SR 1002 (AVIATION PARKWAY), IMPROVE INTERCHANGE AND CONSTRUCT AUXILIARY LANE ALONG I-40 WESTBOUND FROM SR 1002 TO SR 3015 (AIRPORT BOULEVARD)
Wake County

WBS ELEMENT – 43608.1.1
FEDERAL AID PROJECT NO. NHPP-040-7(154)284

TIP PROJECT NO. I-5506

ADMINISTRATIVE ACTION
CATEGORICAL EXCLUSION
US DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
N. C. DEPARTMENT OF TRANSPORTAION
Submitted pursuant to the National Environmental Policy Act
42 USC 4332(2) (c)

APPROVED:

8/30/16
Date

Beverly G. Robinson, Western Region
Project Development Group Supervisor
Project Development and Environmental Analysis Unit

8/30/16
Date

FOR

John F. Sullivan III, P.E. Division Administrator
Federal Highway Administration

SR 1002 (AVIATION PARKWAY), IMPROVE INTERCHANGE AND CONSTRUCT AUXILIARY LANE ALONG I-40 WESTBOUND FROM SR 1002 TO SR 3015 (AIRPORT BOULEVARD)

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August 2016

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8-30-16

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8/30/16

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PROJECT COMMITMENTS

SR 1002 (AVIATION PARKWAY), IMPROVE INTERCHANGE AND CONSTRUCT AUXILIARY LANE ALONG I-40 WESTBOUND FROM SR 1002 TO SR 3015 (AIRPORT BOULEVARD)

Wake County, North Carolina

WBS Element – 43608.1.1

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TIP PROJECT NO. - I-5506

Project Development and Environmental Analysis:

Pedestrian accommodations in the project area will be further coordinated with the Town of Cary, Wake County and GoTriangle. Additional coordination is needed for sidewalk segments #11-14 shown on Figure 7. A municipal agreement will be prepared prior to construction.

Division 5, Roadside Environmental, Town of Cary, and Town of Morrisville:

Coordination will be needed with the Towns of Cary and Morrisville to coordinate enhanced landscaping as part of the project for the loops and/or ramps of this project.

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APPENDIX

SR 1002 (AVIATION PARKWAY), IMPROVE INTERCHANGE AND CONSTRUCT AUXILIARY LANE ALONG I-40 WESTBOUND FROM SR 1002 TO SR 3015 (AIRPORT BOULEVARD)

WAKE COUNTY

WBS Element – 43608.1.1

Federal Aid Project NHPP-040-7(154)284

STIP PROJECT NO. I-5506

I.DESCRIPTON OF PROPOSED ACTION

A. General Description

The North Carolina Department of Transportation (NCDOT) proposes to improve the interchange of I-40 and SR 1002 (Aviation Parkway) near the Raleigh-Durham International Airport in Wake County (see Figure 1 and Figure 2). The proposed project consists of adding a loop off ramp from I-40 westbound to Aviation Parkway. The off-ramp, Loop B, in the northwest quadrant of the existing interchange, will carry traffic southbound towards Morrisville. The on-ramp, Ramp B, from Aviation Parkway to I-40 westbound will be realigned to make space for the proposed loop, and an auxiliary lane will be constructed connecting the westbound on-ramp, Ramp B, from Aviation Parkway to the westbound off-ramp to Airport Boulevard. The westbound off-ramp, Ramp A, will be will be realigned to tie in opposite Ramp B. The other ramp configurations will remain mostly unchanged. The proposed project includes the replacement of the existing bridge over I-40. The bridge needs additional width to accommodate the new interchange design and widening the existing 46 year old bridge is not practical. The proposed improvements to Aviation Parkway are 0.84 mile long. Additional right of way will be required to accommodate the proposed improvements. Control of access will be adjusted and maintained to accommodate ramps proposed for the northeast and northwest quadrants of the interchange. The project did not follow the NEPA 404/Merger Process.

B. Project Schedule

The improvements to the I-40 Interchange are federally funded. Project I-5506 is included in the NCDOT 2016-2025 State Transportation Improvement Program (STIP). Right of way acquisition is scheduled to begin in federal fiscal year (FY) 2017 and construction is scheduled to begin in FY 2018.

C. Cost Estimate

The cost estimate in the STIP for the I-5506 project is $500,000 for right of way and $3,100,000 for construction.

The current cost estimate for the proposed project is:

Construction	$17,300,000
Right of Way	1,750,000
Utilities	262,000
TOTAL	$19,312,000

II. PURPOSE AND NEED

A. Purpose of Project

The purpose of the project is to improve congestion, level of service and traffic flow at the existing interchange of I-40 with SR 1002 (Aviation Parkway).

B. Need for Project

The proposed project will address the following traffic needs in the I-40 and SR 1002 (Aviation Parkway) Interchange area:

- Inadequate capacity to meet projected 2040 traffic demand
- Heavy congestion for traffic movements exiting I-40 westbound to SR 1002 (Aviation Parkway) southbound
- Exiting traffic is backing up to I-40 for westbound traffic creating safety issues and congestion on I-40
- Length of acceleration lane for on ramp westbound is inadequate
- Existing storage length on the eastbound off ramp for the left-turn movement to SR 1002 (Aviation Parkway) northbound is not adequate to accommodate projected demand

1. Crash Data

There were 1,401 reported crashes in the project area from October 1, 2008 to September 30, 2013. These crashes included 5 fatal crashes and 329 non-fatal injury crashes. The remaining crashes were property damage only with a total estimated property damage of $7.4 million during the studied period.

The predominant crash type during the study period was rear end collisions which accounted for 48% of all crashes on I-40, 48% of the crashes on SR 1002 (Aviation Parkway), and 65% of all crashes on the interchange ramps. The second most prevalent crash type on I-40 and the ramps involved vehicles running off of the road, accounting for 19% of the crashes on I-40 and 18% of the crashes on the ramps. On SR 1002 (Aviation Parkway), the second most common crash type involved left turning traffic, making up 21% of the crashes on this route. These crash types are consistent with the congested conditions in the interchange area. The proposed improvements to the interchange will reduce the potential for these types of crashes by reducing congestion and eliminating the heavy left turn from I-40 westbound to SR 1002 (Aviation Parkway).

Table 1
Crash Data

	Total Crashes	Fatal Crashes	Non-Fatal Injury Crashes	Project Crash Rate* (ACC/100MVM)	Statewide Crash Rate* (ACC/100MVM)	Critical Crash Rate** (ACC/100MVM)
I-40	1,065	3	242	113.47	89.93	121.88
SR 1002 (Aviation Pkwy)	269	1	80	177.44	169.09	355.17
Eastbound Off Ramp	43	0	4	1,308.26	N/A	--
Eastbound On Loop	6	1	1	345.88	N/A	--
Westbound Off Ramp	15	0	1	183.36	N/A	--
Westbound On Ramp	3	0	1	121.7	N/A	--

ACC/100MVM - Accidents per 100 million vehicle miles
* Statewide average for Urban Interstates 2010-2012 and the Statewide Average for Urban Secondary Roads with Partial Control of Access 2010-2012
** The critical rate is a statistically derived number that can be used to identify high crash roadway segments. (The critical rate is a 90% confidence level that something else other than chance is causing the accidents.)

2. Traffic Data

Estimated average daily traffic volumes were developed for the proposed project. The 2013 and 2040 build conditions traffic forecast and turning movement volumes for the study area roads are presented in the table below and Figures 3 and 4.

Table 2
Traffic Volumes

	2013 (vpd)	2040 (vpd)
I-40	160,000	225,100
SR 1002 (Aviation Parkway)	26,500	36,600

Vpd - Vehicles per day

3. Capacity

a. Current Conditions

SR 1002 (Aviation Parkway)

SR 1002 (Aviation Parkway) is a 4-lane roadway north of the I-40 Eastbound Ramps carrying 26,500 vehicles per day. South of the I-40 Eastbound Ramps, SR 1002 (Aviation Parkway) narrows to a 2-lane roadway carrying 23,600 vehicles per day. SR 1002 (Aviation Parkway) narrows to 2-lanes because of the constraint of existing 2-lane causeway across Lake Crabtree.

Gateway Centre Boulevard is a loop road that provides two entrances to a large business park. The southernmost entrance is signalized and the other entrance provides right-in right-out access. The southernmost intersection of Gateway Centre Boulevard on SR 1002 (Aviation Parkway) within the study area operates at Level of Service (LOS) D with substantial queuing in the southbound direction during the AM peak hour. Observations in the field confirmed this analysis and that southbound queuing on SR 1002 (Aviation Parkway) at Gateway Centre Boulevard was extending beyond the I-40 Eastbound Ramps (greater than 1200 feet). As noted earlier, directly south of the Gateway Centre Boulevard intersection is the two-lane causeway.

The Gateway Centre Boulevard Right-in Right-Out (RIRO) intersection operates at an unacceptable LOS F. This is expected with the high traffic volumes on the 2-lane section of SR 1002 (Aviation Parkway). It is to be noted that the southbound right-turn lane into Gateway Centre Boulevard RIRO from SR 1002 (Aviation Parkway) extends back to the I-40 Eastbound Off-Ramp.

At the signalized I-40 Eastbound on/off ramps, an existing loop ramp in the southwest quadrant operates acceptably for those traveling to Raleigh from southbound SR 1002 (Aviation Parkway). At the signalized I-40 Westbound Off-Ramp, a channelized free flow right-turn lane provides acceptable operation to the RDU Airport from Raleigh; however, the westbound left-turn operates at LOS E during the AM peak hour and LOS F in the PM peak hour. These two movements

are the heaviest movements at the interchange. The next two heaviest movements are both at the I-40 Westbound Ramps. These movements include:

- Northbound left-turns from SR 1002 (Aviation Parkway) onto I-40 Westbound On-Ramp
- Westbound left-turns from I-40 Westbound Off-Ramp to southbound SR 1002 (Aviation Parkway).

RDU Center Drive currently serves a hotel and a business park. Access out of RDU Center Drive is restricted to right-out only. A southbound left-turn provides access into the RDU Center Drive for those approaching from the north on SR 1002 (Aviation Parkway). This intersection currently operates at an acceptable LOS.

Approximately two-thirds of a mile north of Gateway Centre Boulevard on SR 1002 (Aviation Parkway) is the northernmost intersection, National Guard Drive. National Guard Drive serves a gas station and is the primary access to the RDU Airport's long-term parking facility. National Guard Drive operates at an acceptable LOS; however, during the AM peak hour, it is noted that southbound queuing from the I-40 Westbound on/off ramps intersection may extend to this intersection. See Table 3.

Table 3
Existing - 2013 Level of Service on SR 1002 (Aviation Parkway)

Intersection / Segment	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
Gateway Centre Blvd at Aviation Pkwy	D	41.3	D	51.9
Gateway Centre Blvd RIRO* at Aviation Pkwy	F	210	D	29.1
I-40 EB Ramps at Aviation Pkwy	B	11.0	B	12.5
I-40 WB Ramps at Aviation Pkwy	C	23.1	B	15.1
RDU Drive at Aviation Pkwy	B	14.8	C	23.8
National Guard Drive at Aviation Pkwy	B	14.4	B	12.1

RIRO – Right in and right out only

Interstate 40

I-40 is an 8-lane highway carrying 160,000 vehicles per day east of the SR 1002 (Aviation Parkway) interchange. In the AM peak hour, the predominant flow is in the westbound direction and is reversed in the PM peak hour. While the majority of the freeway segments and ramps currently operate at an acceptable LOS, I-40

westbound east of SR 1002 (Aviation Parkway) and the westbound off ramp operate at LOS E during the AM peak hour and , I-40 eastbound east of SR 1002 (Aviation Parkway) and the eastbound off ramp operate at LOS E during the PM peak hour. See Table 4.

Table 4
Existing - 2013 Level of Service on I-40

Segment / Merge - Diverge	AM Peak		PM Peak	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-40 Westbound East of Aviation Pkwy	E	37.8	D	27.0
I-40 Westbound West of Aviation Pkwy	D	34.0	C	24.6
I-40 Eastbound West of Aviation Pkwy	C	24.6	D	34.0
I-40 Eastbound East of Aviation Pkwy	D	27.0	E	37.8
Diverge Westbound Off Ramp	E	40.4	D	34.3
Merge Westbound On Ramp	D	29.2	C	24.3
Diverge Eastbound Off Ramp	D	29.9	E	35.8
Merge Eastbound On Ramp	C	24.6	D	29.8
Merge Eastbound Loop On Ramp	C	22.9	C	27.5

pc/mi/ln – passenger cars per mile per lane

b. 2040 No-Build Conditions

SR 1002 (Aviation Parkway)

The existing queuing and delay at the intersection of SR 1002 (Aviation Parkway) and Gateway Centre Boulevard is expected to increase to LOS F with 2040 No-Build traffic volumes. Both unsignalized intersections, Gateway Centre Boulevard RIRO and RDU Drive, are also expected to operate at LOS F due to increased volumes on SR 1002 (Aviation Parkway). While overall LOS for the I-40 Westbound Off-Ramp intersection is expected to operate at LOS D or better in 2040, the westbound left-turn is expected to operate at LOS F in both the AM and PM peak hours. In addition, the northbound left-turn at this intersection in 2040 is expected to operate at LOS F in the AM peak hour and LOS E in the PM peak hour. There are also multiple movements at this intersection that experience a volume-to-capacity ratio of 1.0 or greater in the AM peak hour, and the I-40 Westbound ramp would experience excessive queuing. Table 5 summarizes LOS and delay for all intersections within the project limits along SR 1002 (Aviation Parkway). See Table5.

Table 5
Future No-Build – 2040 Level of Service on SR 1002 (Aviation Parkway)

Intersection / Segment	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
Gateway Centre Blvd at Aviation Pkwy	F	136	F	162
Gateway Centre Blvd RIRO* at Aviation Pkwy	F	900+	F	261
I-40 EB Ramps at Aviation Pkwy	C	25.2	C	20.1
I-40 WB Ramps at Aviation Pkwy	D	47.8	D	38.3
RDU Drive at Aviation Pkwy	D	27.6	F	121
National Guard Drive at Aviation Pkwy	C	24.1	C	20.5

RIRO – Right in and right out only

Interstate 40

All segments of I-40 and all merges / diverges on I-40 at SR 1002 (Aviation Parkway) are expected to operate at LOS F with 2040 No-Build traffic volumes. In order to determine if an additional lane in each direction would improve the LOS to an acceptable level, a 2040 capacity analysis was performed on I-40 using five lanes in each direction (currently only 4 lanes in each direction) and LOS E or F was still obtained. Table 6 below summarizes LOS and density for the freeway segments and ramps for the 2040 No-Build condition.

Table 6
Future No-Build – 2040 Level of Service on I-40

Segment / Merge – Diverge	AM Peak		PM Peak	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-40 Westbound East of Aviation Pkwy	F	123	F	53.6
I-40 Westbound West of Aviation Pkwy	F	93.0	F	45.8
I-40 Eastbound West of Aviation Pkwy	F	45.8	F	93.0
I-40 Eastbound East of Aviation Pkwy	F	53.6	F	123
Diverge Westbound Off Ramp	F	63.7	F	47.1
Merge Westbound On Ramp	F	41.2	F	34.1
Diverge Eastbound Off Ramp	F	41.7	F	58.2
Merge Eastbound On Ramp	F	34.4	F	41.7
Merge Eastbound Loop On Ramp	F	32.8	F	39.2

pc/mi/ln – passenger cars per mile per lane

c. 2040 Build Conditions

With the proposed improvements and the future widening of SR 1002 (Aviation Parkway) across the causeway (STIP Project U-5811), SR 1002 (Aviation Parkway)

will operate at an acceptable LOS in 2040. Table 7 below shows the peak hour LOS and delay for each of the intersections within the project limits.

Table 7
Future Build - 2040 Level of Service on SR 1002 (Aviation Parkway)

Intersection / Segment	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
Gateway Centre Blvd (south)at Aviation Pkwy	C	27.9	C	33.1
Gateway Centre Blvd (north) at Aviation Pkwy	B	10.2	B	11.0
I-40 EB Ramps at Aviation Pkwy	A	6.5	A	8.4
I-40 WB Ramps at Aviation Pkwy	C	20.4	C	23.5
RDU Drive at Aviation Pkwy	D	26.4	D	26.4
National Guard Drive at Aviation Pkwy	C	22.9	C	22.6

A diverge analysis was conducted for the proposed I-40 Loop Off-Ramp as well as the existing I-40 Westbound Off-Ramp as the build Alternative affects these two ramps. The results of the analysis for the 2040 traffic conditions detailing LOS and density are summarized in Table 8 below. It is to be noted the LOS and density shown below reflect the existing four lanes in each direction on I-40. To obtain an improved LOS and density for design year 2040, widening I-40 along with managed lanes may be needed.

Table 8
Future Build - 2040 Level of Service on I-40

Segment / Merge - Diverge	AM Peak		PM Peak	
	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-40 Westbound East of Aviation Pkwy	F	123	F	53.6
I-40 Westbound West of Aviation Pkwy	F	93.0	F	45.8
I-40 Eastbound West of Aviation Pkwy	F	45.8	F	93.0
I-40 Eastbound East of Aviation Pkwy	F	53.6	F	123
Diverge Westbound Off Ramp	F	63.7	F	45.3
Diverge Westbound Loop Off Ramp	F	57.2	F	40.2
Merge Westbound On Ramp	F	41.2	F	34.1
Diverge Eastbound Off Ramp	F	41.7	F	58.2
Merge Eastbound On Ramp	F	34.4	F	41.7
Merge Eastbound Loop On Ramp	F	32.8	F	39.2

pc/mi/ln – passenger cars per mile per lane

III. DESCRIPTION OF EXISTING FACILITY

A. Route Classification

In the project area, I-40 is classified as an Interstate on the state's Highway Classification Map. SR 1002 (Aviation Parkway) is shown as a minor arterial.

The Capital Area Metropolitan Planning Origination (CAMPO) shows I-40 in the project area as a "freeway" that needs improvement on their Draft Regional Transportation Highway Map dated October 21, 2010. This map shows SR 1002 (Aviation Parkway) as a "Major Thoroughfare" that needs improvement south of I-40.

B. Typical Section

I-40 is an eight-lane median divided freeway with four 12-foot travel lanes, twelve-foot paved outside shoulders and eight-foot paved median shoulders for each direction of travel. Both the eastbound and westbound off-ramps diverge directly from I-40 without the benefit of deceleration lanes.

SR 1002 (Aviation Parkway) is a four-lane undivided roadway in the interchange area. It is a four-lane divided roadway northwest of the interchange that provides vehicular access to the Raleigh-Durham International Airport (RDU) via the John Brantley Boulevard. SR 1002 (Aviation Parkway) has a four-lane cross section south of the interchange to Gateway Centre Boulevard. However, the roadway narrows to two lanes south of that point on the causeway across a portion of Lake Crabtree. See Figure 6A.

C. Structures

Bridge Number 910073 was built in 1969 and carries SR 1002 (Aviation Parkway) over I-40 within the interchange. It is a four span, reinforced concrete deck/concrete I-beams structure. It was last inspected February 25, 2013, and received a sufficiency rating of 81. There is no posted weight limit restriction assigned to this structure. The structure has a 54-foot clear roadway, which is marked for four travel lanes. The minimum vertical clearance is 16 feet, 4 inches over the eastbound lanes of I-40 and 18 feet, 2 inches over the westbound lanes.

D. Right of Way

Right of way width is variable along both I-40 and SR 1002 (Aviation Parkway) throughout the project limits. The existing right of way on I-40 varies from 350 feet to 1,150 feet through the project area, and the right of way on SR 1002 (Aviation Parkway) varies from 100 feet to 300 feet.

E. Access Control

I-40 is a full control of access freeway facility. The access control runs concurrent with the existing right of way limits. All existing ramps are within the control of access limits and it extends northward up SR 1002 (Aviation Parkway) to RDU Center Drive. SR 1002 (Aviation Parkway) has partial control of access with access limited to intersections.

F. Railroad Crossings

No railroad crossings are within the project area.

G. Greenway, Pedestrian and Bicycle Considerations

There are no greenways located along I-40 or SR 1002 (Aviation Parkway) within the project area. There are sidewalks on the west side of SR 1002 (Aviation Parkway) to the south of the interchange in the vicinity of the Gateway Centre Office Park, and there is a sidewalk along the southern side of the Lake Crabtree Park Entrance. These are the only sidewalks within the project area. Bicycle routes are not permitted along interstate or freeway routes. Thus, there is no bicycle route along I-40 in the project area. SR 1002 (Aviation Parkway) does not have any striped bicycle lanes and it is not a designated bicycle route in Wake County.

H. Speed Limits

The posted speed limit on I-40 is 65 miles per hour (mph) in the project area. The speed limit on SR 1002 (Aviation Parkway) is 45 mph.

I. Intersection and Type of Control

The interchange of I-40 with SR 1002 (Aviation Parkway) is a conventional diamond with a loop ramp in the southwest quadrant, which provides an on-ramp from SR 1002 southbound to I-40 eastbound (toward Raleigh). The existing westbound off ramp at SR 1002 (Aviation Parkway) is signal controlled, with a channelized free flow movement for the right-turn movement (toward the airport) and two left-turn lanes. The eastbound off ramp is signalized at SR 1002 (Aviation Parkway) with separate right/through and left-turn lanes. The northbound approach has two through lanes and a separate right-turn lane to the eastbound on ramp, while the southbound approach has two through lanes. Immediately south of the off ramp terminal, SR 1002 (Aviation Parkway) has a through lane and a right-turn lane to the Gateway Centre Boulevard right in/right out intersection.

J. Geodetic Markers

There are no known geodetic markers located within the project area.

K. Utilities

The project area is fully served by utilities. There are underground gas, jet fuel, water, sewer, power, telephone and cable TV lines as well as overhead electric and phone lines.

L. School Buses

The Wake County School District does not operate any buses that pass through the interchange area either on I-40 or SR 1002 (Aviation Parkway).

M. Adjacent Projects

U-5811 is an adjacent project just south of the project study area (See Figure 5). The STIP describes it as SR 1002 (Aviation Parkway) from NC 54 to I-40 with widening from two lanes to multilanes. This project is currently scheduled for right of way in 2020 and construction in 2022.

I-5700 is the improvement of the I-40 and SR 3015 (Airport Boulevard) interchange just west of the SR 1002 (Aviation Parkway) interchange. It is currently scheduled for right of way in 2019 and construction in 2020.

U-5828 is McCrimmon Parkway from SR 3015 (Airport Boulevard) to SR 1002 (Aviation Parkway). This project is a combination of widening to multilanes and construction on new location. This project is currently scheduled for right of way in 2020 and construction in 2021.

The Town of Morrisville has the NC 54 Bypass/ McCrimmon Parkway Extension project which extends McCrimmon Parkway from NC 54 to SR 1002 (Aviation Parkway) south of the study area. Construction is scheduled to begin in the spring of 2016.

IV. ALTERNATIVES CONSIDERED

A. Project History and Study Alternatives

The State Transportation Improvement Program (STIP) lists U-5811 as SR 1002 (Aviation Parkway) widening to multi-lanes from NC 54 to I-40 with an interchange modification of the I-40 interchange. The interchange modification portion of U-5811 was split out from that project as I-5506. The NCDOT funding tables indicate that right of way for I-5506 is funded in federal fiscal year (FY) 2017 with construction to follow in FY 2018.

During the planning and preliminary design of the proposed project, it was determined that an auxiliary lane is needed along I-40 from SR 1002 (Aviation Parkway) to SR 3015 (Airport Boulevard) to improve traffic operations. On May 18, 2016, the Capitol Area Metropolitan Transportation Organization (CAMPO) amended the project description to include an auxiliary lane along I-40 from SR 1002 (Aviation Parkway) to SR 3015 (Airport Boulevard).

In addition to the "Build" alternatives, Alternative Modes of Transportation, Travel Demand Management (TDM) measures, Transportation Systems Management (TSM) improvements, and the "No Build" Alternative were studied

Alternative Modes of Transportation – Mass transit, bicycle and pedestrian accommodations are examples of alternative modes of transportation that may reduce highway congestion and delay. The proposed project is served by GoTriangle buses and a new bus stop with bus turnouts near National Guard Drive is included as part of the project. The project also includes wide outside lanes for bicycles and a flat area or berm behind the curb and gutter where sidewalks can be constructed in the future. Construction of sidewalks on the eastern side of SR 1002 (Aviation Parkway) between the eastbound I-40 on-ramp and the Town of Cary Town Limits north of RDU Center Drive is proposed in conjunction with the project. Providing accommodations for alternative modes of transportation alone will not address the transportation needs that will be improved by the Preferred Alternative.

Travel Demand Management (TDM) Alternative - Travel Demand Management (TDM) measures such as staggering work hours, carpooling, and van pooling are possible ways to reduce congestion: however, these congestion management measures are not controlled by NCDOT. These alternatives alone will not address the need that will be improved by the Preferred Alternative.

Transportation Systems Management (TSM) Alternative - Transportation Systems Management (TSM) improvements involve increasing the available capacity of the roadway within the existing right-of-way with minimum capital expenditures and without reconstructing or adding additional through lanes to the existing road. Addition of turn lanes, striping, signing, signalization, and minor realignment are examples of TSM physical improvements. Examples of TSM operational improvements include traffic law enforcement, speed restrictions, and signal timing changes. TSM improvements alone will not reduce congestion and delay enough to alleviate the need for the proposed project.

"No Build" Alternative – A "No Build" Alternative was studied to establish a baseline for comparing the effects associated with the "Build" Alternative. The "No Build" Alternative would provide routine maintenance to the existing interchange and would include other projects in NCDOT's STIP. This alternative would not improve traffic flow and would not reduce congestion and delay: therefore, the "No Build" Alternative is not recommended.

Early "Build" Alternatives – A total of five build alternatives were studied and documented in a Capacity Analysis Report, completed by AECOM in April 2014. The five build alternatives are described as follows:

Alternative 1 – I-40 Westbound Loop On-Ramp in northeast corner of the SR 1002 (Aviation Parkway)/I-40 interchange

Alternative 2 – I-40 Westbound Loop Off-Ramp in northwest corner of the SR 1002 (Aviation Parkway)/I-40 interchange

Alternative 3 – Diverging Diamond Interchange

Alternative 4 – Staged Approach Consisting of a Modified Superstreet Option, widening of the causeway across Lake Crabtree, and the addition of an I-40 eastbound auxiliary lane between SR 3015 (Airport Boulevard) and SR 1002 (Aviation Parkway).

Alternative 5 – A combination of Alternatives 2 and 4 that includes an I-40 Westbound Loop Off-Ramp in the northwest quadrant of the SR 1002 (Aviation Parkway)/I-40 interchange and the Modified Superstreet improvement to SR 1002 (Aviation Parkway).

Two of the build alternatives (Alternative 1 and Alternative 2) were selected for further study. Alternative 2 (See Figures 6A and 6B) was chosen as the preferred alternative because studies showed it would provide superior operational characteristics and have lower right of way cost, achieved by avoiding the commercial development in the northeast quadrant of the interchange on RDU Center Drive.

B. Preferred Alternative

The capacity analysis for 2040 projected traffic volumes indicated that Alternative 2 along with approach lane modifications to the SR 1002 (Aviation Parkway) intersections between Gateway Centre Boulevard and National Guard Drive would operate at an acceptable Level of Service. Alternative 2 is compatible with the future conversion of SR

1002 (Aviation Parkway) to a Superstreet, if desired. The northwest loop provided by Alternative 2 would eliminate the need for westbound I-40 traffic destined for southbound SR 1002 (Aviation Parkway) to U-turn on the Superstreet. The preferred alternative includes the construction of an auxiliary lane connecting the westbound on-ramp from SR 1002 (Aviation Parkway) to the westbound off-ramp to Airport Boulevard.

V. PROPOSED IMPROVEMENTS

The proposed project will improve safety and increase the capacity of the existing I-40 and SR 1002 (Aviation Parkway) Interchange by removing the signalized left-turn traffic movement from the existing westbound off ramp at SR 1002 (Aviation Parkway). This movement will be relocated to a loop ramp in the northwest quadrant of the interchange. The on-ramp, Ramp B, from Aviation Parkway to I-40 westbound will be realigned to make space for the proposed loop, and an auxiliary lane will be constructed connecting the westbound on-ramp, Ramp B, from Aviation Parkway to the westbound off-ramp to Airport Boulevard. The addition of a deceleration lane and dual right-turn lanes at SR 1002 (Aviation Parkway) will eliminate congestion and provide safer traffic operation for both through as well as diverging and merging traffic at the interchange. The addition and/or modification of the intersection approach lanes on SR 1002 (Aviation Parkway) between Gateway Centre Boulevard and National Guard Drive will provide increased capacity and safety for both interchange and through traffic on SR 1002 (Aviation Parkway). The existing bridge over I-40 will be replaced as part of the proposed project. The new structure will be longer and wider than the current structure. The additional length will provide sufficient room to construct a deceleration lane and storage for the new westbound off loop, and allow for the potential future construction of managed lanes on I-40. The new bridge will have three northbound lanes, three southbound lanes and a sidewalk on the east side of the bridge. The outside lanes will be 14 feet wide to accommodate bicycles. Southbound there will be two through lanes and a right-turn lane onto the on loop to I-40 eastbound. Northbound there will also be two through lanes and dual left-turn lanes onto the westbound on ramp.

A. Design Speed

The proposed design speeds for the proposed project are as follows:

I-40 westbound deceleration lane, 60 MPH

I-40 westbound loop ramp, 30 MPH
I-40 westbound on ramp, 60 MPH
SR 1002, Aviation Parkway, 50 MPH

B. Typical Section

The proposed typical sections for the project are as follows:

I-40 westbound deceleration lane, 12-foot with a 12-foot paved shoulder
I-40 westbound loop off-ramp, 16-foot tapering to 24-foot for 300 feet before terminal
I-40 westbound on-ramp, 16-foot with four-foot paved shoulder
I-40 eastbound off-ramp, 16-foot flared to 24-foot before terminal
SR 1002 (Aviation Parkway), 12-foot inside travel lanes and 14-foot outside travel lanes (to accommodate bicycles) are proposed. All turn-lanes will also be 12 feet wide.

C. Right of Way

Additional right of way will be required to construct the loop in the northwest quadrant of the interchange. The additional width will vary from 0 to 250 feet as shown on Figure 6A. Additional easements will also be needed for the widening of SR 1002 (Aviation Parkway) as shown on Figure 6A.

D. Speed Limit

I-40 eastbound and westbound currently has a posted speed limit of 65 MPH. The speed limit will not change as a result of the project.

SR 1002 (Aviation Parkway), northbound and southbound currently has a posted speed limit of 45 MPH. The speed limit is not proposed to change as a result of the project.

E. Access Control

I-40 has full control of access on the main-line and all interchange ramps. SR 1002 (Aviation Parkway) has full control of access from Gateway Centre Boulevard to National Guard Drive. The portion of SR 1002 (Aviation Parkway) south of Gateway Centre Boulevard and north of National Guard Drive has partial control of access with at grade intersection as shown of Figure 6A**.**

F. Anticipated Design Exceptions

No design exceptions are anticipated.

G. Greenway, Bicycle and Pedestrian Considerations

Wide (14 ft.) outside lanes are proposed to accommodate bicycle traffic on SR 1002 (Aviation Parkway). The existing sidewalks along the western side of SR 1002 (Aviation

Parkway) from south of Gateway Centre Boulevard to the eastbound I-40 off-ramp, and the sidewalks at the entrance to Lake Crabtree Park will be replaced as part of the proposed project. New sidewalks have been formally requested by the Town of Cary along the east side of SR 1002 (Aviation Parkway) from the eastbound I-40 on-ramp to the Town of Cary Town Limits north of RDU Center Drive to just south of National Guard Drive. The Town of Cary's formal sidewalk request is included in the Appendix. Figure 7 shows potential sidewalk locations along SR 1002 (Aviation Parkway) broken down into segments. Table 9 shows the estimated cost and funding responsibility for each of the segments. Pedestrian accommodations in the project area will be further coordinated with the Town of Cary, Wake County and GoTriangle. Additional coordination is needed for sidewalk segments #11-14 shown on Figure 7. A municipal agreement will be prepared prior to construction.

Table 9
Potential Sidewalk Locations

Segment Description	Map ID	Responsibility	Cost
West Side South of Gateway Centre Blvd.	1	NCDOT	$4255
West Side Between Gateway Centre Blvds.	2	NCDOT	$11,595
West Side North of Gateway Centre Blvd.	3	NCDOT	$13,525
East Side South of Lake Crabtree Park Ent.	4	RDU	$3,860
East Side North of Lake Crabtree Park Ent.	5	RDU	$13,140
East Side South of Ramp	6	RDU	$13,525
East Side North of Ramp & South of Bridge	7	Cary	$7,340
East Side North of Bridge	8	Cary	$8,505
East Side South of RDU Center Drive	9	Cary	$8,157
East Side North of RDU Center Drive	10	Cary	$11,637
East Side South of National Guard Drive	11	RDU	$2,900
East Side North of National Guard Drive	12	RDU	$1,545
West Side South of National Guard Drive	13	RDU	$8,505
West Side North of National Guard Drive	14	RDU	$2,130
Lake Crabtree Park Entrance	15	NCDOT	$1,160
Bridge over I-40	Bridge	NCDOT	$35,415

H. Intersections

At the intersection of SR 1002 (Aviation Parkway) with National Guard Drive, a right-turn lane will be added to the east side of Aviation Parkway to handle traffic turning on to National Guard Drive and the existing U-turn bulb will be retained to accommodate U-turns.

The RDU Center Drive intersection will remain primarily as is with minor improvements to the geometrics.

At the northern ramp terminals, the left turn from the westbound off ramp will be eliminated and replaced by a loop in the northwest quadrant of the interchange. SR 1002 (Aviation Parkway) will be widened to provide two through lanes in each direction, a double left for northbound traffic, and a separate right-turn lane for southbound traffic at the intersection.

At the southern ramp terminal, SR 1002 (Aviation Parkway) will have two through lanes and a right-turn lane in each direction.

At the northernmost intersection of Gateway Centre Boulevard, SR 1002 (Aviation Parkway) will be widened to provide two through lanes in each direction and a separate right-turn lane on to Gateway Centre Boulevard. The intersection will remain stop sign controlled with only right-in and right-out movements allowed.

At the southernmost Gateway Centre Boulevard intersection, SR 1002 (Aviation Parkway) will be widened to provide two through lanes, a separate right-turn lane and a separate left-turn lane for southbound traffic. For northbound traffic, the widening will provide a separate left-turn lane, a through lane and a through-right-turn lane.

I. Noise Barriers

Consideration for noise abatement measures was given to all impacted receptors. Following the criteria for feasibility and reasonableness as described in the 2013 NCDOT Traffic Noise Abatement Policy, noise abatement for this project was deemed not feasible or reasonable. Additional detailed study of potential mitigation measures shall not be necessary subsequent to selection of the final design of this project.

J. Bus Pullouts

GoTriangle provides regional bus service to the Triangle. GoTriangle Route 100 services the RDU airport and uses SR 1002 (Aviation Parkway). Route 100 operates every day, including weekends. There are currently no stops within the project limits.

Bus pullouts are proposed on both sides of SR 1002 (Aviation Parkway) for new bus stops. A pullout is proposed for the east side of SR 1002 (Aviation Parkway) just north of RDU Center Drive, and on the west side between RDU Center Drive and National Guard Drive (See Figure 8).

VI. ENVIRONMENTAL EFFECTS OF PROPOSED ACTION

A. Natural Environment Resources

1. Physical Resources

The study area lies in the piedmont physiographic region of North Carolina. Topography in the project vicinity is comprised of gently rolling hills with narrow, level floodplains along streams. Elevations in the study area range from 270 to 390 ft. above sea level. Land use in the project vicinity consists of forest habitat, along with commercial development along roadways.

a. Soils

The NRCS Web Soil Survey identifies nine soil types within the study area. Five of the soils are classified as hydric soils and the remaining four are non-hydric. A copy of the full technical report entitled "Natural Resources Technical Report" (NRTR) can be viewed at the Project Development and Environmental Analysis Unit, Century Center Building A, 1001 Birch Ridge Drive, Raleigh, NC.

b. Water Resources

Water resources in the study area are part of the Neuse River basin. Nine streams were identified in the study area (Table 10 below). The location of each water resource is shown in Figure 9. The physical characteristics of these streams are provided in Table 11.

Table 10

Water Resources in the Study Area

Stream Name	Map ID	NCDWR Index Number	Best Usage Classification
Unnamed Tributary (UT) to Brier Creek	SA	27-33-4	C;NSW
UT to Brier Creek	SB	27-33-4	C;NSW
UT to Brier Creek	SC	27-33-4	C;NSW
Brier Creek	Brier Creek	27-33-4	C;NSW
UT to Brier Creek	SE	27-33-4	C;NSW
UT to Brier Creek	SF	27-33-4	C;NSW
UT to Crabtree Creek (Lake Crabtree)	SG	27-33-(3.5)	B;NSW
UT to Crabtree Creek (Lake Crabtree)	SH	27-33-(3.5)	B;NSW
UT to Crabtree Creek (Lake Crabtree)	SI	27-33-(3.5)	B;NSW

Table 11

Physical Characteristics of Water Resources in the Study Area

Map ID	Bank Height (ft.)	Bankful Width (ft.)	Water Depth (in)	Channel Substrate	Velocity	Clarity
SA	0.5	2	1	Silt, Sand, Gravel	Slow	Slightly Turbid
SB	2	12	4	Sand, Gravel, Bedrock	Slow	Clear
SC	2	12	4	Silt, Sand, Gravel	Moderate	Clear
Brier Creek	5	20	12	Sand, Gravel, Cobble	Slow	Turbid
SE	1	3	2	Sand, Gravel, Cobble	Slow	Turbid
SF-Intermittent	1	3.5	4	Silt, Sand	Slow	Slightly Turbid
SF-Perennial	1	5	4	Sand, Gravel, Cobble	Slow	Slightly Turbid
SG	1	4	3	Silt, Sand, Gravel	Slow	Slightly Turbid
SH	1.5	3.5	2	Sand, Gravel, Cobble	Slow	Slightly Turbid
SI	1	3	1	Silt, Sand	Slow	Slightly Turbid

A portion of one lake, Lake Crabtree (PA), is located in the southern end of the study area. Lake Crabtree was formed by the impoundment of the confluence of Crabtree and Brier Creeks. The entire study area drains to Lake Crabtree. Approximately 0.02 acres of Lake Crabtree is located in the study area.

There are no designated anadromous fish waters or Primary Nursery Areas (PNA) present in the study area. There are no designated Outstanding Resource Waters (ORW), High Quality Waters (HQW), or water supply watersheds (WS-I or WS-II) within one mile downstream of the study area. The North Carolina 2014 Final 303(d) list of impaired waters identifies Brier Creek as an impaired water due to a PCB Fish Tissue Advisory, and Crabtree Creek (Lake Crabtree) as an impaired water due to turbidity and a PCB Fish Tissue Advisory.

Benthic samples were taken at Crabtree Creek at SR-1795 (Rich Street). It was given a rating of "Poor". Samples were taken on April 19, 1994. Fish samples were taken for PCB bioaccumulation studies at several locations within one mile of the study area. Samples were taken from Brier Creek Reservoir in May and November 2003, Lake Crabtree in November 2003, and Crabtree Creek just below Lake Crabtree in November 2004. No ratings resulted from these samples as they are not NCDWR fish community sampling events.

2. Biotic Resources

Five terrestrial communities were identified in the study area: maintained/disturbed, pine/hardwood (mid-successional), dry-mesic oak-hickory forest (piedmont subtype), piedmont alluvial forest, and lake shoreline.

Community data are presented in the context of total coverage of each type within the study area (Table 12 below).

Table 12
Coverage of Terrestrial Communities in the Study Area

Community	Coverage (ac.)
Maintained/ Disturbed	51.5
Pine/Hardwood (Mid-Successional)	39.3
Dry-Mesic Oak-Hickory Forest (Piedmont Subtype)	27.2
Piedmont Alluvial Forest	5.3
Lake Shoreline	1.3
Total	**124.6**

3. Terrestrial Wildlife, Aquatic Communities and Invasive Species

The study area is comprised of both natural and disturbed habitats that may support a diversity of wildlife and aquatic species. In addition, seven species from the NCDOT Invasive Exotic Plant List for North Carolina were found to occur in the study area. NCDOT will manage invasive plant species as appropriate. A copy of the full technical report entitled "Natural Resources Technical Report" (NRTR) can be viewed at the Project Development and Environmental Analysis Unit, Century Center Building A, 1001 Birch Ridge Drive, Raleigh, NC.

4. Jurisdictional Issues

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

The nine jurisdictional streams identified in the study area are shown on Table 13 below (Stream SF is broken into 2 segments to differentiate between the intermittent and perennial portions of the stream.). The locations of these streams are shown on Figure 9. All jurisdictional streams in the study area have been designated as warm water streams for the purposes of stream mitigation.

Table 13

Jurisdictional Characteristics of Water Resources in the Study Area

Map ID	Length (ft.)	Classification	USACE Compensatory Mitigation Required*	River Basin Buffer
SA	372	Intermittent	No	Not Subject
SB	252	Perennial	Yes	Subject
SC	240	Perennial	Yes	Subject
Brier Creek	80	Perennial	Yes	Subject
SE	131	Intermittent	Yes	Subject
SF	99	Intermittent	Yes	Subject
SF	99	Perennial	Yes	Subject
SG	137	Intermittent	Yes	Subject
SH	415	Intermittent	Yes	Subject
SI	39	Intermittent	No	Not Subject
Total	**1864**			

* Impacts to any stream equal to or exceeding 150 linear feet will require mitigation by NCDWR

Eight jurisdictional wetlands were identified within the study area (Figure 9). Wetland classification and quality rating data are presented in Table 14 below. All wetlands in the study area are within the Neuse River basin. Wetland sites WA, WD, WE, WF, and WH are included within the piedmont alluvial forest community. Sites WB and WC are included under the lake shoreline community, and site WG is included within the pine/hardwood (mid-successional) community.

Table 14

Jurisdictional Characteristics of Wetlands in the Study Area and Wetland Impacts

Map ID	NCWAM Classification	Hydrologic Classification	NCDWQ Wetland Rating	Area (ac.)	Impact (ac.)
WA	Bottomland Hardwood Forest	Riparian	45	0.23	0.032
WB	Non-Tidal Freshwater Marsh	Riparian	42	0.02	0.0
WC	Non-Tidal Freshwater Marsh	Riparian	55	0.39	0.009
WD	Bottomland Hardwood Forest	Riparian	54	<0.01	0.00
WE	Bottomland Hardwood Forest	Riparian	54	0.50	0.102
WF	Bottomland Hardwood Forest	Riparian	34	0.01	0.007
WG	Headwater Forest	Riparian	17	<0.01	0.002
WH	Basin Wetland	Non-Riparian	34	0.54	0.00
Total				**1.43**	**0.152**

b. Clean Water Act Permits

Impacts to jurisdictional surface waters are anticipated. In accordance with provisions of Section 404 of the Clean Water Act, a permit will be required from the USACE for the discharge of fill material into "Waters of the United States." A Nationwide Permit 23 will likely be applicable. Final permitting decisions rest with the USACE.

If a Section 404 permit is required, then a Water Quality General Certification (401) may be required. Section 401 Certification allows surface waters to be impacted for the duration of the construction and insures compliance with the state's water quality standards.

5. Coastal Area Management Act Areas of Environmental Concern

Wake County is not under the jurisdiction of the Coastal Area Management Act.

6. Construction Moratoria

The North Carolina Wildlife Resources Commission (NCWRC) has been contacted regarding construction moratoria. A construction moratorium is not anticipated for the proposed improvements.

7. N.C. River Basin Buffer Rules

Streamside riparian zones within the study area are protected under provisions of the Neuse River Buffer Rules administered by NCDWR. Table 13 indicates which streams are subject to buffer rule protection. Potential impacts to protected stream buffers are shown on Table 15 below.

8. Wetland, Stream and Buffer Impacts

Wetland Impacts are shown on Table 14 above. Stream impacts and Buffer impacts are shown below on Tables 15 and 16 respectively.

Table 15

Stream Impacts

Stream Name	Map ID	NCDWR Index Number	Impact (feet)
Unnamed Tributary (UT) to Brier Creek	SA	27-33-4	219
UT to Brier Creek	SB	27-33-4	32
UT to Brier Creek	SC	27-33-4	57
Brier Creek	Brier Creek	27-33-4	0
UT to Brier Creek	SE	27-33-4	0
UT to Brier Creek	SF	27-33-4	99
UT to Crabtree Creek (Lake Crabtree)	SG	27-33-(3.5)	0
UT to Crabtree Creek (Lake Crabtree)	SH	27-33-(3.5)	0
UT to Crabtree Creek (Lake Crabtree)	SI	27-33-(3.5)	0
Total			**407**

Table 16

Buffer Impacts

Stream Name	Map ID	NCDWR Index Number	Buffer Zone 1 (square feet)	Buffer Zone 2 (square feet)
Unnamed Tributary (UT) to Brier Creek	SA	27-33-4	No Zone ID' d	No Zone ID' d
UT to Brier Creek	SB	27-33-4	3662.28	2982.28
UT to Brier Creek	SC	27-33-4	4447.44	3507.17
Brier Creek	Brier Creek	27-33-4	No Impact	No Impact
UT to Brier Creek	SE	27-33-4	No Zone ID' d	No Zone ID' d
UT to Brier Creek	SF	27-33-4	No Zone ID' d	No Zone ID' d
UT to Crabtree Creek (Lake Crabtree)	SG	27-33-(3.5)	No Zone ID' d	No Zone ID' d
UT to Crabtree Creek (Lake Crabtree)	SH	27-33-(3.5)	No Zone ID' d	No Zone ID' d
UT to Crabtree Creek (Lake Crabtree)	SI	27-33-(3.5)	No Zone ID' d	No Zone ID' d
Total			**8109.72**	**6489.45**
Total (Ac)			**0.186**	**0.149**

9. Avoidance, Minimization and Mitigation

Brier Creek is subject to the Neuse River Basin Buffer Rules. Therefore, Design Standards in Sensitive Watersheds will be implemented during project construction.

Approximately 0.152 acres of wetlands and 407 linear feet of streams may be impacted by the proposed improvements. Final decisions regarding wetland and stream mitigation requirements will be made by the USACE and NCDEQ-Division of Water Resources.

The NCDOT will investigate potential on-site stream and wetland mitigation. If on-site mitigation is not feasible, mitigation (if required) will be provided by North Carolina Department of Environment Quality, Division of Mitigation Services (DMS).

10. Endangered Species Act Protected Species

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered, and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act (ESA) of 1973, as amended. As of April 2, 2015, the United States Fish and Wildlife (USFWS) list four federally protected species for Wake County (Table 17 below). A brief description of each species' habitat requirements follows, along with the Biological Conclusion rendered based on survey results in the study area.

Table 17

Federally Protected Species Listed for Wake County

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Myotis septentrionalis	Northern long-eared bat	T	Yes	MALAA
Picoides borealis	Red-cockaded woodpecker	E	Yes	No Effect
Alasmadonta heterodon	Dwarf wedgemussel	E	Yes	No Effect
Rhus michauxii	Michaux's sumac	E	Yes	No Effect

E - Endangered T - Threatened

MALAA – May Affect, Likely to Adversely Affect

Northern long-eared bat **Threatened**

USFWS optimal survey window: June 1 – August 15

Habitat Description: In North Carolina, the Northern long-eared bat (NLEB) occurs in the mountains, with scattered records in the Piedmont and coastal plain. During the summer, NLEB roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat has also been found, rarely, roosting in structures like barns and sheds, under eaves of buildings, behind window shutters, in bridges, and in bat houses. Foraging occurs on forested hillsides and ridges, and occasionally over forest clearings, over water, and along tree-lined corridors. Mature forests may be an important habitat type for foraging.

Biological Conclusion: **May Affect, Likely to Adversely Affect**

The USFWS has developed a programmatic biological opinion (PBO) in conjunction with the Federal Highway Administration (FHWA), USACE, and NCDOT for the northern long-eared bat (NLEB) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, which includes Wake County. The programmatic determination for NLEB for the NCDOT program is "May Affect, Likely to Adversely Affect". The PBO provides incidental take coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Wake County , where TIP I- 5506 is located.

Red-cockaded woodpecker **Endangered**

USFWS optimal survey window: year round; November-early March (optimal)

Habitat Description: The red-cockaded woodpecker (RCW) typically occupies open, mature stands of southern pines, particularly longleaf pine, for foraging and nesting/roosting habitat. The RCW excavates cavities for nesting and roosting in living pine trees, aged 60 years or older, and which are contiguous with pine stands at least 30 years of age to provide foraging habitat. The foraging range of the RCW is normally no more than 0.5 miles.

Biological Conclusion: **No Effect**

Suitable foraging (Pine/Hardwood Mid-Successional) habitat for the red-cockaded woodpecker was found within the study area. Upon establishment of

suitable habitat within the study area, historical aerial imagery was used to identify potential suitable nesting habitat within 0.5 mile of the identified foraging habitat. All potential nesting habitat was field assessed to determine suitability, including tree age and stand composition. Potential nesting habitat is present within 0.5 mile of the study area foraging habitat. Field surveys were conducted in all identified potential nesting habitat on October 8, 2014. No red-cockaded woodpeckers or nesting trees were found. A review of North Carolina Natural Heritage Program (NCNHP) data, updated October 2014, indicates no known RCW occurrence within 1.0 mile of the study area.

Dwarf wedgemussel **Endangered**

USFWS optimal survey window: year round

Habitat Description: In North Carolina, the dwarf wedgemussel is known from the Neuse and Tar River drainages. The mussel inhabits creek and river areas with a slow to moderate current and sand, gravel, or firm silt bottoms. Water in these areas must be well oxygenated. Stream banks in these areas are generally stable with extensive root systems holding soils in place.

Biological Conclusion: **No Effect**

A habitat assessment was conducted on August 4, 2015 by NCDOT biologists. Brier Creek, two unnamed tributaries to Brier Creek and an unnamed tributary to Crabtree Creek were assessed. Due to the lack of appropriate substrate for dwarf wedgemussel, the fact that this project is in an urban setting which contributes to more runoff from impervious surfaces, that there is a 303d stream and a NPDES facility near the project, that no dwarf wedgemussels were found during the survey, and that there are no known occurrences of dwarf wedgemussel in these streams, this project will have no effect on this species.

Michaux's sumac **Endangered**

USFWS optimal survey window: May-October

Habitat Description: Michaux's sumac, endemic to the inner Coastal Plain and lower Piedmont. The species is found on maintained railroad, roadside, power line, and utility rights of way; areas where forest canopies have been opened up by blowdowns and/or storm damage; small wildlife food plots; abandoned

building sites; under sparse to moderately dense pine or pine/hardwood canopies; and in and along edges of other artificially maintained clearings undergoing natural succession. In the central Piedmont, it occurs on clayey soils derived from mafic rocks.

Biological Conclusion: **No Effect**

Suitable habitat for Michaux's sumac is present in the study area along roadside shoulders and utility right of ways. Surveys of potential habitat were conducted September 30, 2014. No individuals of Michaux's sumac were observed. A known reference population was visited the same day surveys were conducted. A review of NCNHP records, updated October 2014, indicates no known occurrences within 1.0 mile of the study area.

11. Bald Eagle 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 one 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 September 29, 2014 using 2013 color aerials. Water bodies large enough or sufficiently open to be considered potential feeding sources were identified. Suitable habitat for the bald eagle exists in the study area, as it is within one mile of suitable foraging habitat (Lake Crabtree). Additionally, a review of the NCNHP records, updated October 2014, indicated one bald eagle occurrence (EO 2624) within 1.0 mile of the study area. This occurrence is located 500 feet west of the study area near Lake Crabtree. The nest was last observed being actively used in 2009. There was a failed nesting attempt noted in the 2011 survey. On October 8, 2014, a survey of the area within 660 feet of the project limits was conducted. No nests were identified, and no bald eagles were sighted. The EO 2624 location and surrounding area were thoroughly searched. However, no signs of the nest were found. In addition to the survey, a staff member at Lake Crabtree County Park was contacted on October 22, 2014. The staff member stated that bald eagles, including adults and juveniles, are observed at Lake Crabtree throughout the year but are most frequently seen in winter and spring. The park staff conducts annual surveys and no nesting bald eagles have been observed at the park since the failed nesting attempt in 2011.

12. Endangered Species Act Candidate Species

As of April 2, 2015, the USFWS website lists no Candidate species for Wake County.

13. Hazardous Materials Sites

One (1) petroleum site was observed during the field reconnaissance on January 14, 2014 and a regulatory agencies' records search. This active gas station is located on the northeast quadrant of SR 1002 (Aviation Parkway) and National Guard Drive intersection. According to the UST Section Registry there are five (5) tanks currently in use. There is no ground water incident associated with this location. This site is anticipated to present low geoenvironmental impacts to the project. Please note that discovery of additional sites not recorded by regulatory agencies and not reasonably discernable during the project reconnaissance may occur. The Geotechnical Engineering Unit should be notified immediately after discovery of such sites so their potential impact(s) may be assessed.

No hazardous waste sites, landfills or other geoenvironmental concerns were identified within the project limits.

14. Flood Hazard Evaluation

Executive Order 11988, Floodplains Management, requires efforts to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains. It also requires efforts to avoid direct or indirect support of floodplain development wherever there is a practicable alternative, and prohibits floodplain encroachments which are uneconomic hazardous, or result in incomplete uses of the floodplain: as well as any action which would cause a critical interruption of an emergency transportation facility, a substantial flood risk, or adverse impact on the floodplain's natural resource values. Information on the floodplains within the study area was obtained from the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM).

Based on a review of the FIRM mapping available for Wake County (FIRMs 3720075600J and 3720076600J) there are floodplains present in the vicinity of the project. The 100 year floodplain of Brier Creek is on both side of I-40 in the vicinity of the Airport Boulevard Interchange and it crosses SR 1002 (Aviation Parkway) south of the project limits. The proposed project will not impact either of these areas.

Drainage structures will be designed to safely transport any flood flows and flood elevations will not exceed FEMA standards.

B. Section 4(f) Resources and Section 6(f) Resources

Section 4(f) Resources - Section 4(f) of the US Department of Transportation Act of 1966 (49 USC Section 303 and 23 CFR Part 774), states in part the FHWA "may not approve the use of land from a significant publicly-owned park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that: (i) There is no feasible and prudent alternative to the use of land from the property; and (ii) The action includes all possible planning to minimize harm to the property resulting from such use."

Lake Crabtree Park is operated by Wake County on land leased from the Raleigh-Durham Airport Authority. In order to reconstruct the entrance to the park, 0.203 acres of right-of way will be required from the park and an additional 0.161 acres of easements will be needed to contain the fill slope along SR 1002 (Aviation Parkway) south of the entrance.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) amendments to the Section 4(f) requirements allows the US Department of Transportation to determine that certain uses of Section 4(f) land will have no adverse effect on the protected resource. When this is the case, and the responsible official(s) with jurisdiction over the resource agrees in writing, compliance with Section 4(f) is greatly simplified, and a Section 4(f) of feasible and prudent alternative analysis is not required under the SAFTEA-LU amendment. FHWA intends to use Wake County's call of "No Adverse Effect" as the basis of a "de minimis" finding (23CFR 774.3(b)) for Lake Crabtree Park, pursuant to Section 4(f). Coordination is completed with Wake County, and their signed concurrence form is included in the Appendix. A public notice was run in the local newspaper to obtain comments from the public on the impacts to the park, but no comments were received.

No other publicly owned parks or recreational facilities, wildlife or waterfowl refuges, or historic sites of national, state, or local significance will be impacted as a result of the proposed project. 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.

Section 6(f) Resources - The Land and Water Conservation Fund Act of 1965 established funding to provide matching grant assistance to states and local governments for the planning, acquisition, and development of outdoor public recreation sites and facilities. Section 6(f) of the Act prohibits the conversion of property acquired or developed with

these grants to a non-recreational purpose without the approval of the Department of the Interior's National Park Service (NPS). Section 6(f) also requires that any applicable land converted to non-recreational uses be replaced with land of equal or greater value, location, and usefulness.

The proposed project will not require right-of-way acquisition or easement from any land protected under the Land and Water Conservation Fund Act of 1965.

C. Human Environment Resources

1. Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) of 1966 applies to this federally funded undertaking. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties (including archaeological sites).

a. Historic Architectural Resources

A review of the project by a NCDOT Architectural Historian did not identify any historic properties that meet the criteria for eligibility for inclusion in the National Register within the Area of Potential Effects (APE). The APE is mostly undeveloped with some late twentieth and early twenty-first century industrial and commercial resources. Please see the summary of findings on the "Historic Architecture and Landscapes No Survey Required Form" in the Appendix.

b. Archaeological Resources

A preliminary review of the project by NCDOT Archaeologists determined that a field survey was needed. The field survey was conducted from February through April 2015. While 15 newly identified archaeological sites were documented and registered with the Office of State Archaeology, no archaeological resources considered eligible for the National Register of Historic Places were found. A summary of findings on the "No National Register of Historic Places Eligible or Listed Archaeological Sites Present or Affected Form" for archaeological resources is included in the Appendix.

2. Land Use

There are two office parks within the Direct Community Impact Area (DCIA), one of which contains a hotel. The RDU Center Business Park is located approximately 600 feet to the north of the project and includes several office buildings and a Hilton

Garden Inn. To the south of the project is the Gateway Centre Office Park, which is comprised of several office buildings, including one that is currently under construction. Also within the DCIA is a Sheetz gas station which experiences heavy traffic.

Lake Crabtree County Park is located to the southeast of the project on land leased from the Raleigh-Durham Airport Authority. The entrance to the park is located within the DCIA.

The project is located approximately one mile south of Raleigh-Durham International Airport, referred to as RDU. RDU operates a park and ride lot (Park and Ride Lot 3) to the north east of the DCIA along National Guard Drive.

3. Environmental Justice

Census data does not indicate a notable presence of populations meeting the criteria for Environmental Justice within the DSA nor were minority or low income communities observed within the Direct Community Impact Area (DCIA) during the site visit.

No notably adverse community impacts are anticipated with this project and no Environmental Justice populations appear to be affected; thus, impacts to minority and low income populations do not appear to be disproportionately high and adverse. Benefits and burdens resulting from the project are anticipated to be equitably distributed throughout the community, and no denial of benefit is expected.

Census data does not indicate a population that meets or exceeds the US Department of Justice Limited English Proficiency (LEP) Safe Harbor threshold or a notable presence within the Demographic Study Area (DSA).

4. Local Area Plans

The Town of Cary has municipal jurisdiction over the majority of the DCIA. The Town of Cary has a Land Use Plan that guides the growth of the town. Land uses within the DCIA, which are predominantly office/industrial, office/institutional, and open space are consistent with the Land Use Plan. The Town also included a recommended greenway in the bicycle element of their Comprehensive Transportation Plan that would start at Old Reedy Creek Road to the North Carolina Bike Route Number 2 (Mountains to Sea) which at the time of the plan's publication used SR 1002 (Aviation Parkway). The connection would be made through Lake Crabtree County Park. It should be noted that since this plan was written, the North Carolina bike route designation has been shifted away from SR 1002 (Aviation Parkway).

Raleigh-Durham International Airport (RDU) is the primary land owner in the DCIA, and several of its parcels are identified in the Raleigh-Durham International Airport North Carolina Development Strategies for a World-Class Airport as future growth areas for non-airport land uses. The report identified the southeast quadrant, referred to as Parcel D, be developed as a partially restricted, high-performance development such as office or hospitality complex. This is the current location of Lake Crabtree County Park. It also identified Parcel B to be developed, but did not suggest a specific use. Parcel B is located to the northwest of the SR 1002 (Aviation Parkway) interchange. Instead, it recommended that the potential use be determined after the proposed master developer conducts an in-depth market study and analysis. See Figure 10.

5. Known Plans for Development

A parcel within the Gateway Centre Office Park is currently in the early stage of being developed as an office building. This construction is within the DCIA. Also, local planners noted that a school, which is referred to as the E-38 Elementary School, is planned along SR 1002 (Aviation Parkway), but this school is northwest of the project and outside of the DCIA.

6. Bicycle, Pedestrian and/or Greenway Facilities

There is a sign within the DCIA indicating that SR 1002 (Aviation Parkway) is part of the North Carolina bicycle system and is designated as part of the NC Bike Route 2, Mountains to Sea, as well as being part of the United States Bike Route System, designated USBR 1, Carolina Connection. However according to the NCDOT Bicycle and Pedestrian Division, the designation for these routes have been shifted away from SR 1002 (Aviation Parkway).

There are sidewalks on the west side of SR 1002 (Aviation Parkway) to the south of the interchange in the vicinity of the Gateway Centre Office Park. These are the only sidewalks within the DCIA. There are no on-street bicycle facilities in the DCIA, but there are numerous mountain bike trails on the Lake Crabtree County Park. There are also no greenway facilities in the DCIA, although there are numerous recreational hiking trails in Lake Crabtree County Park.

7. Farmland Protection Policy Act [FPPA] Soils

There are approximately 125 acres of prime farmland and farmland of statewide importance within the Project Study Area. These soils are dispersed throughout the DCIA, including in the vicinity of the project, but are not heavily concentrated in one single area. There are no farmlands of unique importance within the DCIA. A preliminary screening of farmland conversion impacts in the project area has been

completed (NRCS Form AD-1006, Part VI only) and a total score of 28 out of 160 points was calculated for the project site (see Appendix). Since the total site assessment score does not exceed the 60-point threshold established by NRCS, notable project impacts to eligible soils are not anticipated, and the form will not be submitted to NRCS.

8. Traffic Noise Analysis

Traffic noise and temporary construction noise can be a consequence of transportation projects, especially in areas in close proximity to high-volume and high-speed existing steady- state traffic noise sources. This Traffic Noise Analysis utilized computer models created with the FHWA Traffic Noise Model software (TNM 2.5), validated to field-collected traffic noise monitoring data, to predict future noise levels and define impacted receptors along the proposed new highway project.

Existing traffic noise impacts no receptors in the vicinity of the proposed SR 1002 (Aviation Parkway) and I-40 Project (TIP I-5506). For Design Year 2040 traffic volumes, the no-build and build conditions each impact 2 receptors in the vicinity of the proposed project.

Furthermore, construction noise impacts – some of them potentially extreme – may occur due to the close proximity of numerous noise-sensitive receptors to project construction activities. It is the recommendation of this traffic noise analysis that all reasonable efforts should be made to minimize exposure of noise-sensitive areas to construction noise impacts.

No traffic noise abatement measures considered in this traffic noise analysis will meet the reasonable and feasible criteria detailed in the NCDOT Traffic Noise Abatement Policy. Consequently, no traffic noise abatement measures are recommended and no noise abatement measures are proposed for incorporation into the project plan. Therefore, additional detailed study of potential mitigation measures shall not be necessary subsequent to selection of the final design of this project unless modifications to presently considered alignments occur, additional alignments are considered, or changes to Design Year 2040 traffic volumes are predicted. This analysis completes the traffic noise requirements of the Title 23 CFR Part 772 and NCDOT Traffic Noise Abatement Policy.

9. Air Quality Analysis

Introduction

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_2), 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 most recent amendments to the NAAQS contain criteria for sulfur dioxide (SO_2), particulate matter (PM_{10}, 10-micron and smaller, $PM_{2.5}$, 2.5 micron and smaller), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb). The National and North Carolina Ambient Air Quality Standards are presented in Table 2 of the full technical report.

The primary pollutants from motor vehicles are unburned hydrocarbons, NO_x, CO, and particulates. Hydrocarbons (HC) and nitrogen oxides (NO_x) can combine in a complex series of reactions catalyzed by sunlight to produce photochemical oxidants such as ozone and NO_2. 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. These pollutants are regional problems.

A project-level quantitative air quality analysis was prepared for this project. A copy of the unabridged version of the full technical report entitled *Air Quality Analysis Report SR 1002 (Aviation Parkway) and I-40 Interchange Wake County* dated January 2016 can be viewed at the Project Development & Environmental Analysis Unit, Century Center Building A, 1010 Birch Ridge Drive, Raleigh.

Carbon Monoxide Microscale Analysis

When this project began, Wake County was within a CO maintenance area. However, in September 2015, the area was redesignated as attainment. Even though it is no longer necessary, a microscale air quality analysis was performed to determine future CO concentrations resulting from the proposed highway improvements. A microscale hot-spot analysis that predicted future carbon

monoxide concentrations resulting from the proposed highway improvements indicated that no violations of the applicable NAAQS CO concentrations are anticipated. Carbon monoxide vehicle emission factors were calculated for 2040 using the MOVES2014 mobile source emissions computer model.

Mobile Source Air Toxics (MSAT)

Background

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050.

MSAT analyses are intended to capture the net change in emissions within an affected environment, defined as the transportation network affected by the project. The affected environment for MSATs may be different than the affected environment defined in the NEPA document for other environmental effects, such as noise or wetlands. Analyzing MSATs only within a geographically-defined “study area” will not capture the emissions effects of changes in traffic on roadways outside of that area, which is particularly important where the project creates an alternative route or diverts traffic from one roadway class to another. At the other extreme, analyzing a metropolitan area’s entire roadway network will result in

emissions estimates for many roadway links not affected by the project, diluting the results of the analysis.

Incomplete or Unavailable Information for Project Specific MSAT Health Impact Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health

impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (www.epa.gov/risk#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million.

In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Conclusion

Based on the qualitative analysis completed, under all DSAs (Detailed Study Alternatives) in the design year it is expected there would not be higher MSAT emissions in the project study area relative to the No-Build Alternative. In comparing the DSAs, MSAT levels could be higher in some locations than others, but current tools and science are not adequate to quantify them. However, in considering the project study area, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause area-wide MSAT levels to be significantly lower than today

Summary

Vehicles are a major contributor to decreased air quality because they emit a variety of pollutants into the air. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. New highways or the widening of existing highways increase localized levels of vehicle emissions, but these increases could be offset due to increases in speeds from reductions in congestion and because vehicle emissions will decrease in areas where traffic shifts to the new roadway. Significant progress has been made in reducing criteria pollutant emissions from motor vehicles and improving air quality, even as vehicle travel has increased rapidly.

After performing a microscale CO analysis, the proposed *TIP Project I-5506* has been found not to exceed the 1-hour or 8-hour standards for this pollutant. The project is located in Wake County, which complies with the National Ambient Air Quality Standards. This project will not add substantial new capacity or create a facility that

is likely to meaningfully increase emissions. Therefore, it is not anticipated to create any adverse effects on the air quality of this maintenance area. This evaluation completes the assessment requirements for air quality of the 1990 Clean Air Act Amendments and the NEPA process, and no additional reports are necessary.

VII. AGENCY/PUBLIC COORDINATION

A. Agency Coordination

Comments regarding the proposed project were requested from various federal, state, and local agencies and are detailed in Table 18. Comments were received at the scoping meeting held on August 20, 2014.

Table 18
Agency Coordination

	Comments Received?	
Agency	**Yes**	**No**
U.S. Army Corps of Engineers (USACE)		X
U.S. Fish and Wildlife Service (USFWS)		X
U.S. Environmental Protection Agency (EPA)	X	
N.C. Dept. of Cultural Resources (NCDCR)	X	
NCDEQ/Natural Heritage Program (NHP)		X
NCDEQ/Parks and Recreation		X
NCDEQ/Soils and Water Conservation		X
NCDEQ/Div. of Water Resources(DWR)	X	
N.C. Dept. of Public Instruction-School Planning		X
N.C. Wildlife Resources Commission (NCWRC)		X
NCDEQ/Division of Environmental Health		X
Triangle Transit Authority)	X	
RDU Airport Authority	X	
Capital Area Metropolitan Planning Organization (CAMPO)	X	

No written comment letters were received. Input from the resource agencies was received at the scoping meeting held on August 20, 2014. A copy of the minutes of this meeting is included in the Appendix.

Following the scoping meeting, NCDOT contacted U.S. Army Corps of Engineers (USACE), North Carolina Division of Water Resources (NCDWR), and the Federal Highway

Administration (FHWA) concerning the merger status of the project. All agreed that I-5506 does not need to follow the merger process.

B. Public Coordination

A public meeting was held on August 4, 2015. The project was well received and comments on the project were positive.

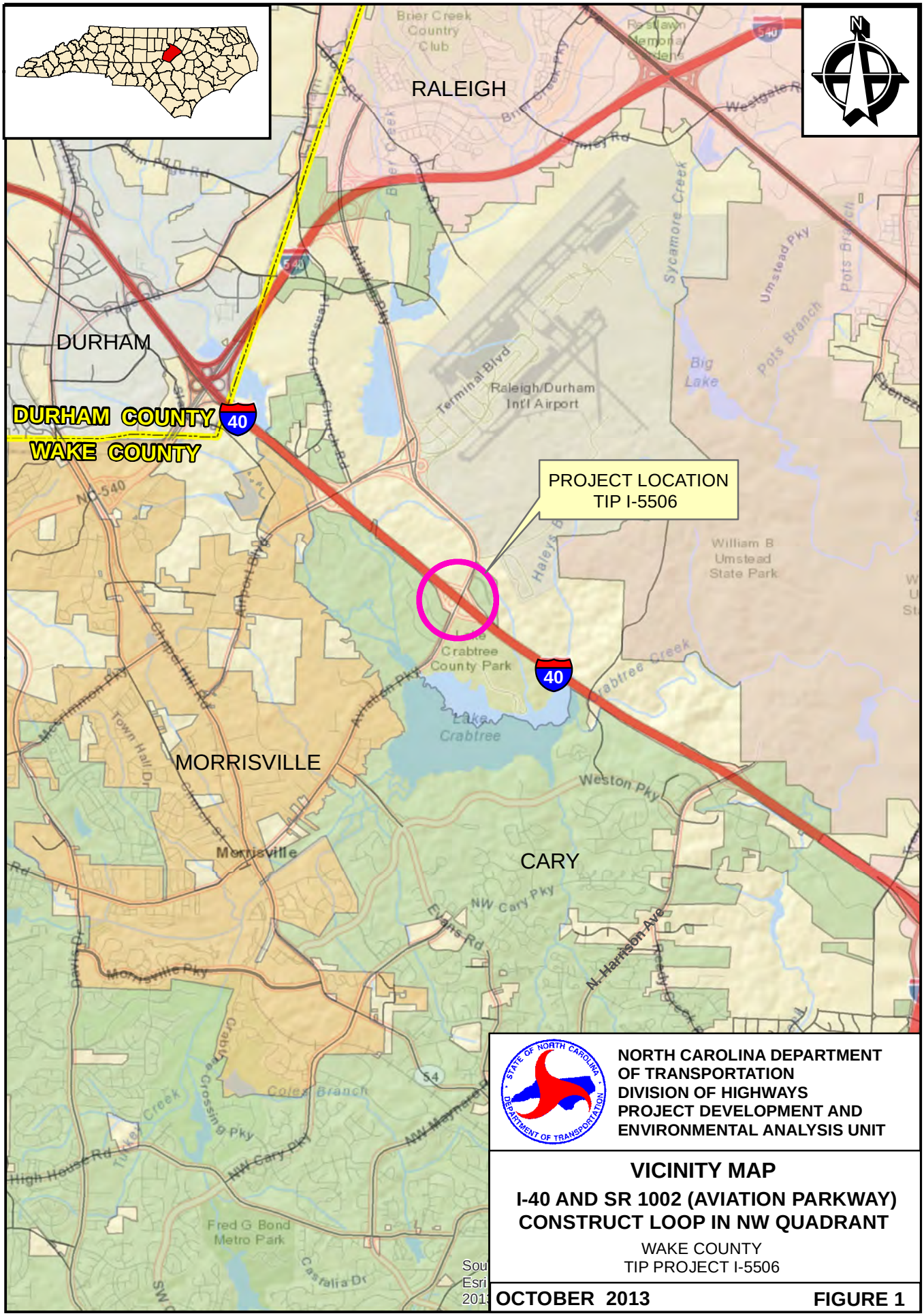
One citizen stated that he wholeheartedly supported the project and wanted the interchange at Exit 284 improved as well. Exit 284 is scheduled to be improved with STIP Project I-5700.

Another citizen recommended sculptural formwork in the concrete, LED lighting, and the use of aesthetic patterns be incorporated into the bridge design, and included picture of designs used elsewhere. A Morrisville Council Member embraced the "Gateway to Morrisville" concept and wants the bridge to be more than just a bridge. It was determined that if Town of Morrisville or Cary wanted to pursue the addition of aesthetic elements into the structure, the Towns would need to participate in the cost. Neither of the Towns expressed a desire to pursue the addition of aesthetic elements in the bridge design; however the Town of Morrisville did express a desire to have enhanced landscaping included with the project.

VIII. BASIS FOR CATEGORICAL EXCLUSION

Based on the studies performed for the proposed project, it is concluded that the project will not result in significant social, economic, or environmental impacts, and that the categorical exclusion classification, as defined in 40 CFR 1508.4 and 23 CFR 771.117, is appropriate.

FIGURES



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

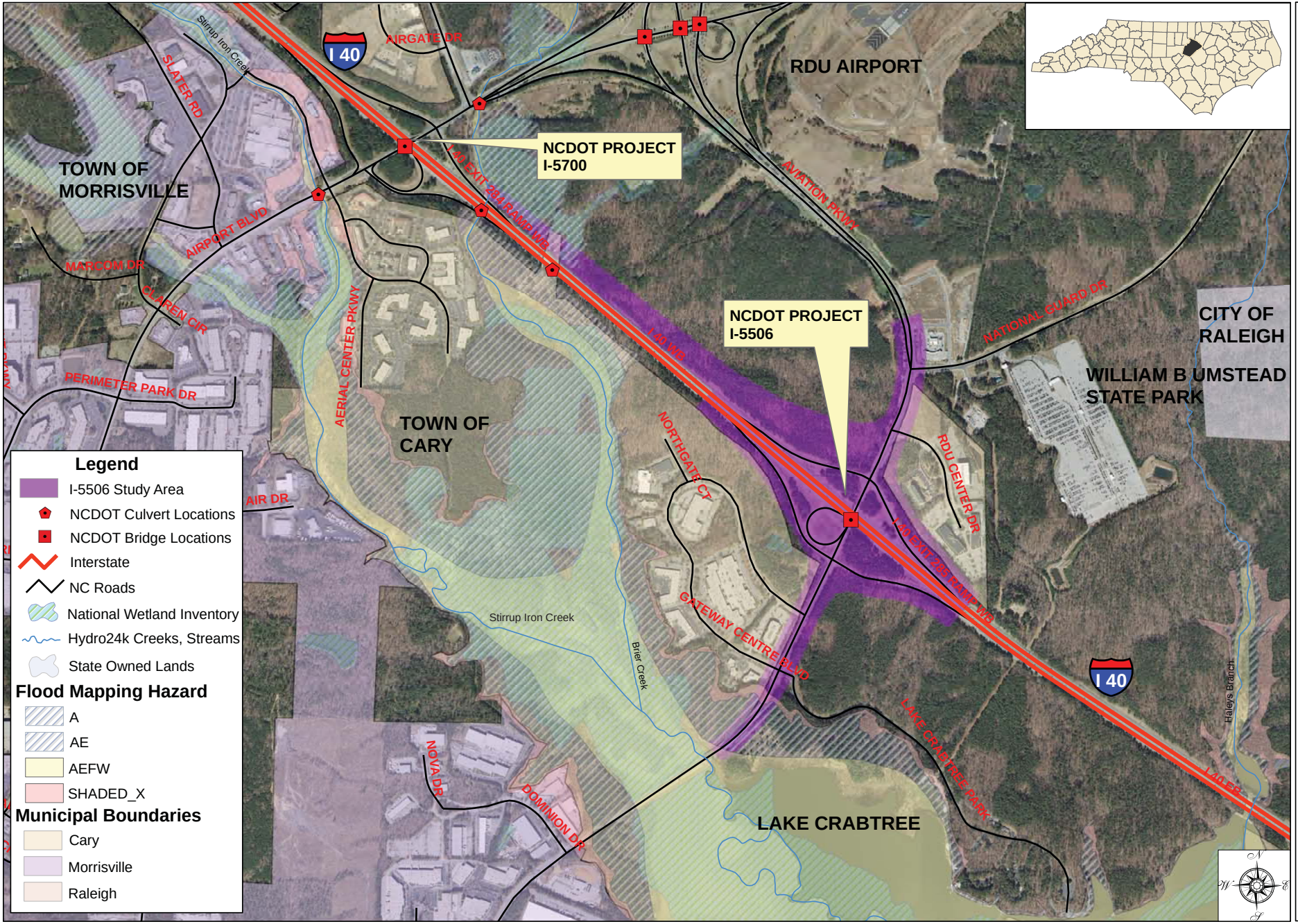
VICINITY MAP

I-40 AND SR 1002 (AVIATION PARKWAY) CONSTRUCT LOOP IN NW QUADRANT

WAKE COUNTY
TIP PROJECT I-5506

OCTOBER 2013 **FIGURE 1**

By: J.TORTORELLA



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANAYSIS UNIT

ETHERILL ENGINEERING

ENVIRONMENTAL FEATURES MAP
AVIATION PARKWAY
FROM GATEWAY CENTER BLVD.
TO NATIONAL GUARD DRIVE

WAKE COUNTY
TIP PROJECT I-5506

County: Wake

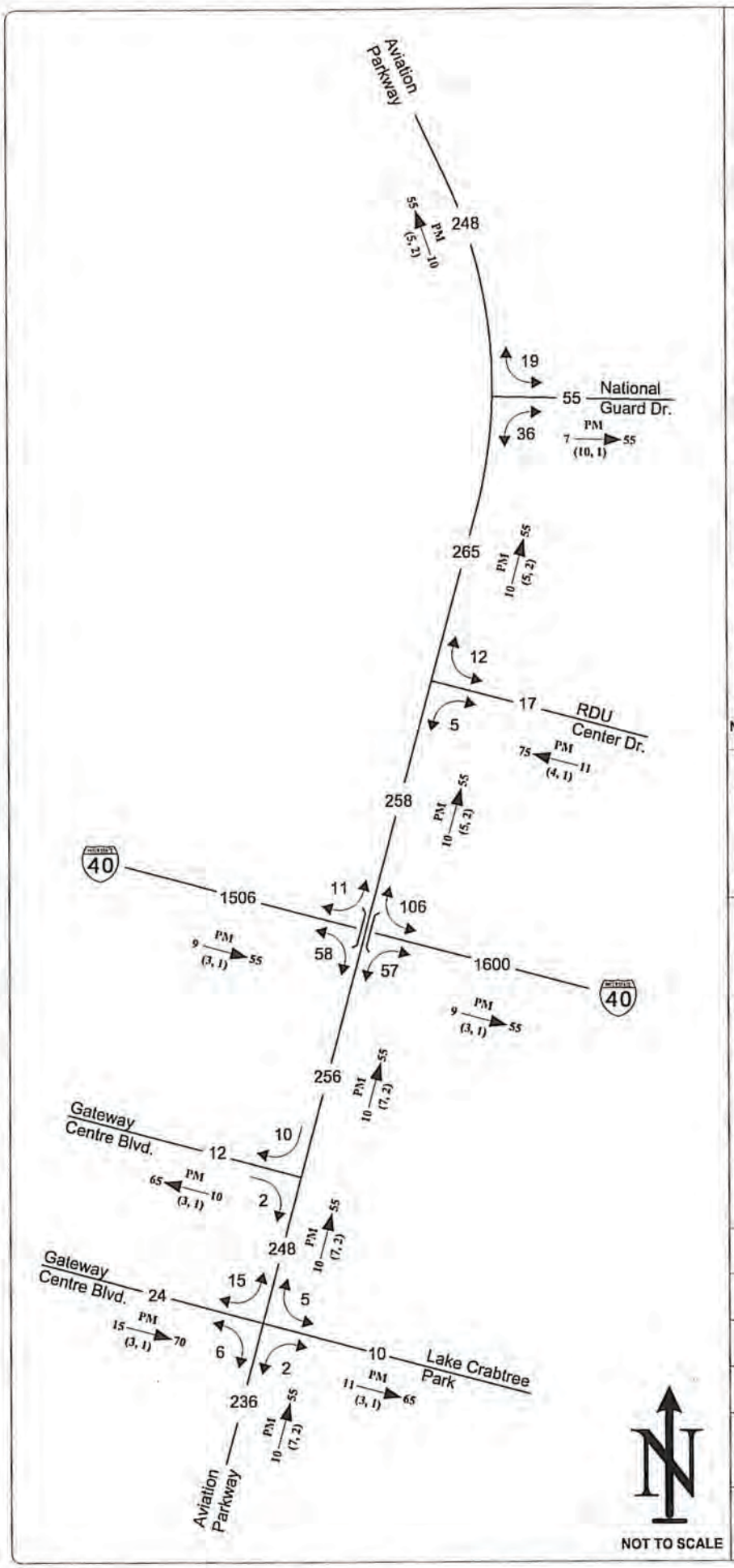
DIV: 5

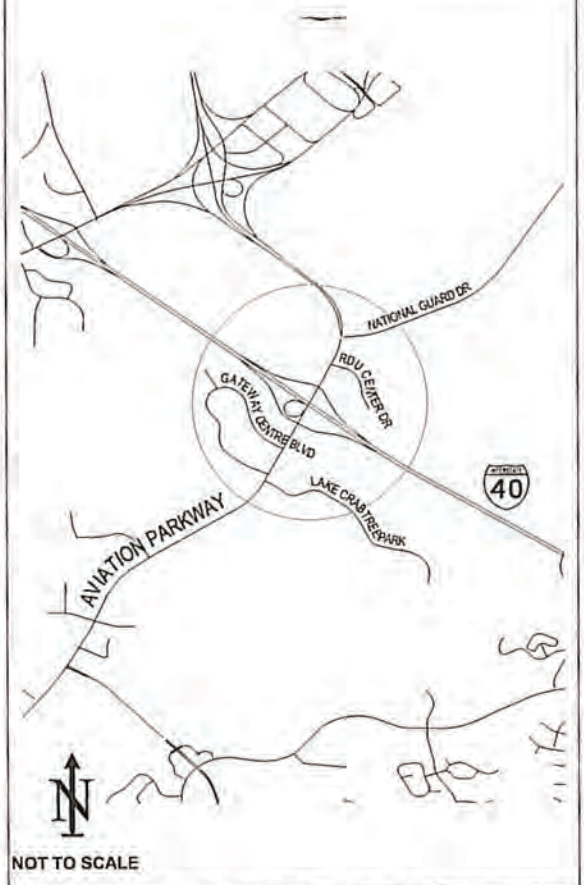
TIP# I-5506

WBS: 34178.1.3

July 2014

Figure 2





NOT TO SCALE

2013 AVERAGE ANNUAL DAILY TRAFFIC

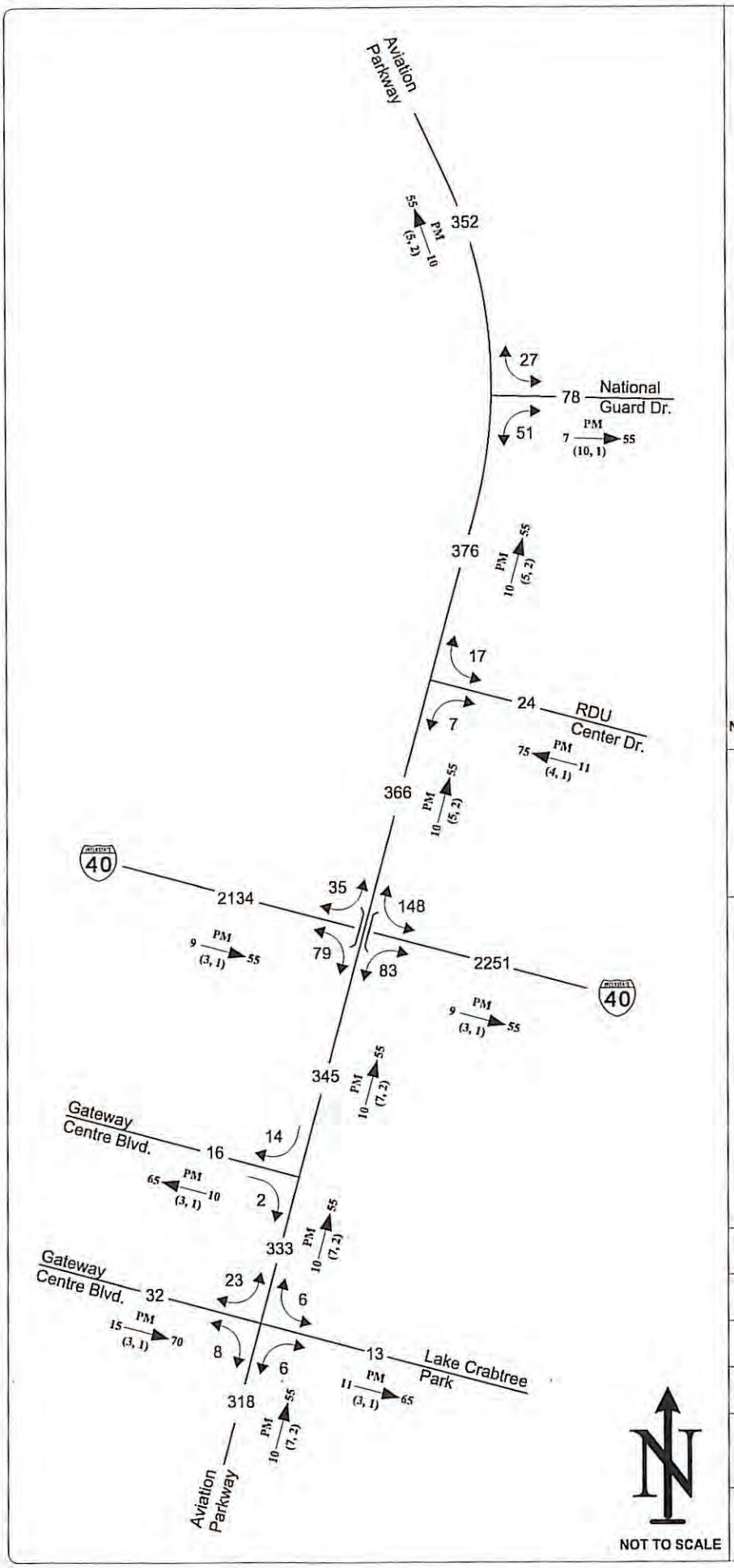
Base Year – No Build
Sheet 1-2

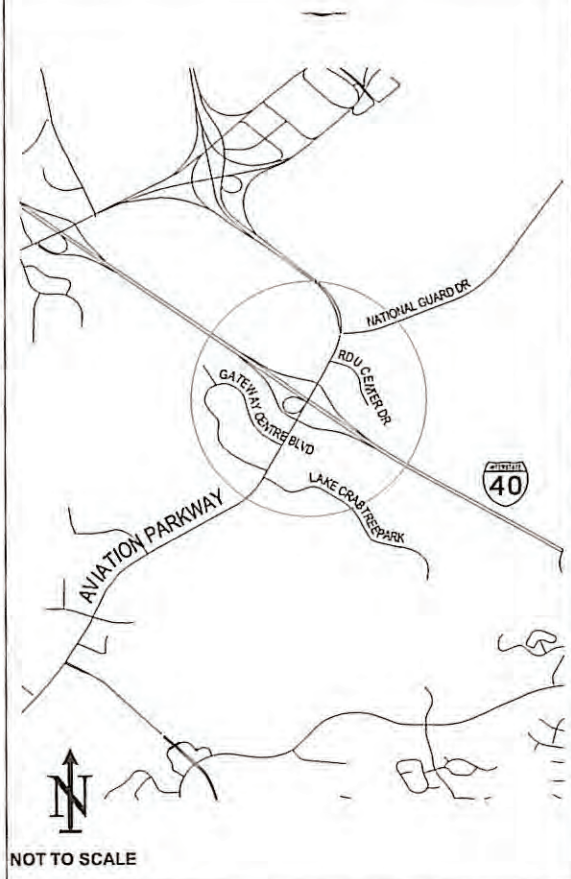
LEGEND

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

TIP: I-5506	**WBS: 43608.1.1**
COUNTY: Wake	**DIVISION: 5**
DATE: February 28, 2014	
PREPARED BY: AECOM	
LOCATION: I-40 at SR 1002 (Aviation Parkway)	
PROJECT: Intersection Improvements	

Figure 3





2040 AVERAGE ANNUAL DAILY TRAFFIC

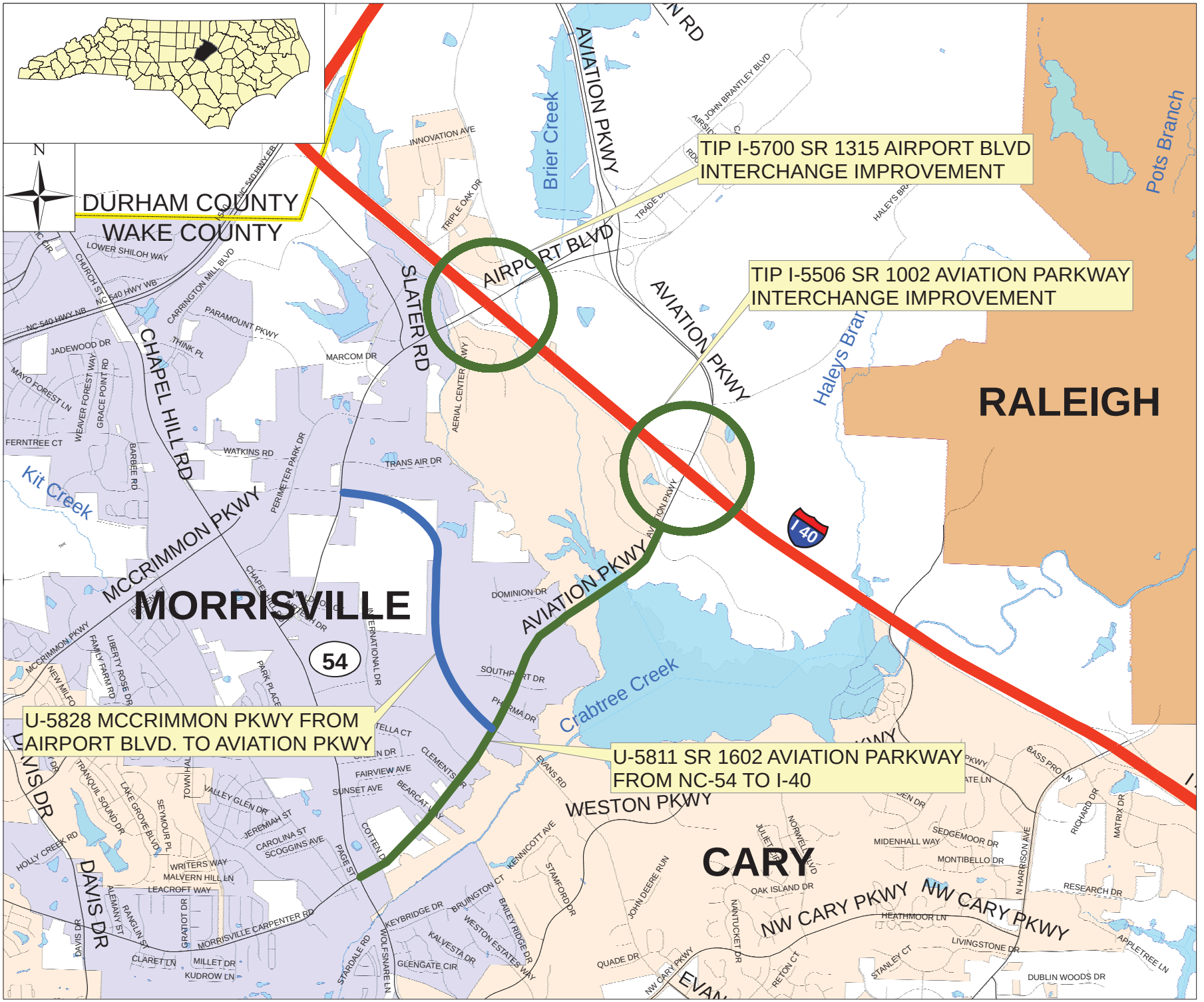
Future Year – Build
Sheet 2-2

LEGEND

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

TIP: I-5506	**WBS: 43608.1.1**
COUNTY: Wake	**DIVISION: 5**
DATE: February 28, 2014	
PREPARED BY: AECOM	
LOCATION: I-40 at SR 1002 (Aviation Parkway)	
PROJECT: Intersection Improvements	

Figure 4



NORTH CAROLINA DEPARTMENT
OF TRANSPORTATION
DIVSION OF HIGHWAYS
PROJECT DEVELOPMENT AND
ENVIRONMENTAL ANALYSIS UNIT

STP PORJECT LOCATION MAP

WAKE COUNTY
TIP PROJECT I-5506, I-5700,
U-5811, U-5828

County:
Wake

DIV: 5
TIP # I-5506, I-5700,
U-5811, U-5828

WBS:
34178.1.3

July 2014

Figure 5

ORTHOPHOTO DATA

THE 2014 AERIAL PHOTOGRAPHY IS PROVIDED BY THE NCDOT PHOTOGRAMMETRY UNIT (MISSION #M7596)

LEGEND

- BUILDINGS
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- PROPOSED EASEMENTS (DRAINAGE, CONSTRUCTION, AND UTILITY)
- EXISTING ROADWAY AND SIDEWALK
- EXISTING ROADWAY TO BE REMOVED
- EXISTING ROADWAY TO BE RESURFACED
- PROPOSED ROADWAY
- PROPOSED STRUCTURES, ISLAND, CURB AND GUTTER, AND SIDEWALK
- PROPOSED CONSTRUCTION LIMITS
- EXISTING STRUCTURES, ISLAND, CURB AND GUTTER TO BE RETAINED
- EXISTING STRUCTURES, ISLAND, CURB AND GUTTER TO BE REMOVED
- LAKES, RIVER, STREAMS AND PONDS
- EXISTING UTILITY EASEMENT
- EXISTING CONTROL OF ACCESS
- STUDY AREA BOUNDARY
- PROPERTY LINES
- WETLAND LIMITS BOUNDARY
- PROPOSED RIGHT OF WAY
- PROPOSED CONTROL OF ACCESS
- TOWN OF CARY LIMITS
- EXISTING TRAFFIC SIGNAL TO BE UPGRADED
- 0000 PRESENT ADT / 0000 FUTURE ADT

RALEIGH-DURHAM AIRPORT AUTHORITY

MATCHLINE –L– STA. 65+00.00 SEE INSET SHT. 1

MATCHLINE –Y– STA. 90+50.00 SEE SHT. 1

TOWN OF CARY LIMITS

RDU CENTER IV LLC

TDC BLUE II LLC

RDU CENTER DRIVE

IA WINSTON HOTELS MORRISVILLE LLC

WINN LTD.-PTNRP

TDC BLUE I LLC

SUN LIFE ASSURANCE CO. OF CANADA

INTERSTATE 40

TO RALEIGH

WAKE GATEWAY, LLC

CROWN-RALEIGH I, LLC

JMDH REAL ESTATE OF RALEIGH

GATEWAY CENTRE BOULEVARD

L AVIATION PARKWAY

LAKE CRABTREE COUNTY PARK

RALEIGH-DURHAM INTERNATIONAL

GATEWAY CENTRE DRIVE

PEARZ CARY, LLC

LAKE CRABTREE PARK

COUNTY OF WAKE

MATCHLINE –L– STA. 35+00.00 SEE INSET

TO 54

100' 0' 100' 200'
50'
(ENGLISH)

DESIGN DATA

FUNCTIONAL CLASSIFICATION: MINOR ARTERIAL
DESIGN SPEED: 50 MPH
MAXIMUM SUPERELEVATION: 4%

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

ANTICIPATED ADJOINING TIP PROJECT
U-5811
SR 1602 AVIATION PARKWAY FROM NC-54 TO I-40

BEGIN TIP PROJECT I-5506 -L- STA 24+30.00

DESIGN PUBLIC MEETING MAP

PROJECT 43608.1.1 (I-5506)
F. A. PROJECT NHPP=040-7(154)284
WAKE COUNTY
I-40 and SR 1002 (Aviation Parkway) Interchange

Figure 6A

SHEET 1 OF 2

100' 0' 100' 200'
50'
(ENGLISH)

DESIGN DATA
FUNCTIONAL CLASSIFICATION: MINOR ARTERIAL
DESIGN SPEED: 50 MPH
MAXIMUM SUPERELEVATION: 4%

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

RALEIGH–DURHAM INTERNATIONAL

TO RDU

–L– AVIATION PARKWAY

NATIONAL GUARD DRIVE

RALEIGH–DURHAM AIRPORT AUTHORITY

RALEIGH–DURHAM INTERNATIONAL

END TIP PROJECT I–5506 –L– STA 68+70.00

TOWN OF CARY LIMITS

RDU CENTER IV LLC

C7A

MATCHLINE –L– STA. 65+00.00 SEE SHT. 2

RALEIGH–DURHAM AIRPORT AUTHORITY

J.B. WILKINSON & MILDRED BOYD WILKINSON

RALEIGH–DURHAM AIRPORT AUTHORITY

TO DURHAM

INTERSTATE 40

45+00 50+00 55+00 60+00 65+00 70+00 75+00 80+00 85+00 90+00

TOWN OF CARY LIMITS

TOWN OF CARY LIMITS

ANTICIPATED ADJOINING TIP PROJECT
TIP I–5700 SR 1315 AIRPORT BOULEVARD INTERCHANGE IMPROVEMENT

AIRPORT BOULEVARD

COUNTY OF WAKE

AERIAL CENTER REALTY CORP.

COUNTY OF WAKE

AERIAL CENTER REALTY CORP.

WAKE GATEWAY, LLC

WAKE GATEWAY, LLC

HOSPITALITY PROPERTIES TRUST

BRE LQ PROPERTIES, LLC

MATCHLINE –L– STA. 90+50.00 SEE SHT. 2

LEGEND

- BUILDINGS
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- PROPOSED EASEMENTS (DRAINAGE, CONSTRUCTION, AND UTILITY)
- EXISTING ROADWAY AND SIDEWALK
- EXISTING ROADWAY TO BE REMOVED
- EXISTING ROADWAY TO BE RESURFACED
- PROPOSED ROADWAY
- PROPOSED STRUCTURES, ISLAND, CURB AND GUTTER, AND SIDEWALK
- PROPOSED CONSTRUCTION LIMITS
- EXISTING STRUCTURES, ISLAND, CURB AND GUTTER TO BE RETAINED
- EXISTING STRUCTURES, ISLAND, CURB AND GUTTER TO BE REMOVED
- LAKES, RIVER, STREAMS AND PONDS
- EXISTING UTILITY EASEMENT
- EXISTING CONTROL OF ACCESS
- STUDY AREA BOUNDARY
- PROPERTY LINES
- EXISTING TRAFFIC SIGNAL TO BE UPGRADED
- 0000 / 0000 PRESENT ADT / FUTURE ADT
- WLB WETLAND LIMITS BOUNDARY
- PROPOSED RIGHT OF WAY
- PROPOSED CONTROL OF ACCESS
- TOWN OF CARY LIMITS

FULL CONTROL OF ACCESS
FULL CONTROL OF ACCESS IS DEFINED AS A CONNECTION TO A FACILITY PROVIDED ONLY VIA RAMPS AT INTERCHANGES. ALL CROSS–STREETS ARE GRADE SEPARATED. NO PRIVATE DRIVEWAY CONNECTIONS ALLOWED.

PARTIAL CONTROL OF ACCESS
PARTIAL CONTROL OF ACCESS IS DEFINED AS AREAS OUTSIDE THE FULLY CONTROLLED ACCESS AS DENOTED ON THIS DESIGN PUBLIC MEETING MAP. ANY ACCESS POINTS WILL BE REVIEWED BY THE TOWN OF CARY AND NCDOT.

DESIGN PUBLIC MEETING MAP
PROJECT 43608.1.1 (I–5506)
F. A. PROJECT NHPP=040–7(154)284
WAKE COUNTY
I–40 and SR 1002 (Aviation Parkway) Interchange
SHEET 2 OF 2

Figure 6B

I–5506
Figure 7

PROJECT: 43608.1.1
F. A. PROJECT: NHPP–040–7(154)284

WAKE COUNTY

I–40 and SR 1002 (Aviation Parkway) Interchange
FERUARY 22, 2016
ROLL 1 OF 1

100' 0' 100' 200'
50'
(ENGLISH)

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83/
NSRS 2007

TO DURHAM

I–40

GATEWAY CENTRE BOULEVARD

GATEWAY CENTRE BOULEVARD

L– AVIATION PARKWAY

L– AVIATION PARKWAY

L– AVIATION PARKWAY

B

C

A

D

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

LAKE CRABTREE PARK

RDU CENTER DRIVE

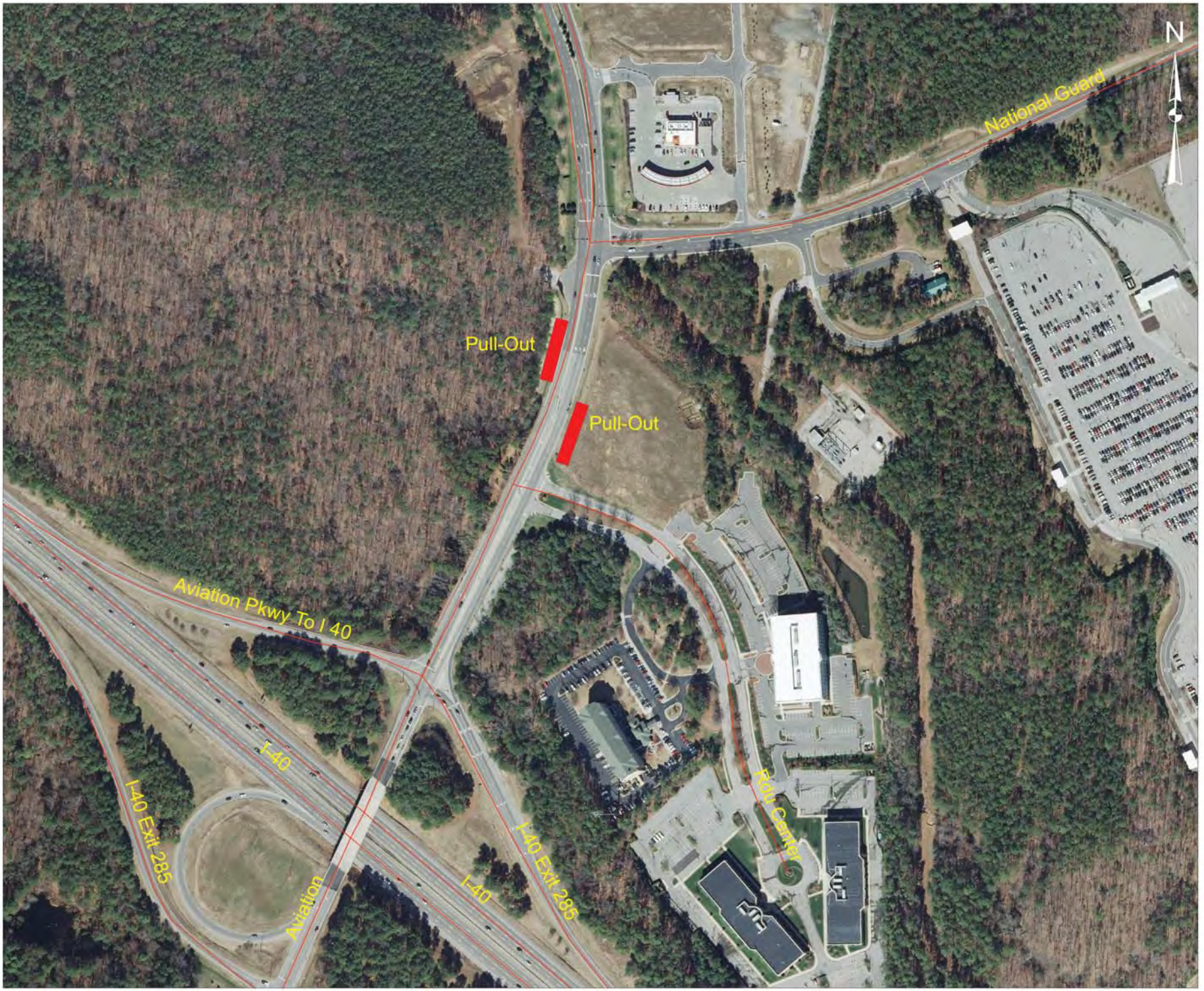
NATIONAL GUARD DRIVE

I–40

TO RALEIGH

PROPOSED SIDEWALK COSTS

LOCATION	AREA (SY)	COST
1–NCDOT	110	$3,720.00
2–NCDOT	300	$10,150.00
3–NCDOT	350	$11,830.00
4	100	$3,380.00
5	340	$11,500.00
6	350	$11,830.00
7	190	$6,420.00
8	220	$7,440.00
9	211	$7,130.00
10	301	$10,180.00
11	75	$2,540.00
12	40	$1,350.00
13	220	$7,480.00
14	55	$1,860.00
15–NCDOT	30	$1,050.00
BRIDGE–NCDOT	N/A	$230,000.00



Bus Pull-Outs

TIP I-5506

I-40 and SR-1002 Interchange Modification

Wake County, NC

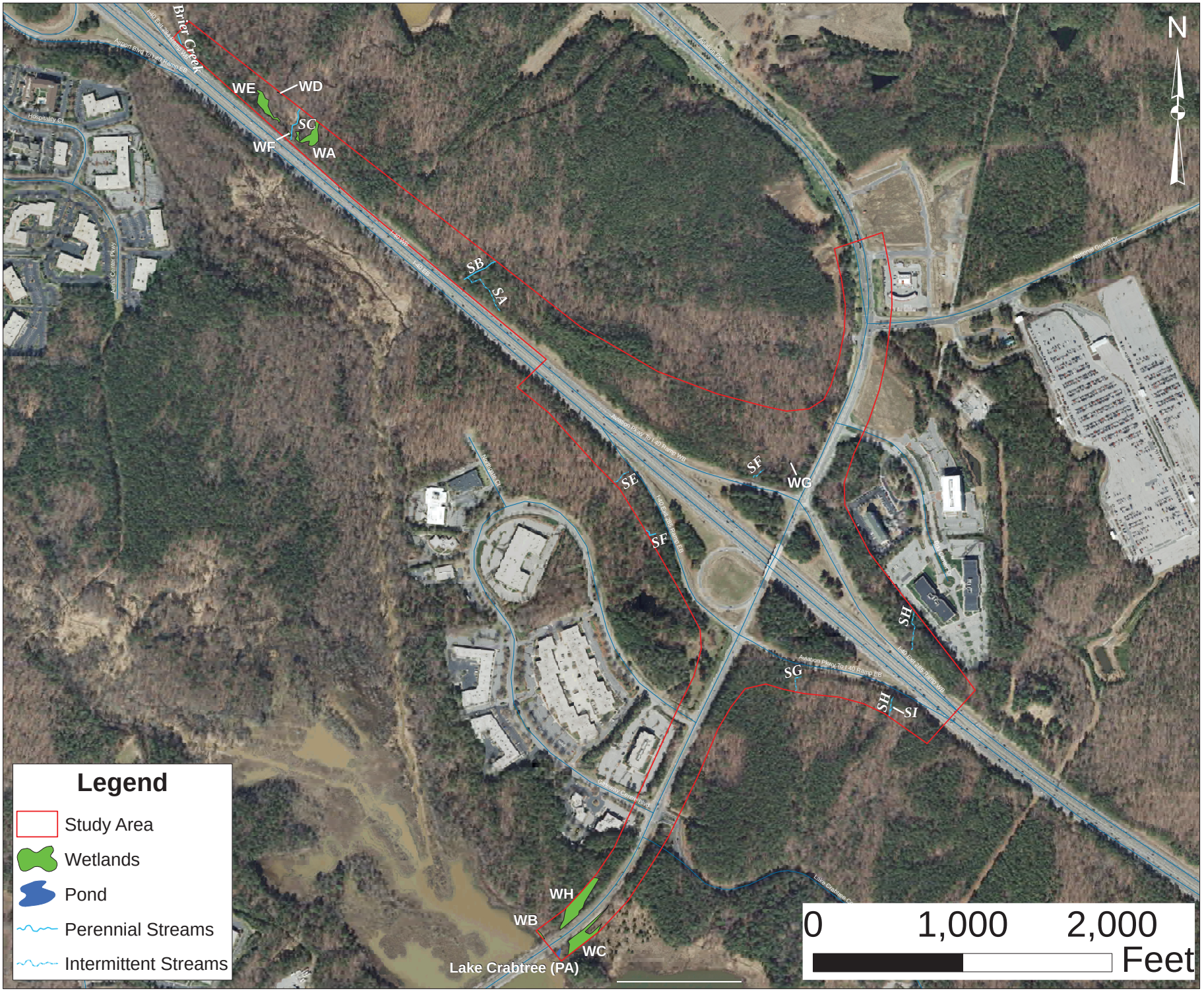
County: Wake

DIV: 5
TIP # I-5506

WBS: 34178.1.3

August 2015

Figure 8



JURISDICTIONAL FEATURES

TIP I-5506

I-40 and SR-1002 Interchange Modification

Wake County, NC

County: Wake

DIV: 5
TIP # I-5506

WBS: 34178.1.3

August 2015

Figure 9

COMMUNITY CONTEXT MAP

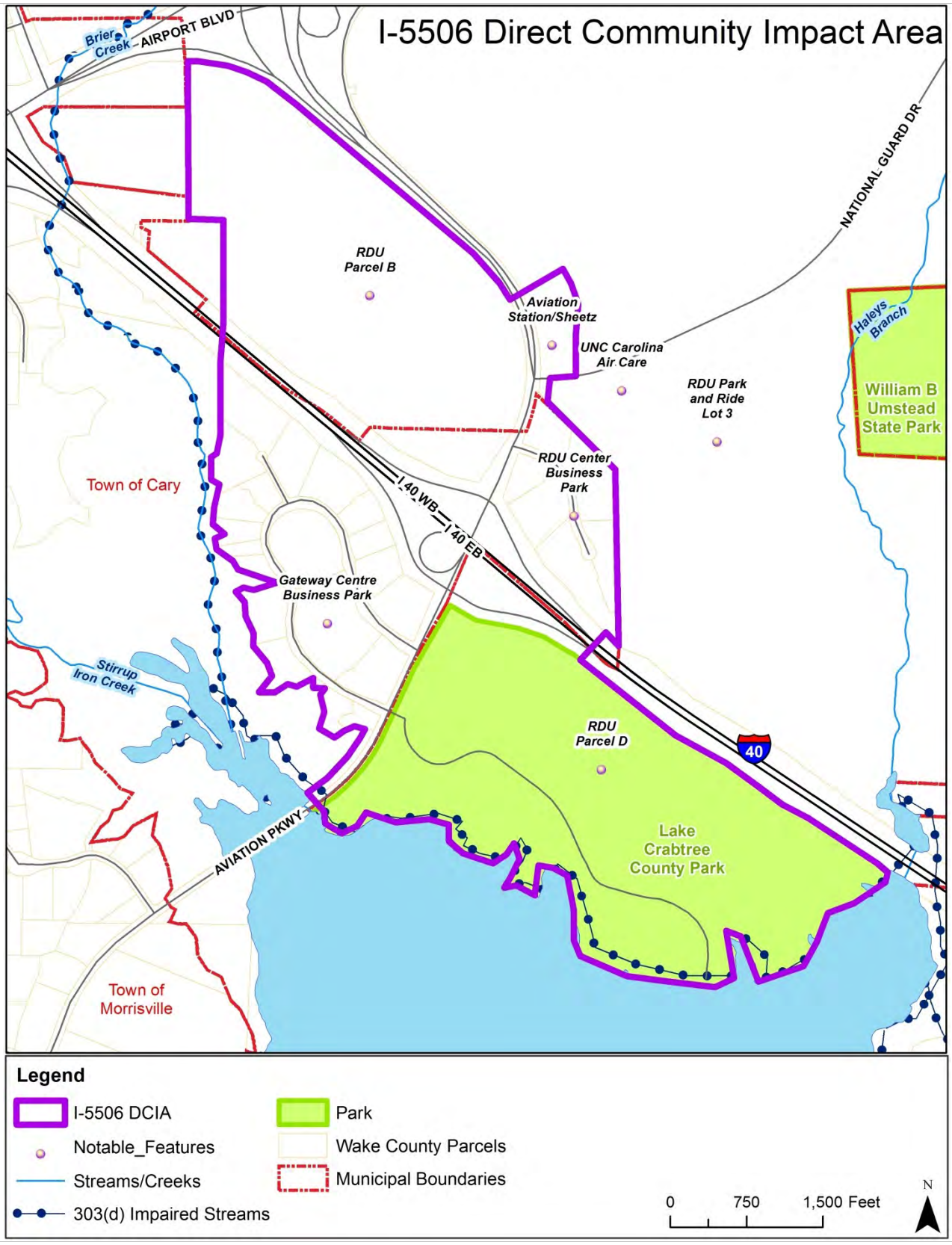


FIGURE 10

APPENDIX

WETHERILL ENGINEERING
WE Design Your Tomorrow . . .

Raleigh
Transportation
Planning
Bridge/Structural
Civil/Site
Construction Observation
Surveying

Wilmington
Surveying

September 15, 2014

Re: **I-5506, I-40 Interchange with SR 1002 (Aviation Parkway), Internal/External Scoping Meeting, Wake County, Federal-Aid Project NHPP-040-7(154)284, WBS No. 43608.1.1**

An internal/external scoping meeting was held on Wednesday August 20th to discuss the proposed Aviation Parkway improvements that include changes to the scope of work for the proposed project due to the updated traffic forecast, analysis and recommendations. The following people were in attendance;

Attendee	Unit
Ms. Beverly Robinson	NCDOT - PDEA
Mr. Eugene Tarascio	NCDOT - PDEA
Mr. Eric Midkiff	NCDOT - PDEA
Mr. Drew Joyner	NCDOT - HES
Mr. Mike Stanley	NCDOT - STIP
Mr. Derek Bradner	NCDOT - Location and Surveys
Mr. Rob Allen	NCDOT - Photogrammetry
Mr. Rupal Desai	NCDOT - TPB
Mr. Kyle Pleasant	NCDOT - Utilities Unit
Mr. Don Proper	NCDOT - Utilities Unit
Ms. Rachelle Beauregard	NCDOT - NES
Mr. Mike Steelman	NCDOT - WZTC
Mr. Allen Hayes	NCDOT - WZTC
Mr. Wally Bowman	NCDOT - Div. 5
Mr. Dennis Jernigan	NCDOT - Div. 5
Mr. Chris Murray	NCDOT - Div. 5
Ms. Anamika Laad	NCDOT - HES
Mr. Sharon Ransom	NCDOT - Program Development
Mr. Mark Staley	NCDOT - REU
Mr. Bill Elam	NCDOT - Hydraulics
Mr. Mack Bailey	NCDOT - SMU
Ms. Kristy Alford	NCDOT - SMU
Mr. Domit Ishak	NCDOT - Congestion Management
Mr. Felix Davila	FHWA
Dr. Cynthia Van Der Wiele	USEPA
Mr. Rob Ridings	NCDWR
Mr. Gary Jordan	USFWS
Mr. Travis Wilson	NCWRC
Ms. Katherine Eggleston	Triangle Transit
Mr. Renee Gledhill-Early	NCDCR – via phone
Mr. Tom Quesenberry	RDU Airport Authority – via phone
Mr. Ellis Cayton	RDU Airport Authority – via phone
Mr. Chris Lukasina	CAMPO – via phone

559 Jones Franklin Road
Suite 164
Raleigh, North Carolina 27606

Phone: 919.851.8077
Fax: 919.851.8107
wei@wetherilleng.com

Mr. Tony Houser	NCDOT – Roadway Design
Mr. Bruce Payne	NCDOT – Roadway Design
Mr. Frank Price	WEI
Ms. Anne Gamber	WEI
Mr. Bob May	WEI
Mr. Greg Purvis	WEI
Mr. Richard Davis	WEI

Mr. Tarascio opened the meeting and introduced the project. After the attendees introduced themselves, Mr. Price conducted a PowerPoint presentation showing the surrounding development, existing traffic problems, and information on the proposed project.

The project was conceived as adding a loop off-ramp from I-40 westbound to Aviation Parkway (SR 1002) southbound in the northwest quadrant of the interchange. The I-40 westbound on-ramp from SR 1002 will require relocation to allow the construction of the proposed loop ramp. Additional right of way will be required, with full control of access, to accommodate the proposed interchange Improvements. As part of the analysis, a second build alternative will be investigated that would add a loop in the northeast quadrant of the interchange modifying the interchange in the northeast quadrant.

In addition to the alternative ramp designs, the project will consider the feasibility of extending the auxiliary lane on I-40 from the westbound on-ramp to the Airport Boulevard (SR 3015) off-ramp. Other issues to be investigated as part of the project include widening or replacing the bridge along Aviation Parkway over I-40 and the potential provision of bicycle and pedestrian accommodations on the bridge.

No threatened or endangered species have been identified in the project area, however Bald Eagles have been known to nest at Lake Crabtree in the past. If a Bald Eagle nest is discovered to be within 660 feet of the proposed construction, additional coordination with the US Fish and Wildlife Service will be required.

Lake Crabtree is located in the Neuse River Basin and is on the 303(d) list of impaired waters. The lake is used for recreation and aquatic life. The Division of Water Resources recommends design standards for sensitive waters be used for the project.

If the auxiliary lane between the Aviation Parkway westbound on-ramp and the Airport Boulevard off-ramp is extended, it could impact a FEMA flood zone at the Airport Boulevard off-ramp. The amount of impact will depend on the extent of widening required for the auxiliary lane.

No impacts to historic properties are expected to occur as a result of the proposed project. There are no structures in the project study area that are eligible for listing on the National Register of Historic Places. Several known archaeological sites are within a quarter mile of the project study area, but are likely outside the project study area. Reconnaissance field work (possibly including subsurface investigations), will be conducted to confirm there are no archaeological sites that will be impacted by the project.

Triangle Transit operates a bus route (Route 100) from Raleigh to the RDU Airport, utilizing I-40, the westbound off-ramp, and Aviation Parkway. They also operate Chapel Hill - Raleigh and Durham - Raleigh express busses, as well as, RTP shuttles through the project area on I-40, including bus on

shoulder operations. Triangle Transit requested consideration be given to adding bus stops on Aviation Parkway northbound at RDU Center Drive and Aviation Parkway southbound at National Guard Drive with a sidewalk connecting the two stops.

The Division 5 personnel supported the proposed improvements, but were concerned with scope creep. Division 5 had concerns additions to the project could jeopardize the construction of the loop or adversely impact the schedule.

The EPA representative indicated that noise and air quality studies would be needed and that air quality conformity determination would be required.

It was noted that the feasibility of having managed lanes from the Durham/Orange County line to the Knightdale Bypass is being studied.

The existing bridge has a 16'-4" clearance over the eastbound lanes. If the Aviation Parkway bridge is replaced with a new bridge, the clearance should be increased. If the bridge is widened it could possibly be raised to increase the vertical clearance.

The environmental document for the project will be a Categorical Exclusion (CE). Following the meeting, NCDOT contacted USACE, NCDWR, and FHWA concerning the merger status of the project. All agreed that I-5506 does not need to follow the merger process at this time.

The schedule for the project has been revised since the scoping sheets were prepared. Right of way is currently scheduled for FY 2017 with construction in FY 2018. Completion of the CE document is expected in FY 2015.

This concluded discussions and the meeting was adjourned.

A copy of the attendance sign in sheet is attached.

If you have any corrections or additions to these meeting minutes, please send them to Mr. Eugene Tarascio at gtarascio@ncdot.gov .

Cc: Meeting Attendees

NRCS FARMLAND SOILS SCREENING

PRELIMINARY SCREENING OF FARMLAND CONVERSION IMPACTS

1. **Area in non-urban use. Points awarded = 8 out of 15**
   While much of the area has been developed, there is a large undeveloped tract of forested land to the northwest of the project, and the Lake Crabtree County Park is southeast of the project.

2. **Perimeter in non-urban use. Points awarded = 8 out of 10**
   Although development has occurred in the project vicinity, there are still large areas of undeveloped land.

3. **Percent of site being farmed. Points awarded = 0 out of 20**
   There are no farms within the project area.

4. **Protection provided by state and local government. Points awarded = 0 out of 20**
   There are no farms participating in a VAD or EVAD within the DCIA.

5. **Distance from urban built-up area. Points awarded = 7 out of 15**
   The DCIA is approximately one mile from an urban built-up area.

6. **Distance to urban support services. Points awarded = 0 out of 15**
   All urban support services are available within the DCIA.

7. **Size of present farm unit compared to average. Points awarded = 0 out of 10**
   There are no farms within the DCIA.

8. **Creation of non-farmable farmland. Points awarded = 0 out of 10**
   No farmland is expected to be converted to non-farmable land as a result of the project.

9. **Availability of farm support services. Points awarded = 5 out of 5**
   All farm support services are available

10. **On-farm investments. Points awarded = 0 out of 20**
    There are no farms within the DCIA.

11. **Effects of conversion on farm support services. Points awarded = 0 out of 10**
    No significant reduction in demand for support services is anticipated as a result of the project.

12. **Compatibility with existing agricultural use. Points awarded = 0 out of 10**
    Although no farms exist in the vicinity of the project, the proposed project is compatible with agricultural uses in the region as it would improve regional mobility, including movement of produce and other farm related items.

Conclusion: Total Points = 28 out of 160

NCDOT has completed a screening of farmland in the project area and calculated the total number of points for the site per Part VI of the NRCS AD-1006 Farmland Conversion Impact Rating Form.

Project Tracking No.:

13-11-0006

NO NATIONAL REGISTER OF HISTORIC PLACES ELIGIBLE OR LISTED ARCHAEOLOGICAL SITES PRESENT OR AFFECTED FORM

This form only pertains to ARCHAEOLOGICAL RESOURCES for this project. It is not valid for Historic Architecture and Landscapes. You must consult separately with the Historic Architecture and Landscapes Group.

PROJECT INFORMATION

Project No:	**I-5506**	*County:*	**Wake**
WBS No:	**43608.1.1**	*Document:*	**CE**
F.A. No:	**NHPP-040-7(154)284**	*Funding:*	☐ State ☒ Federal

Federal Permit Required? ☐ Yes ☒ No *Permit Type:* **na**

Project Description: NCDOT intends improvements at the existing interchange of I-40 and SR 1002 (Aviation Parkway) in Wake County. Federal funding and permits are expected, therefore Section 106 applies. At the time of the Cultural Resources review, no plans had been developed for this project; however, preliminary plans are under review as of September 2015. New right-of-way (ROW) and construction easements will be necessary to complete the project. For the purposes of the archaeological review, a study area encompassing roughly 138 acres will be considered the area of potential effects (APE), much of it disturbed by highway construction and other development. This project is adjacent to I-5700, PA # 14-09-0003, which consists of improvements to the interchange of I-40 and SR 3015 (Airport Boulevard). These two federally funded undertakings have overlapping APEs, and were combined for purposes of survey, evaluation and reporting. Separate PA forms have been created for each project; this form applies only to the SR 1002 (Aviation Parkway) project.

SUMMARY OF ARCHAEOLOGICAL FINDINGS

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

☒ **There are no National Register listed ARCHAEOLOGICAL SITES within the project's area of potential effects.**
☐ No subsurface archaeological investigations are required for this project.
☐ Subsurface investigations did not reveal the presence of any archaeological resources.
☐ Subsurface investigations did not reveal the presence of any archaeological resources considered eligible for the National Register.
☒ **All identified archaeological sites located within the APE have been considered and all compliance for archaeological resources with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.**
☒ **There are no National Register Eligible or Listed ARCHAEOLOGICAL SITES present or affected by this project.** (*Attach any notes or documents as needed*)

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

As noted on the Survey Required Form (dated July 8, 2014 and previously December 11, 2013), a number of archaeological investigations have occurred in the vicinity of the current project study area, and a handful of archaeological sites have been recorded in the vicinity of the proposed interchange improvements, though outside of this project's APE. While construction of the existing highway certainly affected some of the context for bearing significant archaeological sites in certain locations, there exists a moderate potential for the presence significant sites especially in locations removed further from the developed sections of the APE. On September 25, 2014, an archaeological reconnaissance was conducted to determine the potential for archaeological resources in the proposed APE. Based on this reconnaissance, the examination of aerial photography, and previous archaeological investigations in the Briar Creek/Crabtree Creek drainage basin, it was decided that an intensive archaeological investigation of the project area would be required. Given the proximity of the current project to the proposed improvements at the intersection of I-40 and SR 3015, Airport Boulevard (TIP No. I-5700, which also required additional intensive archaeological investigation), it was decided to combine the two projects into a single archaeological study.

The combined archaeological investigations were conducted periodically from February through April 2015 by Legacy Research Associates. This form will outline the results of those investigations, with a heavy emphasis on the findings of the investigations within the I-5506 project area. The detailed results of the combined archaeological investigations are reported in a separate document to be filed with the North Carolina Office of State Archaeology. The official results of the investigations conducted within the I-5700 study area will be outlined in a separate No National Register of Historic Places Eligible or Listed Archaeological Sites Present or Affected form (PA No. 14-09-0003).

As noted above, and in the preliminary investigations of the project area, commercial development following the opening of I-40 in late 1971, as well as the highway construction itself, dominate much of the landscape evolution in the project area. Raleigh-Durham Airport, the largest development in the vicinity, grew out of a set of three military training airstrips built in the area during WWII. Prior to the coming of the airport and I-40, land-use was dominated by single-crop agriculture and widespread clearing of vegetation. As a result, soil deflation and erosion have been severe problems in this portion of the Piedmont. The implications for general site preservation in the area were not overly promising, but it was still hoped that an examination of the remaining cultural resources in the project area might garner a greater understanding of the evolution of the landscape over a long time scale, as well as a much more detailed criteria for assessing local archaeological resources.

In 1978, an archaeological survey conducted on behalf of the Raleigh-Durham Airport Authority (Hall and Littleton 1978) identified 33 archaeological sites, three of which are situated in the vicinity of the I-5506 project area (sites 31Wa125, 31Wa126, and 31Wa127) though outside of the APE. All three of these sites can be characterized as small prehistoric lithic scatters or artifact isolates. Site 31Wa125 yielded a possible Kirk cspp/k while 31Wa126 produced a biface fragment and only quartz debitage at 31Wa127. None of these sites was considered to be archaeologically significant.

Legacy Research Associates conducted intensive archaeological investigation in 130 acres of the combined 280 acres encompassed by the I-5506 and I-5700 project areas. These 130 acres of tested APE represent areas that were not initially excluded from the investigations due to severe disturbance from development. A total of 490 shovel test pits were excavated as part of the testing program using tests placed systematically on 20-meter intervals, judgmentally placed tests to investigate particular features or locations, and tests used to document suspected disturbances within the area subjected to testing. This combination of probabilistic and non-probabilistic testing identified 19 archaeological resources in the combined I-5506 and I-5700 project areas. Of these 19 archaeological resources, fifteen are located within the APE established for the I-5506 project (31Wa1933, 31Wa1934, 31Wa1935, 31Wa1936/1936**, 31Wa1937, 31Wa1938, 31Wa1939, 31Wa 1943, 31Wa1945, 31Wa1946, 31Wa1947, 31Wa1948, 31Wa1949/1949**, 31Wa1950**, and 31Wa1951/1951**).

For the TIP # I-5506 portion of the investigations (Aviation Parkway), these sites consist of prehistoric and historic remains, and sometimes both at the same location. Generally, the prehistoric components were noted as "lithic scatters" for the site type based on the scarcity of artifacts and lack of diagnostic tools. At site 31Wa1938 the presence of an Early Archaic chipped stone projectile point/knife base and a Middle Archaic Morrow Mountain II chipped stone projectile point/knife, the scatter was attributed to include the Early and Middle Archaic period. The historic sites include 31Wa1936/1936**, 31Wa1949/1949**, 31Wa1950**, and 31Wa1951/1951**. While these were generally categorized as "domestic" site types from early to mid 20th century farmsteads, 31Wa1936/1936** yielded a single 18th to 19th century ceramic, pearlware, as a lone isolated find.

Overall, the study conducted by Legacy Research Associates revealed a number of considerations with regards to archaeological resources along the I-40 corridor in Wake County and adjacent areas. The dominant consideration, unsurprisingly, is the high level and pace of landscape alteration that has occurred in this portion of the North Carolina Piedmont. Between clearing and agricultural activities that have caused soil erosion/deflation in the region and the more direct impacts from transportation and commercial development in the modern era, depositional contexts are frequently compromised. Prehistoric sites identified in this area have been pretty consistently characterized as small lithic scatters composed of quartz and metavolcanic debitage associated with toolkit maintenance (rather than toolkit creation or raw material processing). Diagnostic tools that occasionally appear in the assemblages generally date to the mid- and late Holocene. Sites like these may not suffer context degradation from soil deflation as badly as other types of sites, but they also tend to be poor candidates for National Register inclusion. Prehistoric sites that might break out of this pattern could suggest a degree of significance on that fact alone. Historic resources identified in the area generally tend to be characterized as domestic or agricultural sites, which are largely consistent with the picture of historic occupation for the region. An assemblage and site that might be able to adequately convey its significance might provide further detail into these lifeways, but the history of landscape evolution surrounding the airport and I-40 suggests that such well-preserved contexts would be rare.

As noted above, 19 archaeological resources were identified through the combined investigations for I-5700 and I-5506. None of the archaeological resources was considered to be eligible for the National Register of Historic Places. No further archaeological investigations are recommended for the proposed conversion of the existing interchange at I-40 and SR 1002, Aviation Parkway, to a diverging diamond interchange. The area of potential effects studied during this archaeological investigation allows for several variations in final design. Should the project change further investigation may be necessary. The project as described should be considered to be compliant with Section 106 and NCGS121-12a.

References:

Hall, W.K. and T. R. Littleton

1978 *Cultural Resources Survey of the Raleigh-Durham Airport Area.* Prepared for Raleigh-Durham Airport Authority by Coastal One Resources Division, Ocean Data Systems, Inc., Wilmington, North Carolina.

Legacy Research Associates

2015 *Archaeological Survey and Evaluation for Two Intersection Improvements, I-40 at SR 1002 (Aviation Parkway) – TIP I-5506 (WBS No. 43608.1.1) PA Tracking No. 13-11-0006, Federal Aid Number NHPP-040-7(152)284; I-40 at SR 3015 (Airport Boulevard) – TIP I-5700 (WBS No. 50118.1.FS1) PA Tracking No. 14-09-0003, Federal Aid NumberNHPP-040-1(259)286; Wake County, North Carolina.* MS. On file, North Carolina Department of Transportation, Archaeology Group, Raleigh.

SUPPORT DOCUMENTATION

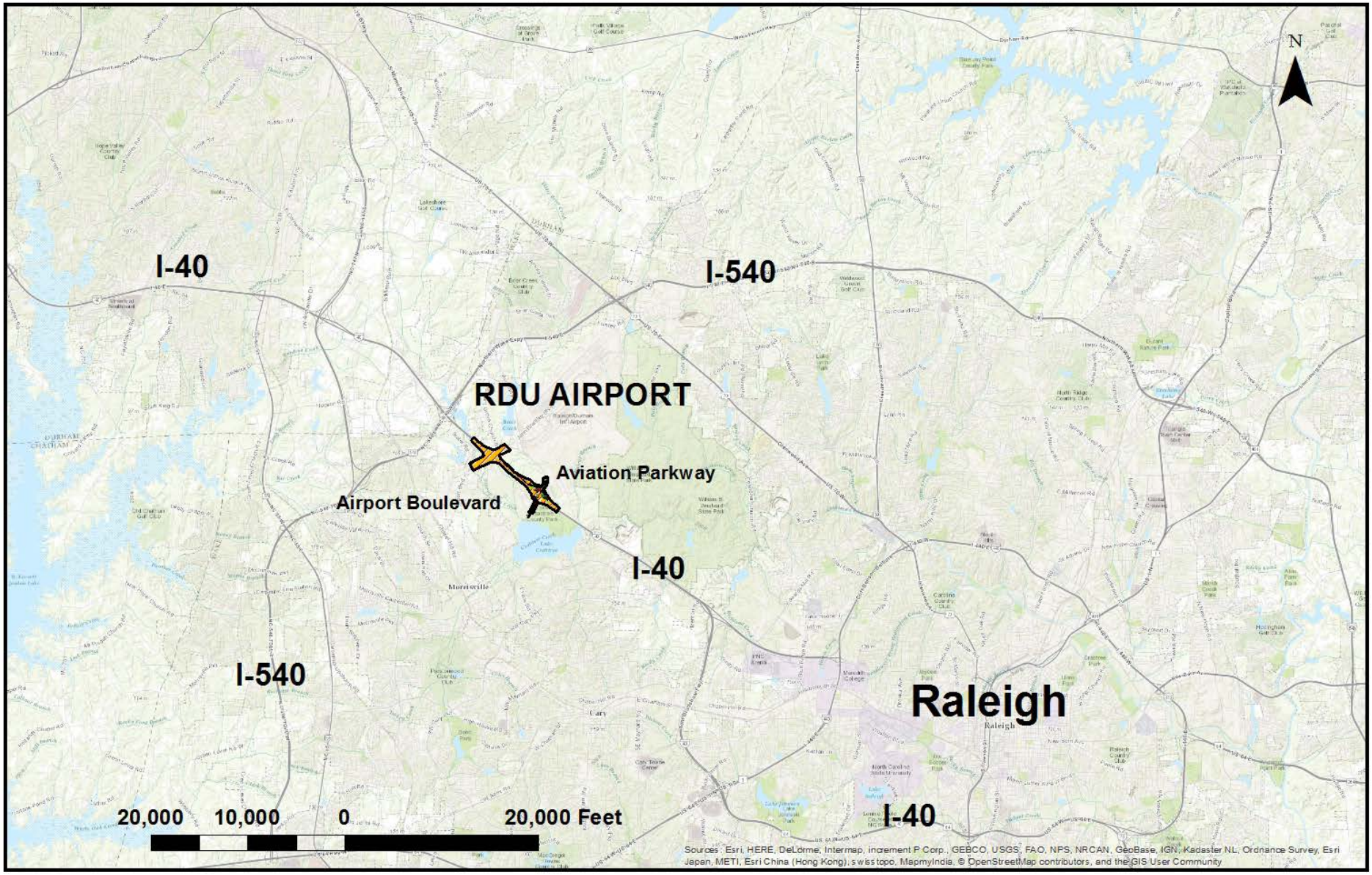
See attached: ☒ Map(s) ☐ Previous Survey Info ☒ Photos ☐ Correspondence
☐ Other:

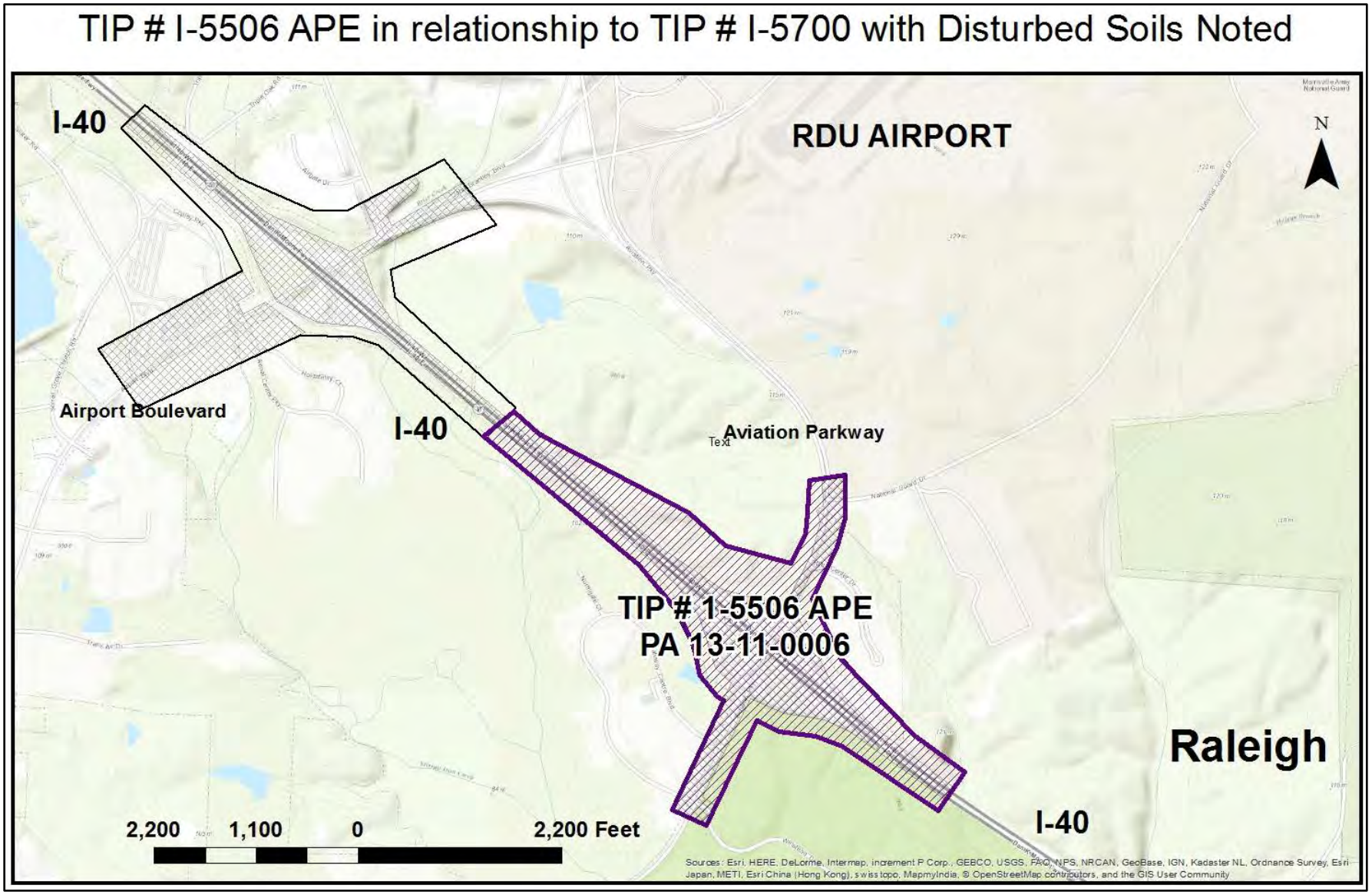
Signed:

October 8, 2015

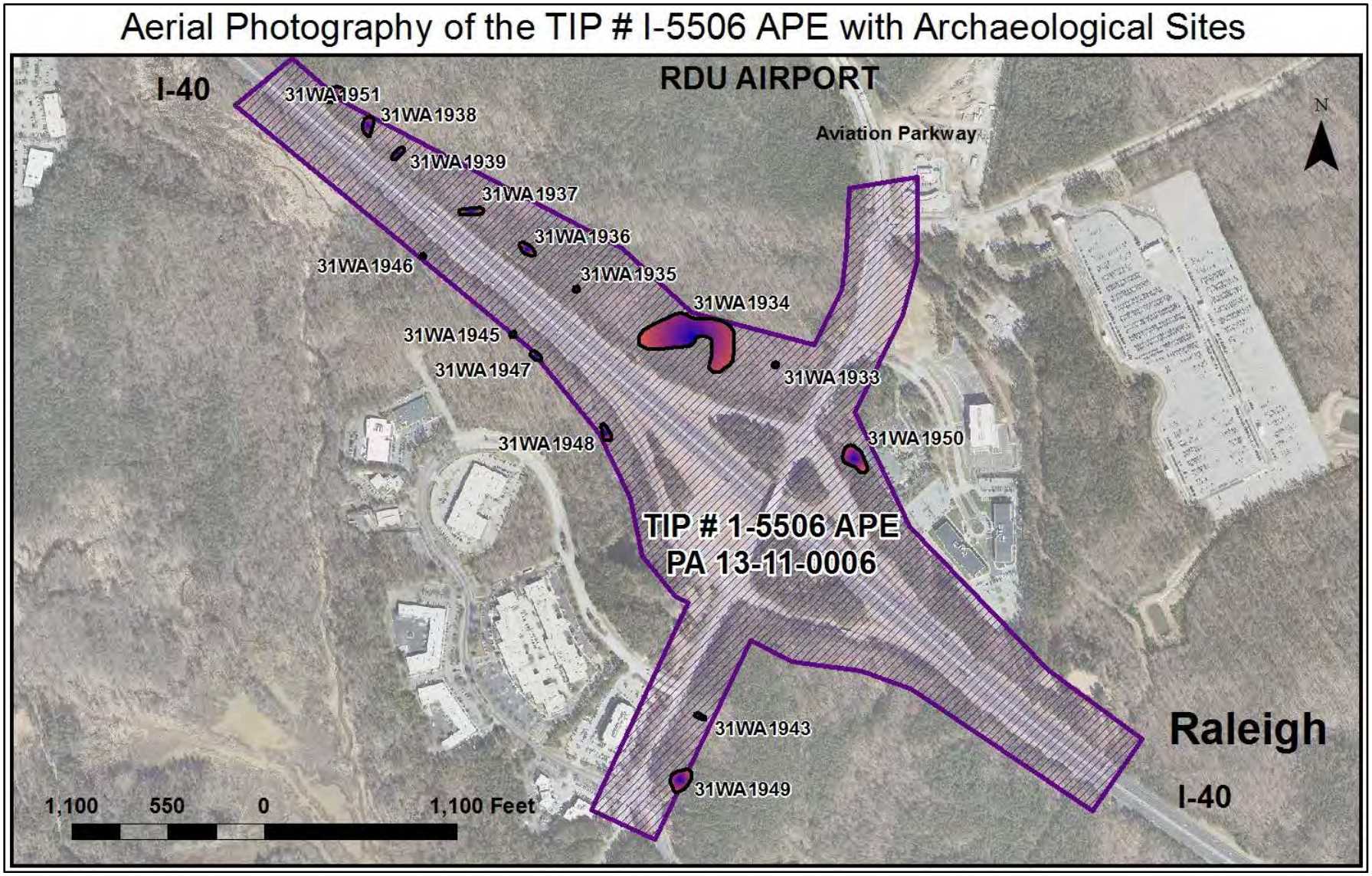
NCDOT ARCHAEOLOGIST **Date**

TIP I-5506 and TIP I-5700 Combined Archaeological Area of Potential Effects





The above illustration shows both related interchange projects' APE with a bold outline for TIP # I-5506. Obviously disturbed areas are cross-hatched.



Aerial photograph of the I-5506 APE illustrating the locations of the archaeological resources identified that are associated with the Aviation Parkway interchange, PA 13-11-0006.

State Historic
Preservation Office
NATURAL AND
CULTURAL RESOURCES

Ramona M. Bartos
Administrator

October 9, 2015

MEMORANDUM

TO: Matt Wilkerson
Office of Human Environment
NCDOT Division of Highways

FROM: Ramona M. Bartos RMB for Ramona M. Bartos

SUBJECT: Archaeological Survey and Evaluation for Two Intersection Improvements, I-40 at SR 1002 (Aviation Parkway) and I-40 at SR 3015 (Airport Boulevard); I-5506 and I5700; PA 13-11-0006 and 14-09-0003; Wake County, ER 15-2052 and ER 14-1905

Thank you for your letter of September 18, 2015, transmitting the above cited archaeological report by Legacy Research Associates concerning the above mentioned projects.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following properties are not eligible for the National Register of Historic Places:

31WA1933, 31WA1934, 31WA1935, 31WA1936&1936**, 31WA1937, 31WA1938, 31WA1939, 31WA1940**, 31WA1941**, 31WA1942, 31WA1943, 31WA1944**, 31WA1945, 31WA1946, 31WA1947, 31WA1948, 31WA1949&1949**, 31WA1950** and 31WA1951&1951**

None of these sites retain stratigraphic integrity nor do they have the potential to yield information important to prehistory or history. Report authors Deborah Joy and Matthew Gill recommend no additional archaeological investigations be conducted in connection with these projects. We concur with this recommendation.

The report meets our office's guidelines and those of the Secretary of the Interior. Specific concerns and/or corrections which need to be addressed in the preparation of a final report are attached for the authors' use. The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Deborah JoyLegacy Research Associates

Specific Comments
Archaeological Survey Report, Wake County
ER 14-1905 and ER 15-2052

1. Page ii: Matt Wilkerson is with the North Carolina Department of Transportation.
2. Page ii & Page 7: Karen Reynolds Quinn or Karen Quinn Reynolds?
3. Page 21, first line under Military Activity: 'found' should be 'fought'.

In general, the report would benefit from editing.

Project Tracking No. (Internal Use)

13-11-0006

HISTORIC ARCHITECTURE AND LANDSCAPES NO SURVEY REQUIRED FORM

This form only pertains to Historic Architecture and Landscapes for this project. It is not valid for Archaeological Resources. You must consult separately with the Archaeology Group.

PROJECT INFORMATION

Project No:	I-5506	***County***:	Wake
WBS No.:	43608.1.1	***Document Type***:	
Fed. Aid No:	NHPP-040-7(154)	***Funding***:	State X Federal
Federal Permit(s):	☐ Yes X No	***Permit Type(s)***:	
Project Description: Construct loop ramp in NE quadrant of I-40 and SR 1002 (Aviation Parkway) interchange (no off-site detour planned).			

SUMMARY OF HISTORIC ARCHITECTURE AND LANDSCAPES REVIEW

DESCRIPTION OF REVIEW ACTIVITIES, RESULTS, AND CONCLUSIONS: HPOWeb reviewed on 13 December 2013 and yielded no NR, SL, LD, DE, or SS properties in the Area of Potential Effects (APE). Wake County current GIS mapping, aerial photography, and tax information indicated a mostly undeveloped APE with some late-twentieth- and early-twentieth-century industrial resources (viewed 13 December 2013). Built in 1969, Bridge No. 73, which carries SR 1002 (Aviation Parkway) over I-40, is neither included in the NCDOT Historic Bridge Survey, nor representative of any distinctive engineering or aesthetic type. Google Maps "Street View" confirmed the absence of critical historic architectural structures/landscapes in APE (viewed 13 December 2013).

No architectural survey is required for the project as currently defined.

***WHY THE AVAILABLE INFORMATION PROVIDES A RELIABLE BASIS FOR REASONABLY PREDICTING THAT THERE ARE NO UNIDENTIFIED SIGNIFICANT HISTORIC ARCHITECTURAL OR LANDSCAPE RESOURCES IN THE PROJECT AREA*:** APE extends 200 feet beyond the study area provided to encompass proposed construction activities (see attached map). The county architectural surveys (1988-91 and 2005-6) and related publication recorded no properties in the APE (Kelly Lally, *The Historic Architecture of Wake County, North Carolina* (Raleigh: Wake County Government, 1994)). County GIS/tax materials and other visuals support the absence of significant architectural resources. No National Register-listed properties are located within the APE.

Should the design of the project change, please notify NCDOT Historic Architecture as additional review may be necessary.

SUPPORT DOCUMENTATION

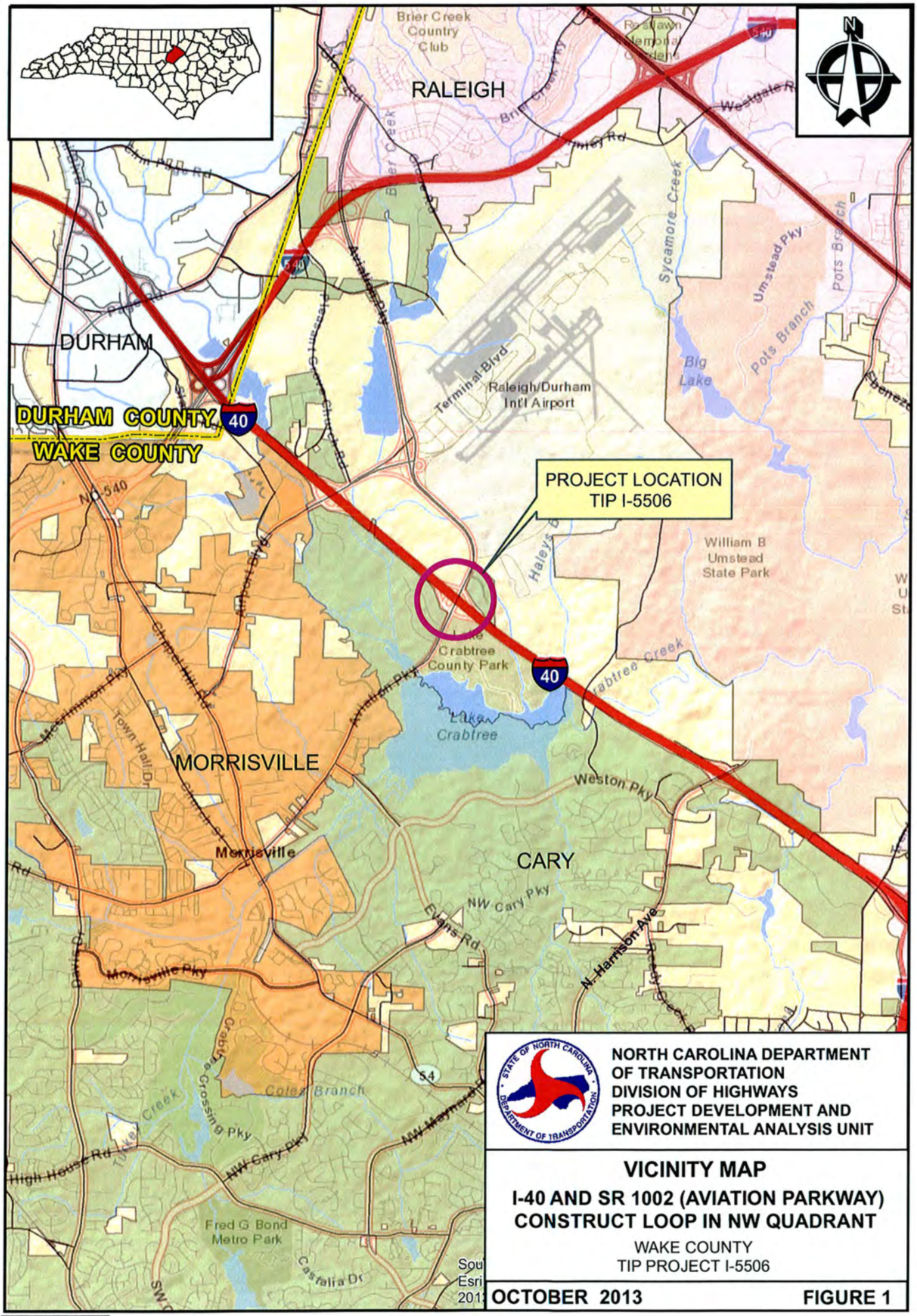
X Map(s) ☐Previous Survey Info. ☐Photos ☐Correspondence ☐Design Plans

FINDING BY NCDOT ARCHITECTURAL HISTORIAN

Historic Architecture and Landscapes -- NO SURVEY REQUIRED

Vanessa E. Patrick — 13 December 2013

NCDOT Architectural Historian — Date



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

VICINITY MAP

I-40 AND SR 1002 (AVIATION PARKWAY) CONSTRUCT LOOP IN NW QUADRANT

WAKE COUNTY
TIP PROJECT I-5506

OCTOBER 2013 **FIGURE 1**

By: J.TORTORELLA

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

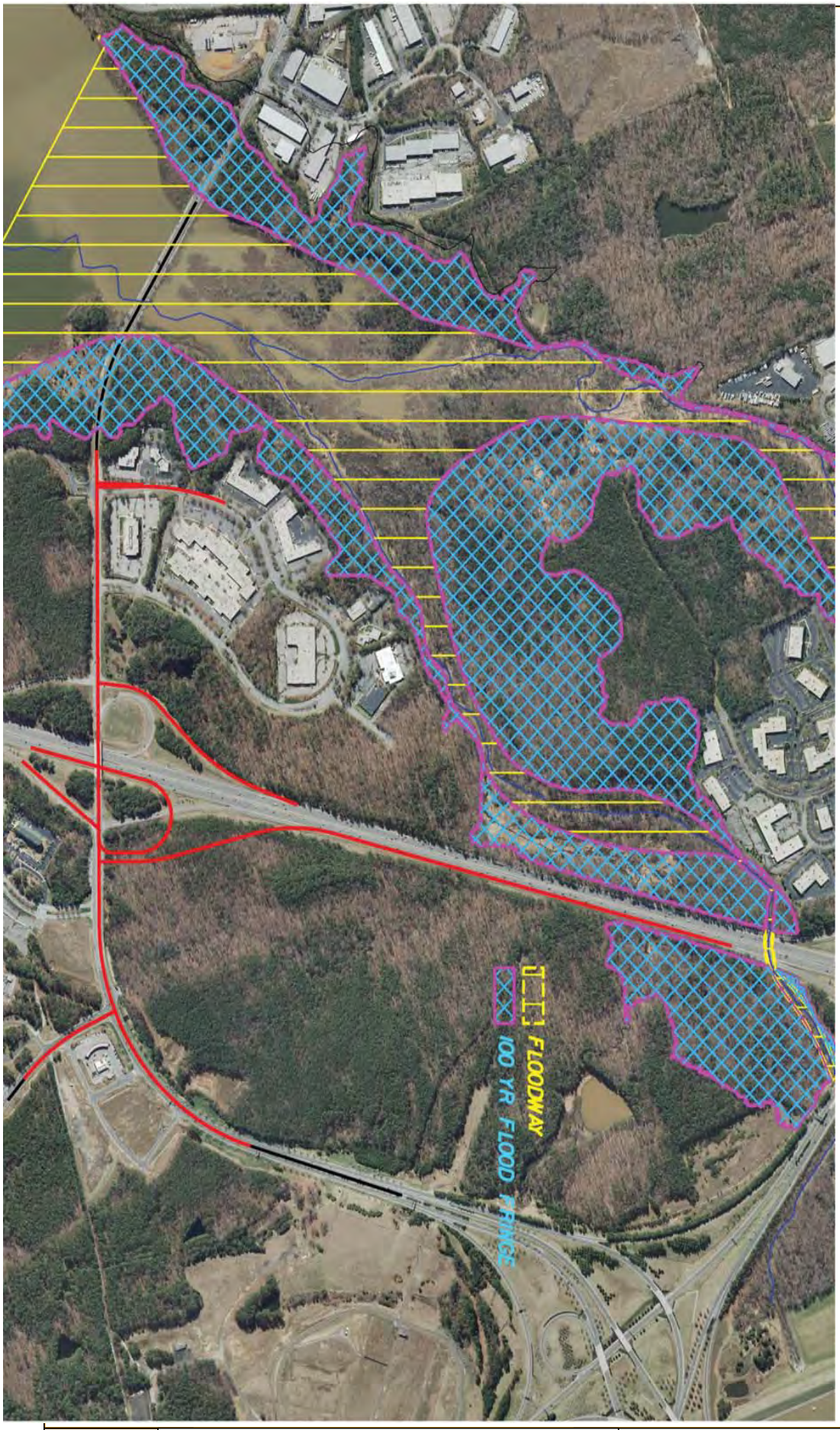
STUDY AREA FOR PA REQUEST
I-40 AND SR 1002 (AVIATION PARKWAY), CONSTRUCT LOOP IN NW QUADRANT

WAKE COUNTY
TIP PROJECT I-5506

N

County: WAKE	
Div: 5	TIP# I-5506
WBS: 43608.1.1	
Date: OCTOBER 2013	

Figure 2



N

NOT TO SCALE

FEMA Floodplains

December 2014

EXIHIBIT 2

TIP I-5506
I-40 and SR-1002 Interchange Modification
Wake County, NC

TRANSPORTATION & FACILITIES DEPARTMENT

August 29, 2016

Eugene Tarascio
Project Development and Environmental Analysis
Century Center Building A
1548 Mail Service Center
1000 Birch Ridge Drive
Raleigh, NC 27610

SUBJECT: I-5506 I-40 and SR 1002 (Aviation Parkway) Interchange Project Sidewalk Request

Dear Mr. Tarascio,

The Town of Cary formally requests that the following sidewalk segments shown in the table below be constructed as part of the North Carolina Department of Transportation's (NCDOT) Transportation Improvement Program (TIP) I-5506 Project: I-40 and SR 1002 (Aviation Parkway) Interchange (Project: 43608.1.1, F.A. Project: NHRP-040-7(154)284. The segment numbers are identified on the I-5506 Sidewalk Segment Map dated February 22, 2016 (attached).

Segment Number	Segment Description	Est. 50% Town of Cary Construction Cost Commitment
1	Westside of Aviation Parkway south of Gateway Centre Boulevard/Lake Crabtree Park	N/A*
2	Westside of Aviation Parkway between the Gateway Centre Boulevard intersections on Aviation Parkway	N/A*
3	Westside of Aviation Parkway between Gateway Centre Boulevard and Ramp C Off-ramp	N/A*
7	Eastside of Aviation Parkway between Ramp D On-ramp and the bridge deck	$3,210.00
8	Eastside of Aviation Parkway between bridge deck and proposed new location Ramp A Off-ramp	$3,720.00
9	Eastside of Aviation Parkway between proposed new location Ramp A Off-ramp and RDU Center Drive	$3,565.00
10	Eastside of Aviation Parkway between RDU Center Drive and Town of Cary Town Limits	$5,090.00

*Sidewalk currently exists along roadway and will be replaced with project and funded entirely by NCDOT.

The Town of Cary agrees to pay for 50% of the cost to construct those new sidewalk locations as outlined in the above table. At such time that the sidewalks have been satisfactorily constructed by NCDOT free of material and workmanship defects, and the warranty period required by the contractor has expired, then the Town of Cary will accept permanent maintenance of all sidewalk segments (1, 2, 3, 7, 8, 9, and 10) listed in the above table, and as identified on the I-5506 Sidewalk Segment Map dated February 22, 2016.

Please let us know if a formal municipal agreement needs to be executed for this in the future. We thank you in advance for allowing the Town to provide input throughout this process.

Sincerely,

Tyler D. Bray, PE
Transportation Planning Engineer

TOWN *of* CARY
316 North Academy Street • Cary, NC 27513 • PO Box 8005 • Cary, NC 27512-8005
tel 919-469-4030 • fax 919-460-4935 • www.townofcary.org

Transportation

PAT McCRORY
Governor

NICHOLAS J. TENNYSON
Secretary

August 18, 2016

Mr. Mark Forestieri, AIA
Director
Wake County Facilities Design & Construction
PO Box 550, Suite 1100
Raleigh, NC 27602

Re: NCDOT STIP Project I-5506: Section 4(f) Coordination for Lake Crabtree Park

Dear Mr. Forestieri,

The North Carolina Department of Transportation (NCDOT) is proposing to make interchange improvements to the I-40/Aviation Parkway interchange. A new loop off-ramp will be added to the northwest quadrant of the I-40/Aviation Parkway interchange. Replacement of the existing bridge with a wider one and widening of Aviation Parkway from the bridge to south of the Lake Crabtree Park entrance will be required as part of this project. Lake Crabtree Park, which will be impacted by this work, is subject to Section 4(f) of the U.S. Department of Transportation Act of 1966.

Attached is a figure detailing the location of the proposed work adjacent to the park. NCDOT and the Federal Highway Administration (FHWA) believe that the proposed project will have no adverse effect on the activities, features, and attributes that qualify Lake Crabtree Park for protection under the Section 4(f). With your agreement, we would deem the impacts from the proposed project to be *de minimis*.

New right of way at the Lake Crabtree Park entrance way will be required to tie in the wider road into the park entrance. Approximately 495 feet of temporary construction easement is also needed to construct the lane widening approaching the park entrance from the south. These are the only impacts to the park anticipated by the proposed project. This widening will facilitate better access to Lake Crabtree Park, and the temporary easement will revert to the park when construction is completed.

If you concur that the proposed impacts to Lake Crabtree Park, as described above and shown on the attached figures, will not adversely affect the park's access and use, the NCDOT is requesting that you sign and date this letter in the spaces provided below, keep a copy for your files, and return a signed original to the address provided. We will keep a copy of the letter in the project files.

Transportation

PAT McCRORY
Governor

NICHOLAS J. TENNYSON
Secretary

As Facilities, Design & Construction Director for Wake County North Carolina, I am the party with signature authority as landowner representative and the official with jurisdiction over the Lake Crabtree Park in Wake County. I concur with the determination that the proposed NCDOT project I-5506 as described in this letter and shown on the accompanying attachments will not adversely affect the activities, features, and attributes that qualify Lake Crabtree Park for protection under Section 4(f) of the Department of Transportation Act as amended. I have been informed that, based on my concurrence, the FHWA intends to make a de minimis finding regarding impacts to the Lake Crabtree Park, thus satisfying the requirements of Section 4(f).

Signed: Mark Forestieri

Mark Forestieri, AIA Wake County Facilities Design And Construction Director
Wake County, North Carolina

Date: 8-18-16

Upon signing and dating this letter, please return it to me within one week of the date of the letter to the following address:

NC Department of Transportation
Project Development and Environmental Analysis
1548 Mail Service Center
Raleigh, NC 27699-1548

The NCDOT greatly appreciates your cooperation in making the I-5506 project possible. Should you have any questions or concerns, please contact me at 919-707-6046 or at gtarascio@ncdot.gov.

Sincerely,

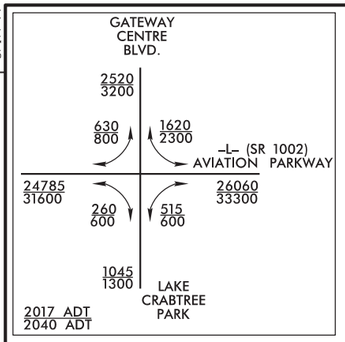
Eugene Tarascio

Eugene Tarascio
Project Planning Engineer
NCDOT Project Development and Environmental Analysis Unit

ET/
Attachments
CC: Eddie Dancausse, FHWA

8/17/99

REVISIONS



–L– (AVIATION PARKWAY)	
PI Sta 26+25.79	PI Sta 34+81.13
Δ = 37° 15' 07.8" (LT)	Δ = 5° 47' 36.6" (RT)
D = 3° 40' 22.1"	D = 0° 47' 25.0"
L = 1,014.27'	L = 733.09'
T = 525.79'	T = 366.86'
R = 1,560.00'	R = 7,250.00'
SE = 0.04 FT/FT	SE = NC
DS = 50 MPH	DS = 50 MPH

NAD 83/NSRS 2011

WETHERILL ENGINEERING
1223 Jones Franklin Road
Raleigh, N.C. 27606
License No. F-0377
Bus: 919 851 8077
Fax: 919 851 8107
TRANSPORTATION PLANNING/DESIGN – BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN – GIS/GPS – CONSTRUCTION OBSERVATION

PROJECT REFERENCE NO.	SHEET NO.
I-5506	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

–L– STA. 23+90.00 BEGIN CONSTRUCTION OF TIP PROJECT I-5506

THE COUNTY OF WAKE
DB 3006 - PG 246
BM 1975 - PG 80

LARZ CARY LLC
DB 10135 - PG 1554
BM 1987 - PG 863

CROWN-RALEIGH I, LLC
A DELAWARE LIMITED LIABILTY COMPANY
DB 11919 - PG 2229
BM 2000 - PG 1746

RALEIGH-DURHAM INTERNATIONAL
DB 3565 - PG 231
BM 1999 - PG 392

BEGIN CONSTRUCTION
–Y5– STA. 11+00.00

–Y5– POT Sta. 10+00.00

–Y5– POT Sta. 12+20.00 =
POC Sta. 32+07.34

–Y6– POT Sta. 10+00.00 =
POC Sta. 32+06.57

600' LANE DROP

200' FULL RIGHT TURN LANE

100' TAPER

BEGIN GRASS COVERED ISLAND
–L– STA. 35+61.48

5' CONC. SW

2'-6" C&G

5" CONC. ISLAND

440' TRANSITION LEFT & RIGHT

100' TAPER

100' LEFT TURN TAPER

250' FULL LEFT TURN LANE

–L– PRC Sta. 31+30.82

250' FULL LEFT TURN LANE

100' TAPER

END CONSTRUCTION
–Y6– STA. 11+20.00
–Y6– POT Sta. 11+70.00

MATCHLINE –L– STA. 36+50.00 SEE SHEET 5

Temporary Construction Easement

Proposed Right of Way

PAVEMENT REMOVAL

REVISED SIGNAL

SEE SHEET 2B-2 FOR –Y5– AND –Y6– INTERSECTION DETAILS
SEE SHEET 11 FOR –L– PROFILE
SEE SHEET 17 FOR –Y5– AND –Y6– PROFILES

2/9/2016
I-5506_Rdy_psh_04.dgn
USER:eus