



COMPLETE 540 REPORT

September 20, 2018

NCDOT STIP Projects R-2721A, R-2721B & R-2828

Triangle Expressway Southeast Extension ("Complete 540")
Phase 1, from NC 55 Bypass to I-40
Wake & Johnston Counties, NC

PREPARED FOR

LEGISLATIVE COMMISSION ON GOVERNMENTAL OPERATIONS
&

JOINT LEGISLATIVE TRANSPORTATION OVERSIGHT COMMITTEE

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Purpose

The dual purpose of this report is to provide information about the “Complete 540” project for the Joint Legislative Commission on Governmental Operations and Joint Legislative Transportation Oversight Committee pursuant to the General Statutes below.

- Pursuant to General Statutes §136-89.183 (a) (2) and §120-76.1, this report is intended to provide information to the Joint Legislative Commission on Governmental Operations.
- Pursuant to General Statute §136-28.11, this report details the intent of the North Carolina Turnpike Authority (NCTA) to use the Design-Build project delivery method for Phase 1 of the Triangle Expressway Southeast Extension project, also known as “Complete 540”. Design and construction of the Phase 1 Extension is divided into three (3) separate Design-Build Contracts in order to provide additional participation opportunities to the local design and construction industry and for contractors of various sizes and resources.

Topics presented in this report include the following:

1. North Carolina Turnpike Authority Background
2. Project Description and Location
3. Project Purpose and Need
4. Estimated Project Capital Cost
5. Environmental Review Status
6. Design-Build Project Delivery Method

1. North Carolina Turnpike Authority Background

G.S. § 136-89.183 (a) (2) sets the powers of the North Carolina Turnpike Authority (the Authority) to “study, plan, develop, and undertake preliminary design work on Turnpike Projects. At the conclusion of these activities, the Turnpike Authority is authorized to design, establish, purchase, construct, operate, and maintain no more than eleven projects.” The addition of any other project proposed by the Authority requires prior consultation with the Joint Legislative Commission on Governmental Operations pursuant to G.S. § 120-76.1.

G.S. § 136-89.183 states the “...Turnpike projects selected for construction by the Turnpike Authority, prior to the letting of a contract for the project, shall meet the following conditions:

- (i) two of the projects must be ranked in the top 35 based on total score on the Department produced list entitled “Mobility Fund Project Scores” dated June 6, 2012, and, in addition, may be subject to G.S. § 136-18(39a);
- (ii) of the projects not ranked as provided in (i), one may be subject to G.S. § 136-18(39a);
- (iii) the projects shall be included in any applicable locally adopted comprehensive transportation plans;
- (iv) the projects shall be shown in the current State Transportation Improvement Program; and
- (v) toll projects must be approved by all affected Metropolitan Planning Organizations and Rural Transportation Planning Organizations for tolling.”

The Complete 540 project meets all legislative requirements to be constructed as a Turnpike project as outlined below:

- (i) – Not applicable because Complete 540 was not one of the two projects cited in this statute.

(ii) – Not applicable. G.S. § 136-18(39a) refers to the ability of the Authority to enter into an agreement with a private entity. Complete 540 will not be delivered in this manner.

(iii) – Complete 540 is currently in the Capital Area Metropolitan Planning Organization (MPO) and Durham-Chapel Hill-Carrboro MPO joint 2045 Metropolitan Transportation Plan (MTP) as a 2025 horizon year project. It is also in the Capital Area MPO 2018 – 2027 Metropolitan Transportation Improvement Program (MTIP).

(iv) – The projects are included in the current State Transportation Improvement Program. STIP Projects R-2721A, R-2721B and R-2828 are programmed in the 2018-2027 STIP for right of way, utilities and construction funding beginning in Fiscal Year (FY) 2019. STIP Project R-2829 is Phase 2 of Complete 540 and is programmed in the 2018-2027 STIP for right of way, utilities and construction funding beginning in Fiscal Year (FY) 2027.

(v) - Complete 540 is currently in the Capital Area Metropolitan Planning Organization (MPO) and Durham-Chapel Hill-Carrboro MPO joint 2045 Metropolitan Transportation Plan (MTP) as a 2025 horizon year project. It is also in the Capital Area MPO 2018 – 2027 Metropolitan Transportation Improvement Program (MTIP).

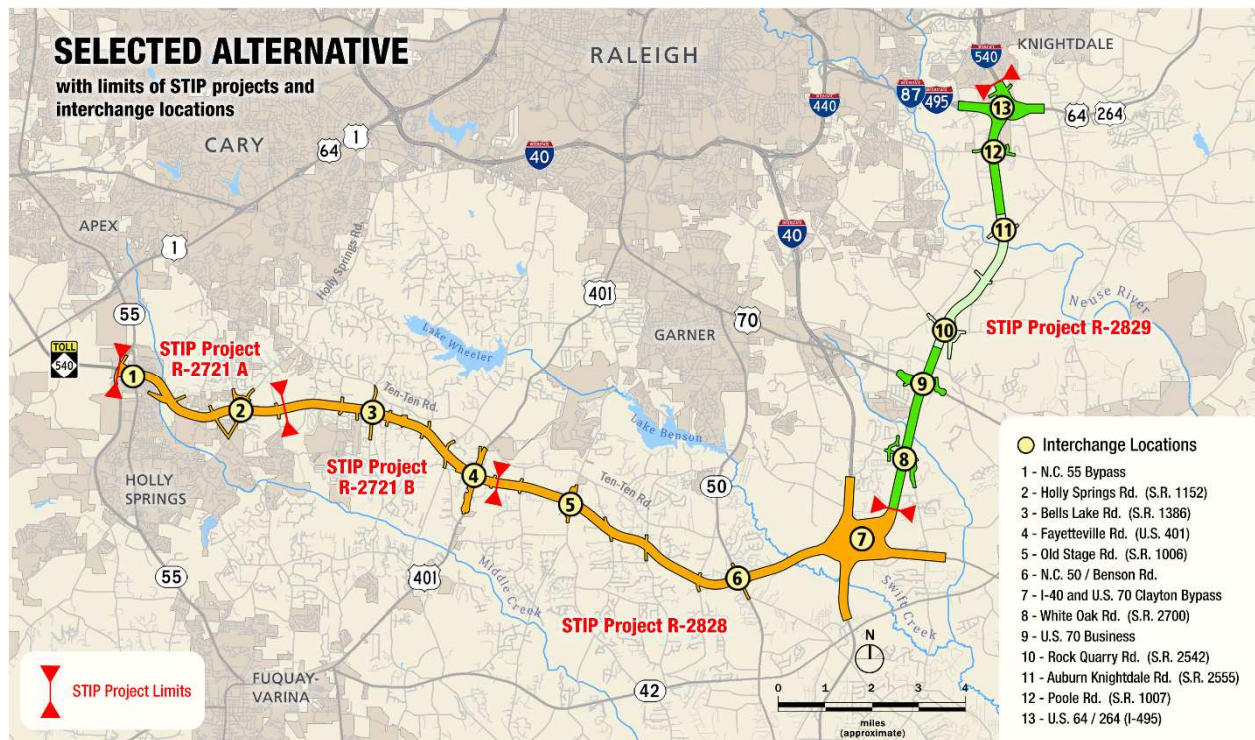
2. Project Description and Location

The Complete 540 Triangle Expressway Southeast Extension Project is comprised of four (4) separate projects as stated in the North Carolina Department of Transportation's (NCDOT's) 2018-2027 State Transportation Improvement Program (STIP) and are shown in **Exhibit 1**.

- STIP project R-2721A: from NC 55 Bypass to east of Holly Springs Road;
- STIP Project R-2721B: from east of Holly Springs Road to east of US 401;
- STIP project R-2828: from east of US 401 to I-40; and
- STIP project R-2829: from I-40 to US 64/US 264 (I-495).

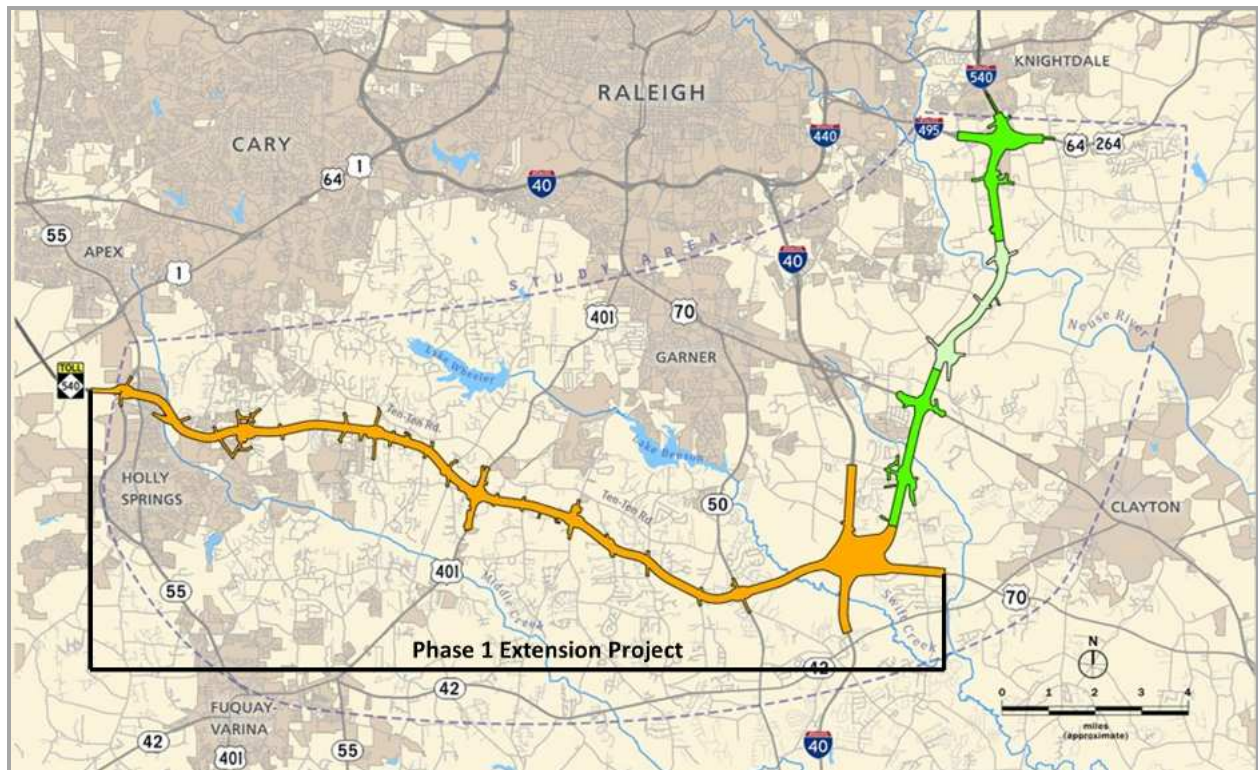
The Complete 540 Triangle Southeast Extension, in the greater Raleigh area in North Carolina, is a proposed greenfield project that would link the towns of Apex, Cary, Clayton, Garner, Fuquay-Varina, Holly Springs, Knightdale and Raleigh. In addition to connecting these towns and cities, the project is anticipated to ease congestion on area roadways, including I-440, I-40, NC 42, NC 55 and Ten-Ten Road. Complete 540 is the extension of the existing Triangle Expressway (NC 540) and will provide the final segments of the 540 Outer Loop around the greater Raleigh area, from the southern terminus of Triangle Expressway to the I-540/I-495 interchange in Knightdale. The new facility is planned as a six-lane, controlled-access toll facility with a 70-foot wide median and a posted speed limit of 70 mph. Tolls will be collected by an electronic toll collection (ETC) system.

Exhibit 1: Complete 540 STIP Projects



Phase 1 of Complete 540 includes STIP Projects R-2721A, R-2721B and R-2828 and is primarily located within Wake County with a small portion in Johnston County. The western terminus of Phase 1 is NC 55 Bypass north of Holly Springs, and extends approximately 17.8 miles easterly to the I-40 interchange between Garner and Clayton, southeast of Raleigh. These projects are programmed in the 2018-2027 STIP for right of way, utilities and construction funding beginning in Fiscal Year (FY) 2019. The limits of Phase 1 are shown in **Exhibit 2**.

Exhibit 2: Complete 540 Phase 1



STIP Project R-2829 is Phase 2 of Complete 540 and is programmed in the 2018-2027 STIP for right of way, utilities and construction funding beginning in Fiscal Year (FY) 2027.

Design and construction of the Phase 1 Extension is divided into three (3) separate Design-Build Contracts in order to provide additional participation opportunities to the local design and construction industry and for contractors of various sizes and resources. The three segments will be contracted east to west due to project readiness and size. Details for each segment is provided in **Exhibit 3**.

Exhibit 3: Phase 1 Extension Segment Information

STIP Project:	R-2828	R-2721B	R-2721A
Limits:	East of US 401 to I-40	East of Holly Springs Road to east of US 401	NC 55 Bypass to east of Holly Springs Road
Length:	8.6 miles	4.9 miles	4.3 miles
Letting Date:	November 2018	February 2019	April 2019
Interchange Location:	Old Stage Road NC 50 I-40 / US 70	Bells Lake Road US 401	NC 55 Bypass Holly Springs Road

The location of each Design-Build Contract is shown in **Exhibit 4**.

Exhibit 4: Phase 1 Extension Design-Build Contract Locations



3. Project Purpose and Need

Need #1 – Mobility for the Movement of People and Goods

Need #2 – Limited Transportation Options to Provide Sufficient Capacity for Efficient, High-Speed Local and Through Travel between Rapidly-Growing Communities South and East of Raleigh and Major Employment and Activity Centers along the 540 Outer Loop and Along Roadways Connecting to the Outer Loop, such as I-40, NC 147, and US 1/64

Need #3 – Existing and Projected Poor Levels of Service (LOS)

- To improve transportation mobility for trips within, or traveling through, the project study area during the peak travel period; and
- To reduce forecast congestion on the existing roadway network within the project study area.

The Final Environmental Impact Statement (FEIS) states:

“Much of the growth that has occurred in the Triangle Region over the past decades has been in developments that include mostly low-density, single-family residences. One outcome of this kind of land use is the heavy burden it places on local roads. These developments often have few connection points to the area’s larger roadway network, meaning that the traffic they generate is all funneled onto the same limited number of roads. The traffic congestion this creates becomes worse when residential areas are far removed from major employment locations, with several of these developments all needing to access the same roadways. The result is a need to

improve mobility by providing additional route choices for those who live or work in, or travel through, the study area.

Reducing Congestion on the existing roadway network—Many of the roads south and east of Raleigh are moderately to severely congested during the morning and evening peak travel times. CAMPO (the Capital Area Metropolitan Planning Organization) predicts that congestion in this area will worsen over the next several years, meaning an increasing number of roadway segments and intersections will provide unacceptably low levels of service. CAMPO's 2040 Metropolitan Transportation Plan identifies several future transportation projects that would help ease this increase in traffic congestion. One of those is the proposed Complete 540 project."

Based on the aforementioned needs, the following purposes for the project have been identified:

- To improve transportation mobility for trips within, or traveling through, the project study area during the peak travel period; and
- To reduce forecast congestion on the existing roadway network within the project study area.

Based on state and local plans, an outcome of the project will be to improve system linkage in the roadway network in the project study area. As included in state and local plans, the proposed action would be the final link in the 540 Outer Loop completing a controlled-access, high-speed circumferential facility around the outskirts of Raleigh. The facility would benefit not only the local commuters living south and east of Raleigh, but also longer distance motorists and trucks that are passing through the Triangle Region to and from points south and east.

4. Estimated Project Capital Cost

The total capital cost of the Phase 1 Extension, including construction, toll equipment, right-of-way, utility relocation, and engineering and design, is estimated at \$1.33 billion; this cost represents a 70% confidence level in anticipated year of expenditure dollars from the FHWA Cost Estimate Review conducted in March 2018. A breakdown of costs is shown in **Exhibit 5** below:

Exhibit 5: Phase 1 Capital Cost Breakdown (in millions)

Segment	R-2721A	R-2721B	R-2828	Total
Planning and Development	\$32.2		\$26.0	\$58.2
Construction	\$175.8	\$186.3	\$471.3	\$833.4
Right of Way	\$52.0	\$75.3	\$67.6	\$194.9
Utilities	\$7.9	\$24.9	\$23.2	\$56.0
Environmental Mitigation	\$10.0	\$8.6	\$26.3	\$44.9
Agency, Administrative and Miscellaneous	\$30.5	\$33.9	\$77.1	\$141.5
Total Expenditures per Segment	\$308.4*	\$329.0	\$691.5	\$1328.9

*Includes all Planning and Development costs for R-2721A and R-2721B (\$32.2M)

5. Environmental Review Status

The development of an “outer loop” beyond what is now the I-440 Beltline around the City of Raleigh has been considered by local and regional planning organizations since the mid-1970s. The northern portion of this outer loop was built in stages and opened to the public between 1997 and 2002. It is currently designated as I-540, and extends from I-40, northwest of Raleigh, easterly to US 64/US 264 (I-495).

Construction of the next segment of this outer loop, currently designated as NC Toll 540 and generally known as the Triangle Expressway, continued the outer loop from the western terminus of the first segment at the I-540/I-40 interchange, southward to NC 55 Bypass in Apex, NC. This western segment of the outer loop was also built in phases opening to the public between 2011 and 2012. The Triangle Expressway is currently a toll road operated and maintained by NCTA.

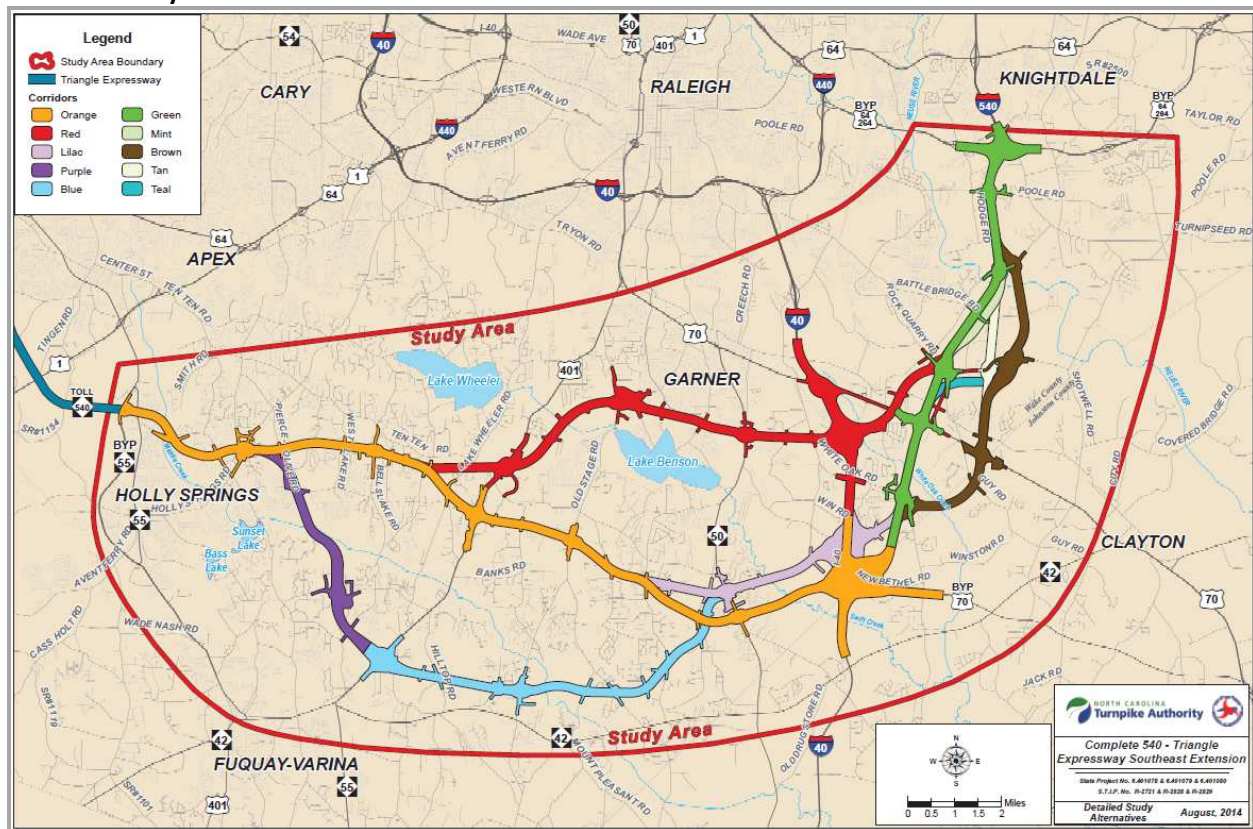
Route location planning for the Complete 540 Triangle Expressway Southeast Extension began when construction of I-540 was underway. Environmental studies began in 2009, and a total of 17 alternatives that included a combination of corridor segments within the study area were studied. In March 2011, North Carolina Session Law 2011-7 was enacted and restricted the NCDOT’s ability to study alternative corridors north of the protected corridor (designated as the red corridor). However, the Federal Highway Administration (FHWA) and the U.S. Army Corps of Engineers (USACE) determined that the full evaluation of the red corridor must be conducted as part of the project development process.

In June 2013, the North Carolina General Assembly enacted House Bill 10 (Session Law 2013-94) and House Bill 817 (Session Law 2013-183), which removed previous restrictions on the evaluation of the red corridor, allowing all environmental studies for the project to resume in July 2013.

In September 2013, NCDOT published a Draft Alternatives Development and Analysis Report and presented the alternatives under evaluation to the public in a series of public hearings in October 2013. In December 2013, NCDOT announced the Detailed Study Alternatives (DSAs) to be evaluated in the Draft Environmental Impact Statement (DEIS).

The DEIS was completed and approved in November 2015, followed by a two-month public comment period. Public meetings regarding the DEIS were held in December 2015. With input from the public meetings and hearings, NCDOT and FHWA selected Detailed Study Alternative 2 (refer to the orange, green, mint-green corridor segments in **Exhibit 6**) as the Preferred Alternative for the Complete 540 project. The Final Environmental Impact Statement (FEIS) was approved in December 2017 and the Record of Decision was approved in June 2018.

Exhibit 6: Study Area and Alternative Routes



The study included an extensive process for informing and involving environmental regulatory and resource agencies, local governments and the public. Details about this process, and details of the information summarized below, can be found in the study's Stakeholder Involvement Report (2018).

NCDOT prepared a detailed plan to guide the required coordination with federal, state and local agencies. The plan identified the Federal Highway Administration as the project's lead agency and the US Army Corps of Engineers (USACE) as a formal cooperating agency. Participating agencies included the US Environmental Protection Agency (USEPA), the US Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), the NC Department of Natural and Cultural Resources (DNCR), the NC Department of Environmental Quality (NCDEQ), the North Carolina Wildlife Resources Commission (NCWRC) and the Capital Area Metropolitan Planning Organization (CAMPO).

NCDOT's plan identified roles and responsibilities at key steps in the National Environmental Policy Act (NEPA) process. Because this project followed the "6002"(Section 6002 of MAP-21, the Moving Ahead for Progress in the 21st Century Act of 2012 (P.L. 112-141)) process instead of the NCDOT's "merger" process, the plan also established procedures for agencies to raise formal issues of concern and procedures for resolving those issues. The main method for government representatives and agencies to receive information and provide comments was through numerous interagency meetings. No formal issues of concern were identified at any of the 18 interagency meetings that were held over the course of the project.

Additional coordination took place with several agencies regarding resources under their jurisdiction:

- U.S. Fish and Wildlife Service (Endangered Species Act Section 7 Consultation)
- National Marine Fisheries Service (critical habitat designation for Atlantic Sturgeon in the Neuse River)
- NC State Historic Preservation Office and NC Office of State Archaeology (cultural resources)
- City of Raleigh (Section 4(f) *de minimis* impact for Neuse River Trail)
- Town of Cary (Section 4(f) *de minimis* impact for Middle Creek School Park)

The following permits will be required from federal and state agencies for implementation of the Preferred Alternative:

- Section 404 Individual Permit from USACE for fill in jurisdictional waters, including wetlands.
- Section 401 Water Quality Certification and Neuse Riparian Buffer Authorization from North Carolina Department of Environment Quality (NCDEQ)-Division of Water Resources for fill in jurisdictional waters, including wetlands.

These permits are expected in late 2018/early 2019.

During the National Environmental Policy Act (NEPA) process, commitments are made to avoid, minimize, or mitigate project impacts. Commitments result from public comment or through the requirements of, or agreements with, environmental regulatory and resource agencies.

In addition to compliance with applicable federal and state requirements and regulations, such as Section 404 Individual Permit Conditions, Nationwide Permit Conditions, Regional Conditions, and State Consistency Conditions; North Carolina Department of Transportation (NCDOT) Guidelines for Best Management Practices for the Protection of Surface Waters; General Certification Conditions and Section 401 Conditions of Certification, and the Endangered Species Act, the Record of Decision lists special project commitments that have been agreed to by the NCDOT.

6. Design-Build Project Delivery Method

Three separate Design-Build contracts will be procured in parallel on a staggered schedule, separated by approximately 3 months for R-2721A, R-2721B and R-2828. The contract for R-2828 will include design, right of way acquisition, traffic management, site investigations, permitting, utility coordination and relocation, as well as construction of the facility. Right of way acquisition for R-2721A and R-2721B will not be included in those Design-Build contracts and will be handled with separate contracts. The aforementioned preconstruction activities will be performed in parallel by a team of contractors and multi-disciplinary private engineering firms to expedite project delivery. It is anticipated that all preconstruction activities will be completed within 12 months of the contract award date. The participation of the construction contractors will enhance innovation, improve constructability of the project and further expedite delivery.

The procurement is being carried out in conformance with the requirements of G.S. § 136-28.11 for Design-Build construction of transportation projects as it has been determined that the Design-Build project delivery method will best serve the public interest.

The contract will be awarded using a best-value procurement method in accordance with the NCDOT

Design-Build Policy and Procedures adopted by the Board of Transportation on October 6, 2011. The project will be managed, the contract written and the design submittals reviewed by NCTA and subject matter experts throughout NCDOT commensurate with past and present Design-Build projects.