

Credit: North Carolina Turnpike Authority

Complete 540 – Triangle Expressway Southeast Extension Project

North Carolina Department of Transportation and North Carolina Turnpike Authority

Wake and Johnston Counties, North Carolina

Constructing new limited-access tolled highway to reduce congestion and improve system linkage.

NOTABLE PRACTICES

☑ Meaningful Public Involvement

- During the project development process, project newsletters reached thousands of stakeholders during key decision points.
- Through outreach, unified stakeholder support for one corridor segment.

☑ Travel Forecasting and Traffic Impacts

- Utilized project-specific socioeconomic data in the travel demand model to ensure a true no action alternative was reflected in effects analyses.

☑ Environmental Analysis

- NCDOT only included tolled alternatives in the detailed study alternatives to meet the project purpose. Non-tolled alternatives were screened out because they did not meet the purpose and need.

North Carolina transportation practitioners have considered an “Outer Loop” around Raleigh since the mid-1980s. Between 1997 and 2007 NCDOT opened the first segments of the loop north of Raleigh; the Triangle Expressway extension opened in December 2012. These segments comprise approximately 60 percent of the Outer Loop project.

The two primary purposes of Complete 540 are to improve mobility and to reduce traffic congestion on the existing roadway network during peak travel periods. A secondary purpose of the project is to improve system linkage in the regional roadway network.



MEANINGFUL PUBLIC INVOLVEMENT

NCDOT and the North Carolina Turnpike Authority strived to share as much information about Complete 540 with the public as possible and provided stakeholders many different opportunities to provide input during the environmental review process. Specifically, NCDOT utilized a higher level of engagement, more tools, and consistent messaging in materials to reach stakeholders who may become customers and users of the new tolled option.

NCDOT used project newsletters to present the preliminary alternatives, announce public meetings, present the detailed study



OVERVIEW

The Complete 540 – Triangle Expressway Southeast Extension Project (Complete 540) will extend the Triangle Expressway by 28.4 miles from the N.C. 55 Bypass in Apex to U.S. 64/U.S. 264 (I-87) in Knightdale, completing the 540 Outer Loop that currently partially encircles greater Raleigh. The project will have six travel lanes with a 70-foot wide median. See Figure 1 for a map of the project.

alternatives, discuss the potential for tolling, and announce the public hearing.

NCDOT sent the newsletters to all addresses in the study area and to others who had requested to be on the mailing list, totaling more than 56,000 addressees. The newsletters highlighted that Complete 540 would be an all-electronic toll facility and that using the NC Quick Pass transponder would save drivers 35 percent on tolls compared to the bill-by-mail option. NCDOT prepared the newsletter in English and Spanish.

NCDOT held public meetings at key decision points in the project development process so that the public could provide feedback on preliminary corridor alternatives, detailed study alternatives, and the Draft Environmental Impact Statement (EIS).

NCDOT discussed anticipated toll rates during public meetings. Toll rates were based on the Triangle Expressway toll road that opened to traffic in 2012. NCDOT emphasized that the toll road is just one travel option, and that travelers who do not choose to take the toll road would receive benefits, such as less-congested toll-free alternatives.

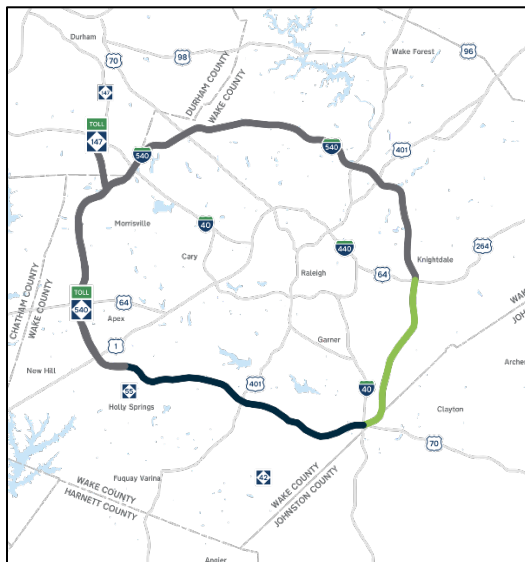


Figure 1. Map of Complete 540. The blue segment indicates Phase I of the Triangle Expressway Southeast Extension that is currently under construction. The Green segment is Phase II which is expected to begin ROW acquisition in 2026. The gray segment is currently open to traffic and encompasses I-540 and the Triangle Expressway. Credit: North Carolina Turnpike Authority.

NCDOT offered to meet with stakeholders in small groups like homeowners' associations and civic organizations. These smaller gatherings allowed the study team to explain specific aspects of the project at a level of detail not always possible at larger meetings or in written material. NCDOT also coordinated extensively with local governments for Complete 540. In 2014, the Capital Area Metropolitan Planning Organization (CAMPO) established the "540 Working Group," which included individuals from many of the jurisdictions in the study area. The study team met with local government staff and elected officials to provide more detailed information about the study and receive comments.

Stakeholder Engagement Influences Selection of Alternatives

Most stakeholders supported the selection of alternatives that use what is known as "the orange corridor segment." Several local governments expressed formal support for the orange corridor segment through resolutions and in written comments from local government staff. The study team received petitions from various neighborhood groups and other local organizations, each with statements expressing support of a particular corridor segment (usually the orange corridor segment), or opposition to other corridor segments. Ultimately, through the NEPA process, NCDOT selected the orange corridor segment as part of the preferred alternative, partially due to the extensive support from stakeholders as well as environmental, engineering and cost considerations.

TRAVEL FORECASTING AND TRAFFIC IMPACTS

During the morning and evening peak travel times, many of the roadways south and east of Raleigh operate at poor levels of service. Estimates prepared by transportation planners at CAMPO show that by 2035 traffic volumes on area roads will be about double what they were in 2005. This increase in traffic, along with anticipated population growth and continuing land development, indicates that an increasing

number of roadway segments and intersections will have unacceptably low levels of service.

In 2016, CAMPO completed one of its regular updates to its regional travel demand model and the socioeconomic data inputs used in the model extended the model's horizon year from 2035 to 2040. The new model assumed the construction of Complete 540. NCDOT and NCTA revisited prior analyses to integrate the updated travel demand model findings into their project specific models.

Establishing an Environmental Baseline for Traffic Impacts Evaluation

To establish an environmental baseline for traffic impacts, NCDOT developed a set of project-specific socioeconomic data to reflect a future no-build condition that excluded the effect of the Complete 540 project on population and employment.

For the base year and future year build forecasts, NCDOT used the regional socioeconomic data developed by CAMPO as part of their regional long range planning process. Once the build and no-build model runs were complete, NCDOT could compare future conditions with and without the project at the network level, corridor level, and intersection/link level.



ENVIRONMENTAL ANALYSIS

NCTA initiated the planning and corridor study for the Complete 540 - Triangle Expressway Southeast Extension in late 2009, shortly after FHWA issued a notice of intent (NOI) to prepare an EIS for the project on November 30, 2009.

Alternatives Analysis

The EIS evaluated non-highway alternatives such as transportation demand management, transportation system management, and a mass transit/multi-modal concept, several different roadway options, and a no-build option. The no-build option assumed the transportation network in the study area will continue to develop as called for in CAMPO's Long Range Transportation Plan, but without the Complete 540 project included.

Through the NEPA process, NCDOT determined that a tolled hybrid option that included existing roadway improvements and new construction and a new tolled highway option were the only alternatives that met the purpose and need of the project. NCDOT screened out non-tolled alternatives because they did not meet the purpose and need. The State ultimately dropped the hybrid concept because it would have required numerous residential relocations and had significant wetland impacts without offering an advantage over the new highway option.

Although NCDOT identified low-income, minority, and elderly individuals in the study area using Census data, their analyses indicated that there would be no disproportionately high and adverse effects on environmental justice populations with any of the detailed study alternatives, including the preferred alternative.

FHWA issued a Final EIS in December 2017 and a Record of Decision in June 2018.



PROJECT OUTCOMES

Building Complete 540 as a tolled facility allowed NCDOT and NCTA to accelerate the timeline for construction of the project.

Construction of this remaining 540 link will benefit local commuters living south and east of Raleigh, as well as motorists making longer trips through the Triangle Region to and from points south and east. Complete 540 will provide a new travel option, resulting in more route choices, less congestion on the existing roadway network, and will ensure that the region's transportation network keeps pace with the area's rapid growth.

Per North Carolina State policy, there remains a free parallel option for individuals unable to afford the tolled facility. NCDOT also offers transponders at no cost.

In 2019, at the urging of the North Carolina General Assembly, NCDOT published a [Toll Project Development Policy Handbook](#) to identify, evaluate, and prioritize toll candidate projects.

Project Status

Complete 540 is being constructed in two Phases: Phase I (southern portion) is 17.8 miles between N.C. 55 in Apex and I-40 near the Johnston County line. Phase II (eastern portion) continues the project at I-40 and ends at U.S.

Complete 540 is being constructed in two Phases

64/U.S. 264 Bypass in Knightdale. NCDOT awarded three design-build contracts to construct Phase I, which began in November 2019. Phase I is expected to open to traffic in 2023, and right-of-way funding for Phase II is currently programmed in fiscal year 2026.



FOR MORE INFORMATION, CONTACT

Rodger Rochelle, P.E.
Chief Engineer, Innovative Delivery
North Carolina Turnpike Authority
(919) 707-2710
rdrochelle@ncdot.gov



PHOTO CREDITS

North Carolina Turnpike Authority



RESOURCES

Complete 540 Project
<https://www.ncdot.gov/projects/complete-540/Pages/default.aspx>