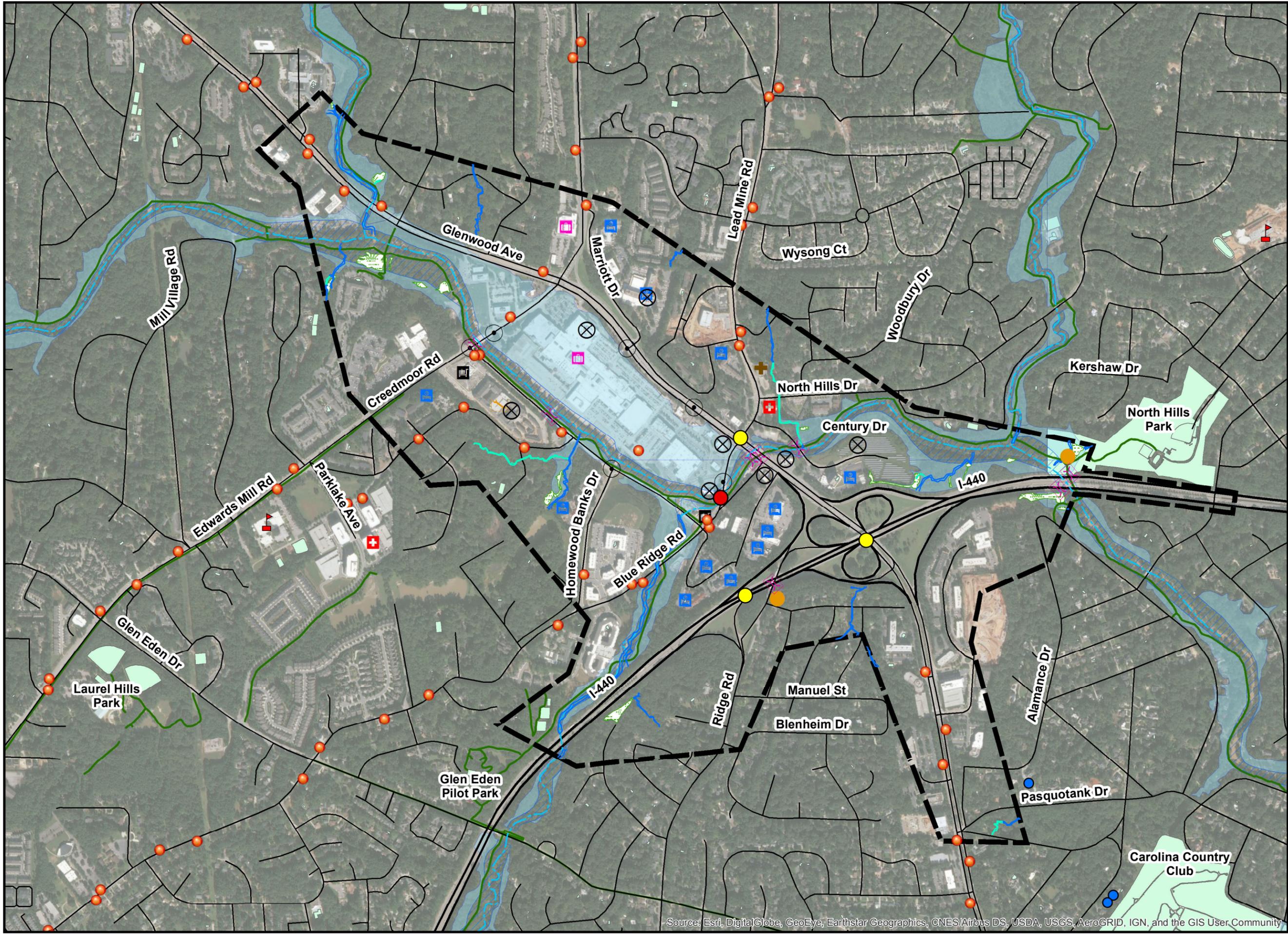
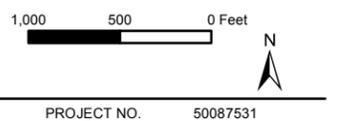
Draft Concurrence Point 1 Signature Form



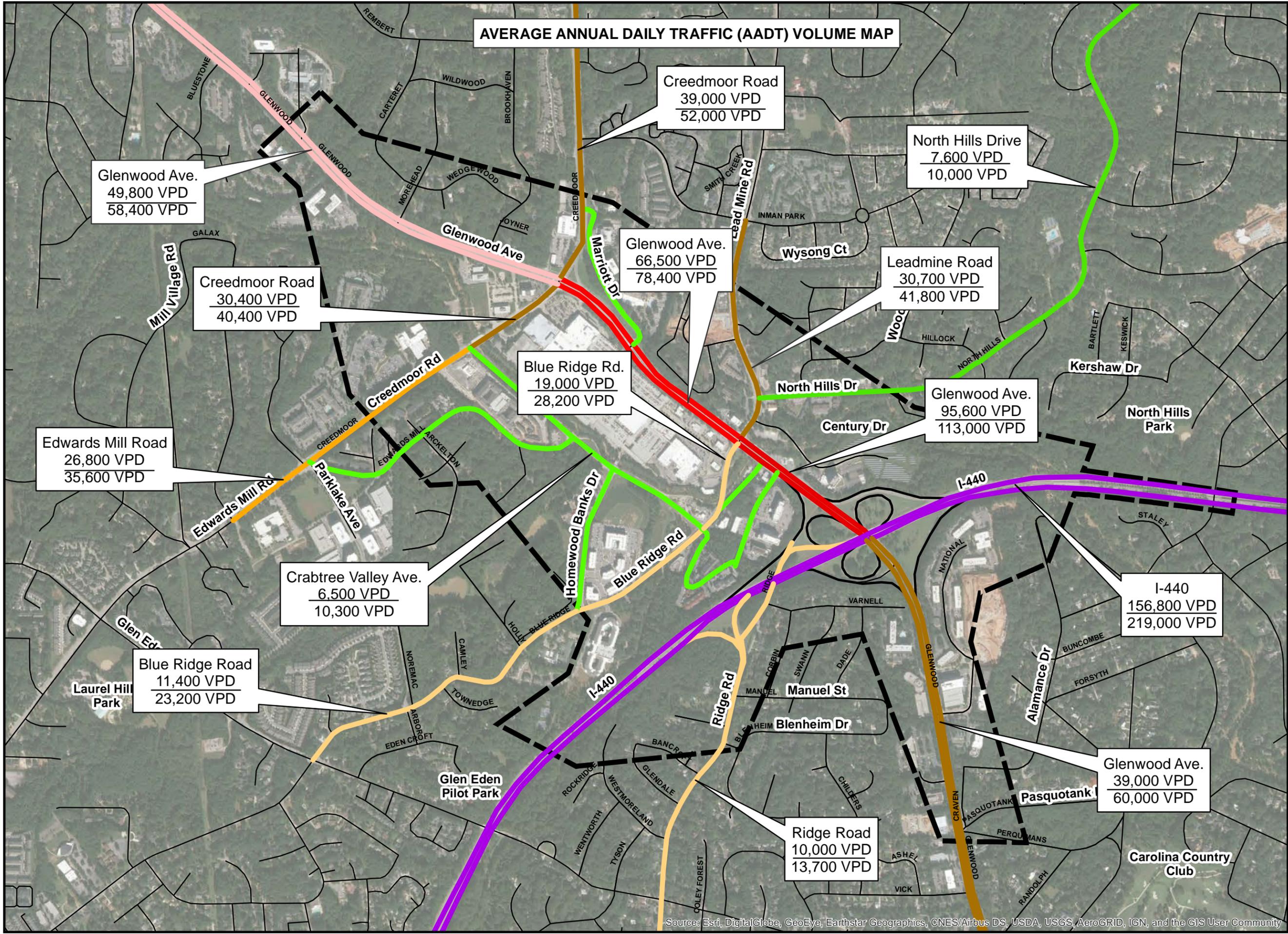
	<p>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PROJECT DELIVERY UNIT</p>
<p align="center">WAKE COUNTY I-440/US 1 CONSTRUCT NEW INTERCHANGE AT RIDGE ROAD TO CONNECT WITH CRABTREE VALLEY AVENUE, REALIGN I-440/US 1 INTERCHANGE WITH US 70, REALIGN AND WIDEN CRABTREE VALLEY AVENUE BETWEEN SR 3009 AND RIDGE ROAD STIP I-5870</p>	
<p align="center">FIGURE 1 VICINITY MAP</p>	

Legend

- Revised STIP I-5870
- STIP B-5676
- ⊗ UST
- Mall Access
- Historic site (NR)
- Section 4(f)
- ⊙ Bus Stop
- + Church
- ▴ Wake County Schools
- ⏏ Under Construction
- + Medical Facility
- Hotel
- Retail
- Restaurant
- ⌒ Bridge
- Study limits
- Greenways
- Intermittent Streams
- Perennial Streams
- ▨ Wetlands
- ▨ Recreation
- ▨ Floodway
- ▨ 100-year Floodplain



AVERAGE ANNUAL DAILY TRAFFIC (AADT) VOLUME MAP



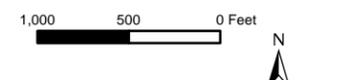
TRAFFIC VOLUME (VPD)*
2017 AADT
2045 AADT

* HIGHEST VOLUME REPORTED FROM TRAFFIC FORECAST 5/29/2018

Legend (2017 AADT)

- >100,000 VPD
- 70,001-100,000 VPD
- 60,001-70,000 VPD
- 50,001-60,000 VPD
- 40,001-50,000 VPD
- 30,001-40,000 VPD
- 20,001-30,000 VPD
- 10,000-20,000 VPD
- <10,000 VPD
- Study limits

VPD - Vehicles Per Day



PROJECT NO. 50087531



NEPA/Section 404 Interagency Merger Agreement

**Concurrence Point 1
Project Purpose and Need**

Project Title: I-440/US 1 at US 70 (Glenwood Avenue)
STIP Project No.: I-5870
WBS No.: 46307.1.1

Purpose and Need of the Proposed Action:

The purpose of the project is to address congestion and safety concerns on US 70 (Glenwood Avenue) by improving operations at the I-440/US 1 interchange and at the intersection of with SR 1670 (Blue Ridge Road)/SR 1820 (Lead Mine Road).

Additional considerations include the replacement of Bridge No. 494 on SR 1670 (Blue Ridge Road) over Crabtree Creek, improvements to bicycle and pedestrian connections within the project study area, and improvements to local traffic operations in the Crabtree Valley area.

The proposed study area is outlined in Figure 2 of the July 11, 2018 merger meeting packet.

The Project Team has concurred on this date _____ with the above purpose and need statement for the proposed project.

<u>Name</u>	<u>Agency</u>
_____	USACE
_____	FHWA
_____	NCDOT
_____	NCDWR
_____	USFWS
_____	USEPA
_____	NCWRC
_____	SHPO
_____	CAMPO