**NEW ISSUE – BOOK ENTRY ONLY** **Ratings: See "RATINGS" herein.**

*This Official Statement has been prepared by the North Carolina Turnpike Authority to provide information on the Series 2024 Bonds. Selected information is presented on this cover page for the convenience of the user. Unless indicated, capitalized terms used on this cover page have the meanings given hereafter in this Official Statement. To make an informed decision regarding the Series 2024 Bonds, a prospective investor should read this Official Statement in its entirety.*

# $340,360,304.70
# NORTH CAROLINA TURNPIKE AUTHORITY
## Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024
**consisting of**

**$304,575,000**
**Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A**

**$35,785,304.70**
**Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds)**

**Dated: Date of Delivery** **Due: as shown on inside of front cover**

*Tax Treatment* In the opinion of Bond Counsel, under current law and subject to conditions described in the Section herein "TAX TREATMENT," interest on the Series 2024 Bonds (a) is not included in gross income for federal income tax purposes, (b) is not an item of tax preference for purposes of the federal alternative minimum tax, (c) is taken into account in determining adjusted financial statement income for applicable corporations (as defined in Section 59(k) of the Internal Revenue Code of 1986, as amended (the "Code")) for the alternative minimum tax imposed on such corporations and (d) is exempt from all income taxes in the State of North Carolina. See "TAX TREATMENT" herein for certain provisions regarding the Code that may subject a holder to other federal tax consequences.

*Redemption* The Series 2024 Bonds are subject to optional and mandatory sinking fund redemption as described herein. See "THE SERIES 2024 BONDS – Redemption Provisions."

*Purpose* The proceeds of the Series 2024 Bonds will be used to (a) pay certain costs of land acquisition for and design, construction and equipping of an extension of the Triangle Expressway System (as hereinafter defined) from I-40 to I-87/US 64/US 264, (b) provide funds to pay interest on certain Series 2024 Bonds, (c) pay the premium for a Bond Insurance Policy issued by the 2024 Bond Insurer, (d) pay the premium for the Series 2024 Debt Service Reserve Policy in the amount of the increase in the Senior Lien Parity Reserve Account Requirement resulting from the issuance of the Series 2024 Bonds and (e) pay certain costs incurred in connection with the issuance of the Series 2024 Bonds. See "PLAN OF FINANCE" for a description of other sources of funds to be used to pay for Complete 540 – Phase 2, including the proceeds of the 2024 TIFIA Loan, which is expected to close prior to or simultaneously with the Series 2024 Bonds.

*Security* The Series 2024 Bonds will be special obligations of the Authority, secured by and payable from the Receipts (hereinafter defined) of the Triangle Expressway System described in this Official Statement and, under certain circumstances, proceeds of the Series 2024 Bonds, investment earnings and certain other available funds. *Neither the credit nor the taxing power of the State of North Carolina (the "State") or any of the State's political subdivisions is pledged for the payment of principal of or interest on the Series 2024 Bonds, and no Owner of the Series 2024 Bonds has the right to compel the exercise of the taxing power of the State or any of the State's political subdivisions or the forfeiture of any of their respective properties other than Receipts in connection with any default on the Series 2024 Bonds.* ACCELERATION IS NOT A REMEDY AVAILABLE TO OWNERS OF THE SERIES 2024 BONDS UPON DEFAULT. THE AUTHORITY HAS NO TAXING POWER.

*Bond Insurance* The scheduled payment of principal of (or, in the case of Capital Appreciation Bonds, the accreted value) and interest on the Series 2024 Bonds (collectively, the "Insured Series 2024 Bonds") when due will be guaranteed under an insurance policy to be issued concurrently with the delivery of the Series 2024 Bonds by Assured Guaranty Municipal Corp. (the "2024 Bond Insurer").

*Interest Payment Dates* Interest on the Series 2024A Bonds will be paid on January 1 and July 1, commencing July 1, 2024. Interest on the Series 2024B Bonds will not be paid currently, but will accrete and be paid upon the maturity thereof. See "THE SERIES 2024 BONDS – Interest Rate Provisions of Series 2024 Bonds."

*Denominations* $5,000 or any whole multiple thereof.

*Closing/Settlement* On or about January 30, 2024

*Bond Counsel* Hunton Andrews Kurth LLP, Charlotte, North Carolina

*Underwriters' Counsel* McGuireWoods LLP, Raleigh, North Carolina

*Trustee and Bond Registrar* Computershare Trust Company, N.A., St. Paul, Minnesota

The Series 2024 Bonds are offered, when, as and if issued and received by the Underwriters, subject to prior sale and the opinion of Bond Counsel as to their validity, the tax treatment of interest thereon and certain other matters.

**BofA Securities**

**Drexel Hamilton, LLC** **Loop Capital Markets**

**PNC Capital Markets LLC** **Ramirez & Co. Inc.**

The date of this Official Statement is January 17, 2024.

## MATURITY SCHEDULE

### $46,290,000 Series 2024A Current Interest Serial Bonds

| Due January 1 | Principal Amount | Interest Rate | Yield | CUSIP** |
|---|---|---|---|---|
| 2053 | $7,190,000 | 5.00% | 4.170%* | 65830R CY3 |
| 2054 | 39,100,000 | 5.00 | 4.180* | 65830R CZ0 |

$258,285,000 Series 2024A 5.00% Term Bonds Due January 1, 2058, Yield 4.230%* CUSIP 65830R DA4**

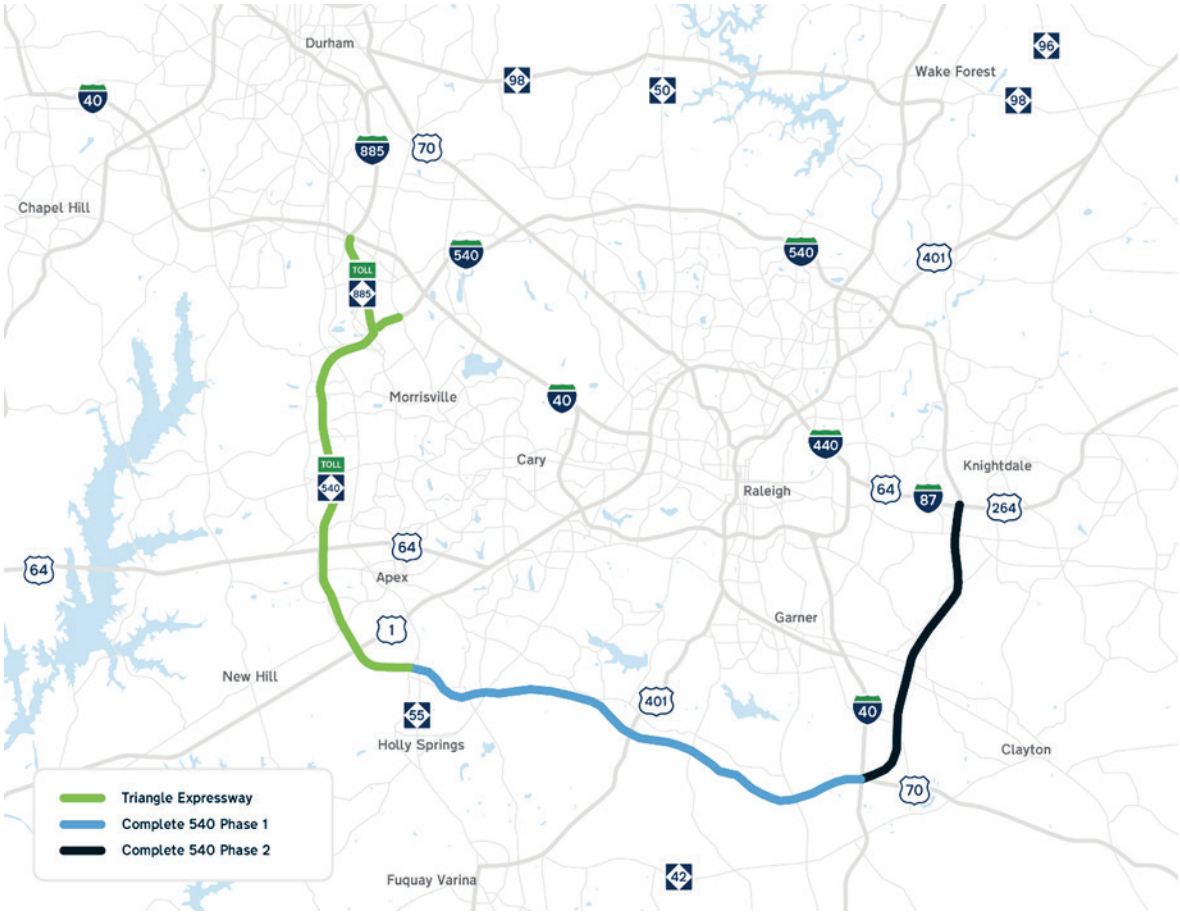
* Yield reflects Series 2024A Bonds priced to first optional call date of January 1, 2034.

### $35,785,304.70 Series 2024B Capital Appreciation Bonds

| Due January 1 | Initial Principal Amount | Maturity Amount | Initial Price Per $5,000 Payable at Maturity | Yield to Maturity | CUSIP** |
|---|---|---|---|---|---|
| 2050 | $9,669,546.60 | $33,740,000 | 100.00 | 4.880% | 65830R DB2 |
| 2051 | 9,480,890.40 | 34,990,000 | 100.00 | 4.910 | 65830R DC0 |
| 2052 | 9,264,083.70 | 36,185,000 | 100.00 | 4.940 | 65830R DD8 |
| 2053 | 7,370,784.00 | 30,400,000 | 100.00 | 4.960 | 65830R DE6 |

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**North Carolina Turnpike Authority Triangle Expressway System**
**(including Complete 540 – Phase 1 and Phase 2)**



**NORTH CAROLINA TURNPIKE AUTHORITY**

STATE OFFICIALS

| | |
|---|---|
| Roy Cooper | Governor |
| Joseph R. Hopkins, P.E. | Secretary of NCDOT |
| Chris Peoples, P.E. | Chief Operating Officer of NCDOT |
| Mark Newsome | Chief Financial Officer of NCDOT |
| Lamar Sylvester, P.E. | Chief Engineer of NCDOT |

AUTHORITY BOARD MEMBERS

| | |
|---|---|
| Joseph R. Hopkins, P.E. | Chairman |
| James Walker | Vice Chairman |
| Robert D. Teer, Jr. | Secretary/Treasurer |
| John Adcock | Member |
| Julie Eiselt | Member |
| Dr. Pamela Gibson Senegal | Member |
| Sam Hunt IV | Member |
| Montell W. Irvin | Member |
| Charles L. Travis III | Member |

AUTHORITY MANAGEMENT STAFF

| | |
|---|---|
| James J. "J.J." Eden | Executive Director |
| David Roy | Chief Financial Officer |
| Cheryl Reed | Deputy Chief Financial Officer |
| Manish G. Chourey | Chief Technology Officer |
| Patrick Norman, P.E. | Chief Engineer |
| Dennis Jernigan, P.E. | Deputy Chief Engineer for Highway Operations |
| Ron McCollum, P.E. | Deputy Chief Engineer for Preconstruction |

MUNICIPAL ADVISOR

PFM Financial Advisors, LLC, Orlando, Florida

TRAFFIC & REVENUE CONSULTANT

CDM Smith Inc., East Hartford, Connecticut

GENERAL ENGINEERING CONSULTANT

HNTB Corporation, Raleigh, North Carolina

BOND COUNSEL

Hunton Andrews Kurth LLP, Charlotte, North Carolina

No dealer, broker, salesman or other person has been authorized to give any information or to make any representation other than those contained in this Official Statement in connection with the offering described herein, and, if given or made, such other information or representation must not be relied upon as having been authorized. This Official Statement does not constitute an offer to sell or the solicitation of an offer to buy any securities other than the Series 2024 Bonds offered hereby, nor shall there be any offer or solicitation of such offer or sale of the Series 2024 Bonds in any jurisdiction in which it is unlawful to make such offer, solicitation or sale. Neither the delivery of this Official Statement nor the sale of any of the Series 2024 Bonds implies that the information herein is correct as of any date subsequent to the date hereof.

Neither the Series 2024 Bonds nor the Trust Agreement have been registered or qualified with the Securities and Exchange Commission by reason of the provisions of Section 3(a)(2) of the Securities Act of 1933, as amended, or Section 304(a)(4) of the Trust Indenture Act of 1939, as amended. The registration or qualification of the Series 2024 Bonds and the Trust Agreement in accordance with applicable provisions of securities laws of the states, if any, in which the Series 2024 Bonds and the Trust Agreement have been registered or qualified, and the exemption from registration or qualification in other states, shall not be regarded as a recommendation thereof.

In making an investment decision, investors must rely on their own examination of the terms of the offering, including the merits and risks involved. These securities have not been recommended by any federal or state securities commission or regulatory authority. Furthermore, the foregoing authorities have not confirmed the accuracy or determined the adequacy of this document. Any representation to the contrary is a criminal offense.

All quotations from and summaries and explanations of laws and documents herein do not purport to be complete, and reference is made to such laws and documents for full and complete statements of their provisions. Any statements made in this Official Statement involving estimates or matters of opinion, whether or not expressly so stated, are intended merely as estimates or opinions and not as representations of fact. The information set forth herein has been obtained from the Authority and other sources that are deemed to be reliable, but is not guaranteed as to accuracy or completeness by, and is not to be construed as a representation of, the Underwriters. The information contained herein is subject to change after the date of this Official Statement, and this Official Statement speaks only as of the date hereof.

Certain statements contained in this Official Statement reflect forecasts and constitute forward-looking statements rather than historical facts. In this respect, the words "estimate," "project," "anticipate," "expect," "intend," "believe" and similar expressions are intended to identify forward-looking statements. All such forward-looking statements are expressly qualified by the cautionary statements set forth in this Official Statement.

References to web site addresses presented herein are for informational purposes only and may be in the form of a hyperlink solely for the reader's convenience. Unless specified otherwise, such web sites and the information or links contained therein are not incorporated into, and are not part of, this Official Statement for purposes of, and as that term is defined in, Rule 15c2-12 (as defined herein).

The Underwriters have provided the following sentence for inclusion in this Official Statement. The Underwriters have reviewed the information in this Official Statement in accordance with, and as part of, their responsibilities to investors under the federal securities laws as applied to the facts and circumstances of this transaction, but the Underwriters do not guarantee the accuracy or completeness of such information.

Assured Guaranty Municipal Corp. (the "2024 Bond Insurer") makes no representation regarding the Series 2024 Bonds or the advisability of investing in the Series 2024 Bonds. In addition, the 2024 Bond Insurer has not independently verified, makes no representation regarding, and does not accept any responsibility for the accuracy or completeness of this Official Statement or any information or disclosure contained herein, incorporated herein, or omitted herefrom, other than with respect to the accuracy of the information regarding the 2024 Bond Insurer supplied by the 2024 Bond Insurer and presented under the heading "BOND INSURANCE" and APPENDIX H – Specimen Municipal Bond Insurance Policy.

The Trustee has not reviewed or participated in the preparation of this Official Statement and assumes no responsibility for the contents, accuracy, fairness or completeness of the information given in this Official Statement or for the recitals contained in the Trust Agreement or for the validity, sufficiency, or legal effect of any of such documents. Furthermore, the Trustee has no oversight responsibility, and is not accountable, for the use or application by the Authority of the proceeds from the sale of the Series 2024 Bonds. The Trustee has no duty to, has not undertaken to evaluate, and has not evaluated, the risks, benefits, or propriety of any investment in the Series 2024 Bonds and makes no representation, and has reached no conclusions, regarding the investment quality of the Series 2024 Bonds, about all of which the Trustee expresses no opinion and expressly disclaims the expertise to evaluate.

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**OFFICIAL STATEMENT**

**concerning**

**$340,360,304.70**
**NORTH CAROLINA TURNPIKE AUTHORITY**
**Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024**

**consisting of**

**$304,575,000**
**Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A**

**$35,785,304.70**
**Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds)**

## INTRODUCTION

The purpose of this Official Statement, which includes the appendices, is to provide certain information in connection with the issuance by the North Carolina Turnpike Authority (the "Authority") of its $340,360,304.70 Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024, consisting of $304,575,000 Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A (the "Series 2024A Bonds") and $35,785,304.70 Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds) (the "Series 2024B Bonds" and, together with the Series 2024A Bonds, the "Series 2024 Bonds"). The Series 2024 Bonds will be issued pursuant to (i) applicable provisions of law, (ii) bond orders adopted by the Authority on October 31, 2023 (collectively, the "Bond Order"), (iii) an Amended and Restated Trust Agreement dated as of December 1, 2019 (the "Amended and Restated Trust Agreement"), which restated and compiled into a single document the Trust Agreement dated as of June 1, 2009 (the "Original Trust Agreement"), as supplemented by a First Supplemental Trust Agreement dated as of July 1, 2009 (the "First Supplemental Trust Agreement"), a Second Supplemental Trust Agreement dated as of March 1, 2017 (the "Second Supplemental Trust Agreement"), a Third Supplemental Trust Agreement dated as of December 1, 2018 (the "Third Supplemental Trust Agreement") and a Fourth Supplemental Trust Agreement dated as of December 1, 2019, as amended by a First Supplement to Fourth Supplemental Trust Agreement dated as of August 1, 2021 (the "Fourth Supplemental Trust Agreement"), between the Authority and Wells Fargo Bank, N.A., as trustee, and which was previously supplemented by a Fifth Supplemental Trust Agreement dated as of October 1, 2020, as amended by a First Supplement to Fifth Supplemental Trust Agreement dated as of August 1, 2021 (the "Fifth Supplemental Trust Agreement") and (iv) a Sixth Supplemental Trust Agreement dated as of January 1, 2024 (the "Sixth Supplemental Trust Agreement" and, together with the Amended and Restated Trust Agreement, the "Trust Agreement"), between the Authority and Computershare Trust Company, N.A., as successor trustee to Wells Fargo Bank, N.A. (the "Trustee").

This introduction provides certain limited information to serve as a guide to the Official Statement and is expressly qualified by the Official Statement as a whole. Investors should make a full review of the entire Official Statement and the documents summarized or described herein.

Forms of the Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement are attached hereto in APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement. Capitalized terms used herein and not otherwise defined have the meanings given such terms in the Trust Agreement unless otherwise indicated.

**Authorization**

The Series 2024 Bonds are being issued pursuant to Article 6H of Chapter 136 of the North Carolina General Statutes (Tolls Roads and Bridges), as amended (the "Authority Act") and The State and Local Government Revenue Bond Act, Article 5 of Chapter 159 of the General Statutes of North Carolina, as amended (the "Revenue Bond Act"), the Bond Order and the Trust Agreement.

**Security**

The Series 2024 Bonds will be special obligations of the Authority, secured by and payable from the Trust Estate which consists of: (i) the money and investment obligations in certain funds and accounts established by the Trust Agreement, including amounts on deposit in the Capitalized Interest Account, (ii) the Receipts of the Triangle Expressway System and the right to receive the same, (iii) the proceeds of any sale or disposition of assets of the Triangle Expressway System and (iv) any net insurance proceeds and net eminent domain proceeds. See "PLAN OF FINANCE" and "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2024 BONDS" herein.

**Purpose and Plan of Finance**

The Series 2024 Bonds are being issued for the purpose of providing funds, together with other available funds, to (a) pay certain costs of land acquisition for and design, construction and equipping of an extension of Complete 540 – Phase 2 (as hereinafter defined), (b) provide funds to pay interest on certain Series 2024 Bonds, (c) pay the premium for a Bond Insurance Policy issued by the 2024 Bond Insurer, (d) pay the premium for the Series 2024 Debt Service Reserve Policy in the amount of the increase in the Senior Lien Parity Reserve Account Requirement resulting from the issuance of the Series 2024 Bonds and (e) pay certain costs incurred in connection with the issuance of the Series 2024 Bonds.

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The previously issued revenue bonds which remain Outstanding under the Trust Agreement are:

| Series of Bonds | Initial Par Amount | Principal Currently Outstanding [1] |
|---|---|---|
| Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2009B (the "2009B Bonds")[2] | $35,173,108.85 | $95,335,518 |
| Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2017 (the "2017 Bonds") | 200,515,000 | 160,020,000 |
| Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2018 (the "2018 Bonds") | 401,155,000 | 393,920,000 |
| Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2019 (the "2019 Bonds") | 370,975,000 | 370,975,000 |
| Triangle Expressway System Revenue Bond, TIFIA Series 2021 (the "TIFIA Series 2021 Bond")[3] | 499,461,980 | 503,593,831 |
| Total | $1,507,280,088.85 | $1,523,844,349 |

[1] As of January 1, 2024.

[2] The 2009B Bonds are capital appreciation bonds. The value displayed represents the initial par amount and the accreted value calculated using the straight-line method.

[3] The TIFIA Series 2021 Bond evidences the Authority's obligation to repay a loan from the United States Department of Transportation, acting by and through the Executive Director of the Build America Bureau ("USDOT"), pursuant to a TIFIA Loan Agreement, dated as of August 5, 2021, between the Authority and USDOT (the "2021 TIFIA Loan Agreement") in an original principal amount not to exceed $499,461,980 (the "2021 TIFIA Loan"), pursuant to the Transportation Infrastructure Finance and Innovation Act of 1998 ("TIFIA"), to provide funds for the costs of the Complete 540 – Phase 1. Principal outstanding exceeds the initial par amount as accrued interest is included and repaid as additional principal.

In addition, the Authority previously issued its State Appropriation Revenue Bonds (as defined below), which are payable solely from State Appropriated Revenues (as described herein) and are not secured by Revenues or Receipts of the Triangle Expressway System under the Trust Agreement. See " FUNDING OF THE TRIANGLE EXPRESSWAY SYSTEM – State Appropriated Revenues; State Appropriation Bonds" herein.

**The Authority and the Triangle Expressway System**

See "THE AUTHORITY" herein for certain information regarding the Authority and "THE TRIANGLE EXPRESSWAY SYSTEM" herein for particular information regarding the Triangle Expressway System. The Initial Project (as defined herein) has been completed and is operating and Complete 540 – Phase 1 is expected to be completed on or about July 2024. See "THE TRIANGLE EXPRESSWAY SYSTEM – General." In addition, see "THE TRIANGLE EXPRESSWAY SYSTEM - Complete 540 – Phase 1 - Construction of Complete 540 – Phase 1" regarding a discussion on possible weather-related delays associated with the completion of Complete 540 – Phase 1.

***The Initial Project***

The proceeds of the 2009 Bonds (as defined herein) were used to pay a portion of the costs of land acquisition, design, construction and equipping of the initial segment of the Triangle Expressway System, which currently consists of an approximately 18.8-mile toll road facility located in Durham and Wake Counties, North Carolina (the "Initial Project"). A portion of the costs of the Initial Project were also paid from the proceeds of State Appropriation Revenue Bonds (see "FUNDING OF THE TRIANGLE EXPRESSWAY SYSTEM – State Appropriated Revenues; 2019 State Appropriation Revenue Bonds") and the Triangle Expressway Revenue Bond, TIFIA Series 2009.

***Complete 540 – Phase 1***

The proceeds of the 2019 Bonds, the 2019 State Appropriation Bonds, the 2020 BANs, and the 2021 TIFIA Loan were used to finance, in part, the costs of land acquisition, design, construction and equipping of the next phase of the Triangle Expressway System known as Complete 540 – Phase 1, consisting of the extension of the Triangle Expressway for approximately 17.8 miles from the NC 55 Bypass in Apex to I-40 ("Complete 540 – Phase 1"). Construction of Complete 540 – Phase 1 began in late 2019 and is expected to be completed on or around July 2024. See "THE TRIANGLE EXPRESSWAY SYSTEM - Complete 540 – Phase 1 - Construction of Complete 540 – Phase 1" regarding a discussion on possible weather-related delays.

***Complete 540 – Phase 2***

The final phase of the Triangle Expressway System consists of the remaining 10.2 miles from I-40 to I-87/US 64/US 264 and is identified in the State Transportation Improvement Program ("STIP") as R-2829A and R-2829B ("Complete 540 – Phase 2" and together with the Initial Project and Complete 540 – Phase 1, the "Triangle Expressway System"). The Authority expects to commence construction of Complete 540 – Phase 2 in mid-2024. The Authority and NCDOT have entered into two design-build contracts for the design and construction of Complete 540 – Phase 2. See "COMPLETE 540 – PHASE 2 – Construction of Complete 540 – Phase 2" for a discussion of each contractual arrangement and a description of each contract.

On October 5, 2022, the North Carolina Board of Transportation approved a resolution to advance funds for initial and early costs for Complete 540 – Phase 2, which will be reimbursed from Series 2024 Bond proceeds. Since the resolution's approval, construction costs to date, including design and engineering costs, development costs, and right-of-way acquisition, have been funded from funds provided by the North Carolina Department of Transportation ("NCDOT") as part of the State Transportation Improvement Program. Such costs are expected to be reimbursed from the proceeds of the Series 2024 Bonds or other sources described herein.

**Consultants Reports**

CDM Smith Inc. (the "Traffic Consultant") prepared a Triangle Expressway and Complete 540 Phases 1 & 2 Forecast Bringdown Letter dated September 29, 2023 (the "2023 Bringdown Letter") to update the comprehensive traffic and revenue study completed in January 2021 (the "2021 Study"). The 2023 Bringdown Letter and the 2021 Study are attached hereto as APPENDIX C, which forecasts the estimated traffic and toll revenue for the Triangle Expressway System, inclusive of Complete 540 – Phase 2.

HNTB Corporation, the General Engineering Consultant (the "GEC") has prepared the GEC's Report attached hereto as APPENDIX D, which, among other things, describes the location, construction cost estimates, construction schedule and operation and maintenance expense cost estimates for Complete 540 – Phase 2.

**Details of Bonds**

The Series 2024 Bonds will be dated the date of delivery thereof.

Interest on the Series 2024A Bonds will be payable on January 1 and July 1, beginning July 1, 2024, at the rates shown on the inside front cover.

Interest on the Series 2024B Bonds will not be paid currently, but will accrue from the date of issuance thereof and be paid at maturity. A purchaser of a Series 2024B Bond at the initial offering price set forth in this Official Statement on the date of issuance and who holds such Series 2024B Bond to maturity will receive at maturity an amount equal to such offering price plus accrued interest, compounded semi-annually on each January 1 and July 1 over the life of the Series 2024B Bond at the approximate yield to maturity shown in this Official Statement. The amount payable on the Series 2024B Bonds at any given time is referred to as the "Accreted Amount."

Principal of the Series 2024 Bonds will be payable, subject to prior redemption, as described herein, on January 1 in the years and amounts shown on the inside front cover.

The Series 2024 Bonds will be issued as fully registered bonds in book-entry-only form, without physical delivery of bond certificates to the beneficial owners of the Series 2024 Bonds. The Bond Registrar will make payment of principal of and interest on the Series 2024 Bonds to The Depository Trust Company, New York, New York ("DTC"), which will in turn remit such payment to its participants for subsequent distribution to the beneficial owners of the Series 2024 Bonds. Individual purchases of the Series 2024 Bonds by the beneficial owners will be made in denominations of $5,000 or whole multiples thereof. See APPENDIX G hereto for more information regarding DTC and the book-entry-only system.

The scheduled payment of principal of and interest on the Series 2024 Bonds (collectively, the "Insured Series 2024 Bonds") when due will be guaranteed under an insurance policy to be issued concurrently with the delivery of the Series 2024 Bonds by the 2024 Bond Insurer. In addition, the 2024 Bond Insurer will provide the Series 2024 Debt Service Reserve Policy in lieu of a cash deposit for the Senior Lien Parity Reserve Account. See "BOND INSURANCE."

See "THE SERIES 2024 BONDS."

**Tax Status**

See "TAX TREATMENT" herein.

**Professionals**

The Underwriters set forth on the cover page of this Official Statement (the "Underwriters") are underwriting the Series 2024 Bonds. Hunton Andrews Kurth LLP, Charlotte, North Carolina, is serving as Bond Counsel. McGuireWoods LLP, Raleigh, North Carolina, is serving as counsel to the Underwriters. Alan McInnes, an Assistant Attorney General for the State, is serving as counsel to the Authority. Computershare Trust Company, N.A., St. Paul, Minnesota, is serving as the Trustee and Bond Registrar. PFM Financial Advisors, LLC, Orlando, Florida, is acting as municipal advisor to the Authority in connection with the issuance of the Series 2024 Bonds.

## THE AUTHORITY

The Authority is a body politic and corporate and a public agency of the State of North Carolina (the "State") created pursuant to the Authority Act and exists within NCDOT. The Authority is authorized to design, establish, purchase, construct, operate, and maintain no more than eleven projects, including the Triangle Expressway System.

The Authority is governed by a nine-member Authority Board, consisting of four members appointed by the General Assembly of North Carolina (two members appointed by the President Pro-Tempore of the Senate and two members appointed by the Speaker of the House of Representatives), four members appointed by the Governor of the State, and the North Carolina Secretary of Transportation. The Chair of the Authority is selected by the Authority Board. Currently, Joseph R. Hopkins, the North Carolina Secretary of Transportation, serves as the Chairman of the Authority Board.

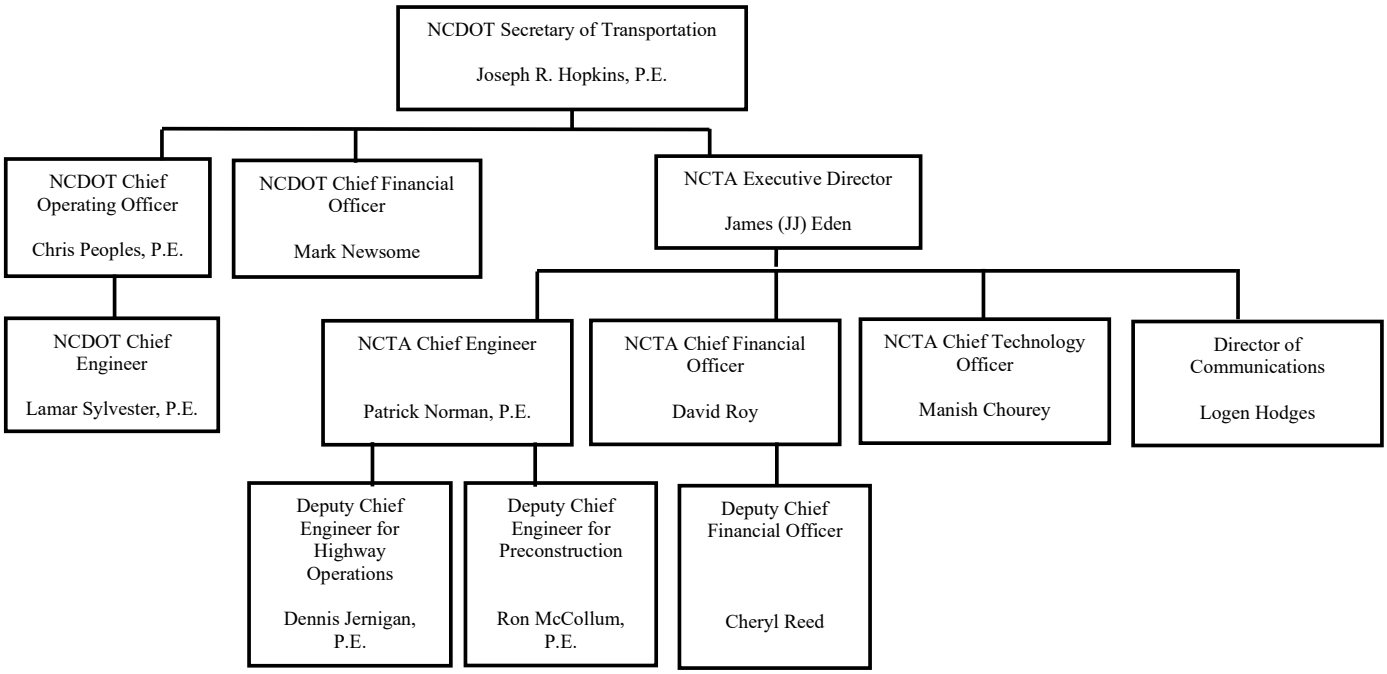
The following is a list of the current members of the Authority Board, their occupations and the expiration of their terms of office.

| Name | Occupation | Term Expires |
|---|---|---|
| Joseph R. Hopkins, P.E. | Secretary, NCDOT | Ex-Officio |
| James Walker | Attorney/Mediator | 2027 |
| Robert D. Teer, Jr. | President, Teer Associates | 2027 |
| John Adcock | Attorney | 2025 |
| Julie Eiselt | Retired; Prior mayor pro tem of the City of Charlotte, NC | 2027 |
| Dr. Pamela Gibson Senegal | President of Piedmont Community College | 2027 |
| Sam Hunt IV | President of Hunt Electric | 2024 |
| Montell W. Irvin | Retired, Former President and CEO, Ramey Kemp & Associates, Inc. | 2025* |
| Charles 'Chuck' L. Travis III | Former Mayor of the Town of Cornelius, NC | 2027* |

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* Updated since the Preliminary Official Statement dated January 4, 2024.

The Authority is part of NCDOT, and the executive leadership of both the Authority and NCDOT are involved in all Authority projects. The following organizational chart demonstrates the integration of various functions of NCDOT and the Authority.




The following are the current members of senior management of NCDOT and the Authority and summaries of their professional experience.

***Joseph R. Hopkins, P.E., Secretary, NCDOT***. Joseph Hopkins was appointed Secretary of NCDOT in October 2023 by the Governor. Mr. Hopkins is a registered professional engineer and has worked at NCDOT for more than 30 years in a variety of roles. Before being named Secretary of NCDOT, Mr. Hopkins served as NCDOT's chief operating officer. He has also served as deputy chief engineer and has held the roles of division engineer, deputy division engineer, division maintenance engineer and division operations engineer in Division 5. He was a member of NCDOT's Transformation Management Team and was instrumental in developing the strategic prioritization process, the forerunner of the strategic mobility formula. This data driven process is used to help prioritize transportation projects in North Carolina. Mr. Hopkins is a graduate of N.C. State University.

***Mark Newsome, Chief Financial Officer, NCDOT***. As Chief Financial Officer, Mark Newsome oversees the NCDOT's financial operations including accounting, budget, treasury, debt financing, forecasting and spend management. Mr. Newsome has worked in the public sector since the early 1990s. He served as the chief financial officer of the N.C. Department of Information Technology and as a controller and chief financial officer in North Carolina higher education and local government. Mr. Newsome has supported state and local governments across the southeast as a risk advisory consultant in public accounting. He came to NCDOT in June 2022 as the deputy chief financial officer of the Authority. Mr. Newsome earned a bachelor's degree in political science from Elon University and a master's degree in accounting from Liberty University.

***Chris Peoples, P.E., Chief Operating Officer, NCDOT***. Chris Peoples was appointed to Chief Operating Officer commencing October 1, 2023. As Chief Operating Officer, he directs and manages the

Division of Highways, Ferry Division, Aviation Division, Rail Division, the Integrated Mobility Division, Division of Planning & Programming, Human Resources and the Communications Office. Mr. Peoples is a registered professional engineer and has worked at NCDOT for more than 28 years in several field engineering positions, including state materials engineer and director of field support. He became Deputy Chief Engineer in 2019. In June 2022, he started his previously held role – Chief Engineer – directing the engineering and program activities of NCDOT's 14 highway divisions, Transportation Mobility and Safety Division, the Central Units and the Technical Services Division. In 1993, Mr. Peoples earned a bachelor of science degree in chemical engineering from N.C. State University.

***Lamar Sylvester, Chief Engineer, NCDOT***. Mr. Sylvester was appointed Chief Engineer commencing October 1, 2023. As Chief Engineer, he oversees and directs the engineering and program activities of NCDOT's 14 highway divisions, Transportation Mobility and Safety Division, the Central Units, and the Technical Services Division. Mr. Sylvester began his NCDOT career in June of 1995 as a transportation engineer associate and he served as an assistant resident and resident engineer in Division 5. Mr. Sylvester had a brief stint working for the City of Raleigh, North Carolina before returning to NCDOT as an airport project manager for the Division of Aviation. In 2005, Mr. Sylvester transferred to the Division of Highways where he held various positions including estimates and claims engineer in the Central Construction Unit, state roadway construction engineer and state construction engineer. In 2020, Mr. Sylvester joined the Chief Engineer's Office, serving in both the Director of Field Support and Deputy Chief Engineer roles. Mr. Sylvester received a bachelor of science degree in civil engineering from N.C. State University.

***James J. "J.J." Eden, Executive Director of the Authority***. James J. "J.J." Eden is the Executive Director of the Authority and is responsible for developing and implementing its strategic vision to address the combined effects of rapid growth, increasing congestion and funding challenges. Prior to serving as executive director of the Authority, Mr. Eden served as vice president and director of the National Tolling & Managed Lanes Division at AECOM. He also serves as president and chief executive officer of the nonprofit Alliance for Toll Interoperability. His previous experience also includes serving as the Authority's chief operating officer from 2006 to 2010, and as a founder of the Interagency Group, better known as the E-ZPass system. Mr. Eden began his career as assistant chief engineer at the Pennsylvania Turnpike Commission, where he designed multiple-award winning facilities and construction and maintenance procedures. He is an honorary member of the International Bridge, Tunnel & Turnpike Association.

***Patrick Norman, P.E., Chief Engineer of the Authority***. Patrick Norman serves as the Chief Engineer of the Authority. Mr. Norman has worked for NCDOT for 22 years and has served in several positions related to long-range planning and budgeting, asset management, operations, and most recently was the division engineer for Division 8. Mr. Norman is a licensed professional engineer and earned his bachelor's degree in civil engineering from N.C. State University.

***Dennis W. Jernigan, P.E., Deputy Chief Engineer for Highway Operations of the Authority***. Dennis Jernigan serves as the Authority's Deputy Chief Engineer for Highway Operations. Prior to his role, Mr. Jernigan served as the NCDOT Division 5 Construction Engineer. Mr. Jernigan has over 28 years of experience with NCDOT, including Roadway Construction Engineer for the Central Construction Unit, Division 4 Resident Engineer, and Assistant Resident Engineer in Divisions 6 and 8. Mr. Jernigan holds a bachelor's degree in civil engineering from N.C. State University, and is a licensed professional engineer and a certified public manager.

***Ron McCollum, P.E., Deputy Chief Engineer for Preconstruction of the Authority***. Ron McCollum services as the Authority's Deputy Chief Engineer for Preconstruction. As Deputy Chief Engineer for Preconstruction, he is responsible for the planning and procurement of Authority projects. Prior to his current role, Mr. McCollum served as NCDOT Design-Build Assistant Manager. Mr.

McCollum has over 28 years of experience with NCDOT, including Senior Airport Project Manager, Design-Build Project Engineer, and Roadway Design Project Engineer. Mr. McCollum earned a bachelor's degree in civil engineering from N.C. State University and is a licensed professional engineer.

***David Roy, Chief Financial Officer of the Authority***. David Roy serves as the Authority's Chief Financial Officer. Mr. Roy joined the Authority in 2013, and is responsible for all aspects of financial analysis, planning, and reporting for turnpike projects. Prior to joining the Authority, Mr. Roy spent seven years in investment banking with Credit Suisse, serving in various fixed income and valuation risk capacities. Mr. Roy is a native of Raleigh, North Carolina and received his undergraduate degree in business administration, with a second major in economics, from The University of North Carolina at Chapel Hill. He has also earned his master's degree in business administration from the University of Chicago, Booth School of Business.

***Cheryl Reed, Chief Financial Officer of the Authority***. Cheryl Reed serves as the Authority's Deputy Chief Financial Officer. Ms. Reed has over 25 years of state and local government experience in finance and budgeting. Most recently, Ms. Reed served as the chief financial officer and deputy chief financial officer for the N.C. Department of Information Technology. In addition, she worked as a senior level analyst with the Office of State Budget and Management, the Administrative Office of the Courts and local government entities. Ms. Reed earned a bachelor's degree in business administration from California State University, Sacramento, and a master's degree in public administration from N.C. State University.

***Manish Chourey, Chief Technology Officer of the Authority***. Manish Chourey serves as the Authority's Chief Technology Officer. Prior to joining the Authority, he was a senior director of system development at Conduent. Mr. Chourey has more than 25 years of experience in all phases of software development and technical solutions for tolling projects. He has bachelor's degrees in physics and applied technology and computer science from the University of Mumbai and has a master's degree in technology management from the University of Maryland Global Campus.

***Logen L. Hodges, Director of Communications & Marketing of the Authority***. Logen Hodges is the Director of Communications & Marketing for the Authority. He joined the Authority as an embedded consultant in 2018 before moving into the Director of Communications & Marketing position in 2021. During his time with the Authority, Mr. Hodges has worked on improving all aspects of the customer experience, public outreach program and marketing strategy. Mr. Hodges earned his undergraduate degree in political science from Liberty University.

The Authority Act authorizes the Authority to issue bonds pursuant to the Revenue Bond Act to finance the cost of the turnpike projects it undertakes, and to fix, revise, charge and collect tolls and fees for the use of the turnpike projects. The Triangle Expressway System was the first toll project financed by the Authority. In addition to the Triangle Expressway System, the Authority has completed the Monroe Expressway, an approximately 19.8-mile controlled access roadway including 18.1 miles of toll road in Mecklenburg and Union Counties, North Carolina (the "Monroe Expressway"), and is proceeding with plans for financing and constructing several additional toll road projects in the State. These projects consist of a network of express lanes along I-77, I-485 and US 74 in the Charlotte area, and the Mid-Currituck Bridge to connect the North Carolina Outer Banks to the mainland, each of which is at a different stage of development.

**Pursuant to North Carolina General Statute §136-89.188(a), revenues derived from any Authority project shall only be used for costs associated with such project and may not be cross-collateralized with other Authority projects; therefore, the revenues from each of the Triangle Expressway System and the Monroe Expressway are only used for their respective system.**

## THE SERIES 2024 BONDS

### Authorization

The issuance of the Series 2024 Bonds received the required approval of the North Carolina Local Government Commission (the "LGC") on December 5, 2023. The LGC is a division of the State Treasurer's office charged with general oversight of local government finance in North Carolina, as well as certain matters of finance by selected State agencies. Its approval is required for the issuance of the Series 2024 Bonds by the Authority. In determining whether to allow bonds to be issued under the Revenue Bond Act, the LGC has been given wide statutory discretion to consider the need for and feasibility of the projects to be financed, the issuing unit's capability to repay the amount financed from the pledged revenue sources and the issuer's general compliance with State budget and finance laws. Under the Revenue Bond Act, the LGC is also responsible, with the Authority's approval, for selling bonds issued pursuant to the Revenue Bond Act.

### General

The Series 2024 Bonds will be dated the date of delivery thereof and will bear interest from their date as described below. The Series 2024 Bonds will mature, subject to prior redemption as described below, on January 1 in the years and amounts shown on the inside front cover. The Series 2024 Bonds will be issued as fully registered bonds and will be subject to the provisions of the book-entry-only system described below. Individual purchases of the Series 2024 Bonds by the beneficial owners will be made in denominations of $5,000 or whole multiples thereof.

### Interest Rate Provisions of Series 2024 Bonds

#### *Series 2024A Bonds*

Interest on the Series 2024A Bonds will be payable on each January 1 and July 1, beginning July 1, 2024, at the rates shown on the inside front cover page hereof.

#### *Series 2024B Bonds*

Interest on the Series 2024B Bonds will not be paid currently but will accrue from the date of issuance thereof and be paid at maturity. A purchaser of a Series 2024B Bond at the initial offering price set forth in this Official Statement on the date of issuance and who holds such Series 2024B Bond to maturity will receive at maturity an amount equal to such offering price plus accrued interest, compounded semi-annually on each January 1 and July 1 over the life of the Series 2024B Bond at the approximate yield to maturity shown in this Official Statement. The amount payable on the Series 2024B Bonds at any given time is referred to as the "Accreted Amount."

APPENDIX A sets forth a Table of Accreted Amounts for the Series 2024B Bonds, which shows the Accreted Amounts of the Series 2024B Bonds on each January 1 and July 1, per $5,000 payable at maturity. Accreted Amounts at times between the dates shown in the table will be interpolated on a straight-line basis.

**Redemption Provisions**

***Optional Redemption***

The Series 2024A Bonds are subject to redemption prior to their respective maturities, at the option of the Authority, from any moneys that may be available for such purposes, either in whole or in part on any date on or after January 1, 2034, at a redemption price equal to 100% of the principal amount of Series 2024A Bonds to be redeemed, plus accrued interest to the date fixed for redemption.

The Series 2024B Bonds are subject to redemption prior to their respective maturities, at the option of the Authority, from any moneys that may be available for such purposes, either in whole or in part on any date on or after January 1, 2034, at a redemption price equal to 100% of the Accreted Amount of such Series 2024B Bonds to be redeemed.

***Sinking Fund Redemption***

The Series 2024A Bonds maturing on January 1, 2058, are subject to mandatory sinking fund redemption in part on each January 1 in the years and principal amounts set forth below, at a redemption price equal to the principal amount to be redeemed, plus accrued interest, if any, to the date fixed for redemption:

| Year | Amount |
|---|---|
| 2055 | $42,405,000 |
| 2056 | 66,690,000 |
| 2057 | 71,855,000 |
| 2058 | 77,335,000 |

* Maturity

***Redemption Provisions***

At least 30 days, but not more than 60 days, prior to the date fixed for redemption of any Series 2024 Bonds to be redeemed, whether such redemption be in whole or in part, the Bond Registrar will cause a notice of redemption to be mailed first-class, postage prepaid, to all Owners of Series 2024 Bonds to be redeemed in whole or in part; provided, however, that notice to any Securities Depository will be sent by registered or certified mail or by other means as is agreed upon by the Bond Registrar and the Securities Depository and provided further that failure to mail any such notice to any Owner or any defect in such notice shall not affect the validity of the proceedings for such redemption as to the Series 2024 Bonds of any other Owner to whom notice was properly given.

The Series 2024 Bonds shall be redeemed only in whole multiples of $5,000 principal amount, in the case of the Series 2024A Bonds, or maturity amount, in the case of the Series 2024B Bonds. If less than all of the Series 2024 Bonds or a Series thereof are called for redemption, the maturities or portions of maturities of Series 2024 Bonds to be redeemed will be as set forth in an Officer's Certificate of the Authority filed with the Trustee. If less than all of a maturity of the Series 2024 Bonds of a Series are called for redemption, and the Series 2024 Bonds are not held in book-entry only form, the Bond Registrar will effect the redemption of the Series 2024 Bonds of such maturity on a pro-rata basis among registered owners, subject to $5,000 minimum denomination requirements, using such method as the Trustee deems fair and appropriate. If the Series 2024 Bonds are held in book-entry only form, and less than all of a maturity of the Series 2024 Bonds of a Series are to be called for redemption, the particular Series 2024 Bonds or portions thereof to be redeemed will be selected by lot in accordance with the procedures of the

Securities Depository. If a portion of a Series 2024 Bond is called for redemption, a new Series 2024 Bond of the same Series and maturity, in principal amount, in the case of the Series 2024A Bonds, or maturity amount, in the case of the Series 2024B Bonds, equal to the unredeemed portion thereof, will be issued to the Owner upon surrender thereof.

Upon giving notice and depositing funds or securities with the Trustee or the Bond Registrar as provided in the Trust Agreement, the Series 2024 Bonds or portions thereof so called for redemption shall become due and payable on the redemption date, and interest on such Series 2024 Bonds or portions thereof shall cease to accrue from and after such date.

Any notice of optional redemption may state that the redemption to be effected is conditioned upon the receipt by the Trustee or Bond Registrar on or prior to the redemption date of moneys sufficient to pay the principal of and premium, if any, and interest on the Series 2024 Bonds to be redeemed and that if such moneys are not so received such notice shall be of no force or effect and such Series 2024 Bonds shall not be required to be redeemed. In the event that such notice contains such a condition and moneys sufficient to pay the principal of and interest on such Series 2024 Bonds are not received by the Trustee or Bond Registrar on or prior to the redemption date, the redemption will not be made and the Bond Registrar will within a reasonable time thereafter give notice, in the manner in which the notice of redemption was given, that such moneys were not so received.

**Book-Entry-Only**

The Series 2024 Bonds will be issued as fully registered bonds in book-entry-only form without physical delivery of bonds to the beneficial owners of the Series 2024 Bonds. The Trustee will make payments of principal of and interest on the Series 2024 Bonds to DTC, which will in turn remit such payments to DTC participants for subsequent distribution to the beneficial owners of the Series 2024 Bonds. See APPENDIX G hereto for more information regarding DTC and the book-entry-only system.

## PLAN OF FINANCE

Pursuant to the Trust Agreement, the proceeds of the Series 2024 Bonds will be applied to (a) pay a portion of the costs of land acquisition, design, construction and equipping of the next phase of the Triangle Expressway System known as Complete 540 – Phase 2, consisting of the extension of the Triangle Expressway from I-40 to I-87/US 64/US 264, (b) provide funds to pay certain interest on the Series 2024A Bonds, (c) pay the premium for the Bond Insurance Policy issued by the 2024 Bond Insurer with respect to [certain maturities of] the Series 2024 Bonds, (d) pay the premium for the Series 2024 Debt Service Reserve Policy in the amount of the increase in the Senior Lien Parity Reserve Account Requirement resulting from the issuance of the Series 2024 Bonds, and (e) pay certain costs incurred in connection with the issuance of the Series 2024 Bonds.

See "COMPLETE 540 – PHASE 2" for additional discussion of Complete 540 – Phase 2.

**THE CLOSING OF THE SERIES 2024 BONDS IS CONDITIONED ON THE CLOSING OF THE 2024 TIFIA LOAN ON OR BEFORE THE CLOSING OF THE SERIES 2024 BONDS. IF FOR ANY REASON THE 2024 TIFIA LOAN IS NOT ABLE TO CLOSE ON OR BEFORE THE CLOSING DATE FOR THE SERIES 2024 BONDS, THE SERIES 2024 BONDS WILL NOT CLOSE.**

**ESTIMATED SOURCES AND USES OF SERIES 2024 BOND PROCEEDS**

| | |
|---|---|
| Sources: | |
| Par Amount of the Series 2024 Bonds | $340,360,305 |
| Original Issue Premium | 19,027,895 |
| Total Sources | $359,388,200 |
| | |
| Uses: | |
| Costs of Complete 540 – Phase 2 | $287,827,395 |
| Costs of Issuance[1] | 7,447,851 |
| Capitalized Interest | 64,112,954 |
| Total Uses | $359,388,200 |

Note: Totals may not foot due to rounding.

[1] Includes legal fees, underwriters' discount, premium for the Bond Insurance Policy, premium for the Series 2024 Debt Service Reserve Policy, rating agency fees, fees and expenses of the Trustee and municipal advisor, and miscellaneous fees and expenses.

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## ESTIMATED COMPLETE 540 – PHASE 2 SOURCES AND USES OF FUNDS

| | FY 2024 [1] | FY 2025 | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Total |
|---|---|---|---|---|---|---|---|
| Sources: [2] | | | | | | | |
| Net Proceeds of Series 2024 Bonds | $219,544,702 | $139,843,498 | - | - | - | - | $359,388,200 |
| 2024 TIFIA Loan | - | 106,559,278 | $121,523,023 | $74,021,764 | $79,709,853 | $35,379,553 | 417,193,471 |
| NCDOT Funds | 7,385,260 | - | 112,100,000 | 120,000,000 | 118,000,000 | 49,900,000 | 407,385,260 |
| Total Sources | $226,929,962 | $246,402,776 | $233,623,023 | $194,021,764 | $197,709,853 | $85,279,553 | $1,183,966,931 |
| Uses: | | | | | | | |
| Costs of Complete 540 – Phase 2 | $147,983,897 | $246,402,776 | $233,623,023 | $194,021,764 | $197,709,853 | $85,279,553 | $1,105,020,866 |
| Costs of Issuance [3] | 7,830,851 | - | - | - | - | - | 7,830,851 |
| Series 2024 Subaccount of the Capitalized Interest Account | 64,112,954 | - | - | - | - | - | 64,112,954 |
| Junior Indebtedness Parity Reserve Account – Reserve Policy Premium | 7,002,260 | - | - | - | - | - | 7,002,260 |
| Total Uses | $226,929,962 | $246,402,776 | $233,623,023 | $194,021,764 | $197,709,853 | $85,279,553 | $1,183,966,931 |

Note: Totals may not foot due to rounding.

[1] Includes reimbursement for costs of Complete 540 – Phase 2 paid prior to FY 2024.

[2] Does not include investment earnings.

[3] Includes legal fees, underwriters' discount, premium for the Bond Insurance Policy, premium for the Series 2024 Debt Service Reserve Policy, rating agency fees, fees and expenses of the Trustee and municipal advisor, and miscellaneous fees and expenses.

## ANNUAL DEBT SERVICE REQUIREMENTS

The following table sets forth for each Fiscal Year ending June 30, the amounts required for the payment of debt service on the Senior Lien Bonds currently Outstanding under the Trust Agreement, the Series 2024 Bonds and the TIFIA Series 2024 Bond.

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| Fiscal Year Ending June 30,[3] | Current Outstanding Senior Lien Indebtedness [2] | | Series 2024A Bonds | | | Series 2024B Bonds | | Total Senior Lien Indebtedness | | TIFIA Series 2021 Bond | | TIFIA Series 2024 Bond [1] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Principal | Interest | Principal | Interest | Capitalized Interest | Initial Principal | Compounded Interest | Principal | Interest | Principal[4] | Interest | Principal[3] | Interest | Total Debt Service |
| 2024 | $17,170,000 | $29,467,062 | - | $6,387,615 | $(6,387,615) | - | - | $17,170,000 | $29,467,062 | - | - | - | - | $46,637,062 |
| 2025 | 18,965,000 | 42,002,219 | - | 15,228,750 | (15,228,750) | - | - | 18,965,000 | 42,002,219 | - | - | - | - | 60,967,219 |
| 2026 | 21,340,000 | 40,994,594 | - | 15,228,750 | (15,228,750) | - | - | 21,340,000 | 40,994,594 | - | $4,789,792 | - | - | 67,124,386 |
| 2027 | 23,995,000 | 39,861,219 | - | 15,228,750 | (15,228,750) | - | - | 23,995,000 | 39,861,219 | - | 5,634,731 | - | - | 69,490,949 |
| 2028 | 26,865,000 | 38,589,719 | - | 15,228,750 | (15,228,750) | - | - | 26,865,000 | 38,589,719 | - | 7,378,265 | - | - | 72,832,983 |
| 2029 | 26,600,000 | 37,319,422 | - | 15,228,750 | - | - | - | 26,600,000 | 52,548,172 | $500,000 | 9,760,015 | - | - | 89,408,187 |
| 2030 | 32,255,000 | 36,024,875 | - | 15,228,750 | - | - | - | 32,255,000 | 51,253,625 | 500,000 | 9,750,865 | - | - | 93,759,490 |
| 2031 | 35,650,000 | 34,480,125 | - | 15,228,750 | - | - | - | 35,650,000 | 49,708,875 | 500,000 | 9,741,715 | - | - | 95,600,590 |
| 2032 | 39,470,000 | 32,686,375 | - | 15,228,750 | - | - | - | 39,470,000 | 47,915,125 | 500,000 | 9,732,558 | - | - | 97,617,683 |
| 2033 | 48,795,000 | 31,322,125 | - | 15,228,750 | - | - | - | 48,795,000 | 46,550,875 | 500,000 | 9,723,415 | - | - | 105,569,290 |
| 2034 | 53,400,000 | 30,407,625 | - | 15,228,750 | - | - | - | 53,400,000 | 45,636,375 | 500,000 | 9,714,265 | - | $13,726,226 | 122,976,866 |
| 2035 | 57,590,000 | 29,353,625 | - | 15,228,750 | - | - | - | 57,590,000 | 44,582,375 | 500,000 | 9,705,115 | - | 14,057,632 | 126,435,122 |
| 2036 | 61,805,000 | 28,170,000 | - | 15,228,750 | - | - | - | 61,805,000 | 43,398,750 | 1,000,000 | 9,693,683 | - | 14,397,043 | 130,294,476 |
| 2037 | 65,845,000 | 26,994,950 | - | 15,228,750 | - | - | - | 65,845,000 | 42,223,700 | 1,000,000 | 9,675,396 | - | 22,051,012 | 140,795,108 |
| 2038 | 60,490,000 | 25,533,650 | - | 15,228,750 | - | - | - | 60,490,000 | 40,762,400 | 1,000,000 | 9,657,096 | - | 22,316,418 | 134,225,914 |
| 2039 | 63,655,000 | 23,247,850 | - | 15,228,750 | - | - | - | 63,655,000 | 38,476,600 | 1,000,000 | 9,638,796 | - | 30,023,294 | 142,793,690 |
| 2040 | 56,855,000 | 20,451,675 | - | 15,228,750 | - | - | - | 56,855,000 | 35,680,425 | 1,000,000 | 9,620,483 | - | 30,023,294 | 133,179,202 |
| 2041 | 49,030,000 | 18,049,700 | - | 15,228,750 | - | - | - | 49,030,000 | 33,278,450 | 19,630,451 | 9,602,196 | - | 30,023,294 | 141,564,390 |
| 2042 | 23,030,000 | 16,723,650 | - | 15,228,750 | - | - | - | 23,030,000 | 31,952,400 | 38,706,595 | 9,073,006 | - | 30,023,294 | 132,785,294 |
| 2043 | 25,600,000 | 15,738,200 | - | 15,228,750 | - | - | - | 25,600,000 | 30,966,950 | 39,418,166 | 8,361,434 | - | 30,023,294 | 134,369,844 |
| 2044 | 28,760,000 | 14,379,200 | - | 15,228,750 | - | - | - | 28,760,000 | 29,607,950 | 40,143,419 | 7,636,181 | - | 30,023,294 | 136,170,844 |
| 2045 | 32,105,000 | 12,857,575 | - | 15,228,750 | - | - | - | 32,105,000 | 28,086,325 | 40,880,804 | 6,898,797 | - | 30,023,294 | 137,994,219 |
| 2046 | 35,300,000 | 11,172,450 | - | 15,228,750 | - | - | - | 35,300,000 | 26,401,200 | 41,632,345 | 6,147,256 | - | 30,023,294 | 139,504,094 |
| 2047 | 38,270,000 | 9,333,200 | - | 15,228,750 | - | - | - | 38,270,000 | 24,561,950 | 42,397,702 | 5,381,898 | - | 30,023,294 | 140,634,844 |
| 2048 | 41,360,000 | 7,342,450 | - | 15,228,750 | - | - | - | 41,360,000 | 22,571,200 | 43,177,731 | 4,601,870 | - | 30,023,294 | 141,734,094 |
| 2049 | 44,645,000 | 5,192,325 | - | 15,228,750 | - | - | - | 44,645,000 | 20,421,075 | 43,970,896 | 3,808,704 | - | 30,023,294 | 142,868,969 |
| 2050 | 14,250,000 | 3,791,200 | - | 15,228,750 | - | $9,669,547 | $24,070,453 | 23,919,547 | 43,090,403 | 19,209,805 | 3,115,850 | $25,087,493 | 29,731,132 | 144,154,231 |
| 2051 | 15,275,000 | 3,200,700 | - | 15,228,750 | - | 9,480,890 | 25,509,110 | 24,755,890 | 43,938,560 | 19,562,953 | 2,762,702 | 26,306,142 | 28,512,483 | 145,838,731 |
| 2052 | 16,360,000 | 2,568,000 | - | 15,228,750 | - | 9,264,084 | 26,920,916 | 25,624,084 | 44,717,666 | 19,922,874 | 2,402,782 | 27,585,788 | 27,232,837 | 147,486,031 |
| 2053 | 17,485,000 | 1,891,100 | 7,190,000 | 15,049,000 | - | 7,370,784 | 23,029,216 | 32,045,784 | 39,969,316 | 20,288,849 | 2,036,806 | 28,923,994 | 25,894,631 | 149,159,381 |
| 2054 | 18,645,000 | 1,168,500 | 39,100,000 | 13,891,750 | - | - | - | 57,745,000 | 15,060,250 | 20,661,834 | 1,663,822 | 30,329,005 | 24,489,620 | 149,949,531 |
| 2055 | 19,890,000 | 397,800 | 42,405,000 | 11,854,125 | - | - | - | 62,295,000 | 12,251,925 | 21,041,675 | 1,283,980 | 31,802,266 | 23,016,359 | 151,691,206 |
| 2056 | - | - | 66,690,000 | 9,126,750 | - | - | - | 66,690,000 | 9,126,750 | 21,428,780 | 896,875 | 33,348,894 | 21,469,732 | 152,961,031 |
| 2057 | - | - | 71,855,000 | 5,663,125 | - | - | - | 71,855,000 | 5,663,125 | 21,822,440 | 503,216 | 34,967,046 | 19,851,579 | 154,662,406 |
| 2058 | - | - | 77,335,000 | 1,933,375 | - | - | - | 77,335,000 | 1,933,375 | 11,060,790 | 102,038 | 47,828,432 | 18,153,021 | 156,412,656 |
| 2059 | - | - | - | - | - | - | - | - | - | - | - | 61,580,277 | 15,564,003 | 77,144,281 |
| 2060 | - | - | - | - | - | - | - | - | - | - | - | 64,574,142 | 12,570,138 | 77,144,281 |
| 2061 | - | - | - | - | - | - | - | - | - | - | - | 67,708,349 | 9,435,931 | 77,144,281 |
| 2062 | - | - | - | - | - | - | - | - | - | - | - | 70,997,347 | 6,146,933 | 77,144,281 |
| 2063 | - | - | - | - | - | - | - | - | - | - | - | 74,446,112 | 2,698,169 | 77,144,280 |
| Total | $1,130,750,000 | $670,713,159 | $304,575,000 | $490,310,740 | $(67,302,615) | $35,785,305 | $99,529,695 | $1,471,110,305 | $1,193,250,979 | $533,458,107 | $210,495,601 | $625,485,286 | $681,571,133 | $4,715,371,412 |

Note: Amounts may not total due to rounding.

[1] Estimated based on an interest rate of 4.80%, subject to change.

[2] Interest for fiscal year 2024 is net of a transfer from the General Reserve Fund to the appropriate Interest Account of the Senior Lien Debt Service Fund for the purpose of paying a portion of interest due on the 2017 Bonds and the 2018 Bonds on January 1, 2024.

[3] July 1 principal payments are included in the prior fiscal year reflecting the timing of debt service fund deposits.

[4] Principal repayments exceed initial principal amounts because accreted interest on the loan is included and repaid as additional principal.

## SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2024 BONDS

### General

The Series 2024 Bonds will be special obligations of the Authority, secured by and payable from the Receipts of the Triangle Expressway System and, under certain circumstances, proceeds of the Series 2024 Bonds, including investment earnings and certain net insurance and other funds.

**The principal of and interest on the Series 2024 Bonds shall not be payable from the general funds of the Authority, nor shall they constitute a legal or equitable pledge, charge, lien, or encumbrance upon any of its property or upon any of its income, receipts, or revenues, except the Receipts and other funds which are pledged under the Bond Order and the Trust Agreement. Neither the credit nor the taxing power of the State or any instrumentality thereof are pledged for the payment of the principal or interest of the Series 2024 Bonds, and no Owner of Series 2024 Bonds has the right to compel the exercise of the taxing power by the State or any instrumentality thereof or the forfeiture of any of its property other than Receipts in connection with any default thereon. Acceleration is not a remedy available to Owners of the Series 2024 Bonds. The Authority has no taxing power.**

As described below under "Application of Receipts," the payment of Operations and Maintenance Expenses of the Triangle Expressway System are payable from Receipts after the payment of debt service on Senior Indebtedness, Subordinated Indebtedness, if any, Junior Indebtedness (including TIFIA Indebtedness), and the funding of certain reserves. As such, the Series 2024 Bonds and other Senior Lien Indebtedness are secured by a "gross revenue" pledge of the Receipts of the Triangle Expressway System.

### Pledge of Receipts

The Receipts of the Triangle Expressway System are pledged to the payment of, and as security for (a) any Senior Lien Parity Debt, Subordinate Lien Parity Debt and Junior Indebtedness (including TIFIA Indebtedness) and (b) any Senior Lien Derivative Agreement Regularly Scheduled Payments and Subordinate Lien Derivative Agreement Regularly Scheduled Payments incurred pursuant to the Trust Agreement.

The term "Receipts" for any particular period means all receipts, revenues, income, proceeds and money received in any period by or for the Authority in respect of the Triangle Expressway System, including all toll revenues, payments, proceeds, fees, charges, rents and all other income derived by or for the Authority from the ownership and operation of the Triangle Expressway System, and all other income derived by the Authority from the operation or ownership of the Triangle Expressway System, the proceeds of use and occupancy or business interruption insurance and amounts received as liquidated damages under contracts for construction of the Triangle Expressway System and the portion of the State Appropriated Revenues transferred to the Revenue Fund from the State Appropriation Revenue Bonds Trust Agreement. See APPENDIX B hereto for a complete definition of Receipts.

### Senior Lien Parity Reserve Account

The Trust Agreement creates a special account of the Senior Lien Debt Service Fund designated the Senior Lien Parity Reserve Account. Each Senior Lien Resolution providing for the issuance or incurrence of Senior Lien Indebtedness may provide that the Senior Lien Indebtedness authorized thereby will be secured by the Senior Lien Parity Reserve Account. If any Senior Lien Indebtedness is secured by the Senior Lien Parity Reserve Account, the Authority must fund the Senior Lien Parity Reserve Account in an amount equal to the Senior Lien Parity Reserve Account Requirement at the time of delivery and

payment for such Senior Lien Indebtedness. If the Senior Lien Resolution authorizing Senior Lien Indebtedness does not provide that such Senior Lien Indebtedness will be secured by the Senior Lien Parity Reserve Account, such Senior Lien Indebtedness will have no claim on the Senior Lien Parity Reserve Account.

The Series 2024 Bonds will be secured by the Senior Lien Parity Reserve Account. Following the issuance of the Series 2024 Bonds, and the effectiveness of the Sixth Supplemental Trust Agreement, the amount required to be on deposit in the Senior Lien Parity Reserve Account will be $49,183,907, which is equal to 50% of the least of (i) the Maximum Long-Term Debt Service Requirement for all Senior Lien Bonds and Senior Lien Parity Debt secured by the Senior Lien Parity Reserve Account, (ii) 125% of the average annual Long-Term Debt Service Requirement for all Senior Lien Bonds and Senior Lien Parity Debt secured by the Senior Lien Parity Reserve Account and (iii) 10% of the stated principal amount of all Senior Lien Bonds and Senior Lien Parity Debt secured by the Senior Lien Parity Reserve Account (the "Senior Lien Parity Reserve Account Requirement"). The Senior Lien Parity Reserve Account Requirement will be satisfied by the Series 2024 Debt Service Reserve Policy issued by the 2024 Bond Insurer. Moneys on deposit in the Senior Lien Parity Reserve Account (or provided under a Reserve Alternative Instrument) will be used as necessary to pay the principal of and interest on all Senior Lien Indebtedness secured by the Senior Lien Parity Reserve Account to the extent that moneys on deposit in the Senior Lien Debt Service Fund and Accounts thereof for such payment are insufficient therefor. See APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement for a more detailed description of the Senior Lien Parity Reserve Account Requirement.

The Authority has purchased the Series 2024 Debt Service Reserve Policy from the 2024 Bond Insurer in an amount equal to the Senior Lien Parity Reserve Account Requirement for all Outstanding Senior Lien Bonds, including the Series 2024 Bonds, which will be deposited in the Senior Lien Parity Reserve Account, and secures all of the Senior Lien Indebtedness.

A Senior Lien Resolution authorizing Senior Lien Indebtedness may also provide for the creation of a Senior Lien Special Reserve Account to be maintained by the Trustee or a Depositary that will secure only the Senior Lien Indebtedness authorized by such Senior Lien Resolution. The Series 2024 Bonds will not be secured by a Senior Lien Special Reserve Account.

**Other Funds and Accounts**

***Revenue Fund***

The Revenue Fund is held by the Trustee. The Authority will deposit all Receipts as received in the Revenue Fund for application as hereinafter described.

***Senior Lien Debt Service Fund***

The Senior Lien Debt Service Fund is held by the Trustee and is composed of seven separate accounts, consisting of the Capitalized Interest Account, the Interest Account, the Principal Account, the Sinking Fund Account, the Redemption Account, the Senior Lien Parity Reserve Account and the Hedging Acquisition Account. Each Supplemental Agreement authorizing a Series of Bonds will provide for the creation, to the extent applicable, of separate subaccounts within the Capitalized Interest Account, the Interest Account, the Principal Account, the Sinking Fund Account and the Redemption Account relating to the Series of Senior Lien Bonds authorized by such Supplemental Agreement. Upon the occurrence of a Bankruptcy Related Event, the TIFIA Interest Account, the TIFIA Principal Account and the TIFIA Debt Service Reserve Account will be moved to the Senior Lien Debt Service Fund.

***Subordinate Lien Debt Service Fund***

In addition to the Senior Lien Debt Service Fund, the Trust Agreement creates a Subordinate Lien Debt Service Fund, which is held by the Trustee and is composed of six separate accounts, consisting of the Capitalized Interest Account, the Interest Account, the Principal Account, the Sinking Fund Account, the Redemption Account and the Subordinate Lien Parity Reserve Account. The deposit to such Fund from Receipts is subordinate to the deposits required to be made to the Senior Lien Debt Service Fund.

***Junior Indebtedness Debt Service Fund***

The Junior Indebtedness Debt Service Fund is composed of six separate accounts, consisting of the Interest Account, the Principal Account, the Junior Indebtedness Debt Service Reserve Account, the TIFIA Interest Account, the TIFIA Principal Account and the TIFIA Debt Service Reserve Account; provided that, if a Bankruptcy Related Event has occurred, the TIFIA Interest Account, the TIFIA Principal Account and the TIFIA Debt Service Reserve Account shall be moved from the Junior Indebtedness Debt Service Fund to the Senior Lien Debt Service Fund. Any deposit to such Fund from Receipts is subordinate to the deposits required to be made to the Senior Lien Debt Service Fund and the Subordinate Lien Debt Service Fund.

The TIFIA Debt Service Reserve Account Requirement is expected to be satisfied by the TIFIA Debt Service Reserve Policy to be issued by the 2024 Bond Insurer. The TIFIA Debt Service Reserve Policy will secure the TIFIA Series 2024 Bond and the TIFIA Series 2021 Bond (collectively, the "TIFIA Bonds"). The TIFIA Debt Service Reserve Policy will be issued in an amount sufficient to satisfy the maximum TIFIA Debt Service Reserve Account Requirement for the life of the TIFIA Series 2024 Bond and TIFIA Series 2021 Bond. The maximum requirement, as of the date of this Official Statement, is estimated to be $77,802,894. The TIFIA Debt Service Reserve Account Requirement means, as of the later of (a) the Substantial Completion Date or (b) the date of the final disbursement of the loans associated with the TIFIA Bonds and thereafter, the least of (i) ten percent (10%) of the issuance amount of the TIFIA Bonds, (ii) the Maximum Debt Service Requirement for the TIFIA Bonds, or (iii) one hundred twenty-five percent (125%) of the average annual TIFIA Debt Service through the Final Maturity Date.

"Final Maturity Date" means the earlier of (a) the semi-annual payment date (January 1 or July 1) occurring on or immediately prior to the thirty-fifth ($35^{th}$) anniversary of the Substantial Completion Date and (b) July 1, 2064.

"Maximum Debt Service Requirement" means (a) in the case of Senior Lien Indebtedness, the highest aggregate amount of senior debt service (including TIFIA Debt Service if a Bankruptcy Related Event has occurred) for the present or any succeeding Fiscal Year, (b) in the case of Subordinate Lien Indebtedness, the highest aggregate amount of subordinate debt service for the present or any succeeding Fiscal Year and (c) in the case of Junior Indebtedness, the highest aggregate amount of Junior Indebtedness debt service (including, if no Bankruptcy Related Event has occurred, the highest aggregate amount of TIFIA Debt Service) for the present or any succeeding Fiscal Year.

***Hedging Acquisition Account***

The Trust Agreement creates a special account designated the Hedging Acquisition Account, which requires that certain deposits be made to such account in the event the Authority issues variable interest rate bonds and enters into a hedging arrangement in connection therewith. The purpose of the Hedging Acquisition Account is to assure that funds are available to pay the termination payments the Authority might be required to pay if such hedge were terminated. The Authority has no present plans to issue variable interest rate bonds under the Trust Agreement.

***Operations and Maintenance Expense Fund***

The Operations and Maintenance Expense Fund is held by the Trustee. Moneys held for the credit of the Operations and Maintenance Expense Fund are to be used only to pay all or a portion of the cost of any Operating Expenses of the Triangle Expressway System.

***Operating Reserve Fund***

The Operating Reserve Fund is held by the Trustee. Moneys held for the credit of the Operating Reserve Fund shall be used to pay all or a portion of the cost of any Operating Expenses or as provided in the Capital Improvements Budget to the extent that funds in the Operating and Maintenance Expense Fund are insufficient for such purpose. Any amounts received from NCDOT under its Operations and Maintenance Expense Guaranty Agreement are deposited to the Operating Reserve Fund.

***Renewal and Replacement Fund***

Moneys held for the credit of the Renewal and Replacement Fund are to be used to pay all or a portion of the cost of unusual or extraordinary maintenance, repairs, renewals or replacements or capital improvements related to the Triangle Expressway System. Any funds provided by NCDOT pursuant to the NCDOT Renewal and Replacement Guaranty may only be used for such purposes. In the Authority's sole discretion, amounts on deposit in the Renewal and Replacement Fund from sources other than the NCDOT Renewal and Replacement Guaranty may be used (i) to make deposits to the appropriate subaccounts in the Interest Account, the Principal Account and the Sinking Fund Account of the Senior Lien Debt Service Fund or the Subordinate Lien Debt Service Fund or the Junior Indebtedness Debt Service Fund (including the TIFIA Interest Account and the TIFIA Principal Account) to remedy any deficiency therein, (ii) to make any required deposits or pay interest on or the Principal of or amortization requirements in respect of any Senior Lien Parity Debt or Subordinate Lien Parity Debt when due or (iii) to make any Senior Lien Derivative Agreement Regularly Scheduled Payments or Subordinate Lien Derivative Agreement Regularly Scheduled Payments when due, whenever moneys are insufficient for such purpose. In addition, following an Event of Default, amounts in the Renewal and Replacement Fund (other than amounts provided by NCDOT) shall be used to remedy such default.

***Insurance and Condemnation Award Fund***

In the event needed, the Insurance and Condemnation Award Fund will be held by the Trustee. Under certain circumstances described in the Trust Agreement, Net Insurance Proceeds and Net Eminent Domain Proceeds are required to be deposited by the Authority in the Insurance and Condemnation Award Fund. Moneys held in the Insurance and Condemnation Award Fund will be disbursed to repair or replace the Triangle Expressway System or to pay or redeem Bonds and Parity Debt, in the manner set forth in the Trust Agreement.

***General Reserve Fund***

Under the Trust Agreement, the TIFIA 2024 Loan Agreement and the TIFIA 2021 Loan Agreement, there are two accounts within the General Reserve Fund, the Restricted Account and the Unrestricted Account. The TIFIA 2024 Loan Agreement and the TIFIA 2021 Loan Agreement place certain restrictions on the use of funds in both the Restricted Account and the Unrestricted Account of the General Reserve Fund. Subject to such restrictions, funds in the Unrestricted Account may be used for any lawful purpose of the Authority, including payment of Operating Expenses, payment for capital improvements, repayment to NCDOT of any amount owed under the NCDOT O&M Guaranty or the NCDOT Renewal and Replacement Guaranty, and funding of Non-System Projects. See "The Amended and Restated Trust

Agreement – General Reserve Fund" in APPENDIX B –Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement.

**Application of Receipts**

The Trust Agreement provides that on the last Business Day of each month, the Trustee shall withdraw all Receipts and other amounts held in the Revenue Fund and apply the same in the following manner and order (see "The Trust Agreement – Application of Receipts" in APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement hereto for a more detailed description of the application of the Receipts):

(a) to the Interest Account (and the TIFIA Interest Account if a Bankruptcy Related Event has occurred) of the Senior Lien Debt Service Fund and to any other Persons entitled thereto as the holder of Senior Lien Parity Debt the amount (in equal monthly deposits) needed to pay interest payable on Senior Lien Bonds (including TIFIA Indebtedness if a Bankruptcy Related Event has occurred) and other Senior Lien Parity Debt on the next Interest Payment Date (if such Interest Payment Date is within seven months of such deposit);

(b) to the Principal Account and the Sinking Fund Account (and the TIFIA Principal Account if a Bankruptcy Related Event has occurred) of the Senior Lien Debt Service Fund and to any other Persons entitled thereto as the holder of Senior Lien Parity Debt the amount (in equal monthly deposits) needed to pay the Principal payable on Senior Lien Bonds (including TIFIA Indebtedness if a Bankruptcy Related Event has occurred) and any other Senior Lien Parity Debt on the next Principal Payment Date for each such Senior Lien Bonds or Senior Lien Parity Debt;

(c) if the amount in the Senior Lien Parity Reserve Account is less than the Senior Lien Parity Reserve Account Requirement or the amount in any Senior Lien Special Reserve Account is less than the applicable Senior Lien Special Reserve Account Requirement, or, if a Bankruptcy Related Event has occurred, the TIFIA Debt Service Reserve Account is less than the TIFIA Debt Service Reserve Account Requirement, (1) one-twelfth (1/12) of the amount required to make up any deficiency in the Senior Lien Parity Reserve Account, (2) to the Trustee or other Person holding a Senior Lien Special Reserve Account, one-twelfth (1/12) of the amount required to make up any deficiencies in any Senior Lien Special Reserve Account and (3) if a Bankruptcy Related Event has occurred, one twelfth (1/12) of the amount required to make up any deficiency in the TIFIA Debt Service Reserve Account for deposit in the TIFIA Debt Service Reserve Account; provided, however, that if there shall not be sufficient Receipts to satisfy all such deposits and payments, such deposits and payments shall be made for deposit to the Senior Lien Parity Reserve Account, each Senior Lien Special Reserve Account and, if a Bankruptcy Related Event has occurred, the TIFIA Debt Service Reserve Account ratably according to the amount so required to be deposited or paid;

(d) to the appropriate subaccounts of the Subordinate Lien Debt Service Fund amounts needed (in equal monthly installments) to pay interest on and Principal of Subordinate Lien Bonds or Subordinate Lien Parity Debt;

(e) to the Subordinate Lien Parity Reserve Account, if any, and any Subordinate Lien Special Reserve Account, the amount required to make up any deficiencies therein;

(f) to the credit of the Junior Indebtedness Debt Service Fund, an amount (in equal monthly installments) equal to the sum of (i) the amount of interest payable on any Outstanding Junior Indebtedness on the next Interest Payment Date for such Junior Indebtedness and (ii) Principal as due pursuant to the applicable Junior Indebtedness Agreement(s); provided, provided that, with respect to any TIFIA Indebtedness, if no Bankruptcy Related Event has occurred, there shall be transferred the following amounts

(in equal monthly installments) with respect to such TIFIA Indebtedness and in the following order of priority (x) to the TIFIA Interest Account, the interest portion of TIFIA Mandatory Debt Service then due (or the accrual of appropriate amounts in advance thereof), (y) to the TIFIA Principal Account, the principal portion of TIFIA Mandatory Debt Service then due (or the accrual of appropriate amounts in advance thereof) and (z) to the TIFIA Principal Account, the TIFIA Scheduled Debt Service then due;

(g) if the amount in the Junior Indebtedness Debt Service Reserve Account is less than the Junior Indebtedness Debt Service Reserve Account Requirement or the amount in the TIFIA Debt Service Reserve Account is less than the TIFIA Debt Service Reserve Account Requirement, (1) to the credit of the Junior Indebtedness Debt Service Reserve Account, one-twelfth (1/12) of the amount required to make up any deficiency in the Junior Indebtedness Debt Service Reserve Account and (2) if no Bankruptcy Related Event has occurred, to the credit of the TIFIA Debt Service Reserve Account, one-sixth (1/6) of the amount required to make up any deficiency in the TIFIA Debt Service Reserve Account for deposit in the TIFIA Debt Service Reserve Account, provided that, if there shall not be sufficient Receipts to satisfy all such deposits and payments, such deposits and payments shall be made for deposit to the Junior Indebtedness Debt Service Reserve Account and the TIFIA Debt Service Reserve Account ratably according to the amount so required to be deposited or paid;

(h) to a Bond Insurer for Insured Bonds, including the Series 2009B Bond Insurer, the Series 2017 Bond Insurer, the Series 2018 Bond Insurer, the Series 2019 Bond Insurer, and the 2024 Bond Insurer, any Series 2024 Bond Insurer Installment Premium and any fees and interest, including Excess Interest, due to such Bond Insurer in excess the amount of principal and interest paid by it with respect to such Insured Bonds, to any provider of a Reserve Alternate Instrument, including the Series 2024 Debt Service Reserve Policy and the TIFIA Debt Service Reserve Policy, any fees and interest payable to such provider in excess of the amount paid to it from the applicable Senior Lien Parity Reserve Account, Senior Lien Special Reserve Account, Subordinate Lien Parity Reserve Account or Subordinate Lien Special Reserve Account, and to any Credit Provider of a Credit Facility other than a Bond Insurance Policy or a Reserve Alternate Instrument, any fees and interest payable to such Credit Provider in excess of the amount paid to it directly or indirectly from the sources listed in (a) through (g) above; provided that, to the extent there are insufficient amounts available to pay all amounts referenced in this subsection, amounts due relating to Senior Lien Bonds shall be paid first;

(i) to the credit of the Hedging Acquisition Account, the amount of the requirement therefor;

(j) to the credit of the Operations and Maintenance Expense Fund, an amount equal to the next succeeding month's budgeted Operating Expenses as set forth in the Annual Budget;

(k) to the credit of the Operating Reserve Fund such amount as necessary to make the amount on deposit therein equal to one-fourth (1/4) of the total budgeted Operating and Maintenance Expenses of the Triangle Expressway System for the current Fiscal Year as set forth in the Annual Budget;

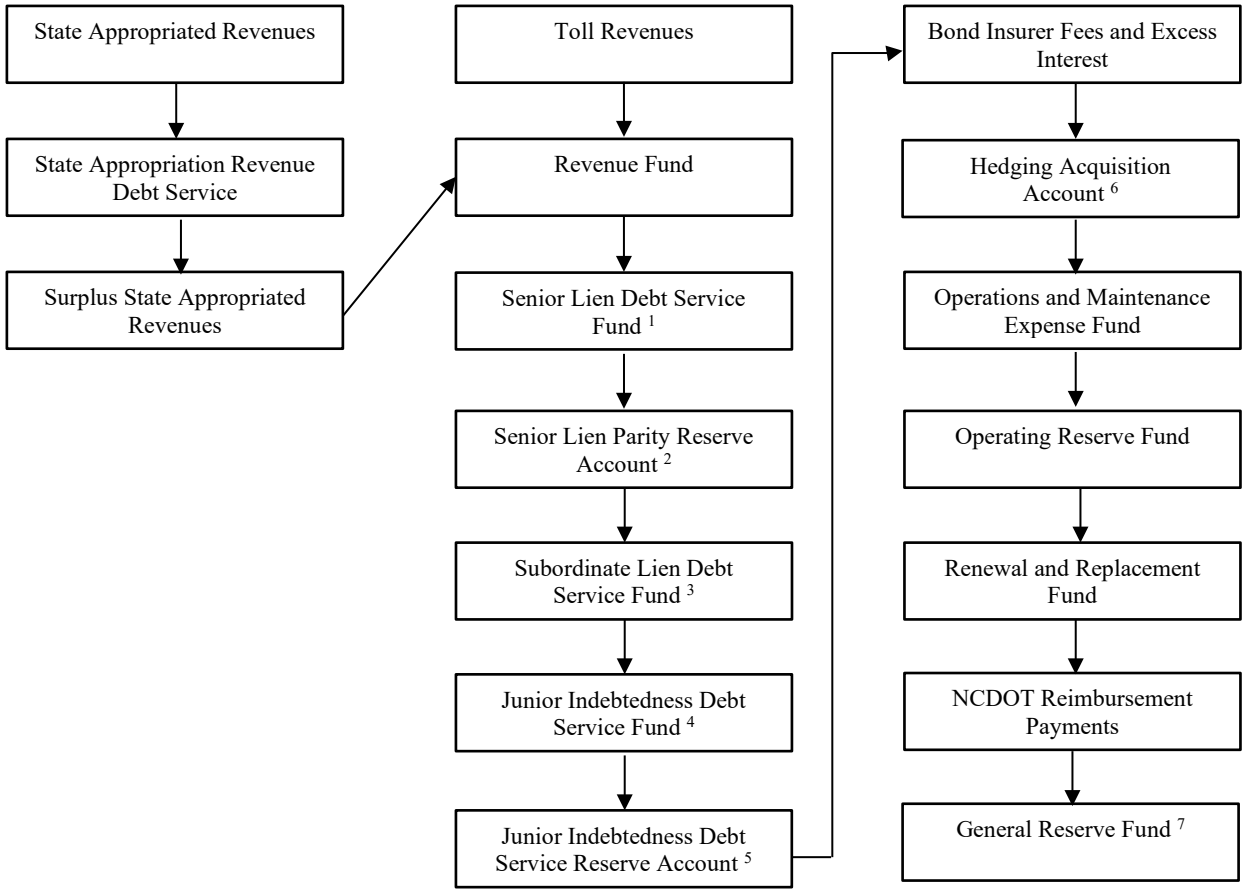
(l) to the credit of the Renewal and Replacement Fund one-twelfth (1/12) of the total amount, if any, required to be deposited therein in such Fiscal Year as set forth in the Annual Budget;

(m) to NCDOT any amounts necessary to reimburse NCDOT for any Operating Advance made by NCDOT to the Authority pursuant to the Operations and Maintenance Expense Guaranty Agreement or any payments by NCDOT to the Authority pursuant to the Construction Completion and Renewal and Replacement Guaranty, together with interest thereon, at the rates and in the manner provided in the Operations and Maintenance Expense Guaranty Agreement or the Construction Completion and Renewal and Replacement Guaranty;

(n) after all deposits or payments are made in accordance with subsections (a) through (m) above, any remaining moneys shall be deposited in the Restricted Account and Unrestricted Account of the General Reserve Fund in accordance with the terms of the Trust Agreement, the 2024 TIFIA Loan Agreement and the 2021 TIFIA Loan Agreement.

Upon the occurrence of a Bankruptcy Related Event, any Outstanding TIFIA Indebtedness shall automatically and without notice become a Senior Lien Bond, and the TIFIA Interest Account, the TIFIA Principal Account and the TIFIA Debt Service Reserve Account will be moved to the Senior Lien Debt Service Fund and will be funded on a parity with the accounts in the Senior Lien Debt Service Fund as described in (a), (b) and (c) above.

The following chart depicts the flow of funds under the Trust Agreement, including the flow of funds of the State Appropriation under the State Appropriation Revenue Bond Trust Agreement into the Revenue Fund created by the Trust Agreement.




_____
Footnotes begin on next page

[1] Deposits to the following Accounts in the following order of priority until each Account requirement is funded: Interest Account, Principal Account and Sinking Fund Account. After a Bankruptcy Related Event has occurred, this Fund will include a TIFIA Interest Account and TIFIA Principal Account, to be paid on parity with the Interest Account and Principal Account.

[2] After a Bankruptcy Related Event has occurred, the TIFIA Debt Service Reserve Account will be funded on parity with the Senior Lien Parity Reserve Account.

[3] Deposits to the following Accounts in the following order of priority until each Account requirement is funded: Interest Account, Principal Account and Sinking Fund Account, and Subordinate Lien Parity Reserve Account.

[4] Includes the TIFIA Interest Account and TIFIA Principal Account within the Junior Indebtedness Debt Service Fund (so long as no Bankruptcy Related Event has occurred).

[5] Includes the TIFIA Debt Service Reserve Account (so long as no Bankruptcy Related Event has occurred).

[6] The Hedging Acquisition Account would only be used if the Authority were to issue variable interest rate bonds. At present, the Authority has no plans to issue such Bonds.

[7] Deposits into the Restricted Account and Unrestricted Account of the General Reserve Fund in accordance with the terms of the Trust Agreement, the 2024 TIFIA Loan Agreement and the 2021 TIFIA Loan Agreement.

**TIFIA Indebtedness Upon Occurrence of Bankruptcy Related Event**

In the case of the occurrence of a Bankruptcy Related Event, any TIFIA Indebtedness automatically and without notice is deemed to constitute a Senior Lien Bond, and the Holder of such TIFIA Indebtedness will be entitled to all rights of a Holder of a Senior Lien Bond, except that the Holders of any such TIFIA Indebtedness will have no rights in, or claim to, any amounts held in the Senior Lien Parity Reserve Account or any Senior Lien Special Reserve Account. A Bankruptcy Related Event is defined in the Trust Agreement, the 2021 TIFIA Loan Agreement and the 2024 TIFIA Loan Agreement to include voluntary and involuntary proceedings with respect to the Authority under any Insolvency Law, application for or consent by the Authority to the appointment of a receiver for itself and its assets, failure by the Authority generally to pay its debts with respect to the Triangle Expressway as they become due, and failure by the Authority to make two (2) consecutive payments on the TIFIA Series 2024 Bond in accordance with the 2024 TIFIA Loan Agreement or the TIFIA Series 2021 Bond in accordance with the 2021 TIFIA Loan Agreement. See APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement.

**Rate Covenant**

Under the Trust Agreement, the Authority has covenanted as follows:

(i) to fix, charge and collect tolls, fees, rentals and other charges for the use of and for services furnished or to be furnished by the Triangle Expressway System, and that from time to time and as often as it shall appear necessary, to revise such tolls, fees, rentals and other charges as may be necessary or appropriate, in order that for each Fiscal Year, beginning with the first full Fiscal Year in which the Triangle Expressway System is in operation, the Revenues in such Fiscal Year will be not less than 130% of the Long-Term Debt Service Requirement for Senior Lien Indebtedness only for such Fiscal Year; and

(ii) to fix, charge and collect tolls, fees, rentals and other charges for the use of and for services furnished or to be furnished by the Triangle Expressway System, and that from time to time and as often as it shall appear necessary, to revise such tolls, fees, rentals and other charges as may be necessary or appropriate, in order that for each Fiscal Year, beginning with the first full Fiscal Year in which the Initial Project is in operation, the Revenues in such Fiscal Year will be not less than 110% of (x) the Long-Term Debt Service Requirement for Senior Lien Indebtedness, Subordinate Lien Indebtedness and TIFIA Indebtedness for such Fiscal Year and (y) the deposits to be made to the Senior Lien Parity Reserve Account, the Subordinate Lien Parity Reserve Account, the Junior Indebtedness Debt Service Reserve Account and the TIFIA Debt Service Reserve Account for such Fiscal Year.

The Authority also covenants to fix, charge and collect tolls, fees, rentals and other charges so that the Receipts will be sufficient in each Fiscal Year to make all the deposits described in paragraphs (a) through (i) in "-Application of Receipts" above to the various funds described above. The Trust Agreement contains certain additional provisions regarding the Authority's covenants as to tolls. See "The Trust Agreement – Rate Covenant" in APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement hereto for such additional details.

If the rate covenant described in (i) and (ii) above (herein, the "Rate Covenant") is not met, the Authority is obligated to request a Traffic Consultant to make its recommendations, if any, as to a revision of the Authority's tolls, fees, rentals and charges, its Operating Expenses or the method of operation of the Triangle Expressway System in order to satisfy the Rate Covenant. The Authority is obligated under the Trust Agreement to revise its tolls, fees, rentals and charges or its Operating Expenses or alter its methods of operation, which revisions or alterations need not comply with the Traffic Consultant's recommendations but which are projected by the Authority to result in compliance with the Rate Covenant. See also "TOLLING OF THE TRIANGLE EXPRESSWAY SYSTEM – Toll Rate Policy" herein.

**Parity and Subordinated Indebtedness**

Under the conditions and limitations set forth in the Trust Agreement and without the approval or consent of the Owners or Holders of Indebtedness, the Authority may issue or incur additional Senior Lien Indebtedness secured by a pledge, charge and lien upon the Trust Estate on a parity with the Series 2024 Bonds.

In general, additional Long-Term Indebtedness constituting Senior Lien Indebtedness may be incurred if prior to incurrence there is delivered to the Trustee:

(i) an Officer's Certificate certifying that the Authority was in compliance with its rate covenant as described above for the most recent Fiscal Year for which audited financial statements are available;

(ii) a report of a Traffic Consultant stating that for each Fiscal Year next succeeding the date on which such Senior Lien Indebtedness is incurred through the final maturity date of all Senior Lien Indebtedness, the forecasted Revenues in each such Fiscal Year are at least 140% of the Long-Term Debt Service Requirement with respect to all Senior Lien Indebtedness (excluding any Long-Term Indebtedness constituting Senior Lien Indebtedness to be refunded by the Long-Term Indebtedness to be incurred) and the Long-Term Indebtedness proposed to be incurred;

(iii) a report of a Traffic Consultant stating that for each Fiscal Year next succeeding the date on which such Long-Term Indebtedness is incurred through the final maturity date of any Long-Term Indebtedness, the forecasted Revenues in each such Fiscal Year are at least (x) 130% of the sum of (1) the Long-Term Debt Service Requirement with respect to all Outstanding Senior Lien Indebtedness, Subordinate Lien Indebtedness and TIFIA Indebtedness (excluding any Long-Term Indebtedness to be refunded by the Long-Term Indebtedness to be incurred) and the Long-Term Indebtedness to be incurred and (2) the amounts to be deposited in such Fiscal Year to the Senior Lien Parity Reserve Account, the Subordinate Lien Parity Reserve Account, and the TIFIA Debt Service Reserve Account, and (y) the Loan Life Coverage Ratio is a least 130%;

(iv) a report of a Traffic Consultant showing that (1) for each Fiscal Year next succeeding the date on which such Long-Term Indebtedness is incurred through the final maturity date of any Long-Term Indebtedness, the forecasted Receipts in each Fiscal Year will be sufficient to make all of the deposits in each such Fiscal Year required under the Trust Agreement as described in paragraphs (a) through (i) under

"– Application of Receipts" above and (2) all Outstanding TIFIA Indebtedness will be fully retired by its final maturity date; and

(v) evidence that such Senior Lien Indebtedness will be rated at an investment grade rating by Fitch, Moody's or S&P.

In addition, so long as any of the Insured Bonds are Outstanding, unless AGC and AGM agree otherwise, additional Long-Term Senior Lien Indebtedness may not be incurred unless the Authority files with the Trustee, AGC and AGM (a) an Officer's Certificate demonstrating that the Revenues for each of the two most recent Fiscal Years for which audited financial statements are available were, in each Fiscal Year, at least 175% of the Long-Term Debt Service Requirement with respect to all Outstanding Long-Term Indebtedness constituting Senior Lien Indebtedness for such Fiscal Year, (b) a report of the Traffic Consultant described in (ii) above showing that (1) the forecasted Revenues in each Fiscal Year is at least 175% of the Long-Term Debt Service Requirement with respect to all Outstanding Long-Term Indebtedness constituting Senior Lien Indebtedness (excluding any Long-Term Indebtedness constituting Senior Lien Indebtedness to be refunded by the Long-Term Indebtedness to be incurred) and the Long-Term Indebtedness proposed to be incurred, and (2) the forecasted Revenues in each Fiscal Year is also at least 150% of the Long-Term Debt Service Requirement with respect to all Outstanding (and proposed to be incurred) (A) Long-Term Indebtedness constituting Senior Lien Indebtedness (excluding any Long-Term Indebtedness constituting Senior Lien Indebtedness to be refunded by the Long-Term Indebtedness to be incurred) and (B) TIFIA Indebtedness, and (c) evidence that the proposed Senior Lien Indebtedness has been rated at an investment grade rating by at least one nationally recognized municipal bond rating agency.

Notwithstanding the foregoing, AGC and AGM have waived the foregoing provisions with respect to the issuance of the Series 2024 Bonds and the TIFIA Series 2024 Bond.

So long as the TIFIA Series 2024 Bond and the TIFIA Series 2021 Bond are Outstanding, the 2024 TIFIA Loan Agreement and the 2021 TIFIA Loan Agreement, as applicable, contains additional restrictions on the issuance of additional Senior Lien Indebtedness. Pursuant to the 2021 TIFIA Loan Agreement, TIFIA has consented to the issuance of the Series 2024 Bonds. See "The Trust Agreement – Limitation on Senior Lien Indebtedness" in APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement hereto for such additional restrictions.

The Trust Agreement contains certain additional provisions setting forth requirements for the issuance of Senior Lien Indebtedness and certain additional conditions under which Senior Lien Indebtedness may be incurred in order to complete the Initial Project or any Additional Project or to refund Outstanding Long-Term Indebtedness or in certain other circumstances. See "The Trust Agreement – Limitation on Senior Lien Indebtedness" in APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement hereto for such additional details.

## THE TRIANGLE EXPRESSWAY SYSTEM

### General

The "Triangle Expressway" currently extends for approximately 18.8 miles from the interchange of I-40 and Toll NC 885 (formerly Toll NC 147) to the north end to the NC 55 Bypass near Holly Springs, North Carolina on the south end, and includes 12 interchanges (collectively, the "Triangle Expressway System"). The Triangle Expressway is a segment of the partially complete "Outer Loop" around the greater Raleigh, North Carolina area. Using the Triangle Expressway, travelers have a limited-access, six-lane, high-speed facility from I-40 to the NC 55 Bypass near Holly Springs, reducing congestion on NC 55, a heavily utilized road which runs parallel to the Triangle Expressway. The Triangle Expressway provides access to a rapidly developing area within the Triangle region, which is projected to have substantial increases in both population and employment over the next 25 years, and improves access into the Research Triangle Park and other area employment centers.

The Triangle Expressway System initially was comprised of two major construction projects known as the Triangle Parkway (also referred to as "Toll NC 885") and the Western Wake Freeway (also referred to as "Toll NC 540"). The two projects were financed together, but had three different opening dates based on the volume of work in each project. The first segment of the Triangle Expressway System, the Triangle Parkway, broke ground in August 2009 and opened to traffic in December 2011. The second and third segments of the Triangle Expressway System, which made up the Western Wake Freeway, opened in August 2012 and December 2012, respectively.

In April 2017, a new interchange known as the Veridea Parkway Interchange opened to traffic. The Veridea Parkway Interchange is located between the US 1 interchange and the NC 55 Bypass interchange on the southern end of the Triangle Expressway and provides a direct local link between the Triangle Expressway and Veridea Parkway/Old Holly Springs-Apex Road. The Veridea Parkway Interchange was paid for in part with proceeds of the Series 2009 Bonds. A second interchange, the Morrisville Parkway Interchange, was constructed to provide increased connectivity and access. The Morrisville Parkway Interchange opened to traffic in February 2020; work on the modifications and additions to the tolling system was completed in August 2020. Toll revenues from both the Veridea Parkway Interchange and the Morrisville Parkway Interchange are included in Receipts and Revenues of the Triangle Expressway System.

The Authority and NCDOT entered into a Project Specific Agreement for the Triangle Expressway and Executory Contract for Lease of Right-of-Way for Triangle Expressway (the "Project Specific Agreement") on March 6, 2008. The Project Specific Agreement establishes the terms and conditions under which NCDOT supports the Authority in its efforts to finance, construct, equip, operate and maintain the Triangle Expressway System in accordance with the Authority Act. The Authority and NCDOT entered into a Lease Agreement (the "Lease Agreement") under which NCDOT leases to the Authority all rights-of-way necessary for the Triangle Expressway System for one dollar per year. The Lease Agreement provides the Authority uninterrupted access to and full use of the Triangle Expressway System rights-of-way up to and until the Authority ceases to operate the Triangle Expressway System as a toll facility, at which time the Lease Agreement will terminate and the Triangle Expressway System will revert to NCDOT.

### Extension of NC 885

The current STIP includes, as Project U-5966, funding for the preliminary engineering of a multilane highway that will connect the segment of the Triangle Expressway System known as Toll NC 885 (at the interchange with Toll NC 540) to McCrimmon Parkway at Town Hall Drive in Morrisville,

North Carolina (the "Highway 885 Extension"). The current STIP does not show funding for right-of-way acquisition, utility relocation, or construction for the Highway 885 Extension. The Highway 885 Extension would provide the area with more direct access to the Triangle Expressway System from the communities to the south of the Triangle Expressway, but it will not be part of the Triangle Expressway System.

**Maintenance of the Triangle Expressway System**

Maintenance of the Triangle Expressway is performed to standards defined in the Authority's maintenance rating program guidelines, standard operating procedures for roadway elements, and NCDOT performance standards, and utilizes criteria used to measure compliance. The Authority has an independent consultant who conducts the Maintenance Rating Program ("MRP") for the Triangle Expressway on a quarterly basis. The MRP assesses various elements of the Triangle Expressway, including road surface, unpaved shoulders and ditches, drainage, roadside and traffic control devices. The Authority's target rating for the MRP is 90; the Triangle Expressway's MRP rating as of June 30, 2023, was 96.4 and has been consistently above 90 since 2015. If the Authority is unable to fund the maintenance costs after satisfying debt payments, the NCDOT O&M Guaranty ensures that operating and maintenance costs will be paid by NCDOT. See "FUNDING OF THE TRIANGLE EXPRESSWAY SYSTEM – NCDOT Operations and Maintenance Guaranty" for a discussion regarding the O&M Guaranty.

**Complete 540 – Phase 1**

Complete 540 – Phase 1 is an extension of the Triangle Expressway System and is a six-lane controlled access toll facility. It modifies one interchange and will add six new interchanges to the Triangle Expressway System. Complete 540 – Phase 1 consists of three separate STIP Projects R-2721A, R-2721B and R-2828, that make up the approximately 17.8-mile portion of Complete 540 from the NC 55 Bypass in Apex east to I-40 in Johnston County. STIP Project R-2721A is the portion of the Triangle Expressway from the NC 55 Bypass to east of Holly Springs Road; STIP Project R-2721B is the portion from east of Holly Springs Road to east of US 401; and STIP Project R-2828 is the portion from east of US 401 to I-40. Complete 540 – Phase 1 has controlled access interchanges with the following roads: NC 55 Bypass, Holly Springs Road, Bells Lake Road, Fayetteville Road (US 401), Old Stage Road, Benson Road (NC 50) and US 70/I-40 and has six mainline toll collection zones.

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The following map shows the route of Complete 540 – Phase 1, including the STIP Project references:

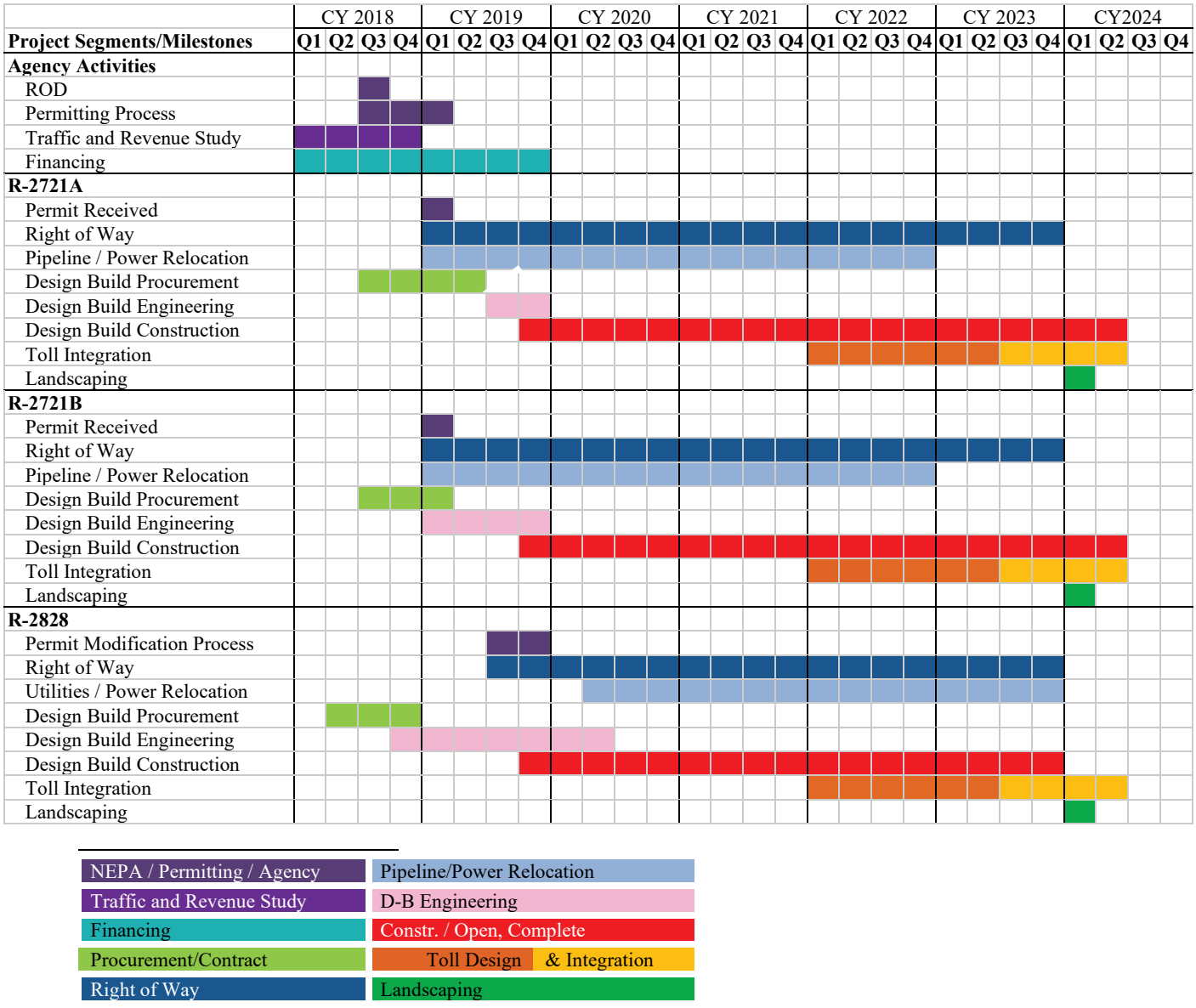



***Construction of Complete 540 – Phase 1***

Complete 540 – Phase 1 is being built using the design-build method of contracting. A joint venture consisting of Flatiron Constructors, Inc. and Branch Civil, Inc. was selected to design and build STIP Projects R-2721A and R-2721B ("Flatiron-Branch"). A joint venture consisting of The Lane Construction Corporation and Blythe Construction, Inc. ("Lane-Blythe;" and with Flatiron-Branch, each, a "Phase 1 Design-Build Contractor" and, collectively, the "Phase 1 Design-Build Contractors") was selected to design and build STIP Project R-2828. Such contracts are fixed price contracts, subject to certain contingencies. Design of all three projects began in early 2019, with groundbreaking on November 13, 2019.

Approximately 86% of scheduled activities for the construction of Complete 540 – Phase 1 is completed, and as planned, the three design-build contracts are progressing in close conformity to one another. Both R-2721A and R-2721B are expected to reach substantial completion on or before July 1, 2024. The contractor for R-2828, Lane-Blythe, has stated that the severity of any poor weather conditions during the winter months could push the substantial completion date for R-2828 past July 1, 2024. In the event of such construction impacts, Lane-Blythe expects that R-2828 would reach substantial completion no later than September 3, 2024. The potential impact of weather conditions on the completion of R-2828 will not be known until late winter or early spring in 2024.

The estimated schedule for the remainder of Complete 540 – Phase 1 is set forth in the following table:




PFM has estimated the impact on revenues and debt service coverage from a delay in completion of R-2828 by shifting out revenues generated from Complete 540 – Phase 1 to begin October 1, 2024, including subsequent impacts to the ramp-up period through Fiscal Year 2028. This shift in revenues in the financial model results in a reduction in projected Senior Lien Debt Service Coverage in Fiscal Years 2025 through 2028 from that shown in Column G of the Table entitled "Preliminary Projected Cash Flow and Debt Service Coverage Ratio." See "PROJECTED CASH FLOW AND DEBT SERVICE COVERAGE" and the related footnotes. The Authority does not believe that any potential delay beyond July 1, 2024, would have a material impact on the construction or funding of Complete 540 – Phase 2 or the Triangle Expressway System in general.

***Complete 540 – Phase 1 Project Cost Contingencies***

The design-build contracts with the Phase 1 Design-Build Contractors for Complete 540 – Phase 1 (the "Phase 1 Design-Build Contracts") are fixed fee, lump sum contracts that limit the Authority's exposure to the majority of risk elements for design and construction of Complete 540 – Phase 1. The unlimited notices to proceed under the Phase 1 Design-Build Contracts were issued on September 26, 2019 and in accordance with the Phase 1 Design-Build Contracts, the bid amounts were adjusted based on the 20-City Construction Cost Index published in the Engineering News Record, using the percentage calculated from the baseline index value as compared to the index value for September 2019 (the month in which the unlimited notices to proceed were issued). These increases are $0.3 million (R-2721A), $1.2 million (R-2721B), and $2.9 million (R-2828). Additional contingencies are still included in the capital cost breakdown for Complete 540 – Phase 1 to account for any reasonable possible issues that may arise through completion. Contingency funds have been set aside for change orders, supplementals and other unforeseen circumstances to ensure project delivery.

***Complete 540 – Phase 1 Payment and Performance Bonds***

Each Phase 1 Design-Build Contractor was required to provide a payment and performance bond equal to its respective Phase 1 Design-Build Contract amount. The performance bonds secure each Phase 1 Design-Build Contractor's agreement to construct the applicable STIP project in accordance with the terms and conditions of its Phase 1 Design-Build Contract, and within the time allowed. The payment bond protects the laborers, material suppliers and subcontractors against non-payment. For R-2721A and R-2721B, Liberty Mutual Insurance Company, Travelers Casualty and Surety Company of America, Fidelity and Deposit Company of Maryland, Zurich American Insurance Company, Federal Insurance Company, Berkshire Hathaway Specialty Insurance Company and Hartford Fire Insurance Company are serving as surety for the bonds with a coverage amount of $183,459,000 for R-2721A and $159,983,000 for R-2721B. For R-2828, Liberty Mutual Insurance Company, National Union Fire Insurance Company of Pittsburgh, PA, Zurich American Insurance Company, Fidelity and Deposit Company of Maryland and Berkshire Hathaway Specialty Insurance Company are serving as surety for the bonds with a coverage amount of $403,200,000.

***Complete 540 – Phase 1 Warranty***

Each Phase 1 Design-Build Contractor was also required to provide a three-year warranty on its work, beginning at substantial completion of its portion of Complete 540 – Phase 1. The warranty begins after acceptance of that portion of Complete 540 – Phase 1 at substantial completion. Each Phase 1 Design-Build Contractor must furnish a warranty bond in the amount of 5% of the total cost of its Phase 1 Design-Build Contract (R-2721A: $9.17 million, R-2721B: $8.00 million, R-2828: $20.16 million, for a total of $37.33 million) to guarantee that the contract warranty requirements will be satisfied. In addition to the warranty that is required by the applicable contract, each Phase 1 Design-Build Contractor has provided additional warranties.

For R-2721A and R-2721B, Flatiron-Branch will extend the asphalt pavement warranty to six years for materials and workmanship, doubling the required warranty period using the criteria provided in the Warranty Criteria for New Hot Mix Asphalt Pavement section of the Construction RFPs. Flatiron-Branch team will extend the bridge component warranty to 10 years for materials and workmanship, using the criteria provided in the Warranty Criteria for Bridge Components section of the Construction RFPs. Additional warranty bonds will be provided for the extended warranty periods listed above.

For R-2828 project, Lane-Blythe is extending the overall warranty by an additional two years for a total of five years. This extended warranty will apply to major components of work defined as bridges,

pavements, retaining walls, noise walls, culverts, and overhead sign structures. Lane-Blythe will warrant and guarantee materials and workmanship against latent and patent defects arising from faulty materials, faulty workmanship, or negligence. Materials and workmanship will be guaranteed for a period of five years following the date of final acceptance of the work by the Authority. The first 36 months of the guarantee will be supported by Lane-Blythe's warranty bond described above, and the additional 24 months will be covered by an extension of the warranty bond. Over the duration of the warranty and guarantee period, Lane-Blythe will replace and/or remediate mutually agreed-upon defective materials and workmanship without cost to the Authority or NCDOT.

***Complete 540 – Phase 1 Liquidated Damages***

Liquidated damages will be assessable from each Phase 1 Design-Build Contractor for failure to perform within the applicable Phase 1 Design-Build Contract time requirements. In particular, each Phase 1 Design-Build Contractor will be liable for liquidated damages in the amount of $20,000 per calendar day for each day of delay in achieving substantial completion beyond the projected applicable substantial completion date. In addition, if a Phase 1 Design-Build Contractor does not achieve final completion by the projected final completion date, liquidated damages in the amount of $5,000 per calendar day for each day of delay will be due. These liquidated damage provisions provide an additional layer of performance protection in the Phase 1 Design-Build Contracts. There is no prescribed limit to the amount of liquidated damages included in the Phase 1 Design-Build Contracts.

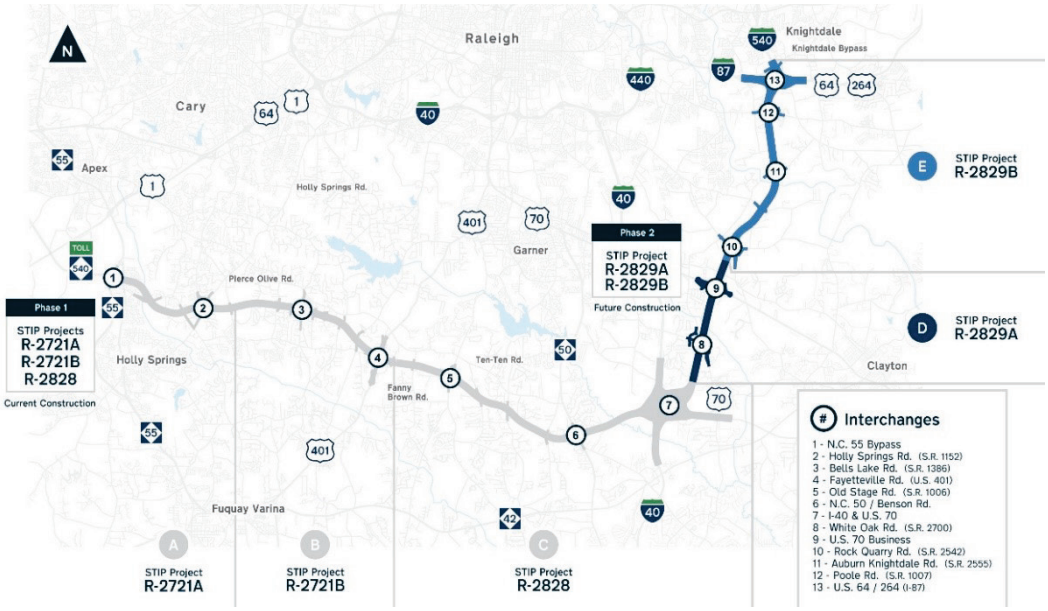
As described in "Construction of Complete 540 – Phase 1" above, the potential impact of weather conditions on the completion of R-2828 will not be known until late winter or early spring in 2024. In the event substantial completion of R-2828 is delayed beyond the contractual substantial completion date, the Authority will have rights to assess Lane-Blythe for liquidated damages.

## COMPLETE 540 – PHASE 2

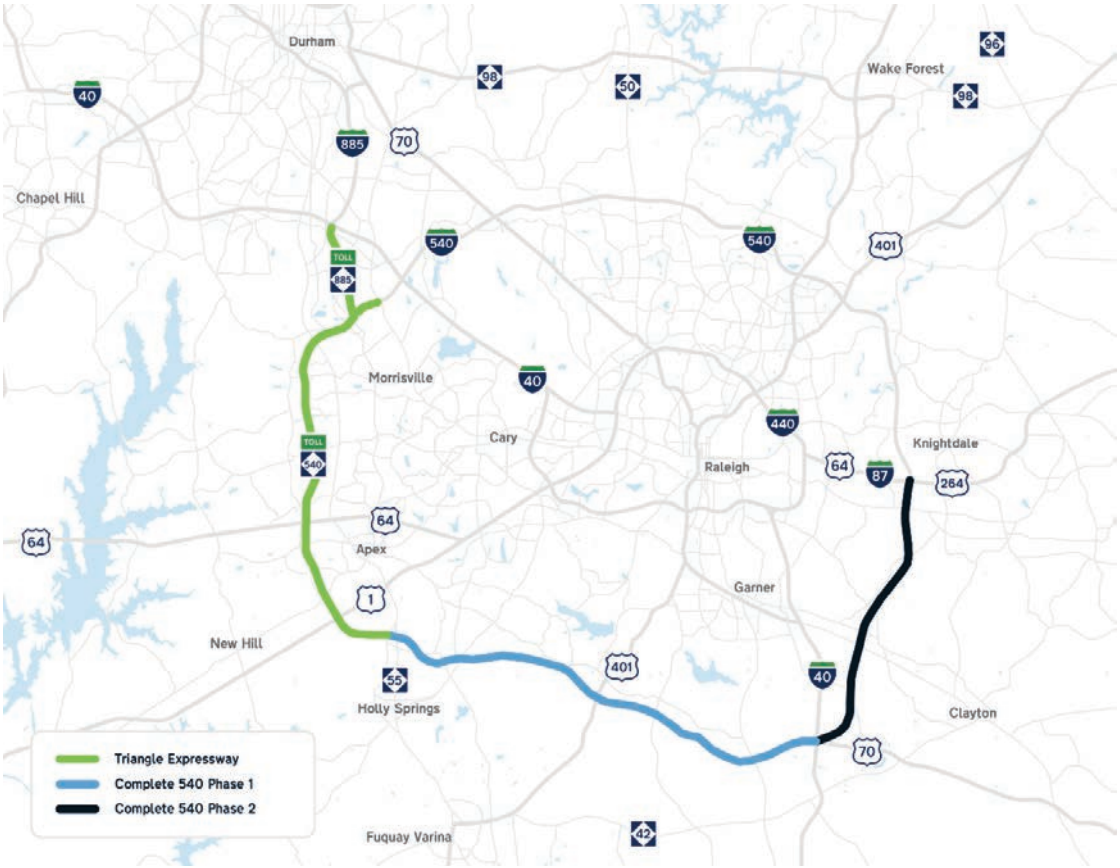
The final phase of the Triangle Expressway System consists of the remaining 10.2 miles from I-40 to I-87/US 64/US 264 and consists of two separate STIP Projects R-2829A and R-2829B. STIP Project R-2829A will extend the System from I-40 to south of Rock Quarry Road, and STIP Project R-2829B will extend from south of Rock Quarry Road to I-87/US 64/US 264. Complete 540 – Phase 2 will complete the 540 Outer Loop around the greater Raleigh area, which will accomplish several objectives, including improved mobility within or through the area during peak travel periods, reduction of forecasted congestion on the existing roadway network within the area, and improving linkage in the regional roadway network. It is expected that completion of the 540 Outer Loop 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.

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The following map shows the route of Complete 540 – Phase 2, including the STIP Project references:




The following map shows the route of Complete 540 – Phase 1 and Complete 540 – Phase 2, including the Triangle Expressway:



**Construction of Complete 540 – Phase 2**

Complete 540 – Phase 2 will also be built using the design-build method of contracting. A joint venture consisting of Branch Civil, Inc. and S.T. Wooten Corporation ("Branch-S.T. Wooten") was selected to design and build STIP Project R-2829A. A joint venture consisting of Flatiron Constructors, Inc. and Fred Smith Company ("Flatiron-Fred Smith", and with Branch-S.T. Wooten, each, a "Phase 2 Design-Build Contractor" and collectively, the "Phase 2 Design-Build Contractors") was selected to design and build STIP Project R-2829B. Such contracts are fixed price contracts, subject to certain contingencies. Final design of each STIP Project of Complete 540 – Phase 2 will begin immediately following the execution of each design-build contract with the Phase 2 Design-Build Contractors (the "Phase 2 Design-Build Contracts"). The estimated project costs for Complete 540 – Phase 2, based on the prices bid by the Phase 2 Design-Build Contractors, are set forth in the following table:

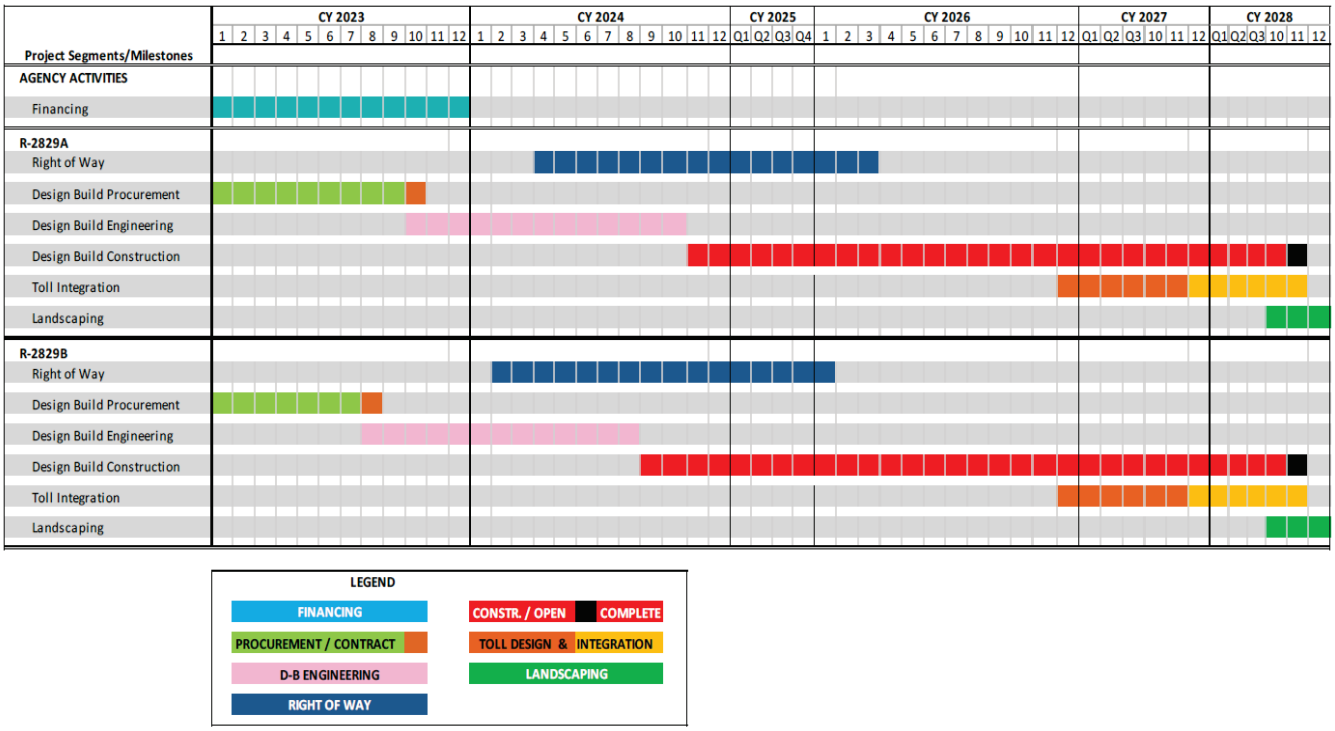
**Complete 540 – Phase 2 Capital Cost Breakdown (in millions)**

| | | | |
|---|---|---|---|
| Construction | $266.80 | $417.92 | $684.72 |
| Toll Integration | 13.05 | 12.69 | 25.74 |
| Landscaping | 4.05 | 6.34 | 10.39 |
| Right-of-Way | 75.26 | 76.88 | 152.14 |
| Utilities | 9.24 | 5.95 | 15.19 |
| Labor & Expenses | 7.32 | 11.44 | 18.76 |
| Change Order Allowance | 17.56 | 27.46 | 45.02 |
| Public Education | - | - | 0.20 |
| CEI and Materials Testing | 27.00 | 26.00 | 53.00 |
| Stipends | 0.83 | 1.20 | 2.03 |
| Engineering Reserve Fund | 3.96 | 6.16 | 10.12 |
| Agency Reserve Fund | 8.59 | 11.38 | 19.97 |
| NCDOT Surcharges | 15.13 | 20.68 | 35.81 |
| Environmental Mitigation | - | - | 22.94 |
| Diesel Fuel Reserve Fund | 2.00 | 2.00 | 4.00 |
| Asphalt Binder Reserve Fund | 1.50 | 1.50 | 3.00 |
| Steel Price Reserve Fund | 1.00 | 1.00 | 2.00 |
| Total Cost ($M) | $453.30 | $628.59 | $1,105.03 |

* Totals may not add due to rounding.

The costs of Complete 540 – Phase 2 will be paid from proceeds of the Series 2024 Bonds and the TIFIA Series 2024 Bond. The Authority expects to close on the 2024 TIFIA Loan Agreement prior to or simultaneously with the issuance of the Series 2024 Bonds. The remaining costs of Complete 540 – Phase 2 are expected to be paid from one or more issuances of the State of North Carolina Grant Anticipation Revenue Vehicle Bonds ("GARVEE Bonds") and State matching funds. The Authority believes that sufficient funds will be available to pay the costs of Complete 540 – Phase 2 from the sources described above. Nevertheless, in the event that unexpected or unforeseen circumstances result in additional unanticipated costs, NCDOT has undertaken pursuant to the NCDOT Renewal and Replacement Guaranty in the Trust Agreement to provide additional funding to complete construction of Complete 540 – Phase 2 if the amounts described above are not sufficient. The Trust Agreement provides that such payments are to be paid by NCDOT from amounts then available in the State Highway Fund or the State Highway Trust Fund, subject to appropriation and availability of amounts for such use in such funds.

The construction schedule for Complete 540 – Phase 2 is set forth in the following table:




**Phase 2 Design-Build Contractors**

The selected Phase 2 Design-Build Contractor for STIP Project R-2829A is Branch-S.T. Wooten, a joint venture of Branch Civil, Inc. ("Branch") and S.T. Wooten Corporation ("S.T. Wooten"). Branch and S.T. Wooten are individually prequalified with NCDOT and Branch-S.T. Wooten is prequalified with NCDOT. Branch and S.T. Wooten are experienced contractors in delivering projects featuring greenfield and toll facilities, including all-electronic toll highways, across the country. Branch-S.T. Wooten has teamed with RK&K, LLP ("RK&K") as the lead design firm for Project R-2829A. Branch-S.T. Wooten and RK&K provide North Carolina design-build experience and a deep pool of resources for construction and self-performance.

Branch and S.T. Wooten have successfully delivered more than $2 billion in design-build projects, many of which were for NCDOT. S.T. Wooten and RK&K have worked together on multiple award-winning projects. The partnership of S.T. Wooten and RK&K has delivered nine NCDOT design-build projects, totaling more than $1 billion in value. All of these projects were completed on or ahead of schedule.

Branch-S.T. Wooten teamed with RK&K as the lead designer for STIP Project R-2829A. RK&K will serve as the lead designer and will be responsible for performing and coordinating all design services, including subconsultant services. RK&K is a 1,350-person, multi-disciplinary consulting engineering firm with three North Carolina offices, including a major production office in Raleigh. RK&K has continuously served NCDOT since 1964 and maintains a North Carolina staff of 350 and more than 60 North Carolina licensed Professional Engineers. RK&K is an experienced design-build firm, having been selected for 26 NCDOT and Authority design-build projects totaling $2.4B. These projects include more than 149 miles of roadway, 213 bridges, 46 interchanges, and include nearly every engineering discipline.

The selected Phase 2 Design-Build Contractor for STIP Project R-2829B is Flatiron Fred Smith, a joint venture of Flatiron Constructors, Inc. ("Flatiron") and Fred Smith Company ("Fred Smith"), which combines two experienced design-build contractors with experience in North Carolina. For example, Flatiron-Fred Smith is currently building the I-5986B/I-5878/I-5883 I-95 from SR-1002 to I-40 project in Harnett County. The joint venture of Flatiron and Fred Smith combines the capabilities of two experienced heavy civil contractors local to the project location with significant resources available to self-perform complex structures, earthwork features, and asphalt paving.

Flatiron-Fred Smith has teamed with ICE of Carolinas, PLLC ("ICE") as the lead designer for STIP Project R-2829B. ICE is the lead design firm and will manage the design under the direction of Flatiron-Fred Smith project manager Jon Wallace. ICE will perform the required design services from their NCDOT prequalified Raleigh office. The firm currently has a staff of over 300 with over 90 professional engineers having extensive road, bridge, hydraulic, and geotechnical design and design-build experience in the Carolinas. In less than 10 years, ICE has served as the lead design firm/major participant on 28 design-build projects with a combined value of $1.9 billion, nine of which received awards for engineering excellence from American Council of Engineering Companies. ICE is Flatiron's lead designer on the I-95 widening design-build project in Lumberton, completing request for comment plans in less than a year after notice to proceed.

Flatiron and ICE of Carolinas, PLLC ("ICE") are currently teamed on the $433 million I-6064A, B & C/I-5879 I-95 Widening Project in Lumberton, North Carolina and have completed preconstruction efforts within one year of notice to proceed.

ICE is leading a design team of quality firms, supplemented by former NCDOT staff serving as subject matter experts. These include subconsultant firms ICE works with frequently, such as Arcadis, and that have extensive NCDOT experience, like H&H and Michael Baker.

**Description of Phase 2 Design-Build Contracts**

The Phase 2 Design-Build Contracts provide that the Phase 2 Design-Build Contractors will design and construct the project segments of Complete 540 – Phase 2 in accordance with the functional plans provided by the Authority. The Phase 2 Design-Build Contractors are required to design the project in accordance with the project contract documents that include the request for proposals (the "Construction RFPs") and all standard drawings, details and specifications that are referred to therein. The design is required to conform to Federal Highway Administration and American Association of State Highway and Transportation Officials ("AASHTO") guidelines.

**Right-of-Way Acquisition**

NCDOT has completed several advanced right-of-way acquisitions for portions of Complete 540 – Phase 2. The acquisition of two of the parcels is affected by the Transportation Corridor Official Map Act ("Map Act"), under which NCDOT recorded corridor maps that imposed restrictions on a landowner's rights to improve, develop and subdivide property within the corridor, but was not required to purchase the property at the time of the filing of a future corridor map. In June of 2016, the North Carolina Supreme Court ruled that the filing of a transportation corridor map pursuant to the Map Act resulted in a taking of the property owners' rights to improve, develop and subdivide their property, for which the landowners were entitled to compensation, and the corridor maps were rescinded.

The Map Act parcels on Complete 540 – Phase 2 have been or are in the process of being acquired as advanced right-of-way acquisitions. The Authority does not believe that the possibility of Map Act claims will delay the acquisitions as one MAP Act-eligible parcel has been settled and recorded and the

other has been settled and awaits recordation. Both of these acquisitions included a Map Act waiver against future claims related to the corridor map. The construction budget for right-of-way acquisition for each project segment of Complete 540 – Phase 2 uses certain assumptions based on appraised value of the rights-of-way to be acquired and historical data on right-of-way acquisitions for similar projects.

**Insurance Coverage**

Each Phase 2 Design-Build Contractor will be required to provide limited amounts of insurance coverage during construction including workers compensation insurance in the amount required by law. Additionally, commercial general liability insurance coverage (including bodily injury, property damage, personal injury and advertising injury), umbrella excess liability coverage, business automobile liability insurance, pollution liability insurance, builders risk insurance are expected to meet or exceed limits required by law, licensing requirements, by the respective surety and/or good business practice. Railroad Protective Liability Insurance for Bodily Injury Liability, Property Damage Liability, and Physical Damage to Property are required by the Phase 2 Design-Build Contracts, and general liability insurance is required by the Professional Engineering Firm prequalification process utilized by the Authority.

**Status of Permitting**

The Authority and NCDOT obtained a phased North Carolina Department of Environmental Quality, Division of Water Resources ("NCDEQ-DWR") Section 401 Water Quality Certification and Neuse Riparian Buffer Authorization for Complete 540 – Phase 1 and Complete 540 – Phase 2 (collectively, "Complete 540") in February 2019. The Authority and NCDOT obtained a phased United States Army Corps of Engineers ("USACE") Section 404 Permit for Complete 540 in October 2019. The initial USACE permit is a phased permit based on final impact calculations for the R-2721A and R-2721B projects, and preliminary impact calculations for R-2828, R-2829A and R-2829B.

Because the Section 401 and Section 404 Permits for R-2828, R-2829A and R-2829B were based on preliminary impact calculations, permit modifications are necessary for R-2828, R-2829A and R-2829B. The permit modification for R-2828 was obtained in February 2020 based on final design drawings prepared by the Lane-Blythe team. The permit modifications for R-2829A and R-2829B will be obtained by the Phase 2 Design-Build Contractors after their final designs are prepared.

**Settlement of Lawsuit**

Sound Rivers, Inc., Center for Biological Diversity, and Clean Air Carolina, represented by the Southern Environmental Law Center, filed claims in federal court in 2018, and the North Carolina Office of Administrative Hearings in 2019, related to the environmental process and impacts of the construction of Complete 540. On August 22, 2019, NCDOT and Sound Rivers, Inc., Center for Biological Diversity and Clean Air Carolina signed a settlement agreement pursuant to which the plaintiffs agreed to dismiss such claims in return for an agreement from NCDOT to set in place protections for clean air, clean water and endangered aquatic species. The expenditures the Authority is obligated to make under the settlement are included in the plan of finance for Complete 540 – Phase 1. The settlement agreement includes covenants not to challenge future approvals for Complete 540 – Phase 1 or Phase 2, and permits the Authority to proceed with the implementation of Complete 540 – Phase 1 and Phase 2.

**Project Management and Compliance**

The Authority is implementing a comprehensive and proactive Project Management and Compliance Monitoring Plan (the "Plan") for Complete 540 – Phase 2, designed to ensure that planning, design, right-of-way acquisition, construction, operation and maintenance of the project meet all applicable

federal, state and local laws and regulations (including the requirements generated by the National Environmental Policy Act ("NEPA") process, as well as the design and construction standards and specifications). The Plan includes the following concepts:

***Preliminary / Right-of-Way Design***

After award of the Phase 2 Design-Build Contracts, right-of-way acquisition will be based upon plans developed by the Phase 2 Design-Build Contractors and priorities established by the Phase 2 Design-Build Contractors.

***Final Design***

The Phase 2 Design-Build Contractors are responsible for final design of their respective component of Complete 540 – Phase 2, within the criteria and specifications of the Phase 2 Design-Build Contract. As part of the Authority's management process, it will conduct frequent "over-the-shoulder" design reviews and audits of Complete 540 – Phase 2 with FHWA and other units of NCDOT to ensure that Complete 540 – Phase 2 is in compliance with applicable design criteria from the earliest stages of design.

***Right-of-Way Acquisition***

The Authority has already acquired several key parcels as advanced right-of-way acquisitions. Preliminary right-of-way plans will be prepared by the Phase 2 Design-Build Contractors' lead engineering firms. The Phase 2 Design-Build Contractors are responsible for right-of-way acquisitions during the design-build phase. The Phase 2 Design-Build Contractors have right-of-way acquisition firms on their teams. American Acquisition Group, LLC, is the right-of-way firm for R-2829A and THC, Inc. and Right of Way Consultants, LLC are the right-of-way firms for R-2829B. These firms have extensive experience in right-of-way acquisition, relocation and other related services and will adhere to the provisions of the Uniform Relocation and Real Property Acquisition Act of 1970 ("Uniform Act") as well as all appropriate state and federal guidelines.

To ease some of the workload on NCDOT Division 5 and to streamline certain right-of-way processes for the Authority, the Authority has hired Carolina Land Acquisitions, Inc., with the approval of NCDOT, to serve as the right-of-way agent.

***Construction Oversight***

The Authority is directly responsible for the construction management and oversight of Complete 540 – Phase 2, including overseeing the Construction Engineering and Inspection firm (the "CEI firm") WSP USA ("WSP"). The activities of the CEI firm include inspection, erosion control inspection, materials sampling and testing, surveying grade verification, documentation of pay quantities, and claims avoidance.

***QA/QC Testing***

The Authority has retained WSP to provide certain testing and quality control services in connection with Complete 540 – Phase 2.

***Environmental and Permit Monitoring***

The Authority will require the selected Phase 2 Design-Build Contractors to provide or to procure environmental and permit monitoring services in conjunction with Complete 540 – Phase 2. This will

include the monitoring of items during each phase of the construction, including construction runoff water quality device inspections, hazardous material spill reporting and response, compliance with US Army Corps of Engineers Section 404 permit requirements and NC Department of Environmental Quality (NCDEQ) - Division of Water Resources (DWR) 401 permit requirements, and notification of archaeological discoveries. The Authority will rely on NCDOT's Roadside Environmental Unit for monitoring erosion control device installation and maintenance. In addition, the Authority has engaged Sage Ecological to monitor permit site compliance.

## TOLLING OF TRIANGLE EXPRESSWAY SYSTEM

The Authority utilizes an all-electronic tolling ("AET") system for the Triangle Expressway System where vehicles are detected while traveling at highway speeds, without having to stop and pay cash tolls. Six mainline toll zones for Complete 540 – Phase 2 will be located between interchanges to ensure that all users of the Triangle Expressway pay a toll. Customers may elect to pay tolls using a prepaid transponder-based account, which results in a 35% discount on rates compared to customers without a transponder. For customers using the Triangle Expressway without a transponder, an image of their license plate is captured and they are sent an invoice by U.S. Mail. All customers can make their payments by cash, check, money order or credit card.

### Toll Collection System Technology

#### *Electronic Toll Collection System*

The Electronic Toll Collection System ("ETCS") consists of the transponder and reader/antenna technology, which will be installed and operated by a vendor qualified to provide goods and services under the E-ZPass Next Generation ETC Equipment and Services Contract ("ETCS Contractor"). The ETCS facilitates AET by processing transponder reads from multiple transponder programs at highway speeds and assigning reads to the proper vehicles. The ETCS Contractor coordinates with the Roadside Toll Collection System ("RTCS") contractor to ensure seamless and accurate operation with and within the RTCS. The ETCS Contractor also interfaces with the Back Office System contractor through the transponder reader for automatic input of the transponders into a transponder inventory application and customer accounts. The ETCS is a multiprotocol solution that allows the Authority to read transponders issued by the Authority, as well as transponders issued by all E-ZPass Group member agencies (described below) and all toll agencies in Florida and Georgia.

#### *Roadside Toll Collection System*

The RTCS is a fully-automated, multi-lane, free-flow system, specifically designed for accurately detecting and classifying vehicles traveling the roadway at high speeds and building transactions through transponder reads or license plate images. The RTCS functionality includes multiple levels of optical character recognition and automated license plate recognition, and the vendor is responsible for performing manual license plate image reviews to ensure complete and timely transactions are transmitted to the Back Office System ("BOS"). The RTCS includes fully-automated toll zones, a toll facilities host and database, a digital video audit system and interfaces with the BOS. The RTCS will be selected from the bench of contracted vendors under the State-Wide Roadside Toll Collection System contract using a Task Order.

#### *Back Office System*

The BOS, currently operated by TransCore, processes the roadside toll transactions and posts these transactions to the transponder and video-based accounts. The BOS includes the system host, databases, and the video processing for customers without registered prepaid transponder accounts. The BOS is the

interface to the payment systems and commercial establishments. In February 2023, the Authority transitioned its BOS to the current system operated by TransCore. The BOS contractor's responsibilities include the design, development, installation, and implementation of hardware, software, and telecommunication networks for customer account processing, billing processing, necessary system interfaces, and maintenance.

***Operation Services***

The Operation Services contractor (the "Operations Contractor") is GC Services, which provides for the operations and staffing of the operations and customer service centers. Customer service and account management services include operational service for the call center, walk-in counters, mail and e-mail processing, transponder inventory control, and all other activities involving BOS processes.

**Interoperability**

The Authority is a full member of the E-ZPass Group, with an interoperability agreement that permits all E-ZPass® agencies to accept the NC Quick Pass® E-ZPass transponder as a form of payment and permits the Authority to accept E-ZPass as a form of payment on toll roads in North Carolina. This agreement enables the Authority to do business with the 53 million drivers who have E-ZPass transponders.

A similar agreement exists between the Authority and Florida's Turnpike Enterprise, Central Florida Expressway Authority and Georgia's State Road and Tollway Authority, permitting interoperability between NC Quick Pass, Florida's SunPass®, the Central Florida E-Pass and Georgia's Peach Pass® prepaid toll programs.

The interoperability agreements have expanded the versatility of the NC Quick Pass system and allow NC Quick Pass to be the premier interoperable transponder program along the east coast. In September of 2016 and again in October of 2018, the Authority received the President's Award for Excellence from the International Bridge, Tunnel and Turnpike Association (IBTTA) for its Multi-Agency Interoperability Program and its leadership in technology solutions for interoperability.

In Fiscal Year 2023, the total number of transactions for interoperable agency customers utilizing NC Quick Pass facilities was approximately 21.2 million; the number of NC Quick Pass transactions utilizing other states' facilities was approximately 4.2 million.

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The map set forth below shows states with systems that are interoperable with the NC Quick Pass system and where the NC Quick Pass E-ZPass transponder can be used.




**Toll Collection Enforcement**

The Authority maintains a NC Quick Pass Operations Center and three Customer Service Centers (each, a "CSC") in the State. The Morrisville CSC is adjacent to the Triangle Expressway for customers to pay toll invoices, establish accounts and buy transponders.

The Authority administers two payment programs on the Triangle Expressway: electronic toll collection using NC Quick Pass transponders, or Bill by Mail using the OCR/ALPR system described under "Toll Collection System Technology – *Roadside Toll Collection System*" above. Under the Authority's Toll Rate Policy, Bill by Mail toll rates are the base rates, and NC Quick Pass customers receive a 35% discount off the Bill by Mail toll rates. The NC Quick Pass transponder program involves setting up a prepaid account with the Authority and installing a transponder in the vehicle to allow for the automatic deduction of tolls from the prepaid account. Drivers not in the NC Quick Pass transponder program are invoiced for tolls incurred through the Bill by Mail program.

If a customer uses the Triangle Expressway System and the tolls are not paid within the invoice cycle, a Bill by Mail invoice will be sent to the registered owner of the motor vehicle by first-class mail to the address associated with the vehicle and provided by the North Carolina Division of Motor Vehicles ("NC DMV"), another state's DMV, or another recognized source, as applicable. The first Bill by Mail invoice will include any tolls incurred during the invoice cycle. A person who receives an invoice for an unpaid toll must either pay the invoice or request a review of the invoice by the Authority. If the person invoiced does not take one of such actions within 30 days after the invoice is generated, the Authority will add a $6.00 processing fee to the toll amount the person owes, with a maximum of $48.00 in processing fees allowed against that person within a twelve-month period. In February 2023, NC H198 was introduced to the North Carolina General Assembly, and if the bill passes, the Authority's processing fee would go up to $9.00 with a maximum of $72.00 in processing fees allowed against that person within a twelve-month period. Each invoice also includes a "failure to pay" statement explaining the fees and the consequences of non-payment. The Authority will add a $25.00 civil penalty after the second unpaid invoice. Only one civil

penalty may be assessed within a six-month period. The failure of a North Carolina resident to pay an invoice, including any processing fee and any civil penalty, is grounds to withhold the registration renewal of any motor vehicle registered in that person's name. When the Authority notifies the North Carolina Commissioner of Motor Vehicles of a North Carolina resident who owes a toll, processing fee or civil penalty, the North Carolina Commissioner of Motor Vehicles must withhold the registration renewal of any motor vehicle registered in that person's name until the required payment is made. If necessary, the Authority uses collection agencies to collect unpaid tolls and fees from users of the Triangle Expressway. As of the end of Fiscal Year 2023, the Authority was billing approximately 95.3% of total lane transactions on the Triangle Expressway and Monroe Expressway. Of the transactions billed for the Triangle Expressway and Monroe Expressway, the Authority collected approximately 95.1%, resulting in a combined toll collection rate of approximately 90.6%.

If a person receiving an invoice asks for a review of the invoice for use of the Triangle Expressway, then the Authority is to conduct a review and determine whether the person is liable for the toll. If the Authority determines that the person is liable for the toll, the person may contest this determination by filing a petition for a contested case hearing at the North Carolina Office of Administrative Hearings.

Under the State constitution, amounts collected in the form of civil penalties in excess of the cost of collection are required to be paid to the school administrative unit to provide additional support for the public school system. Therefore, most or all of the civil penalties the Authority collects from the Triangle Expressway System will not be treated as Receipts under the Trust Agreement and will not be paid to the Authority. The Authority will be entitled to collect the full amount of all tolls and the processing fees.

**Intelligent Transportation System**

The Triangle Expressway Intelligent Transportation System ("ITS") consists of roadside devices including closed circuit television cameras, microwave vehicle detection stations, full-matrix dynamic message signs and a wrong-way vehicle detection and notification system. The ITS is currently connected via a 38-mile fiber-optic communications system using Gigabit Ethernet technology for both the toll collection system and the Intelligent Transportation System. The ITS will be expanded for the Complete 540 – Phase 1 and Phase 2 with similar technologies. The ITS provides video and data sharing with the Authority, NCDOT, and Triangle Expressway System users.

The Authority has traffic management workstations and office space allocated in the North Carolina Statewide Transportation Operations Center ("STOC") located in the National Guard Joint Force Headquarters Building in Raleigh. This facility hosts the State's emergency management center. A portion of the STOC is dedicated for the Authority, and serves as a location for the Authority to monitor traffic conditions on the Triangle Expressway.

**Toll Rate Policy**

Pursuant to Section 136-89.183 of the North Carolina General Statutes, the Authority has the power to fix, revise, charge, retain, enforce, and collect tolls and fees for the use of turnpike projects, including the Triangle Expressway System.

On September 17, 2008, the Authority adopted a toll rate policy (the "Toll Rate Policy") which provides guidelines pursuant to which the Authority shall establish and adjust toll rate schedules for its turnpike projects. Pursuant to the Toll Rate Policy, the Authority was required to hire the Traffic Consultant to prepare a traffic and revenue study for the Triangle Expressway System and forecast the projected traffic for and the toll revenues to be generated from the Triangle Expressway System. After receipt of such traffic and revenue study, the Toll Rate Policy directs the Authority to adopt a toll rate schedule for the use of the

turnpike project based upon factors it determines appropriate, including but not limited to, the location of the turnpike project for which the toll is collected, the type of vehicles anticipated to use the turnpike project, the method of collection of the toll (electronic, video, cash or other method) and other factors, including the rate increase assumptions in the traffic and revenue study. The Traffic Consultant prepared the initial Comprehensive Traffic and Revenue Study Final Report for the Triangle Expressway System dated April 6, 2009 (the "2009 Traffic and Revenue Report"), which contained a proposed toll rate schedule with the assumption that the tolls would be increased each year. A copy of the 2009 Traffic and Revenue Report is available on the Authority's web page at https://www.ncdot.gov/divisions/turnpike/turnpike-projects/Pages/triangle-expressway-documents.aspx.

Under the Toll Rate Policy, an increase in the toll rates is required in each year unless the Authority provides to the Trustee (1) a resolution of the Authority's Board directing that the toll rates will not be increased or will be increased in a lesser amount than assumed in the 2009 Traffic and Revenue Report; (2) a certificate of an officer of the Authority to the effect that the Authority is in compliance with all applicable rate covenants in the Trust Agreement and all other documents for the Bonds issued to finance the Triangle Expressway; and (3) a report of the Traffic Consultant showing that for each succeeding Fiscal Year through the final maturity date for all indebtedness issued to finance the Triangle Expressway, the forecasted Revenues in each such Fiscal Year would be such that one dollar of additional senior lien indebtedness could be issued by the Authority in compliance with the requirements of the additional debt limitations set forth in the documents related to all bonds issued to finance the Triangle Expressway.

In 2012 and 2013, in order to reflect the actual start of toll collections on various phases of the Triangle Expressway System and to ensure that toll rates were not increased precipitately, the Authority engaged the Traffic Consultant to provide revised annual gross toll revenue estimates based on delayed implementation dates for programmed toll increases to better reflect the actual dates of operation of the Triangle Expressway. The Traffic Consultant delivered a 2012 Revised Toll Revenue Letter dated December 13, 2012 (the "2012 T&R Letter") and a 2013 Revised Toll Revenue Letter dated June 3, 2013 (the "2013 T&R Letter"). By resolutions adopted on December 20, 2012, and again on June 20, 2013, the Authority determined to adopt a toll rate schedule that deferred inception of rates or rate increases for certain road segments and changed the date of toll increases from July to January in each year. In March 2016, the Traffic Consultant delivered a report addressing the impact of the addition of the new Veridea Parkway Interchange to the Triangle Expressway System, based on an expected opening date by the end of March 2017, which included a revised proposed toll rate schedule for that interchange. On August 4, 2016, the Authority adopted the rates included in the March 31, 2016 report as the toll rates for the Veridea Parkway Interchange. That report included a confirmation of certain tolling conventions, including that the Class 2 toll rates will equal two times the Class 1 toll rates, that Class 3 toll rates will equal four times the Class 1 toll rates, and that electronic toll collection rates continue to be discounted by 35% of the Bill by Mail rates. In addition, rates were recommended for new toll zones to keep per mile toll rates as consistent as possible. A similar report was prepared to address the impact of the addition of the new Morrisville Parkway Interchange to the Triangle Expressway System, based on an expected opening date in 2020, which includes a proposed toll rate schedule for that interchange. The Authority adopted the rates for the Morrisville Parkway Interchange in October 2019. A Traffic and Revenue Report for the Triangle Expressway System completed by the Traffic Consultant in 2019 included the proposed toll rates for Complete 540 – Phase 1. It is anticipated that the setting of future toll rates will continue to follow the conventions currently in place with respect to the Triangle Expressway System, including the goal of relatively consistent per mile rates. In any case, such toll rates will meet the requirement of the Toll Rate Policy that the forecasted Revenues resulting from such toll rates would support the issuance of at least one dollar of additional senior lien indebtedness under the Trust Agreement.

Each revision of the toll rate schedule includes a formal revision to the 2009 Traffic and Revenue Report, a determination by the Authority's financial advisor that the new forecasted revenues would be

sufficient under the Trust Agreement to meet the Rate Covenant, and an opinion of bond counsel to the Authority that such action would not have an adverse effect on the exclusion of interest on the Bonds issued under the Trust Agreement from gross income for federal income tax purposes or cause the Authority to be in violation of any of its covenants under the Trust Agreement.

## HISTORICAL PERFORMANCE OF TRIANGLE EXPRESSWAY SYSTEM

The Authority's audited financial statements for the Fiscal Years ended June 30, 2020, 2021, 2022, and 2023 show total operating revenues (reported on an accrual basis) for the Authority of $82.613 million, $57.185 million, $107.272 million, and $111.772 million, respectively. The audited financial statements for Fiscal Year ended June 30, 2019 were the first to include operating revenues from both the Triangle Expressway System and the Monroe Expressway. For additional information regarding the operations of the Authority, see APPENDIX E – Audited Financial Statements of the Authority for Fiscal Years ended June 30, 2023 and 2022. Based on those numbers, and certain agreed upon procedures performed by the Authority's auditor, the Authority's revenues from the Triangle Expressway have been above the levels required to meet the Rate Covenant. The Authority's audited financial statements and the corresponding report on agreed upon procedures are posted as part of the Authority's Continuing Disclosure undertaking.

Total revenue of the Triangle Expressway System, which is shown on a cash basis and inclusive of toll revenue and processing fees, is listed in the chart below with operating expenses. Fiscal Year 2023 revenues increased by $7,091,585 or 13.1% from the prior year, while Fiscal Year 2023 operating expenses increased $4,652,245 or 32.9% from the prior year. Fiscal Year 2022 revenues increased $14,964,131 or 38.3% from the prior year while Fiscal Year 2022 operating expenses increased $236,843 or 1.7% from the prior year.

| | **Fiscal Year 2021 [1]** | **Fiscal Year 2022 [1]** | **Fiscal Year 2023 [1]** |
|---|---|---|---|
| Total Revenue | $39,078,585 | $54,042,716 | $61,134,301 |
| Operating Expenses | 13,899,836 | 14,136,679 | 18,788,924 |

[1] The revenue and operating expenses vary from the amounts shown in the audited financial statements, which are generally presented on an accrual basis rather than a cash basis.

| **Rate Covenant** | **2019** | **2020** | **2021** | **2022** | **2023** |
|---|---|---|---|---|---|
| Revenues to Long-Term Debt Service Requirement for Senior Lien Indebtedness (130% minimum) | 235% | 160% | 149% | 150% | 169% |
| Revenues to (i) Long-Term Debt Service Requirement for Senior Lien Indebtedness, Subordinate Lien Indebtedness and Junior Indebtedness for such Fiscal Year plus (ii) required deposits to Senior Lien Parity Reserve Account, Subordinate Lien Parity Reserve Account, Junior Indebtedness Debt Service Reserve Account and the TIFIA Debt Service Reserve Account (110% minimum) | 175% | 160% | 149% | 150% | 169% |

The following table shows the annual toll transactions and collected revenue from calendar year 2013 through 2023.

| Calendar Year | Toll Transactions and Year-over-Year Percent Growth: Transactions (000's) | Growth | Collected Toll Revenue and Year-over-Year Percent Growth [2]: Revenue (000's) | Growth | Average Weighted Toll Rate and Year-over-Year Percent Growth [1]: Toll Rate | Growth | Percent Annual Toll Increase |
|---|---|---|---|---|---|---|---|
| 2013 | 23,059 | - | $14,238 | - | 0.62 | - | - |
| 2014 | 30,650 | 32.9% | 21,045 | 47.8% | 0.69 | 11.2% | 5.1% |
| 2015 | 38,319 | 25.0 | 28,779 | 36.7 | 0.75 | 9.4 | 5.3 |
| 2016 | 45,244 | 18.1 | 35,393 | 23.0 | 0.78 | 4.2 | 4.2 |
| 2017 | 49,460 | 9.3 | 40,792 | 15.3 | 0.82 | 5.4 | 3.0 |
| 2018 [3] | 53,121 | 7.4 | 45,061 | 10.5 | 0.85 | 2.9 | 4.0 |
| 2019 | 58,130 | 9.4 | 51,791 | 14.9 | 0.89 | 5.0 | 3.5 |
| 2020 [4] | 43,153 | -25.8 | 37,859 | -26.9 | 0.88 | -1.5 | 3.5 |
| 2021 | 56,520 | 31.0 | 43,030 | 13.7 | 0.76 | -13.2 | 3.5 |
| 2022 | 64,120 | 13.5 | 50,329 | 17.0 | 0.78 | 3.1 | 3.5 |
| 2023 [5] | 61,125 | N/A | 49,081 | N/A | 0.80 | 1.8 | 3.0 |
| **Average Annual Percentage Change** | | | | | | | |
| 2013-2017 | | 21.0 | | 30.1 | | 7.5 | 4.4 |
| 2017-2019 | | 8.4 | | 12.7 | | 3.9 | 3.7 |

[1] The average weighted toll rate is calculated by dividing total toll revenue for the year by total transactions for the year.
[2] This is toll revenue collected during the indicated year. It does not include fee revenue.
[3] Hurricane Florence made landfall near Wilmington on September 14, 2018.
[4] Beginning of COVID-19 Global Pandemic.
[5] Represents transactions and revenue through October 2023.
Source: The Authority.

## FUNDING OF THE TRIANGLE EXPRESSWAY SYSTEM

The Triangle Expressway System, including Complete 540 – Phase 1, has been funded through various sources of funds, including revenue bonds, state appropriation bonds, TIFIA loans, and state matching funds.

### 2009B Bonds

The Authority issued the 2009B Bonds on July 29, 2009, in the original principal amount of $35,173,108.85, as Capital Appreciation Bonds maturing January 1, 2030, through January 1, 2038, in order to provide a portion of the financing for the Triangle Expressway System. As of January 1, 2024, the current accreted amount outstanding was $95,335,518 and at maturity the total accreted amount will be $250,000,000. The 2009B Bonds remain outstanding under the Trust Agreement and are secured on parity with the Series 2024 Bonds. The scheduled payment of principal of and interest on the 2009B Bonds when due is guaranteed under an insurance policy issued by Assured Guaranty Corp. ("AGC").

**2017 Bonds**

The Authority issued the 2017 Bonds on March 30, 2017, in the original principal amount of $200,515,000 maturing January 1, 2018 through 2039, in order to refund in advance of their maturities the Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2009A (the "2009A Bonds" and together with the 2009B Bonds, the "2009 Bonds") maturing on and after January 1, 2020. The 2009 Bonds were issued to provide funds for the costs of the Triangle Expressway System. $160,020,000 in principal amount of the 2017 Bonds remains outstanding under the Trust Agreement. The outstanding 2017 Bonds are secured on parity with the Series 2024 Bonds. The scheduled payment of principal of and interest on certain maturities of the 2017 Bonds when due is guaranteed under an insurance policy issued by Assured Guaranty Municipal Corp. ("AGM").

**2018 Bonds**

The Authority issued the 2018 Bonds on December 12, 2018, in the original principal amount of $401,155,000 maturing January 1, 2020 through 2041, in order to refund in advance of its maturity the Authority's Triangle Expressway Revenue Bond, TIFIA Series 2009 (the "TIFIA Series 2009 Bond"). The TIFIA Series 2009 Bond evidenced the Authority's obligation to repay a loan from USDOT, which was incurred to provide funds for the costs of the Triangle Expressway System. $393,920,000 in principal amount of the 2018 Bonds remain outstanding under the Trust Agreement. The outstanding 2018 Bonds are secured on parity with the Series 2024 Bonds. The scheduled payment of principal of and interest on certain maturities of the 2018 Bonds when due is guaranteed under an insurance policy issued by AGM.

**2019 Bonds**

The Authority issued the 2019 Bonds on December 17, 2019, in the original principal amount of $370,975,000 maturing January 1, 2042 through January 1, 2055, in order to provide a portion of the financing for Complete 540 – Phase 1. The full principal amount of the 2019 Bonds remains outstanding under the Trust Agreement. The outstanding 2019 Bonds are secured on parity with the Series 2024 Bonds. The scheduled payment of principal of and interest on certain maturities of the 2019 Bonds when due is guaranteed under an insurance policy issued by AGM.

**2021 TIFIA Loan**

The Authority entered into the TIFIA 2021 Loan Agreement with USDOT on August 5, 2021, pursuant to which the Authority borrowed an amount not to exceed $499,461,980 under the 2021 TIFIA Loan. Interest on the 2021 TIFIA Loan will compound semi-annually, will be fully accrued until July 1, 2025, and will be partially accrued until July 1, 2028. Accrued interest is added to the outstanding loan balance.

The TIFIA 2021 Loan Agreement replaced the TIFA Loan Agreement dated as of December 17, 2019 (the "TIFIA 2019 Loan Agreement"), between the Authority and USDOT, which was entered into to provide funds for costs of the Complete 540 – Phase 1. The TIFIA 2021 Loan Agreement replaced the TIFIA 2019 Loan Agreement in order to reset the interest rate to a lower rate that was then applicable to TIFIA direct loans. In January 2023, the full amount available under the TIFIA 2021 Loan Agreement was drawn and used to defease the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Bond Anticipation Notes, Series 2020 (the "2020 BANs"), issued to provide interim financing for a portion of the costs of Complete 540 – Phase 1.

The 2021 TIFIA Loan is evidenced by the TIFIA Series 2021 Bond, issued under the Fourth Supplemental Trust Agreement. $503,593,831 in principal amount of the TIFIA Series 2021 Bond remains

outstanding under the Trust Agreement. The unpaid balance of the 2021 TIFIA Loan bears interest at an interest rate of 1.83% per annum.

The Authority's obligation to make the loan repayments required under the TIFIA 2021 Loan Agreement is evidenced by the TIFIA Series 2021 Bond, and is secured by a pledge under the Trust Agreement of the Trust Estate. The pledge of the Trust Estate to secure the 2021 TIFIA Loan repayments is generally subordinate to the payment of Senior Lien Indebtedness, including the Series 2024 Bonds. However, if obligations are owed to USDOT under the TIFIA 2021 Loan Agreement, upon the occurrence of a Bankruptcy Related Event under the Trust Agreement with respect to the Authority, the obligations of the Authority to USDOT under the TIFIA 2021 Loan Agreement will become Senior Lien Indebtedness, secured on parity with other Senior Lien Indebtedness, including the Series 2024 Bonds, except that USDOT will not be entitled to be paid from amounts on deposit in the Senior Lien Reserve Fund or the Series 2024 Subaccount of the Capitalized Interest Account. See "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2024 BONDS – TIFIA Indebtedness Upon Occurrence of Bankruptcy Related Event."

**State Appropriated Revenues; State Appropriation Bonds**

Pursuant to Section 136-176(b2) of the North Carolina General Statutes, the General Assembly of North Carolina has provided for a continuing annual appropriation of $25,000,000 to the Authority from the Highway Trust Fund to finance the Triangle Expressway System. Pursuant to the legislation, amounts so appropriated may be used by the Authority to pay debt service or related financing costs and expenses on revenue bonds or notes issued by the Authority to finance costs of the Triangle Expressway System or to fund debt service reserves, operating reserves, and similar reserves in connection therewith. This State appropriation for the Triangle Expressway System is defined in the Trust Agreement and herein as the "State Appropriated Revenues." The annual appropriation does not constitute a pledge of the faith and credit and taxing power of the State, and nothing prohibits the General Assembly from amending the annual appropriation to decrease or eliminate the amount annually appropriated to the Authority.

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The Authority previously entered into a separate Trust Agreement, dated as of July 1, 2009 (as supplemented and amended, the "State Appropriation Revenue Bond Trust Agreement"), pursuant to which the Authority has issued revenue bonds secured by State Appropriation Revenues, of which the following remain outstanding:

| Series of Bonds | Initial Par Amount | Principal Currently Outstanding [1] |
|---|---|---|
| Triangle Expressway System Appropriation Revenue Refunding Bonds, Series 2018A (the "2018A State Appropriation Bonds")[2] | $150,125,000 | $150,125,000 |
| Triangle Expressway System Appropriation Revenue Refunding Bond, Series 2018B (the "2018B State Appropriation Bond")[3] | 161,759,000 | 121,236,000 |
| Triangle Expressway System Appropriation Revenue Bonds, Series 2019 (Capital Appreciation Bonds) (the "2019 State Appropriation Bonds ")[4] | 115,979,250 | 131,649,0005 [5] |
| Total | $780,538,250 | $403,010,000 |

[1] As of July 1, 2023.

[2] The 2018A State Appropriation Bonds were issued to refund certain maturities of the Triangle Expressway System State Appropriation Revenue Bonds, Series 2009B (Federally Taxable – Issuer Subsidy – Build America Bonds) (the "2009 State Appropriation Bonds").

[3] The 2018B State Appropriation Bond was privately placed with a financial institution, the proceeds of which were used to redeem certain additional maturities of the 2009 State Appropriation Bonds on January 1, 2019.

[4] The 2019 State Appropriation Bonds were used to pay a portion of the costs of Complete 540 – Phase 1.

[5] The Series 2019 Bonds are capital appreciation bonds. The values represent the initial par outstanding and the accreted value calculated using the straight-line method.

**The 2018A State Appropriation Bonds, the 2018B State Appropriation Bond and the 2019 State Appropriation Bonds are payable solely from the State Appropriated Revenues, and are not secured by the Trust Estate under the Trust Agreement.**

The 2018A State Appropriation Bonds, the 2018B State Appropriation Bond, the 2019 State Appropriation Bonds and any other bonds issued under the State Appropriation Revenue Bond Trust Agreement (collectively, the "State Appropriation Revenue Bonds") are secured solely by the State Appropriated Revenues and investment earnings thereon and certain funds established under the State Appropriation Revenue Bond Trust Agreement. The State Appropriation Revenue Bonds are not secured by the tolls or other revenues of the Triangle Expressway System or any funds held under the Trust Agreement. Under the State Appropriation Revenue Bond Trust Agreement, amounts not needed in any Fiscal Year to make debt service payments on the State Appropriation Revenue Bonds will be withdrawn from the State Appropriation Revenue Bond Trust Agreement and deposited to the Revenue Fund under the Trust Agreement. Upon such withdrawal from the State Appropriation Revenue Bond Trust Agreement, the amounts so transferred shall be transferred free and clear of the lien on and pledge created under the State Appropriation Revenue Bond Trust Agreement and will constitute "Revenues" and "Receipts" under the Trust Agreement. There is no assurance that any such amounts will be available to be transferred to the Trust Agreement.

**NCDOT Operations and Maintenance Guaranty**

As described below under "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2024 BONDS," Operating Expenses of the Triangle Expressway System are payable from Receipts after the prior payment of debt service on Senior Lien Bonds, Subordinate Lien Bonds, if any, Junior Indebtedness (including TIFIA Indebtedness), if any, and the funding of certain debt service and related reserves. In order

to assure a source of funds for payment of Operating Expenses of the Triangle Expressway System, the Authority and NCDOT entered into the Operations and Maintenance Expense Guaranty Agreement dated August 20, 2008 (the "Operations and Maintenance Expense Guaranty Agreement"), which provided that NCDOT would fund the deficiency in the Operations and Maintenance Expense Fund in the event that there is a deficiency in the Receipts such that there are not funds available in the Operations and Maintenance Expense Fund to pay Operating Expenses on the Initial Project. On May 3, 2018, NCDOT adopted a resolution approving similar guaranties of operation and maintenance expenses for Complete 540 – Phase 1 and Complete 540 – Phase 2 (the "2018 NCDOT Guaranty"). The Amended and Restated Trust Agreement incorporates NCDOT's obligations under the Operations and Maintenance Expense Guaranty Agreement and the 2018 NCDOT Guaranty (collectively, the "NCDOT O&M Guaranty"). To date, the Authority has not requested any such funding from NCDOT under the NCDOT O&M Guaranty.

The NCDOT O&M Guaranty provides that any amounts required to be paid by NCDOT thereunder are payable solely from the State Highway Fund, and are subject to appropriation by the State and the availability of amounts in such fund. There is no assurance that funds will be available in the State Highway Fund to make such payments if needed. The Authority will be required to repay any amount so advanced, with interest. The Trust Agreement creates an Operating Reserve Fund that the Authority would draw upon to pay required Operating Expenses prior to any draw on the NCDOT O&M Guaranty. See "The Amended and Restated Trust Agreement – Funds Received by the Authority; Application of Money in Revenue Fund" in APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement.

**NCDOT Renewal and Replacement Guaranty – Funding Deficiencies in Completion Costs and in the Renewal and Replacement Fund**

The Trust Agreement creates a Renewal and Replacement Fund as a special fund to which deposits are to be made from Receipts to pay all or a portion of the cost of unusual or extraordinary maintenance, repairs, renewals or replacements or capital improvements related to the Triangle Expressway System. Under the Trust Agreement, deposits to the Renewal and Replacement Fund are to be made from Receipts in amounts designed to assure that funds will be available for the required purpose when needed, as described under the caption "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2024 BONDS – Application of Receipts." In order to assure that construction of the Initial Project was completed and that the Renewal and Replacement Fund is funded as required, the NCDOT undertook pursuant to the Construction Completion Assurance and Standby Renewal and Replacement Funding Agreement dated April 15, 2009 (the "Renewal and Replacement Funding Agreement"), to (i) fund the costs of construction and completion with respect to the Initial Project and (ii) fund any deficiency in the Renewal and Replacement Fund from the amount that is required at the time to be on deposit in the Renewal and Replacement Fund. In the Amended and Restated Trust Agreement, NCDOT has agreed to provide similar funding of the costs of construction and completion with respect to Complete 540 – Phase 1 and Complete 540 – Phase 2. NCDOT's obligation to provide funds to complete construction and to fund the Renewal and Replacement Fund is referred to collectively as the "NCDOT Renewal and Replacement Guaranty". To date, the Authority has not requested any such funding from NCDOT under the Renewal and Replacement Guaranty.

The NCDOT Renewal and Replacement Guaranty provides that any amounts required to be paid by NCDOT thereunder are payable solely from the State Highway Fund or the State Highway Trust Fund and are subject to appropriation by the State and the availability of amounts in the respective source funds. There is no assurance that funds will be available in the State Highway Fund or the State Highway Trust Fund to make such payments if needed. The Authority will be required to repay any amount so advanced, with interest. See "The Amended and Restated Trust Agreement – Funds Received by the Authority;

Application of Money in Revenue Fund" in APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement.

In the NCDOT Renewal and Replacement Guaranty, the Authority agreed to cooperate with appropriate officials of NCDOT such that the timing of payments to pay the costs of Complete 540 – Phase 1 pursuant to the undertaking will not disrupt NCDOT's other contractual obligations being funded from the State Highway Trust Fund or the State Highway Fund and will not interfere with NCDOT's committed debt service payments. On June 27, 2019, the State issued its $300,000,000 Limited Obligation (Build NC) Bonds, Series 2019A (the "Build NC 2019A Bonds"), on November 12, 2020, the State issued its $700,000,000 Limited Obligation (Build NC) Bonds, Series 2020B (the "Build NC 2020B Bonds") and on May 19, 2022, the State issued its $300,000,000 Limited Obligation (Build NC) Bonds, Series 2022A (the "Build NC 2022A Bonds"), which were all issued pursuant to the State Capital Facilities Finance Act, Article 9 of Chapter 142 of the North Carolina General Statutes, as previously amended and as amended by North Carolina Session Law 2018-16, Session Law 2020-91 and Session Law 2021-189 (collectively, the "Build NC Bond Act"). The Build NC Bond Act provides that funds from the State Highway Trust Fund shall be the source of repayment for the Build NC 2019A Bonds, the Build NC 2020B Bonds and the Build NC 2022A Bonds. The Build NC Bond Act authorizes the issuance of up to $3 billion in bonds, of which $1,700,000,000 remains eligible to be issued, for regional and divisional projects identified in the Statewide Transportation Improvement Plan through December 31, 2028, subject to a number of constraints.

**State Funds**

The State is contributing approximately $371 million in State funds to pay for costs of Complete 540 – Phase 1, $7 million of which is being used to purchase the TIFIA Debt Service Reserve Policy.

**Repayment of NCDOT Contributions**

The Authority may be required to repay any amounts advanced by NCDOT as described above under "NCDOT Operations and Maintenance Guaranty" and "NCDOT Renewal and Replacement Guaranty," with interest, from Receipts, but only after payment of current debt service on the Series 2024 Bonds and other Senior Lien Indebtedness, Subordinate Lien Indebtedness and any Junior Indebtedness, including TIFIA Indebtedness, the funding of any deficiency in all debt service reserve funds held under the Trust Agreement, the funding of required deposits to the Operations and Maintenance Expense Fund, the Operating Reserve Fund, and the Renewal and Replacement Fund required under the Trust Agreement, or from amounts deposited and held in the General Reserve Fund available for such expense. See "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2024 BONDS – Application of Receipts."

## 2023 TRAFFIC AND REVENUE UPDATE STUDY

In connection with the issuance of the Series 2024 Bonds, the Traffic Consultant prepared the Triangle Expressway and Complete 540 – Phase 2 Traffic and Revenue Study (the "2023 Traffic and Revenue Update Study"). The 2023 Traffic and Revenue Update Study consists of the Triangle Expressway and Complete 540 Phases 1 & 2 Traffic and Revenue Study completed in January 2021 (the "2021 Traffic and Revenue Study") and the subsequent Triangle Expressway and Complete 540 Phases 1 & 2 T&R Forecast Bringdown Letter completed in September 2023 (the "2023 Bringdown Letter"). A complete copy of the 2023 Traffic and Revenue Update Study is included as APPENDIX C attached hereto.

**The traffic and revenue estimates for the Triangle Expressway System in the 2023 Bringdown Letter supersede the previous estimates in the 2021 Traffic and Revenue Study.**

The 2023 Traffic and Revenue Update Study sets forth estimated traffic and revenue for the Triangle Expressway System, including Complete 540 – Phase 1 and Complete 540 – Phase 2, in which traffic and revenue estimates are based on the existing Triangle Expressway (referred to herein as the "Triangle Expressway"), Complete 540 – Phase 1, which will extend Triangle Expressway from its current southern terminus at NC 55 Bypass eastward to I-40, and Complete 540 – Phase 2, which will extend the Triangle Expressway from I-40 to I-87/US 64/US 264.

The 2023 Traffic and Revenue Update Study has been prepared on the basis of numerous assumptions and other factors described in the 2023 Traffic and Revenue Update Study and should be read in its entirety and in light of such assumptions and other factors. The sensitivity analyses in the 2023 Traffic and Revenue Update Study make certain assumptions about toll rates through 2064. The Authority Board has not authorized tolls for the original Triangle Expressway System beyond 2049.

**Assumptions**

The traffic and revenue estimates for the existing Triangle Expressway, Complete 540 – Phase 1 and Complete 540 – Phase 2 contained in the 2023 Traffic and Revenue Update Study are predicated on the basic assumptions contained in the 2021 Traffic and Revenue Study except as such assumptions were updated by the 2023 Bringdown Letter as listed below.

***2023 Updated Assumptions***

The following key inputs and assumptions were updated in the 2023 Bringdown Letter:

1. Updates to current and projected socioeconomic data in Wake, Durham, and Johnston Counties, were provided by Dr. Stephen Appold, independent economist.

2. Updates to future travel demand model roadway networks were made based on:

    a. 2024-2033 NC State Transportation Improvement Program (STIP) as of July 2023,

    b. NC Capital Area Metropolitan Planning Organization (CAMPO) and Durham – Chapel Hill – Carrboro Metropolitan Planning Organization (DCHC MPO) 2050 Metropolitan Transportation Plan (MTP) and interactive maps as of July 2023.

3. Updates were made to inflation forecasts and other corresponding variables such as travelers' values of time (VOT) and vehicle operating costs (VOC).

4. Near-term assumptions for traffic and revenue growth by vehicle class and method of payment were updated based on an additional 32 months of historical monthly traffic and revenue data on Triangle Expressway.

5. Future-year travel demand model trip table adjustments were made to account for observed changes in the hourly distribution of transactions on Triangle Expressway related to increased rates of work from home.

6. Complete 540 – Phase 1 is assumed to open to traffic and begin collecting toll revenue by July 1, 2024. The forecasts within the 2023 Traffic and Revenue Update Study assume that prior to this date, the Triangle Expressway will continue to operate as it currently exists.

7. Complete 540 – Phase 2 is assumed to open by January 1, 2029.

***2021 Traffic and Revenue Study Assumptions***

1. Tolls on the Triangle Expressway and Complete 540 – Phases 1 and 2 will be charged for three vehicle classes, using a cashless all-electronic toll collection methodology. Two payment types will continue to be offered; electronic toll collection with transponders (ETC) and Bill by Mail (BBM), utilizing video imaging of license plates for those vehicles not equipped with transponders. Toll rates for each year of the forecast period will be as shown in Tables 6.1 and 6.2 of the 2021 Traffic and Revenue Study, which assumes continued annual increases in toll rates. Any changes in the assumed rates of annual increase, or discontinuation of annual rate increases, will impact traffic and revenue forecasts.

2. Highway and other transportation improvements as set forth in Tables 5.6, 5.7 and 5.8 of the 2021 Traffic and Revenue Study will be implemented within the time frames assumed in those tables. No other transportation improvement projects, particularly new roads, additional road capacity or new interchanges will be constructed during the forecast period, other than those shown in Table 5.6, 5.7 and 5.8 of the 2021 Traffic and Revenue Study.

3. The annual rate of inflation will be as shown in Table 5.9 of the 2021 Traffic and Revenue Study for purposes of the forecast. Any change in inflation rates could affect traffic and revenue even if toll rates continue to be adjusted in accordance with the assumed toll rates shown in Tables 6.1 and 6.2 of the 2021 Traffic and Revenue Study.

4. Estimated method-of-payment market shares among ETC and BBM transactions will be as shown in Table 6.9 of the 2021 Traffic and Revenue Study.

5. Economic growth in the project study area will generally occur as forecasted by the independent economist used in the study, whose work is summarized in Chapter 3 of the 2021 Traffic and Revenue Study, along with the two-year growth lag and 4 percent reduction in work-based trips due to long-term COVID-19 impacts discussed in section 5.9 of the 2021 Traffic and Revenue Study.

6. Leakage and fee revenue adjustments are applied to the estimated gross toll revenue forecasts. The adjustments are based on seven years of actual experience on the Triangle Expressway, provided by the Authority. The forecast assumes that toll revenue collection, particularly as related to BBM transactions and processing fee revenue, will continue to be collected at similar rates over the forecast period.

7. The Triangle Expressway will continue to be well maintained, efficiently operated, effectively signed and promoted to encourage maximum usage.

8. Motor fuel will remain in adequate supply throughout the forecast period. Fuel price increases will not significantly exceed the overall rate of inflation. Fuel price forecasts provided by the U.S. Energy Information Administration through 2050 will generally be experienced.

9. No national, state or regional emergency will arise that would abnormally restrict the use of motor vehicles. Future transportation technology changes will not significantly negatively impact traffic and revenue on Triangle Expressway over the projection period.

**Study Process**

Following is a summary of the study process used in developing the 2021 Traffic and Revenue Study:

A comprehensive work program was developed to meet the specific objectives of the 2021 Traffic and Revenue Study. In general, the 2021 Traffic and Revenue Study was comprised of five major efforts:

1. Data Collection and Summarization;

2. Corridor Growth Analysis;

3. Triangle Regional Model Refinement and Calibration;

4. Traffic and Toll Revenue Analysis; and

5. Traffic and Toll Revenue Sensitivity Tests.

In preparing the 2021 Traffic and Revenue Study, the Traffic Consultant conducted a data collection program including traffic counts, travel speed data, origin-destination data, and roadway improvement plans, including the following:

Available Traffic Counts and Toll Revenue Data

- CDM Smith coordinated with the NCDOT Traffic Survey Group to obtain Raleigh-area hourly traffic count data at 91 locations collected primarily in fall 2019.

- CDM Smith obtained updated toll transaction and revenue data for the Triangle Expressway from the Authority. In addition, CDM Smith received data on leakage and fee revenue associated with BBM transactions on the Triangle Expressway.

HERE Travel Speed Data

- Updated travel speed data was obtained in the study area from HERE via the Regional Integrated Transportation Information System (RITIS) with the permission of the NCDOT.

Streetlight Data

- Origin-destination data was obtained from StreetLight Data, Inc. for travel patterns and trip distances for movements on Triangle Expressway and selected area roads.

Future Roadway Improvements

- Future roadway improvement projects were reviewed and checked against assumed improvements in the TRMv6. The following sources were used to identify planned roadway improvements.

    - 2020-2029 NC State Transportation Improvement Program (STIP) and amendments through October 2020.

- NC Capital Area Metropolitan Planning Organization (CAMPO) and Durham – Chapel Hill – Carrboro Metropolitan Planning Organization (DCHC MPO) Transportation Improvement Program (TIP) and interactive map.

- CAMPO and DCHC MPO long range plan – the 2045 Metropolitan Transportation Plan and interactive map.

CDM Smith coordinated with NCDOT and Authority staff and/or MPO staff to identify needed changes to the TRMv6 model to reflect the current understanding of improvement completion dates or definitions.

The Traffic Consultant obtained the most recent officially adopted version of the Triangle Regional Model, the Triangle Regional Model Version 6 (the "TRMv6"), from the Institute of Transportation Research and Education at North Carolina State University. The Triangle Regional Model is a key tool for evaluating future corridor growth and travel demand in the region and encompasses three complete counties – Durham, Orange and Wake – and seven other partial counties in North Carolina. The official base year of the TRMv6 is 2013 and supported forecast years 2020, 2025, 2035, and 2045.

The socioeconomic assumptions in the TRMv6 were analyzed by an independent economist, Dr. Stephen J. Appold, who has expertise in North Carolina economic trends and forecasts. Dr. Appold developed a set of socioeconomic inputs to the TRMv6 to enable the Traffic Consultant to create a model year 2019 for calibration purposes for the 2021 Traffic and Revenue Study. Using an analysis of major employers, employment centers, housing developments, and the latest available historic trends and forecasts, Dr. Appold also created revised socioeconomic inputs, including population, number of households, and employment, for each of the Forecast Years. Dr. Appold's adjustments to socioeconomic inputs, after review and acceptance by the Traffic Consultant, were used to create revised trip tables for each forecast year.

Estimated "values of time" ("VOT") for motorists in the study area were based on stated preference surveys conducted in 2016 by Resource Systems Group, Inc. ("RSG"). VOT expresses a driver's willingness to pay a toll to achieve a time savings. Estimated VOT was developed for different market segments and geographic areas in the model area and incorporated into the TRMv6 to support the development of traffic and toll revenue forecasts. Roadway improvements in the study area were reviewed against current plans of NCDOT and the two Metropolitan Planning Organizations ("MPO") in the area (the Capital Area MPO and the Durham Chapel-Hill Carrboro MPO) and adjusted where necessary.

The TRMv6 was used to analyze the traffic and toll revenue potential of the existing Triangle Expressway System, including Complete 540 – Phase 1 and Complete 540 – Phase 2. Traffic assignments were conducted using the refined and calibrated TRMv6, incorporating the adjusted trip tables, and using the Traffic Consultant's toll diversion algorithms. The assignments included model inputs developed by the Traffic Consultant and RSG, including motorist VOTs, motor vehicle operating cost ("VOC"), toll rate schedules, and NC Quick Pass and BBM market shares. Estimated annual transactions and revenues were calculated for the forecast years 2025, 2035, and 2045. Intermediate years were developed by interpolating between observed Triangle Expressway traffic in 2023 and model year 2025, model years 2025 and 2035, and model years 2035 and 2045. After 2045, nominal increases in traffic were assumed.

Lastly, a transaction and toll revenue sensitivity analysis was conducted for Fiscal Years 2030 and 2045 to provide information on the sensitivity of the forecasts to changes in key assumptions. In particular, the sensitivity tests analyzed the sensitivity of the base condition forecasts against reduced economic growth, reduced motorist VOT, increased motor fuel prices, reduced truck market share, and an extension of Toll NC 147 (since renamed Toll NC 885).

The 2023 Traffic and Revenue Update Study should be read in its entirety and in light of the assumptions and other factors set forth above. See APPENDIX C – 2023 Traffic and Revenue Update Study.

## GEC REPORT

The GEC has prepared the GEC's Engineering Report (the "GEC Report") attached hereto as APPENDIX D, which documents and describes the following for the Triangle Expressway:

- Authority Organizational Structure
- Complete 540 Project Background and History
- Project Construction and Implementation
- Design Details
- Toll Collection Operations
- Operations, Maintenance, Renewal and Replacement
- Environmental Considerations
- Public Involvement
- Project Costs
- Cash Flow Projections
- Implementation Schedule

The GEC Report has been prepared on the basis of numerous assumptions and other factors described in the GEC Report. Specifically, the GEC Report makes the following key assumptions and used the described methodology:

- At the time the financial plan and the GEC Report were prepared, the capital cost of the combined highway design-build contracts was budgeted as $684.72 million. Additionally, an administration and engineering contingency of $30.09 million and a change order contingency of $45.02 million have been budgeted.

- The Phase 2 Design-Build Contractors' bids were based on fuel, asphalt binder and steel prices as of July 1, 2023 (R-2829B) and September 1, 2023 (R-2829A). In accordance with the price adjustment clauses as outlined in the Phase 2 Design-Build Contracts, the Phase 2 Design-Build Contractors' invoices will be adjusted either positively or negatively according to the current commodity price at the time certain construction activities occur. Contingency in the amount of $9.0 million ($4.5 million per project) for price escalation of these commodities has been included in the Project budget.

- The capital cost items that are not included in the Phase 2 Design-Build Contracts include landscaping, toll system integration, right-of-way purchases, dry utility relocation, construction management and oversight, and other Authority expenses such as financial incentives for on-

time completion by the Phase 2 Design-Build Contractors and management reserves. In summary, these costs were estimated as follows:

- Landscaping: Pursuant to Authority standards, landscaping and special aesthetic treatments are budgeted to approximately 3-4% of the total project cost.

- Toll System Integration: The Authority anticipates utilizing its existing pool through the Statewide Roadside Toll Collection (SRTCS) to issue a task order for the Toll Collection Technology. This will be an amendment to existing contracts for the Back-Office System (BOS), Electronic Toll Collection System (ETCS), and Customer Service Center Operations.

- Right of Way: Preliminary designs and right-of-way plans will be prepared by the Phase 2 Design-Build Contractors' lead engineering firms. The lead engineering firm for R-2829A is RK&K, and the lead engineering firm for R-2829B is ICE.

- Utility Relocation: NCDOT is responsible for utility relocation costs when the utility owner has prior rights of way/compensable interest. The Phase 2 Design-Build Contractors are responsible for all costs associated with utility relocations due to haul roads and/or any other temporary conditions resulting from the Phase 2 Design-Build Contractors' methods of operation or sequence of work. The Phase 2 Design-Build Contractors are also responsible for all costs associated with relocating or adjusting utilities, due to the Phase 2 Design-Build Contractors' construction methods or their design change, that have already been relocated once, or have been authorized to be relocated, to accommodate the design shown on the right-of-way plans provided by the Authority.

- Construction Engineering and Inspection ("CEI"): NCDOT and the Authority have selected WSP to provide CEI services for the Project. The activities of the CEI firm will include inspection, erosion control inspection, materials sampling and testing, surveying grade verification, documentation of pay quantities, and claims avoidance.

- NCDOT/Authority Expenses and Reserves: The budget includes the costs of construction administration and support, public education and outreach, and administrative reserves.

- Construction Management and Oversight: The Authority will be directly responsible for construction management and construction oversight for Complete 540 – Phase 2. The construction management budget for these services is included within the NCDOT labor and administration budget.

- Operations and Maintenance ("O&M") cost estimates were based on the preliminary project design plans and the actual O&M costs incurred by the Triangle Expressway System. The operating and maintenance budgets will be assessed and updated annually through the Authority's budgeting process.

The GEC Report should be read in its entirety and in light of the assumptions and other factors set forth above. See APPENDIX D – GEC Report for a current capital cost budget for Complete 540 – Phase 2.

## PROJECTED CASH FLOW AND DEBT SERVICE COVERAGE

### Table of Projected Revenues, Operations and Maintenance Expenses, Cash Flows and Debt Service Coverage Ratios

The table below has been compiled by the Authority to show the projections for estimated Toll Revenues, the debt service requirements for the Series 2024 Bonds, the TIFIA Series 2024 Bond, the TIFIA Series 2021 Bond, the 2019 Bonds, the 2018 Bonds, the 2017 Bonds, and the 2009B Bonds, estimated debt service coverage ratios for Senior Lien Bonds, projected Operation and Maintenance Expenses, projected deposits to the Renewal and Replacement Fund, and projected deposits to the General Reserve for each of the Fiscal Years ending June 30, 2024 through June 30, 2058.

The Authority Board has only approved toll rates through 2049 for the section of Triangle Expressway System currently open to traffic; however, in accordance with the Authority Board adopted Toll Rate Policy (see "TOLLLING OF TRIANGLE EXPRESSWAY SYSTEM – Toll Rate Policy" herein), management expects that in advance of Complete 540 – Phase 1 opening to traffic in 2024 the Authority Board will consider and approve a revised toll rate schedule for the entirety of the Triangle Expressway System, including Complete 540 – Phase 1 and Complete 540 – Phase 2, with toll rates effective through at least 2058. Therefore, revenues from such tolls are included in Receipts in Projected Cash Flow and Debt Service Coverage table below.

The Act requires the Authority to remove tolls from the Triangle Expressway System only after fulfillment of all obligations of the Authority in connection with revenue bonds issued to finance a turnpike project, as defined in the Act. The Act defines all segments of the Triangle Expressway System as a single "project" under the Act. To the extent the Authority Board authorizes tolling and establishes toll rates beyond 2049, revenues from such tolls would be included in "Revenue" and "Receipts."

See also "RISK FACTORS – Forward-Looking Statements."

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## Preliminary Projected Cash Flow and Debt Service Coverage

| Fiscal Year June 30, | A<br>Total Revenues | B<br>Net State Appropriation | C<br>Total Pledged Receipts | D<br>Outstanding Senior Lien Net Debt Service | E<br>Series 2024 Bond Net Debt Service | F<br>Total Senior Lien Debt Service | G<br>Senior Lien Debt Service Coverage[1] | H<br>Excess Revenues after Senior Lien Debt Service |
|---|---|---|---|---|---|---|---|---|
| 2024 | $65,961,929 | $1,661,811 | $67,623,740 | $(46,637,062) | - | $(46,637,062) | 1.45 | $20,986,678 |
| 2025 | 94,481,412 | 1,635,681 | 96,117,093 | (60,967,219) | - | (60,967,219) | 1.58 | 35,149,875 |
| 2026 | 107,790,335 | 1,637,507 | 109,427,842 | (62,334,594) | - | (62,334,594) | 1.76 | 47,093,248 |
| 2027 | 118,756,779 | 1,641,599 | 120,398,378 | (63,856,219) | - | (63,856,219) | 1.89 | 56,542,159 |
| 2028 | 126,743,760 | 1,645,844 | 128,389,604 | (65,454,719) | - | (65,454,719) | 1.96 | 62,934,886 |
| 2029 | 138,963,308 | 1,649,524 | 140,612,833 | (63,919,422) | $(15,228,750) | (79,148,172) | 1.78 | 61,464,661 |
| 2030 | 156,297,336 | 1,654,964 | 157,952,300 | (68,279,875) | (15,228,750) | (83,508,625) | 1.89 | 74,443,675 |
| 2031 | 168,321,166 | 1,658,473 | 169,979,639 | (70,130,125) | (15,228,750) | (85,358,875) | 1.99 | 84,620,764 |
| 2032 | 179,755,135 | - | 179,755,135 | (72,156,375) | (15,228,750) | (87,385,125) | 2.06 | 92,370,010 |
| 2033 | 189,078,134 | - | 189,078,134 | (80,117,125) | (15,228,750) | (95,345,875) | 1.98 | 93,732,259 |
| 2034 | 198,612,314 | - | 198,612,314 | (83,807,625) | (15,228,750) | (99,036,375) | 2.01 | 99,575,939 |
| 2035 | 208,809,283 | - | 208,809,283 | (86,943,625) | (15,228,750) | (102,172,375) | 2.04 | 106,636,908 |
| 2036 | 218,704,121 | - | 218,704,121 | (89,975,000) | (15,228,750) | (105,203,750) | 2.08 | 113,500,371 |
| 2037 | 228,288,078 | - | 228,288,078 | (92,839,950) | (15,228,750) | (108,068,700) | 2.11 | 120,219,378 |
| 2038 | 238,715,689 | - | 238,715,689 | (86,023,650) | (15,228,750) | (101,252,400) | 2.36 | 137,463,289 |
| 2039 | 249,185,825 | - | 249,185,825 | (86,902,850) | (15,228,750) | (102,131,600) | 2.44 | 147,054,225 |
| 2040 | 259,818,953 | - | 259,818,953 | (77,306,675) | (15,228,750) | (92,535,425) | 2.81 | 167,283,528 |
| 2041 | 270,949,634 | - | 270,949,634 | (67,079,700) | (15,228,750) | (82,308,450) | 3.29 | 188,641,184 |
| 2042 | 282,872,913 | - | 282,872,913 | (39,753,650) | (15,228,750) | (54,982,400) | 5.14 | 227,890,513 |
| 2043 | 296,127,423 | - | 296,127,423 | (41,338,200) | (15,228,750) | (56,566,950) | 5.23 | 239,560,473 |
| 2044 | 309,708,572 | - | 309,708,572 | (43,139,200) | (15,228,750) | (58,367,950) | 5.31 | 251,340,622 |
| 2045 | 323,819,153 | - | 323,819,153 | (44,962,575) | (15,228,750) | (60,191,325) | 5.38 | 263,627,828 |
| 2046 | 334,819,847 | - | 334,819,847 | (46,472,450) | (15,228,750) | (61,701,200) | 5.43 | 273,118,647 |
| 2047 | 342,664,541 | - | 342,664,541 | (47,603,200) | (15,228,750) | (62,831,950) | 5.45 | 279,832,591 |
| 2048 | 351,008,188 | - | 351,008,188 | (48,702,450) | (15,228,750) | (63,931,200) | 5.49 | 287,076,988 |
| 2049 | 359,637,711 | 21,658,090 | 381,295,801 | (49,837,325) | (15,228,750) | (65,066,075) | 5.86 | 316,229,726 |
| 2050 | 368,660,658 | - | 368,660,658 | (18,041,200) | (48,968,750) | (67,009,950) | 5.50 | 301,650,708 |
| 2051 | 377,925,902 | - | 377,925,902 | (18,475,700) | (50,218,750) | (68,694,450) | 5.50 | 309,231,452 |
| 2052 | 386,963,292 | - | 386,963,292 | (18,928,000) | (51,413,750) | (70,341,750) | 5.50 | 316,621,542 |
| 2053 | 396,182,560 | - | 396,182,560 | (19,376,100) | (52,639,000) | (72,015,100) | 5.50 | 324,167,460 |
| 2054 | 405,902,502 | - | 405,902,502 | (19,813,500) | (52,991,750) | (72,805,250) | 5.58 | 333,097,252 |
| 2055 | 415,928,996 | - | 415,928,996 | (20,287,800) | (54,259,125) | (74,546,925) | 5.58 | 341,382,071 |
| 2056 | 426,272,191 | - | 426,272,191 | - | (75,816,750) | (75,816,750) | 5.62 | 350,455,441 |
| 2057 | 436,328,840 | - | 436,328,840 | - | (77,518,125) | (77,518,125) | 5.63 | 358,810,715 |
| 2058 | 446,706,294 | - | 446,706,294 | - | (79,268,375) | (79,268,375) | 5.64 | 367,437,919 |
| 2059 | 458,918,666 | - | 458,918,666 | - | - | - | - | 458,918,666 |
| 2060 | 472,988,976 | - | 472,988,976 | - | - | - | - | 472,988,976 |
| 2061 | 486,071,554 | - | 486,071,554 | - | - | - | - | 486,071,554 |
| 2062 | 498,213,465 | - | 498,213,465 | - | - | - | - | 498,213,465 |
| 2063 | 510,811,071 | - | 510,811,071 | - | - | - | - | 510,811,071 |
| 2064 | 523,732,288 | - | 523,732,288 | - | - | - | - | 523,732,288 |

Footnotes begin on next page

A Source: CDM Smith Inc.; Triangle Expressway and Complete 540 Phases 1 & 2 Forecast Bringdown Letter dated September 29, 2023.
B Scheduled annual state appropriation of $25,000,000 less debt service on the outstanding State Appropriation Revenue Bonds.
C Total Revenues (A) plus Net State Appropriation (B).
D Debt service on the Outstanding Senior Lien Bonds, net of capitalized interest and a transfer from the General Reserve Fund to the appropriate subaccounts in the Interest Account of the Senior Lien Debt Service Fund for the purpose of paying a portion of interest due on the 2017 Bonds and the 2018 Bonds on January 1, 2024.
E Debt service on the Series 2024 Bonds net of capitalized interest through July 1, 2028.
F Outstanding Senior Lien Debt Service (D) plus Series 2024 Bond Net Debt Service (E).
G Total Pledged Receipts (C) divided by Total Senior Lien Debt Service (F).
H Total Pledged Receipts (C) less Total Senior Lien Debt Service (F).
[1] As described in "THE TRIANGLE EXPRESSWAY SYSTEM – Complete 540 – Phase 1 – Construction of Complete 540 – Phase 1", if the substantial completion date for Complete 540 – Phase 1 is delayed and revenues to be generated from Complete 540 – Phase 1 do not commence until October 1, 2024, the Senior Lien Debt Service Coverage for Fiscal Years 2025 through 2028 are projected to be:1.46x in 2025, 1.72x in 2026, 1.86x in 2027 and 1.95x in 2028. The remainder of the Fiscal Years are not expected to be impacted by such potential delay.

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## Preliminary Projected Cash Flow and Debt Service Coverage (continued)

| Fiscal Year June 30, | I<br>TIFIA Mandatory Debt Service | J<br>TIFIA Scheduled Debt Service (net of mandatory) | K<br>TIFIA Reserve Fund (Deposit) / Release | L<br>Senior & Mandatory TIFIA Debt Service Coverage | M<br>Senior & All TIFIA Debt Service Coverage[1] | N<br>Bond Insurance Premium Payments[2] | O<br>Operations & Maintenance Requirement | P<br>Renewal & Replacement Requirement | Q<br>General Reserve Deposit/ (Withdrawal) | R<br>General Reserve Balance |
|---|---|---|---|---|---|---|---|---|---|---|
| 2024 | - | - | - | 1.45 | 1.45 | - | $(21,893,610) | $(501,697) | $(1,408,628) | $66,940,542 |
| 2025 | $(60,227) | $(341,285) | - | 1.57 | 1.57 | - | (35,138,428) | (1,166,148) | (1,556,213) | 65,384,329 |
| 2026 | (719,021) | (4,074,453) | - | 1.74 | 1.63 | - | (36,578,533) | (11,420,849) | (5,699,607) | 59,684,722 |
| 2027 | (865,842) | (4,906,626) | - | 1.86 | 1.73 | - | (38,583,896) | (7,711,633) | 4,474,161 | 64,158,883 |
| 2028 | (1,148,311) | (6,548,898) | - | 1.93 | 1.76 | - | (39,723,100) | (14,582,113) | 932,464 | 65,091,347 |
| 2029 | (1,463,887) | (8,795,359) | - | 1.74 | 1.57 | - | (45,317,216) | (17,004,872) | (11,116,672) | 53,974,675 |
| 2030 | (1,462,514) | (8,787,582) | - | 1.86 | 1.68 | - | (51,218,249) | (2,915,235) | 10,060,095 | 64,034,769 |
| 2031 | (1,542,374) | (8,696,338) | - | 1.96 | 1.78 | - | (53,044,076) | (21,245,184) | 92,794 | 64,127,563 |
| 2032 | (2,433,506) | (7,800,518) | - | 2.00 | 1.84 | - | (54,933,196) | (19,864,366) | 7,338,424 | 71,465,987 |
| 2033 | (3,003,849) | (8,365,172) | - | 1.92 | 1.77 | - | (55,811,233) | (21,320,332) | 5,231,672 | 76,697,659 |
| 2034 | (9,305,326) | (14,662,074) | - | 1.83 | 1.61 | $(572,773) | (56,803,777) | (4,174,739) | 14,057,249 | 90,754,908 |
| 2035 | (9,670,027) | (14,656,452) | - | 1.87 | 1.65 | (578,547) | (57,624,620) | (15,587,958) | 8,519,302 | 99,274,210 |
| 2036 | (12,061,866) | (13,677,581) | - | 1.87 | 1.67 | (584,607) | (58,748,281) | (52,303,767) | (23,875,730) | 75,398,480 |
| 2037 | (12,194,677) | (20,552,425) | - | 1.90 | 1.62 | (590,969) | (60,086,666) | (24,022,585) | 2,772,055 | 78,170,535 |
| 2038 | (12,904,711) | (20,720,391) | - | 2.09 | 1.77 | (597,649) | (61,392,777) | (27,709,001) | 14,138,760 | 92,309,294 |
| 2039 | (20,312,293) | (20,339,157) | - | 2.04 | 1.75 | (604,661) | (62,740,914) | (8,571,693) | 34,485,506 | 126,794,801 |
| 2040 | (25,636,248) | (15,015,093) | - | 2.20 | 1.95 | (612,022) | (64,127,321) | (7,885,605) | 54,007,239 | 180,802,039 |
| 2041 | (47,335,452) | (15,011,647) | - | 2.09 | 1.87 | (619,750) | (65,554,250) | (32,485,499) | 27,634,585 | 208,436,624 |
| 2042 | (62,791,247) | (15,011,647) | - | 2.40 | 2.13 | (627,863) | (67,019,951) | (31,039,524) | 51,400,281 | 259,836,906 |
| 2043 | (64,045,608) | (13,750,394) | - | 2.46 | 2.20 | (636,380) | (68,530,924) | (29,091,948) | 63,505,219 | 323,342,124 |
| 2044 | (77,809,786) | - | - | 2.27 | 2.27 | (645,321) | (70,084,670) | (40,967,136) | 61,833,708 | 385,175,832 |
| 2045 | (77,802,894) | - | - | 2.35 | 2.35 | (654,708) | (71,758,940) | (32,052,181) | 81,359,105 | 466,534,937 |
| 2046 | (77,802,894) | - | - | 2.40 | 2.40 | (664,563) | (72,790,718) | (31,893,076) | 89,967,397 | 556,502,334 |
| 2047 | (77,796,002) | - | - | 2.44 | 2.44 | (674,907) | (73,298,406) | (45,286,810) | 82,776,467 | 639,278,801 |
| 2048 | (77,809,786) | - | - | 2.48 | 2.48 | (685,768) | (74,020,760) | (41,170,569) | 93,390,105 | 732,668,906 |
| 2049 | (77,727,446) | - | - | 2.67 | 2.67 | (697,168) | (74,739,885) | (7,705,413) | 155,359,815 | 888,028,721 |
| 2050 | (77,144,281) | - | - | 2.56 | 2.56 | (709,138) | (75,472,546) | (7,826,203) | 140,498,541 | 1,028,527,262 |
| 2051 | (77,144,281) | - | - | 2.59 | 2.59 | (650,890) | (76,214,493) | (55,688,215) | 99,533,573 | 1,128,060,835 |
| 2052 | (77,144,281) | - | - | 2.62 | 2.62 | (587,125) | (76,968,979) | (73,710,946) | 88,210,211 | 1,216,271,046 |
| 2053 | (77,144,281) | - | - | 2.66 | 2.66 | (506,878) | (77,735,504) | (55,612,873) | 113,167,925 | 1,329,438,971 |
| 2054 | (77,144,281) | - | - | 2.71 | 2.71 | (387,428) | (78,512,818) | (2,937,171) | 174,115,555 | 1,503,554,526 |
| 2055 | (77,144,281) | - | - | 2.74 | 2.74 | (323,820) | (79,304,923) | (8,603,786) | 176,005,261 | 1,679,559,787 |
| 2056 | (77,144,281) | - | - | 2.79 | 2.79 | (223,785) | (80,108,570) | (21,927,748) | 171,051,057 | 1,850,610,844 |
| 2057 | (77,144,281) | - | - | 2.82 | 2.82 | (116,003) | (80,924,260) | (5,888,392) | 194,737,780 | 2,045,348,625 |
| 2058 | (77,144,281) | - | - | 2.86 | 2.86 | - | (81,754,494) | (23,130,528) | 185,408,616 | 2,230,757,241 |
| 2059 | (77,144,281) | - | - | 5.95 | 5.95 | - | (82,597,524) | (38,261,683) | 260,915,179 | 2,491,672,420 |
| 2060 | (77,144,281) | - | - | 6.13 | 6.13 | - | (83,399,805) | (32,755,945) | 279,688,944 | 2,771,361,364 |
| 2061 | (77,144,281) | - | - | 6.30 | 6.30 | - | (84,278,322) | (4,404,724) | 320,244,227 | 3,091,605,591 |
| 2062 | (77,144,281) | - | - | 6.46 | 6.46 | - | (85,164,359) | (3,079,909) | 332,824,916 | 3,424,430,506 |
| 2063 | (70,715,590) | - | - | 7.22 | 7.22 | - | (86,063,667) | (6,332,557) | 347,699,257 | 3,772,129,763 |
| 2064 | - | - | - | - | - | - | (88,929,497) | - | 434,802,791 | 4,206,932,554 |

Footnotes begin on next page

I Estimated TIFIA Mandatory Debt Service as of the date of this Official Statement. Assumes an interest rate of 4.80% on the 2024 TIFIA Loan.

J Estimated TIFIA Scheduled Debt Service, net of Mandatory Debt Service, as of the date of this Official Statement.

K Sum of estimated deposits to the TIFIA Reserve Fund to meet the requirement thereof as annual debt service on the TIFIA Loan increases and releases of projected fund earnings. No deposits are estimated as the requirement is assumed to be met with the TIFIA Debt Service Reserve Policy, see section "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2024 BONDS – Other Funds and Accounts – Junior Indebtedness Debt Service Fund".

L Total Pledged Receipts (C) divided by the sum of Total Senior Lien Debt Service (F), and TIFIA Mandatory Debt Service (I).

M Total Pledged Receipts (C) divided by the sum of Total Senior Lien Debt Service (F), plus TIFIA Mandatory Debt Service (I) and plus TIFIA Scheduled Debt Service (J).

N Annual bond insurance premium payments associated with the Insured Series 2024 Bonds and the TIFIA Series 2024 Bond.

O Estimated deposits to the Operations and Maintenance Expenses Fund and the Operating Reserve Fund.

P Estimated deposits to the Renewal and Replacement Fund.

Q The sum of Excess Revenues after Senior Lien Debt Service (H), plus TIFIA Mandatory Debt Service (I), plus TIFIA Scheduled Debt Service (J), plus TIFIA Reserve Fund (Deposit) / Release (K), plus Bond Insurance Premium Payments (N), plus Operations & Maintenance Requirement (O) and plus Renewal & Replacement Requirement (P).

R The sum of the prior year General Reserve Balance (R) plus current year General Reserve Deposit / (Withdrawal) (Q).

[1] As described in "THE TRIANGLE EXPRESSWAY SYSTEM – Complete 540 – Phase 1 – Construction of Complete 540 – Phase 1", if the substantial completion date for Complete 540 – Phase 1 is delayed and revenues to be generated from Complete 540 – Phase 1 do not commence until October 1, 2024, the Senior and all TIFIA Debt Service Coverage for Fiscal Years 2025 through 2028 are projected to be: 1.42x in 2025, 1.52x in 2026, 1.61x in 2027 and 1.65x in 2028. The remainder of the Fiscal Years are not expected to be impacted by such potential delay.

[2] It is anticipated that any bond insurance premiums with respect to the Bond Insurance Policy will be paid in an upfront fee and subsequent annual payments. The Bond Insurance Policy will be irrevocable and any event of a non-payment of the annual bond insurance premium payments will not impact the validity of the Bond Insurance Policy with respect to the Insured Series 2024 Bonds.

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## RISK FACTORS

The following is a discussion of certain risk factors that should be considered in evaluating an investment in the Series 2024 Bonds. This discussion does not purport to be either comprehensive or definitive. The order in which risks are presented is not intended to reflect either the likelihood that a particular event will occur or the relative significance of such an event. Moreover, there may well be other risks associated with an investment in the Series 2024 Bonds in addition to those set forth herein.

### General

The financial forecasts in this Official Statement are based generally upon certain assumptions and upon projections as to estimated Revenues and Operations and Maintenance Expenses. See APPENDIX C – 2023 Traffic and Revenue Update Study. Inevitably, some underlying assumptions and projections used to develop the forecasts will not be realized, and unanticipated events and circumstances may occur. Therefore, the actual results achieved during the forecast periods will vary from the forecasts, and such differences may be material.

### Forward-Looking Statements

The statements contained in this Official Statement, and in other information provided by the Authority, that are not purely historical, are forward-looking statements, which generally can be identified with words or phrases such as "anticipates," believes," "could," "estimates," "expects," "foresees," "may," "plan," "predict," "should," "will" or other words or phrases of similar import. All statements included in this Official Statement and Appendices hereto that any person expects or anticipates will, should or may occur in the future, including, but not limited to, the projections in the 2023 Traffic and Revenue Update Study, are forward-looking statements. These statements are based on assumptions and analysis made by the Authority and the Traffic Consultant, as applicable, in light of their experience and perception of historical trends, current conditions and expected future developments as well as other factors they believe are appropriate in the circumstances. However, whether actual results and developments will conform with expectations and predictions is subject to a number of risks and uncertainties and factors beyond the Authority's control. The risk factors and assumptions described under the caption "RISK FACTORS" and elsewhere in this Official Statement could cause actual results to differ materially from those expressed in any forward-looking statement. All of the forward-looking statements made in this Official Statement and any Appendices are qualified by these cautionary statements. There can be no assurance that the actual results or developments anticipated will be realized or, even if substantially realized, that they will have the expected consequences to or effects on Receipts. All forward-looking statements included in this Official Statement are based on information available to the Authority on the date hereof, and the Authority assumes no obligation to update any such forward-looking statements.

The forward-looking statements herein are necessarily based on various assumptions and estimates that are inherently subject to numerous risks and uncertainties, including risks and uncertainties relating to the possible invalidity of the underlying assumptions and estimates and possible changes or developments in social, economic, business, industry, market, legal and regulatory circumstances and conditions and actions taken or omitted to be taken by third parties, including customers, suppliers, business partners and competitors, and legislative, judicial and other governmental authorities and officials. Assumptions related to the foregoing involve judgments with respect to, among other things, future economic, competitive and market conditions and future business decisions, all of which are difficult or impossible to predict accurately and, therefore, there can be no assurance that the forward-looking statements included in this Official Statement will prove to be accurate.

**Costs of Complete 540 – Phase 2**

As described in "COMPLETE 540 – PHASE 2 – Construction of Complete 540 – Phase 2" herein, the undertaking consists of the planning, designing, engineering and construction of the portion of the Triangle Expressway System referred to as Complete 540 – Phase 2 (as described in the GEC Report attached as APPENDIX D). The Authority has entered into the Phase 2 Design-Build Contracts with the Phase 2 Design-Build Contractors. The Phase 2 Design-Build Contracts are fixed price, lump sum contracts obligating the applicable Phase 2 Design-Build Contractor to perform the design, construction and utility relocation coordination, of Complete 540 – Phase 2 by the deadlines set forth therein.

As with any major construction effort, Complete 540 – Phase 2 involves many risks that could result in cost overruns, in delays or in a failure to complete the Complete 540 – Phase 2. Certain of the risks to achieving the construction milestones on time and within budget include shortages of materials and labor, work stoppages, labor disputes, bad weather, floods, earthquakes, hurricanes and other casualties, delays in achieving utility relocations, unforeseen engineering, environmental or geological problems, changes in law, discovery of unidentified hazardous materials, historical artifacts or unidentified utilities, third-party litigation or protests (including protests or litigation about noise or vibrations or traffic delays in adjacent lanes resulting from construction), difficulties in obtaining or renewing permits or other federal, state or local government approvals, changes in federal and state or local design or building requirements and permit conditions, and interference with or by military operations, any of which could increase the cost and delay of the Project. In addition, lack of coordination among the Authority, the Phase 2 Design-Build Contractors, NCDOT, utility owners or permitting agencies or the failure of any of them to complete their portions of the work or their inspections or approvals on schedule could also result in delays and/or cost overruns or in a failure to complete the Project.

Specifically, while the Phase 2 Design-Build Contracts shift to the Phase 2 Design-Build Contractors a significant amount of the risk and responsibility for time delays and cost increases associated with design, engineering, utility relocation coordination and construction, the Phase 2 Design-Build Contracts ultimately allow for increases in price and extensions of time for performance in certain cases, including, but not limited to, those involving Authority directed changes, Authority caused delays, hazardous materials and certain defined force majeure events. The Authority is relying on the Phase 2 Design-Build Contractors to design, engineer, permit, manage and construct the highway in accordance with standards, specifications and an agreed-upon scope of work. There is no assurance that the Phase 2 Design-Build Contractors can design and engineer Complete 540 – Phase 2 in a manner such that it reasonably can be constructed for the fixed price and by the completion dates set forth in the Phase 2 Design-Build Contracts. Further, the responsibility of the Phase 2 Design-Build Contractors for all phases of design and engineering under the Phase 2 Design-Build Contracts may increase the impact that any financial instability, insolvency or bankruptcy of either Phase 2 Design-Build Contractor, or any entity guaranteeing the obligations of a Phase 2 Design-Build Contractor, could have on the cost of, or completion date for, Complete 540 – Phase 2. The number of rights-of-way yet to be acquired for Complete 540 – Phase 2 could result in delays to the construction schedule, or higher costs for acquisition of the parcels than budgeted, particularly as a result of Map Act claims that become part of the purchase price for some parcels.

To the extent cost increases result in costs of Complete 540 – Phase 2 exceeding funds available to pay such costs, NCDOT will contribute funds necessary to complete construction of Complete 540 – Phase 2 to the Authority as described above under "COMPLETE 540 – PHASE 2 – Construction of Complete 540 – Phase 2." The NCDOT's obligation to make such payments is subject to appropriation of funds therefor. The NCDOT's obligation is limited to payment of the costs of an Additional Project such as Complete 540 – Phase 2, defined as all costs for right-of-way acquisition, design, engineering, construction, acquisition and equipping thereof in accordance with the plans and specifications therefore. It is not clear

whether such costs would include construction period interest if completion of the project was delayed. The Authority is required to repay such contributions, if any, to NCDOT, with interest.

**Payment and Performance Bonds**

A potential purchaser of the Series 2024 Bonds can have no assurance that the Phase 2 Design-Build Contractors or subcontractor, guarantor, surety or property insurer will be willing or capable of meeting its responsibilities in connection with Complete 540 – Phase 2 or that the issuer of any performance or payment bond, any guarantee or any property insurance policy will honor or will be able to honor a claim in a timely manner.

Although the Authority does not expect its payment obligations outstanding at any one time under the Phase 2 Design-Build Contracts to exceed the amount of the payment bonds provided by the Phase 2 Design-Build Contractors, there can be no assurance that the payment and performance bonds provided by the Phase 2 Design-Build Contractors will be sufficient to satisfy the Authority's payment or performance obligations under such design-build contracts. Not all events are covered under such payment and performance bonds. The issuer of each of the Phase 2 Design-Build Contractor's payment and performance bonds does not guarantee payment or performance under all circumstances, and the issuer of such bonds may assert any defenses it may have for payment or performance. Moreover, in the event that a default occurs under a Phase 2 Design-Build Contract, there is a possibility of litigation between the Authority and the applicable Phase 2 Design-Build Contractor, or between the Authority and the providers of the related performance bonds and payment bonds, which could further delay the construction and opening of Complete 540 – Phase 2. In addition, there can be no assurance that the Authority will recover any amounts under the performance bonds and payment bonds provided by a Phase 2 Design-Build Contractor or any other contractor related to Complete 540 – Phase 2.

**Liquidated Damages**

The amount of liquidated damages the Phase 2 Design-Build Contractors could be required to pay in connection with Complete 540 – Phase 2 may be limited by contract and may not be sufficient to cover all of the Authority's losses in the event of a delay or a failure to complete the required work in accordance with the plans and specifications, and other requirements of the contract documents. There are numerous events that could cause an extension of the schedule and that could result in increased costs for Complete 540 – Phase 2. Liquidated damages, however, are payable by the Phase 2 Design-Build Contractors only under certain circumstances and even if paid, may not be sufficient to cover debt service payments on the Series 2024 Bonds. In addition, collection of liquidated damage amounts may require extensive litigation, and no assurance can be provided that such amounts will in fact be collected.

Pursuant to the Phase 2 Design-Build Contracts, the Phase 2 Design-Build Contractors will be liable for liquidated damages in the amount of $20,000 per day for delays after the contractual substantial completion date (June 21, 2028 for R-2829A and May 26, 2028 for R-2829B), $30,000 per day for delays after July 1, 2028 and $5,000 per day for delays after November 1, 2028.

**Events of Force Majeure**

Construction and operation of the Triangle Expressway System is at risk from events of force majeure, such as earthquakes, tornados, hurricanes or other natural disasters, epidemics, blockades, rebellions, war, riots, acts of sabotage, terrorism or civil commotion, and spills of hazardous materials, among other events. The State self-insures for such risks, and a significant casualty event could affect the availability of funds to repair the Triangle Expressway. Construction or operations may also be stopped or

delayed from non-casualty events such as discovery of archaeological artifacts, changes in law, and litigation, among other things.

**Limited Insurance Coverage**

Although the Phase 2 Design-Build Contractors are required to provide insurance during construction of Complete 540 – Phase 2, such required insurance policy will not cover damage and delay from all events that could interrupt construction. Risks that may not be insurable/insured include the following risks that may delay the project without causing property damage: epidemics, blockades, strikes and riots. Other risks that may not be insured/insurable include war, nuclear events, criminal or intentional acts of the insured, pollution, unforeseeable environmental or geological conditions, discovery of archaeological artifacts, changes in law, bankruptcy and acts of terrorism. Insurance policies may not be maintained or obtainable in amounts that would be sufficient or be paid in sufficient time in all events to pay all of the Authority's expenses under the Trust Agreement and the supplements thereto, including debt service on the Series 2024 Bonds.

**Funding Risk**

Proceeds of the 2024 TIFIA Loan constitute a key component of the funding for Complete 540 – Phase 2. Failure to meet certain disbursement conditions set forth in the 2024 TIFIA Loan Agreement as well as an event of default under the 2024 TIFIA Loan Agreement may result in the suspension or delay in the disbursement of proceeds of the 2024 TIFIA Loan Agreement.

A portion of the cost of Complete 540 – Phase 2 is expected to be paid from one or more issues of the GARVEE Bonds and State matching funds. GARVEE Bonds are issued under Section 136-18(12b) of the North Carolina General Statutes, as amended from time to time (the "GARVEE Act"), and The State and Local Government Revenue Bond Act, Section 159-80 et. seq. of the North Carolina General Statutes (collectively with the GARVEE Act, the "Act"). GARVEE Bonds are payable solely from Federal Transportation Funds, which are federal aid revenues received by or on behalf of the State pursuant to Title 23 of the United States Code, the Federal Aid Agreement (which is a memorandum of Agreement between NCDOT and the Federal Highway Administration ("FHWA") pursuant to which NCDOT and FHWA agree to the debt service costs on GARVEE Bonds relating to specific eligible projects that will be paid by FHWA) and the Act. Federal Transportation Funds have historically been authorized by Congress under multiple-year authorizing legislation designed to provide continuity in the flow of Federal Transportation Funds to the states, including the State. The current authorization is provided by the Infrastructure Investment and Jobs Act which provides for funding through September 30, 2026. There can be no assurance that such measures will be continued under any future federal reauthorization or that, if continued, such measures will be sufficient to ensure that Federal Transportation Funds will be available as needed if in the future Congress amends existing laws or fails to reauthorize expired transportation legislation, or if future legislation or federal administrative action reduces the amount of Federal Transportation Funds available to NCDOT.

NCDOT is required to provide matching funds for the projects financed with GARVEE Bond proceeds. Such funds are provided from the State Highway Trust Fund, which in turn is funded from the North Carolina motor fuels tax, a tax on the transfer of motor vehicle titles, DMV titles and other fees, and interest income. Although the Authority and NCDOT have modeled the STIP and the State Highway Trust Fund to ensure that there will be adequate cash to pay for projects in the STIP, including matching funds for GARVEE Bond funded projects, there is no guaranty that such funds will be sufficient.

**Change in Law**

The Authority and the Triangle Expressway System are subject to various laws and regulations, including, among others, laws governing environmental protection and laws governing tolling, which may change from time to time. The Authority's business, financial condition and results of operations may be adversely affected by changes in such laws or regulations. In each session of the North Carolina General Assembly, bills may be introduced that have a potential impact on the Authority or NCDOT. Although NCDOT and the Authority actively monitor such bills and proposals and interact with members of the General Assembly and staff members during the legislative sessions, there can be no assurance that there will not be future legislative changes that may have a material effect on the Authority. To the extent that the Authority is required to expend additional funds not originally contemplated to comply with any new or amended regulations or laws, such amended or new law or regulation could have a negative impact on the Authority's cash flow.

**Operating Risks**

The ability of the Triangle Expressway System to generate Receipts in amounts sufficient to pay debt service on the Series 2024 Bonds when due is subject to the risks inherent in toll facilities. The ability to repay the Series 2024 Bonds will be dependent on the volume of traffic that utilizes the Triangle Expressway System and the ability of the Authority and its vendor's computer systems to accurately process data. Revenues to be generated through such use will be influenced by numerous factors, including, among others, the ability to manage toll evasion; the ability to control expenses; the availability of adequately-trained personnel; population, employment and income trends within the region; the congestion on alternative freeways, highways, and streets; time savings experienced by utilizing the Triangle Expressway System; the toll rates; the availability and price of fuel; and the construction of new or improved competitive roadways or other transit facilities.

**Rate Covenant Not a Guarantee**

The Authority's ability to pay the debt service with respect to the bonds secured by the Trust Agreement (including the Series 2024 Bonds) depends on its ability to generate Receipts at the levels required by the Trust Agreement, which in turn depends on the use of the Triangle Expressway System by a sufficient number of toll-paying vehicles. Although the Authority has covenanted in the Trust Agreement to establish toll rates at specified levels as more particularly described herein, and expects that sufficient Receipts will be generated through the imposition and collection of such tolls, the Authority's covenant does not constitute a guarantee that sufficient Receipts will be available to pay debt service with respect to bonds secured by the Trust Agreement (including the Series 2024 Bonds).

**Ability to Maintain or Raise Rates**

The Authority may need to raise toll rates in the future above the anticipated scheduled toll rate increases under the projected toll rate schedule to support its debt service requirements. The effect of any future rate increase is unknown. It is possible that a future increase in rates could result in reduced usage of the Triangle Expressway System, resulting in decreased Receipts.

**Maintenance Costs**

Successful operation of the Triangle Expressway System will require timely and complete maintenance and replacement of components of such facilities. No assurance can be given that sufficient funds will be available to maintain the toll facilities adequately over the long term. Any significant deterioration in the toll facilities may result in increased operating costs and in reduced usage, as well as

temporary lane closures, and may adversely affect the amount of funds available to pay debt service on the indebtedness secured by the Trust Agreement. Although the Trust Agreement requires the deposit of budgeted amounts to the Operations and Maintenance Expense Fund, the Operating Reserve Fund and the Renewal and Replacement Fund, no assurance can be given that sufficient funds will be available to maintain the entire Triangle Expressway System adequately over the long term.

**Traffic and Revenue Assumptions**

The revenue forecasts in the 2023 Traffic and Revenue Update Study are based upon certain assumptions described above. See "2023 Traffic and Revenue Update Study" herein and APPENDIX C – 2023 Traffic and Revenue Update Study. The 2023 Traffic and Revenue Update Study is not a guarantee of any future events or trends and the forecasts therein are subject to future economic and social conditions and demographic developments that cannot be predicted with certainty. Further, any of the estimates and assumptions in the 2023 Traffic and Revenue Update Study are inherently subject to significant economic and competitive uncertainties and contingencies, many of which are beyond the control of the Authority. Changes in social conditions might include, for example, the increased use of telecommuting. Cultural shifts in attitudes towards public transportation, casual and arranged carpools and telecommuting, governmental or employer incentive programs or subsidies and other trends that are hard to predict could affect the number of commuters willing and able to pay a toll on the Triangle Expressway System. Technological advancements might include broadened use of electric or battery-driven cars, which, together with more stringent air quality standards, might radically change the characteristics of vehicles on the road. Increased use of ride-sharing services like Uber and Lyft might decrease traffic congestion and, therefore, the use of the Triangle Expressway System as a result of reduced car ownership or surge pricing which could possibly delay or divert peak hour demands. Further development and widespread adoption of autonomous vehicles could also reduce traffic congestion through decreases in accidents due to fewer incidents of human error and better synchronized traffic flow through communication between such vehicles. These are only a few of the potential societal or technological changes which may adversely affect use of the Triangle Expressway System.

No representation is made or intended, nor should any representation be inferred, with respect to the likely existence of any particular future set of facts or circumstances, and prospective purchasers of the Series 2024 Bonds are cautioned not to place undue reliance upon the projections in the 2023 Traffic and Revenue Update Study or upon any other projections or requirements for projections. If actual results are less favorable than the results projected or if the assumptions used in preparing such projections prove to be incorrect, the Authority's ability to make payments pursuant to the Trust Agreement in the amounts and at the times required to pay debt service on the Series 2024 Bonds or other payments required under the Trust Agreement with respect to the Series 2024 Bonds, may be materially and adversely affected.

Other risks that are impossible to predict and thus are not taken into account in the long-term forecasts included in the 2023 Traffic and Revenue Update Study or in the projected financial information, but that could affect the number of toll payers and Receipts in the shorter term, include malfunctions of the tolling system, unusual weather, casualty events and other emergencies. Neither the Traffic Consultant nor the Authority can guarantee that the projected results set forth in the 2023 Traffic and Revenue Update Study will reflect actual results and the differences may be material. Failure to achieve or realize any of the assumptions described above may have a materially adverse effect upon the Receipts actually realized.

**Free Alternate Route**

The Authority Act requires NCDOT to maintain an existing, alternate, comparable non-toll route corresponding to each turnpike project undertaken by the Authority. Although the alternate route for the

Triangle Expressway is a less desirable route, motorists wishing to avoid tolls may choose this alternate route.

**Motor Fuel Prices and Taxes**

Among other assumptions, the revenue forecasts in the 2023 Traffic and Revenue Update Study make certain assumptions about motor fuel supply, prices and taxes. There is no assurance that motor fuel will remain in adequate supply or that motor fuel prices and federal and State motor fuel taxes will not increase by more than the assumed amounts during the forecast period covered by the 2023 Traffic and Revenue Update Study. Increases in the price of motor fuel or other sources of power for operating motor vehicles could negatively impact the use of the Triangle Expressway System and the Receipts.

**Dilution of Senior Lien Security Upon Bankruptcy Related Event**

Upon the occurrence of an Event of Default that is a Bankruptcy Related Event under the Trust Agreement, in the event that any TIFIA Indebtedness is outstanding, the Authority's obligations under the TIFIA Indebtedness will be deemed to be Senior Lien Indebtedness, and USDOT will be deemed to be the secured owner of such Senior Lien Indebtedness. A Bankruptcy Related Event is defined in the Trust Agreement, the 2024 TIFIA Loan Agreement and the 2021 TIFIA Loan Agreement to include voluntary and involuntary proceedings with respect to the Authority under any Insolvency Law, application for or consent by the Authority to the appointment of a receiver for itself and its assets, failure by the Authority generally to pay its debts with respect to the Triangle Expressway as they become due, and failure by the Authority to make two (2) consecutive payments on the TIFIA Series 2024 Bond or the TIFIA Series 2021 Bond in accordance with the 2024 TIFIA Loan Agreement or the 2021 TIFIA Loan Agreement, respectively. In such event, the TIFIA Indebtedness would be secured by and payable from the Trust Estate (except for the Senior Lien Parity Reserve Account) on a basis equal to that of other Outstanding Senior Lien Obligations.

**Holders of Series 2024 Bonds Not Majority Holders**

Under the Trust Agreement, the Holders of a majority of Bonds and Parity Debt then Outstanding have the ability to direct remedies after an Event of Default, and take certain actions under the Trust Agreement. At the time of issuance of the Series 2024 Bonds, the Holders of the Series 2024 Bonds will hold less than a majority of the Bonds Outstanding under the Trust Agreement. See "The Amended and Restated Trust Agreement – Remedies" in APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement.

**Limitation and Enforceability of Remedies**

The remedies available to Owners of the Series 2024 Bonds upon an Event of Default under the Trust Agreement are limited to the seeking of specific performance or a writ of mandamus or other suit, action or proceeding compelling and requiring the Authority and its officers to observe and perform any covenant, condition or obligation prescribed in the Trust Agreement. ACCELERATION IS NOT A REMEDY AVAILABLE TO OWNERS OF THE SERIES 2024 BONDS. See "The Amended and Restated Trust Agreement – Remedies" in APPENDIX B – Forms of Amended and Restated Trust Agreement and the Sixth Supplemental Trust Agreement.

The remedies available under the Trust Agreement are in many respects dependent upon regulatory and judicial actions that are often subject to discretion and delay. Under existing law, such remedies may not be readily available. In addition, enforcement of such remedies (i) may be subject to general principles of equity which may permit the exercise of judicial discretion, (ii) are subject to the exercise in the future

by the State and its agencies and political subdivisions of the police power inherent in the sovereignty of the State, (iii) are subject, in part, to the provisions of the United States Bankruptcy Act and other applicable bankruptcy, insolvency, reorganization, moratorium or similar laws relating to or affecting the enforcement of creditors' rights generally, now or hereafter in effect, and (iv) are subject to the exercise by the United States of the powers delegated to it by the federal Constitution. The various legal opinions to be delivered concurrently with the delivery of the Series 2024 Bonds will be qualified to the extent that the enforceability of certain legal rights related to the Series 2024 Bonds is subject to limitations imposed by bankruptcy, reorganization, insolvency or other similar laws affecting the rights of creditors generally and by equitable remedies and proceedings generally.

**Cybersecurity**

The Authority relies on large and complex technology networks, systems, information and other assets ("Information and Operations Technology"), for efficient operations, provision of services to the public, and collection of tolls and other revenue on the Triangle Expressway System. In connection with its delivery of critical services to the public, the Authority's Information and Operations Technology collects and stores sensitive customer data, including financial information, security information, proprietary business information, information regarding customers, suppliers and business partners, and personally identifiable information of customers and employees (collectively "Personal Information").

The Authority implements physical, technical, and administrative safeguards to protect the operations of its Information and Operations Technology and Personal Information, including measures to comply with applicable requirements of federal and State law. Despite implementation of a security program and measures to protect its Information and Operations Technology and Personal Information, the Authority's Information and Operations Technology may experience cybersecurity risks and threats from time to time, including those that may result in the compromise of personal information, theft or manipulation of information, and operational disruptions and outages, by employees through error or malfeasance, criminal or malicious hackers, terrorists, and hacktivists. Although the Authority maintains cybersecurity liability insurance, any cybersecurity incident, intrusion or attack could result in unauthorized access to or acquisition of sensitive information or Personal Information, disruptions to the Authority's operations, including toll collection and financial reporting or other activities, legal claims or proceedings, including but not limited to laws that protect the privacy of personal information, and regulatory inquiries and penalties.

In the past five years, the Authority has not experienced a cybersecurity incident that resulted in the identification of unauthorized access to sensitive systems or data in connection with the Triangle Expressway System.

## CONTINUING DISCLOSURE

In the Sixth Supplemental Trust Agreement, the Authority will undertake, for the benefit of the beneficial owners of the Series 2024 Bonds, to provide to the Municipal Securities Rulemaking Board (the "MSRB"):

(a) by not later than seven months from the end of each Fiscal Year, beginning with the Fiscal Year ending June 30, 2023, audited financial statements of the Authority for such Fiscal Year, if available, prepared in accordance with Section 159-34 of the General Statutes of North Carolina, as it may be amended from time to time, or any successor statute, or, if such audited financial statements of the Authority are not available by seven months from the end of such Fiscal Year, unaudited financial statements of the Authority for such Fiscal Year to be replaced subsequently by audited financial statements of the Authority to be delivered within fifteen (15) days after such audited financial statements become available for distribution;

(b) by not later than seven months from the end of each Fiscal Year, beginning with the Fiscal Year ending June 30, 2023, the financial and statistical data as of a date not earlier than the end of the preceding Fiscal Year evidencing compliance by the Authority with the Rate Covenant described under the heading "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2024 BONDS – Rate Covenant" including the calculation of Revenues and Long-Term Debt Service Requirement, to the extent that such items are not included in the financial statements referred to in (a) above;

(c) within ten (10) Business Days following the occurrence of an event, notice of any of the following events with respect to the Series 2024 Bonds:

(i) principal and interest payment delinquencies;

(ii) unscheduled draws on debt service reserves reflecting financial difficulties;

(iii) unscheduled draws on credit enhancements reflecting financial difficulties;

(iv) substitution of credit or liquidity providers, or their failure to perform;

(v) issuance by the Internal Revenue Service of a proposed or final determination of taxability with respect to the Series 2024 Bonds; a Notice of Proposed Issues on IRS Form 5701-TEB with respect to the Series 2024 Bonds; adverse tax opinions, material notices or determinations with respect to the tax status of the Series 2024 Bonds; or other event affecting the tax status of the Series 2024 Bonds;

(vi) defeasances;

(vii) rating changes;

(viii) tender offers;

(ix) bankruptcy, insolvency, receivership or similar proceeding by the Authority; and

(x) default, event of acceleration, termination event, modification of terms, or other similar events under the terms of the financial obligation of the Authority, any of which reflect financial difficulties;

(d) within ten (10) Business Days following the occurrence of an event, notice of any of the following events with respect to the Series 2024 Bonds, if material:

(i) non-payment related defaults;

(ii) modification to the rights of the beneficial owners of the Series 2024 Bonds;

(iii) bond calls, other than bond calls relating to mandatory sinking fund redemption;

(iv) release, substitution or sale of any property securing repayment of the Series 2024 Bonds;

(v) mergers, consolidations, acquisition and sales of assets (other than in the ordinary course of business);

(vi) appointment of a successor or additional trustee or a change in the name of the trustee;

(vii) legislation shall be filed with the North Carolina General Assembly by the Governor of North Carolina or legislation is reported out of a committee in either body of the General Assembly which, if adopted in the form so filed or reported, would result in a reduction or delay in the receipt of $25 million in State Appropriated Revenues in any Bond Year;

(viii) an administrative action is taken by the Governor of North Carolina, NCDOT or any other agency or authority of the State which will result in a reduction or delay in the receipt of $25 million in State Appropriated Revenues in any Bond Year; and

(ix) incurrence of a financial obligation of the Authority, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a financial obligation of the Authority, any of which affect security holders, if material.

(e) within ten (10) Business Days following the occurrence of a failure, notice of a failure of the Authority to provide required annual financial information described in (a) or (b) above on or before the date specified.

For purposes of (c)(x) and (d)(ix) above, "financial obligation" means (x) a debt obligation, (y) a derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation, or (z) a guarantee of either clause (x) or (y) above. The term "financial obligation" does not include municipal securities as to which a final official statement has been provided to the MSRB consistent with Rule15c2-12 (as defined below).

At present, Section 159-34 of the General Statutes of North Carolina requires the Authority's financial statements to be prepared in accordance with generally accepted accounting principles and to be audited in accordance with generally accepted auditing standards.

The Sixth Supplemental Trust Agreement will also provide that if the Authority fails to comply with the undertaking described above, any beneficial owner of the Series 2024 Bonds may take action to protect and enforce the rights of all beneficial owners with respect to such undertaking, including an action for specific performance; provided, however, that the Authority's failure to comply with the undertaking shall not be an Event of Default under the Trust Agreement. All actions shall be instituted, had and maintained for the benefit of all beneficial owners of the Series 2024 Bonds.

Pursuant to the Sixth Supplemental Trust Agreement, the Authority will reserve the right to modify from time to time the information to be provided to the extent necessary or appropriate in the judgment of the Authority, provided that:

(a) any such modification may only be made in connection with a change in circumstances that arises from a change in legal requirements, change in law, or change in the identity, nature, or status of the Authority;

(b) the information to be provided, as modified, would have complied with the requirements of Rule 15c2-12 issued under the Securities Exchange Act of 1934 (as amended, "Rule 15c2-12") as of the date of this Official Statement, after taking into account any amendments or interpretations of Rule 15c2-12, as well as any changes in circumstances; and

(c) any such modification does not materially impair the interests of the beneficial owners of the Series 2024 Bonds, as determined either by the Trustee or bond counsel, or by the approving vote of the Owners of a majority in aggregate principal amount of the Series 2024 Bonds then outstanding pursuant to the terms of the Trust Agreement, as it may be amended from time to time, at the time of the amendment.

Any annual financial information containing modified operating data or financial information is required to explain, in narrative form, the reasons for the modification and the impact of the change in the type of operating data or financial information being provided.

The undertaking described above will terminate upon payment, or provision having been made for payment in a manner consistent with Rule 15c2-12, in full of the principal of and interest on all of the Series 2024 Bonds.

During the previous five years, the Authority has not failed to comply, in all material respects, with its other undertakings relating to continuing disclosure of information pursuant to Rule 15c2-12.

The Authority has procedures in place to ensure timely filings pursuant to Rule 15c2-12, and has engaged Digital Assurance Certification, LLC ("DAC") to assist it in its continuing disclosure filings.

## LITIGATION

No litigation is now pending or, to the best of the Authority's knowledge, threatened against or affecting the Authority seeking to restrain or enjoin the authorization, execution or delivery of the Series 2024 Bonds, the TIFIA Series 2024 Bond or the Sixth Supplemental Trust Agreement or contesting the validity or the authority or proceedings for the authorization, execution or delivery of the Series 2024 Bonds, the TIFIA Series 2024 Bond or the Sixth Supplemental Trust Agreement or the Authority's creation, organization or corporate existence, or the title of any of the Authority's present officers to their respective offices, or the Authority's authority to carry out its obligations thereunder.

## CERTAIN RELATIONSHIPS

Hunton Andrews Kurth LLP is serving as Bond Counsel in connection with the issuance of the Series 2024 Bonds. Hunton Andrews Kurth LLP also represents the Trustee and the Underwriters and their affiliates in unrelated matters. McGuireWoods LLP is serving as counsel to the Underwriters in connection with the issuance of the Series 2024 Bonds, and also represents the Trustee and the Underwriters and their affiliates in unrelated matters. In addition, McGuireWoods LLP provides bond counsel services on other bond issues of the Authority, and may advise the Authority from time to time with respect to such issues.

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## LEGAL MATTERS

Legal matters related to the authorization, execution, sale and delivery of the Series 2024 Bonds are subject to the approval of Hunton Andrews Kurth LLP, Bond Counsel. See the form of the Bond Counsel opinion (the "Bond Opinion") attached hereto as APPENDIX F. The Bond Opinion will be limited to matters relating to authorization and validity of the Series 2024 Bonds and to the tax status of interest thereon, as described in the section "TAX TREATMENT." Bond Counsel has not been engaged to investigate the financial resources of the Authority or its ability to provide for payment of the Series 2024 Bonds, and the Bond Opinion will make no statement as to such matters or as to the accuracy or completeness of this Official Statement or any other information that may have been relied on by anyone in making the decision to purchase Series 2024 Bonds.

Certain legal matters will be passed upon for the Authority by Alan McInnes, an Assistant Attorney General for the State, and for the Underwriters by McGuireWoods LLP, Raleigh, North Carolina, counsel to the Underwriters.

## TAX TREATMENT

### Opinion of Bond Counsel

In the opinion of Bond Counsel under current law, interest on the Series 2024 Bonds (a) is not included in gross income for federal income tax purposes, (b) is not an item of tax preference for purposes of the federal alternative minimum tax, (c) is taken into account in determining adjusted financial statement income for applicable corporations (as defined in Section 59(k) of the Internal Revenue Code of 1986, as amended (the "Code")) for the alternative minimum tax imposed on such corporations and (d) is exempt from all income taxes in the State. No other opinion is expressed by Bond Counsel regarding the tax consequences of the ownership of or the receipt or accrual of interest on the Series 2024 Bonds.

Bond Counsel's opinion with respect to the Series 2024 Bonds will be given in reliance upon certifications by representatives of the Authority as to certain facts relevant to both the opinion and requirements of the Code. Bond Counsel's opinion is subject to the condition that there is compliance by the Authority subsequent to the issuance of the Series 2024 Bonds with all requirements of the Code that must be satisfied in order for interest thereon to remain excludable from gross income for federal income tax purposes. The Authority has covenanted to comply with the current provisions of the Code regarding, among other matters, the use, expenditure and investment of the proceeds of the Series 2024 Bonds and the timely payment to the United States of any arbitrage rebate amounts with respect to the Series 2024 Bonds. Failure by the Authority to comply with such covenants, among other things, could cause interest on the Series 2024 Bonds to be included in gross income for federal income tax purposes retroactively to their date of issue. The Authority may in its discretion, but has not covenanted to, take any and all such actions as may be required by future changes in the Code and applicable regulations in order that interest on the Series 2024 Bonds remain excludable from gross income for federal income tax purposes.

Customary practice in the giving of legal opinions includes not detailing in the opinion all of the assumptions, limitations and exclusions that are a part of the conclusions therein. *See "Statement on the Role of Customary Practice in the Preparation and Understanding of Third-Party Legal Opinions," 63 Bus. Law. 1277 (2008), and "Legal Opinion Principles," 53 Bus. Law. 831 (May 1998), updated by "Statement of Opinion Practices," 74 Bus. Law. 801, 807 (2019)*. Purchasers of the Series 2024 Bonds should seek advice or counsel concerning such matters as they deem prudent in connection with their purchase of Series 2024 Bonds.

Bond Counsel's opinion represents its legal judgment based in part upon the representations and covenants referenced therein and its review of current law, but is not a guarantee of a result or binding on the Internal Revenue Service (the "Service") or the courts. Bond Counsel assumes no duty to update or supplement its opinion to reflect any facts or circumstances that may come to Bond Counsel's attention after the date of its opinion or to reflect any changes in law or the interpretation thereof that may occur or become effective after such date.

**Original Issue Premium**

Series 2024 Bonds purchased, whether upon issuance or otherwise, for an amount (excluding any amount attributable to accrued interest) in excess of their principal amount will be treated for federal income tax purposes as having amortizable bond premium. A holder's basis in such a Series 2024 Bond must be reduced by the amount of premium that accrues while such Series 2024 Bond is held by the holder. No deduction for such amount will be allowed, but it generally will offset interest on the Series 2024 Bonds while so held. Purchasers of such Series 2024 Bonds should consult their own tax advisors as to the calculation, accrual and treatment of amortizable bond premium and the state and local tax consequences of holding such Series 2024 Bonds.

**Alternative Minimum Tax**

***Individuals***

Bond Counsel's opinion states that under current law interest on the Series 2024 Bonds is not an item of preference and is not subject to the alternative minimum tax on individuals.

***Applicable Corporations***

Bond Counsel's opinion also states that under current law interest on the Series 2024 Bonds is taken into account in determining adjusted financial statement income for applicable corporations (as defined in Section 59(k) of the Code) for the alternative minimum tax imposed on such corporations. Under current law, an "applicable corporation" generally is a corporation with average annual adjusted financial statement income for a 3-taxable-year period ending after December 31, 2021, that exceeds $1 billion.

**Other Tax Matters**

In addition to the matters addressed above, prospective purchasers of the Series 2024 Bonds should be aware that the ownership of tax-exempt obligations may result in collateral federal income tax consequences to certain taxpayers, including, without limitation, financial institutions, property and casualty insurance companies, S corporations, foreign corporations subject to the branch profits tax, recipients of Social Security or Railroad Retirement benefits and taxpayers who may be deemed to have incurred or continued indebtedness to purchase or carry tax-exempt obligations. Prospective purchasers of the Series 2024 Bonds should consult their tax advisors as to the applicability and impact of such consequences.

Prospective purchasers of the Series 2024 Bonds should consult their own tax advisors as to the status of interest on the Series 2024 Bonds under the tax laws of any state other than North Carolina.

The Service has a program to audit state and local government obligations to determine whether the interest thereon is includible in gross income for federal income tax purposes. If the Service does audit the Series 2024 Bonds, under current Service procedures, the Service will treat the Authority as the taxpayer, and the owners of the Series 2024 Bonds will have only limited rights, if any, to participate.

There are many events that could affect the value, liquidity and/or marketability of the Series 2024 Bonds after their issuance, including but not limited to public knowledge of an audit of the Series 2024 Bonds by the Service, a general change in interest rates for comparable securities, a change in federal or state income tax rates, federal or state legislative or regulatory proposals affecting state and local government securities and changes in judicial interpretation of current law. In addition, certain tax considerations relevant to owners of Series 2024 Bonds who purchase Series 2024 Bonds after their issuance may be different from those relevant to purchasers upon issuance. Neither Bond Counsel's opinion nor this Official Statement purports to address the likelihood or effect of any such potential events or such other tax considerations, and purchasers of the Series 2024 Bonds should seek advice concerning such matters as they deem prudent in connection with their purchase of Series 2024 Bonds.

## BOND INSURANCE

### Series 2024 Bond Insurance Policy

Concurrently with the issuance of the Series 2024 Bonds, Assured Guaranty Municipal Corp. ("AGM") will issue its Municipal Bond Insurance Policy (the "Bond Insurance Policy") for the Series 2024 Bonds (the "Insured Series 2024 Bonds"). The Bond Insurance Policy guarantees the scheduled payment of principal of (or, in the case of Capital Appreciation Bonds, the accreted value) and interest on the Insured Series 2024 Bonds when due as set forth in the form of the Bond Insurance Policy included as APPENDIX H to this Official Statement.

The Bond Insurance Policy is not covered by any insurance security or guaranty fund established under New York, California, Connecticut or Florida insurance law.

It is anticipated that any bond insurance premiums with respect to the Bond Insurance Policy will be paid in an upfront fee and subsequent annual payments. The Bond Insurance Policy will be irrevocable and any event of a non-payment of the annual bond insurance premium payments will not impact the validity of the Bond Insurance Policy with respect to the Insured Series 2024 Bonds.

### Assured Guaranty Municipal Corp.

AGM is a New York domiciled financial guaranty insurance company and an indirect subsidiary of Assured Guaranty Ltd. ("AGL"), a Bermuda-based holding company whose shares are publicly traded and are listed on the New York Stock Exchange under the symbol "AGO". AGL, through its subsidiaries, provides credit enhancement products to the U.S. and non-U.S. public finance (including infrastructure) and structured finance markets and participates in the asset management business through ownership interests in Sound Point Capital Management, LP and related entities. Neither AGL nor any of its shareholders or affiliates, other than AGM, is obligated to pay any debts of AGM or any claims under any insurance policy issued by AGM.

AGM's financial strength is rated "AA" (stable outlook) by S&P Global Ratings, a business unit of Standard & Poor's Financial Services LLC ("S&P"), "AA+" (stable outlook) by Kroll Bond Rating Agency, Inc. ("KBRA") and "A1" (stable outlook) by Moody's Investors Service, Inc. ("Moody's"). Each rating of AGM should be evaluated independently. An explanation of the significance of the above ratings may be obtained from the applicable rating agency. The above ratings are not recommendations to buy, sell or hold any security, and such ratings are subject to revision or withdrawal at any time by the rating agencies, including withdrawal initiated at the request of AGM in its sole discretion. In addition, the rating agencies may at any time change AGM's long-term rating outlooks or place such ratings on a watch list for possible downgrade in the near term. Any downward revision or withdrawal of any of the above ratings, the assignment of a negative outlook to such ratings or the placement of such ratings on a negative watch list

may have an adverse effect on the market price of any security guaranteed by AGM. AGM only guarantees scheduled principal and scheduled interest payments payable by the issuer of bonds insured by AGM on the date(s) when such amounts were initially scheduled to become due and payable (subject to and in accordance with the terms of the relevant insurance policy), and does not guarantee the market price or liquidity of the securities it insures, nor does it guarantee that the ratings on such securities will not be revised or withdrawn.

Current Financial Strength Ratings. On October 20, 2023, KBRA announced it had affirmed AGM's insurance financial strength rating of "AA+" (stable outlook). AGM can give no assurance as to any further ratings action that KBRA may take.

On July 13, 2023, S&P announced it had affirmed AGM's financial strength rating of "AA" (stable outlook). AGM can give no assurance as to any further ratings action that S&P may take.

On March 18, 2022, Moody's announced it had upgraded AGM's insurance financial strength rating to "A1" (stable outlook) from "A2" (stable outlook). AGM can give no assurance as to any further ratings action that Moody's may take.

For more information regarding AGM's financial strength ratings and the risks relating thereto, see AGL's Annual Report on Form 10-K for the fiscal year ended December 31, 2022.

Capitalization of AGM. At September 30, 2023:

- The policyholders' surplus of AGM was approximately $2,569 million.
- The contingency reserve of AGM was approximately $908 million.
- The net unearned premium reserves and net deferred ceding commission income of AGM and its subsidiaries (as described below) were approximately $2,048 million. Such amount includes (i) 100% of the net unearned premium reserve and net deferred ceding commission income of AGM, and (ii) the net unearned premium reserves and net deferred ceding commissions of AGM's wholly owned subsidiary Assured Guaranty UK Limited ("AGUK") and its 99.9999% owned subsidiary Assured Guaranty (Europe) SA ("AGE").

The policyholders' surplus of AGM and the contingency reserves, net unearned premium reserves and net deferred ceding commission income of AGM were determined in accordance with statutory accounting principles. The net unearned premium reserves and net deferred ceding commissions of AGUK and AGE were determined in accordance with accounting principles generally accepted in the United States of America.

Incorporation of Certain Documents by Reference. Portions of the following documents filed by AGL with the Securities and Exchange Commission (the "SEC") that relate to AGM are incorporated by reference into this Official Statement and shall be deemed to be a part hereof:

(i) the Annual Report on Form 10-K for the fiscal year ended December 31, 2022 (filed by AGL with the SEC on March 1, 2023);

(ii) the Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2023 (filed by AGL with the SEC on May 10, 2023);

(iii) the Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2023 (filed by AGL with the SEC on August 9, 2023); and

(iv) the Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2023 (filed by AGL with the SEC on November 8, 2023).

All information relating to AGM included in, or as exhibits to, documents filed by AGL with the SEC pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, excluding Current Reports or portions thereof "furnished" under Item 2.02 or Item 7.01 of Form 8-K, after the filing of the last document referred to above and before the termination of the offering of the Series 2024 Bonds shall be deemed incorporated by reference into this Official Statement and to be a part hereof from the respective dates of filing such documents. Copies of materials incorporated by reference are available over the internet at the SEC's website at http://www.sec.gov, at AGL's website at http://www.assuredguaranty.com, or will be provided upon request to Assured Guaranty Municipal Corp.: 1633 Broadway, New York, New York 10019, Attention: Communications Department (telephone (212) 974-0100). Except for the information referred to above, no information available on or through AGL's website shall be deemed to be part of or incorporated in this Official Statement.

Any information regarding AGM included herein under the caption "BOND INSURANCE – Assured Guaranty Municipal Corp." or included in a document incorporated by reference herein (collectively, the "AGM Information") shall be modified or superseded to the extent that any subsequently included AGM Information (either directly or through incorporation by reference) modifies or supersedes such previously included AGM Information. Any AGM Information so modified or superseded shall not constitute a part of this Official Statement, except as so modified or superseded.

Miscellaneous Matters. AGM makes no representation regarding the Series 2024 Bonds or the advisability of investing in the Series 2024 Bonds. In addition, AGM has not independently verified, makes no representation regarding, and does not accept any responsibility for the accuracy or completeness of this Official Statement or any information or disclosure contained herein, or omitted herefrom, other than with respect to the accuracy of the information regarding AGM supplied by AGM and presented under the heading "BOND INSURANCE".

## LEGALITY FOR INVESTMENT

Section 159-140 of the General Statutes of North Carolina provides that the Series 2024 Bonds are securities in which all public officers and public bodies of the State and its political subdivisions and agencies and all insurance companies, trust companies, investment companies, banks, savings banks, building and loan associations, savings and loan associations, credit unions, pension or retirement funds, other financial institutions engaged in business in the State, executors, administrators, trustees and other fiduciaries may properly and legally invest funds, including capital in their control or belonging to them, and the Series 2024 Bonds are securities which may properly and legally be deposited with and received by any State or municipal officer or any agency or political subdivision of the State for any purpose for which the deposit of bonds, notes or obligations of the State is now or may hereafter be authorized by law.

## RATINGS

S&P Global Ratings, a business unit of Standard & Poor's Financial Services LLC ("S&P"), assigned the Insured Series 2024 Bonds the rating of "AA" (stable outlook) on the understanding that the 2024 Bond Insurer will issue and deliver the Bond Insurance Policy simultaneously with the issuance and delivery of the Series 2024 Bonds. S&P and Fitch Ratings ("Fitch") have given the Series 2024 Bonds underlying ratings of "BBB" (stable outlook) and "BBB+" (stable outlook), respectively.

Further explanation of the significance of such ratings may be obtained from S&P and Fitch. The Authority has provided to S&P and Fitch, as applicable, certain information not included in this Official Statement. The ratings are not a recommendation to buy, sell or hold the Series 2024 Bonds and should be evaluated independently. The ratings reflect only the view of the particular rating agency, and neither the Authority nor the LGC makes any representation as to the appropriateness of the ratings. There is no assurance that such ratings will not be withdrawn or revised downward by S&P or Fitch. Such action may have an adverse effect on the market price or marketability of the Series 2024 Bonds. Neither the Authority, the LGC nor the Underwriters have undertaken any responsibility after the issuance of the Series 2024 Bonds to assure maintenance of the ratings or to oppose any such revision or withdrawal.

Moody's Investor Services ("Moody's") rated the Series 2009 Bonds, but has not provided a rating for the 2017 Bonds, the 2018 Bonds, the 2019 Bonds or the Series 2024 Bonds. No assurance can be given that the issuance of the Series 2024 Bonds will not have a negative effect on the rating currently assigned to the Series 2009B Bonds, which are currently outstanding.

## UNDERWRITING

The Underwriters have entered into a Bond Purchase Agreement to purchase all of the Series 2024 Bonds, if any of the Series 2024 Bonds are to be purchased, at a purchase price equal to 100% of the principal amount thereof, plus original issue premium of $19,027,895.40, and less an underwriters' discount of $1,044,606.14. The obligation of the Underwriters to pay for the Series 2024 Bonds is subject to certain terms and conditions set forth in the Bond Purchase Agreement.

The Underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, principal investment, hedging, financing and brokerage services. Certain of the Underwriters and their respective affiliates have, from time to time, performed, and may in the future perform, various financial advisory and investment banking services for the Authority, for which they received or will receive customary fees and expenses.

In the ordinary course of their various business activities, the Underwriters and their respective affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities, which may include credit default swaps) and financial instruments (including bank loans) for their own account and for the accounts of their customers and may at any time hold long and short positions in such securities and instruments. Such investment and securities activities may involve securities and instruments of the Authority.

The Underwriters and their respective affiliates may also communicate independent investment recommendations, market color or trading ideas and/or publish or express independent research views in respect of such assets, securities or instruments and may at any time hold, or recommend to clients that they should acquire, long and/or short positions in such assets, securities and instruments.

The Underwriters may offer and sell the Series 2024 Bonds to certain dealers (including dealers depositing the Series 2024 Bonds into investment trusts) and others at prices lower than the initial public offering prices stated on the inside front cover page hereof. The public offering prices may be changed from time to time by the Underwriters.

BofA Securities, Inc., an underwriter of the Series 2024 Bonds, has entered into a distribution agreement with its affiliate Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S"). As part of this arrangement, BofA Securities, Inc. may distribute securities to MLPF&S, which may in turn distribute such securities to investors through the financial advisor network of MLPF&S. As part of this arrangement, BofA Securities, Inc. may compensate MLPF&S as a dealer for their selling efforts with respect to the Series 2024 Bonds

Drexel Hamilton, LLC has entered into distribution agreements with Multi-Bank Securities, Inc., and Tigress Financial Partners LLC. Under these distribution agreements, such firms may purchase the Series 2024 Bonds from Drexel Hamilton at the original issue price less a negotiated portion of the selling concession applicable to any Series 2024 Bonds that such firm sells.

PNC Capital Markets LLC and PNC Bank, National Association are both wholly-owned subsidiaries of the PNC Financial Services Group, Inc. PNC Capital Markets LLC is not a bank, and is a distinct legal entity from PNC Bank, National Association. PNC Bank, National Association has other banking and financial relationships with the Authority.

PNC Capital Markets LLC may offer to sell to its affiliate, PNC Investments, LLC ("PNCI"), securities in PNC Capital Markets LLC's inventory for resale to PNCI's customers.

## MISCELLANEOUS

Members of the LGC staff have participated in the preparation of this Official Statement and other documents related to the issuance of the Series 2024 Bonds, but the LGC and its staff assume no responsibility for the accuracy or completeness of any representation or statement in this Official Statement.

The LGC and the Authority have each duly authorized the execution and delivery of this Official Statement.

NORTH CAROLINA LOCAL GOVERNMENT COMMISSION

By: */s/ Jennifer Wimmer*
Deputy Secretary

NORTH CAROLINA TURNPIKE AUTHORITY

By: */s/ Joseph R. Hopkins, P.E.*
Chairman

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# APPENDIX A

# ACCRETED AMOUNTS FOR CAPITAL APPRECIATION BONDS

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| Date | Capital Appreciation Bonds (Call Jan 1, 2034) 01/01/2050 4.88% | Capital Appreciation Bonds (Call Jan 1, 2034) 01/01/2051 4.91% | Capital Appreciation Bonds (Call Jan 1, 2034) 01/01/2052 4.94% | Capital Appreciation Bonds (Call Jan 1, 2034) 01/01/2053 4.96% |
|---|---|---|---|---|
| 01/30/2024 | 1,432.95 | 1,354.80 | 1,280.10 | 1,212.30 |
| 07/01/2024 | 1,462.25 | 1,382.65 | 1,306.60 | 1,237.45 |
| 01/01/2025 | 1,497.90 | 1,416.55 | 1,338.85 | 1,268.15 |
| 07/01/2025 | 1,534.45 | 1,451.35 | 1,371.95 | 1,299.60 |
| 01/01/2026 | 1,571.90 | 1,487.00 | 1,405.85 | 1,331.85 |
| 07/01/2026 | 1,610.25 | 1,523.50 | 1,440.55 | 1,364.85 |
| 01/01/2027 | 1,649.55 | 1,560.90 | 1,476.15 | 1,398.70 |
| 07/01/2027 | 1,689.80 | 1,599.20 | 1,512.60 | 1,433.40 |
| 01/01/2028 | 1,731.00 | 1,638.45 | 1,549.95 | 1,468.95 |
| 07/01/2028 | 1,773.25 | 1,678.70 | 1,588.25 | 1,505.40 |
| 01/01/2029 | 1,816.55 | 1,719.90 | 1,627.45 | 1,542.70 |
| 07/01/2029 | 1,860.85 | 1,762.15 | 1,667.65 | 1,580.95 |
| 01/01/2030 | 1,906.25 | 1,805.40 | 1,708.85 | 1,620.20 |
| 07/01/2030 | 1,952.75 | 1,849.70 | 1,751.05 | 1,660.35 |
| 01/01/2031 | 2,000.40 | 1,895.15 | 1,794.30 | 1,701.55 |
| 07/01/2031 | 2,049.25 | 1,941.65 | 1,838.65 | 1,743.75 |
| 01/01/2032 | 2,099.25 | 1,989.30 | 1,884.05 | 1,787.00 |
| 07/01/2032 | 2,150.45 | 2,038.15 | 1,930.60 | 1,831.30 |
| 01/01/2033 | 2,202.90 | 2,088.20 | 1,978.30 | 1,876.70 |
| 07/01/2033 | 2,256.70 | 2,139.45 | 2,027.15 | 1,923.25 |
| 01/01/2034 | 2,311.75 | 2,192.00 | 2,077.20 | 1,970.95 |
| 07/01/2034 | 2,368.15 | 2,245.80 | 2,128.55 | 2,019.85 |
| 01/01/2035 | 2,425.95 | 2,300.95 | 2,181.10 | 2,069.95 |
| 07/01/2035 | 2,485.10 | 2,357.40 | 2,235.00 | 2,121.25 |
| 01/01/2036 | 2,545.75 | 2,415.30 | 2,290.20 | 2,173.90 |
| 07/01/2036 | 2,607.90 | 2,474.60 | 2,346.75 | 2,227.80 |
| 01/01/2037 | 2,671.50 | 2,535.35 | 2,404.70 | 2,283.05 |
| 07/01/2037 | 2,736.70 | 2,597.60 | 2,464.10 | 2,339.65 |
| 01/01/2038 | 2,803.45 | 2,661.35 | 2,525.00 | 2,397.70 |
| 07/01/2038 | 2,871.90 | 2,726.70 | 2,587.35 | 2,457.15 |
| 01/01/2039 | 2,941.95 | 2,793.65 | 2,651.25 | 2,518.10 |
| 07/01/2039 | 3,013.75 | 2,862.20 | 2,716.75 | 2,580.55 |
| 01/01/2040 | 3,087.25 | 2,932.50 | 2,783.85 | 2,644.55 |
| 07/01/2040 | 3,162.60 | 3,004.50 | 2,852.60 | 2,710.10 |
| 01/01/2041 | 3,239.75 | 3,078.25 | 2,923.05 | 2,777.35 |
| 07/01/2041 | 3,318.80 | 3,153.80 | 2,995.25 | 2,846.20 |
| 01/01/2042 | 3,399.80 | 3,231.25 | 3,069.25 | 2,916.80 |
| 07/01/2042 | 3,482.75 | 3,310.55 | 3,145.05 | 2,989.15 |
| 01/01/2043 | 3,567.75 | 3,391.85 | 3,222.75 | 3,063.25 |
| 07/01/2043 | 3,654.80 | 3,475.10 | 3,302.35 | 3,139.25 |
| 01/01/2044 | 3,743.95 | 3,560.45 | 3,383.90 | 3,217.10 |
| 07/01/2044 | 3,835.30 | 3,647.85 | 3,467.50 | 3,296.85 |
| 01/01/2045 | 3,928.90 | 3,737.40 | 3,553.15 | 3,378.65 |
| 07/01/2045 | 4,024.75 | 3,829.15 | 3,640.90 | 3,462.40 |
| 01/01/2046 | 4,123.00 | 3,923.15 | 3,730.85 | 3,548.30 |
| 07/01/2046 | 4,223.60 | 4,019.45 | 3,823.00 | 3,636.30 |
| 01/01/2047 | 4,326.65 | 4,118.15 | 3,917.40 | 3,726.45 |
| 07/01/2047 | 4,432.20 | 4,219.25 | 4,014.20 | 3,818.90 |
| 01/01/2048 | 4,540.35 | 4,322.85 | 4,113.35 | 3,913.60 |
| 07/01/2048 | 4,651.15 | 4,428.95 | 4,214.95 | 4,010.65 |
| 01/01/2049 | 4,764.60 | 4,537.70 | 4,319.05 | 4,110.10 |
| 07/01/2049 | 4,880.90 | 4,649.10 | 4,425.70 | 4,212.05 |
| 01/01/2050 | 5,000.00 | 4,763.25 | 4,535.05 | 4,316.50 |
| 07/01/2050 | | 4,880.15 | 4,647.05 | 4,423.55 |
| 01/01/2051 | | 5,000.00 | 4,761.85 | 4,533.25 |
| 07/01/2051 | | | 4,879.45 | 4,645.70 |
| 01/01/2052 | | | 5,000.00 | 4,760.90 |
| 07/01/2052 | | | | 4,879.00 |
| 01/01/2053 | | | | 5,000.00 |

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# APPENDIX B

# FORMS OF AMENDED AND RESTATED TRUST AGREEMENT AND THE SIXTH SUPPLEMENTAL TRUST AGREEMENT

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Execution Version

AMENDED AND RESTATED TRUST AGREEMENT

Dated as of December 1, 2019

Between

NORTH CAROLINA TURNPIKE AUTHORITY

and

WELLS FARGO BANK, N.A.
Trustee

Amending and Restating the Trust Agreement dated as of June 1, 2009, as previously amended by the First Supplemental Trust Agreement dated as of July 1, 2009, the Second Supplemental Trust Agreement dated as of March 1, 2017, and the Third Supplemental Trust Agreement dated as of December 1, 2018, and incorporating amendments from Article VII of the Fourth Supplemental Trust Agreement dated as of December 1, 2019

Authorizing and Securing

North Carolina Turnpike Authority
Turnpike Revenue Bonds and Indebtedness
(Triangle Expressway System)

*This document includes major and minor amendments to the Trust Agreement dated as of June 1, 2009, made by the supplemental trust agreements noted above and pursuant to Article VII of the Fourth Supplemental Trust Agreement. Details of the amendments and purposes of the restatement are provided in Section 701(a) of the Fourth Supplemental Trust Agreement. Forms of the First, Second and Third Supplemental Trust Agreements are attached as Exhibits B, C and D hereto. If a section or subsection has been added or amended to the original text of the Trust Agreement dated as of June 1, 2009, an explanatory note (in italics) follows that section or subsection herein indicating the source of the addition or amendment. If a section in a supplement has been amended, an explanatory note (in italics) follows that section in the relevant exhibit indicating the source of the amendment. The language in italics is not a part of the Trust Agreement or the supplements, as amended, for substantive purposes.*

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## AMENDED AND RESTATED TRUST AGREEMENT

This **AMENDED AND RESTATED TRUST AGREEMENT** dated as of December 1, 2019, between the **North Carolina Turnpike Authority** a political subdivision within the Department of Transportation ("NCDOT") of the State of North Carolina (the "State") duly organized and existing under the laws of the State (the "Authority"), and **Wells Fargo Bank, N.A.**, a national banking association duly organized and existing under the laws of the United States of America and having a designated corporate trust office in Philadelphia, Pennsylvania, which is authorized under such laws to exercise trust powers (the "Trustee");

**WITNESSETH**:

**WHEREAS,** the Authority is a body corporate and politic and a public agency of the State of North Carolina duly organized and existing under the laws of the State of North Carolina, and is authorized under Article 6H of Chapter 136, as amended, of the General Statutes of North Carolina (the "Act"), to issue revenue bonds for the purpose of financing and refinancing the cost of acquiring, constructing and equipping the "turnpike projects" (as defined in the Act);

**WHEREAS**, the Authority issued revenue bonds pursuant to the Act and the Original Trust Agreement (hereafter defined) to finance the costs of the Initial Project (hereinafter defined);

**WHEREAS**, pursuant to the Act, the Authority entered into the Original Trust Agreement for the purpose of authorizing the issuance of Senior Lien Bonds, Subordinate Lien Bonds and Junior Indebtedness (each as hereinafter defined) and securing the payment thereof and any Senior Lien Parity Debt, Senior Lien Derivative Agreement Regularly Scheduled Payments, Subordinate Lien Parity Debt, Subordinate Lien Derivative Agreement Regularly Scheduled Payments and TIFIA Indebtedness (all as hereinafter defined) by pledging and assigning its rights, title and interest in and to the Trust Estate to the Trustee in the manner and subject to the priorities set forth herein;

**WHEREAS**, under the Constitution and laws of the State of North Carolina, including the Act, the Authority was and is authorized to enter into the Original Trust Agreement and this Amended and Restated Trust Agreement, to issue Bonds as hereinafter provided and to do or cause to be done all the acts and things herein provided which have been done or are required to be done as hereinafter covenanted;

**WHEREAS**, all acts, conditions and things required by the Constitution and laws of the State of North Carolina, including the Act, to happen, exist and be performed precedent to and in the execution and delivery of the Original Trust Agreement and this Amended and Restated Trust Agreement have happened, exist and have been performed as so required to make this Amended and Restated Trust Agreement a valid and binding trust agreement securing the Senior Lien Bonds, Senior Lien Parity Debt, Senior Lien Derivative Agreement Regularly Scheduled Payments, Subordinate Lien Bonds, Subordinate Lien Parity Debt, Subordinate Lien Derivative Agreement Regularly Scheduled Payments and Junior Indebtedness in accordance with its terms; and

*See the introductory clauses to the Fourth Supplemental Trust Agreement for additional "WHEREAS" paragraphs setting forth the issuance of the Series 2009 Bonds pursuant to the First Supplemental Trust Agreement, the issuance of the TIFIA Series 2009 Bond pursuant to the June 2009 Trust Agreement, the issuance of the Series 2017 Bonds pursuant to the Second Supplemental Trust Agreement for the purpose of refunding in part the Series 2009 Bonds, the issuance of the Series 2018 Bonds pursuant to the Third Supplemental Trust Agreement for the purpose of refunding the TIFIA Series 2009 Bond, authorizing the issuance of the Series 2019 Bonds pursuant to the Fourth Supplemental Trust Agreement, authorizing the issuance of the TIFIA Series 2019 Bond pursuant to the Fourth Supplemental Trust Agreement, and providing for amendments to provisions of the Trust Agreement and its restatement and amendment.*

**WHEREAS**, the Trustee has accepted the trusts created by this Amended and Restated Trust Agreement (hereafter referred to as the Trust Agreement) and in evidence thereof has joined in the execution hereof;

**NOW, THEREFORE, THIS TRUST AGREEMENT WITNESSETH** that in consideration of the premises, of the acceptance by the Trustee of the trusts hereby created, and of the issuance of the Senior Lien Bonds, the Subordinate Lien Bonds and Junior Indebtedness as provided herein, and also for and in consideration of the sum of One Dollar in hand paid by the Trustee at or before the execution and delivery of this Trust Agreement, and for other good and valuable consideration, the receipt and sufficiency whereof is hereby acknowledged, and for the purpose of fixing and declaring the terms and conditions upon which Bonds are to be issued, authenticated, delivered, secured and accepted by all persons who shall from time to time be or become Owners (hereinafter defined) thereof, and to secure the payment of all Bonds at any time issued and Outstanding (hereinafter defined) under this Trust Agreement and to further secure payment of (a) any Senior Lien Parity Debt, Subordinate Lien Parity Debt (both as hereinafter defined) and Junior Indebtedness and (b) any Senior Lien Derivative Agreement Regularly Scheduled Payments and Subordinate Lien Derivative Agreement Regularly Scheduled Payments, and to secure the performance and observance of all the covenants, agreements and conditions, express or implied, therein and herein contained, the Authority has executed and delivered this Trust Agreement, and by this Trust Agreement has, subject to the terms hereof, given, granted, bargained, aliened, remised, released, conveyed, transferred, assigned, confirmed, set over, and pledged, and does hereby give, grant, bargain, alien, remise, release, convey, transfer, assign,

confirm, set over, and pledge unto the Trustee, and its successor or successors in trust, the Trust Estate (as herein defined);

**TO HAVE AND TO HOLD** all the same with all privileges and appurtenances hereby conveyed and assigned, or agreed or intended so to be, to the Trustee and its successor or successors in trust and to them and their assigns forever;

**IN TRUST, NEVERTHELESS**, upon the terms and trusts herein set forth, for the benefit, security and protection of all and singular the present and future Owners of the Bonds issued or to be issued under and secured by this Trust Agreement and the Holders (hereinafter defined) of any Senior Lien Parity Debt, Subordinate Lien Parity Debt or Junior Indebtedness and the payee of any Senior Lien Derivative Agreement Regularly Scheduled Payment or Subordinate Lien Derivative Agreement Regularly Scheduled Payment, without preference, priority or distinction as to lien or otherwise, except as may otherwise be provided for herein, of (a) any Senior Lien Bond, Senior Lien Parity Debt or Senior Lien Derivative Agreement Regularly Scheduled Payment over any other Senior Lien Bond, Senior Lien Parity Debt or Senior Lien Derivative Agreement Regularly Scheduled Payment, (b) any Subordinate Lien Bond, Subordinate Lien Parity Debt or Subordinate Lien Derivative Agreement Regularly Scheduled Payment over any other Subordinate Lien Bond, Subordinate Lien Parity Debt or Subordinate Lien Derivative Agreement Regularly Scheduled Payment or (c) any Junior Indebtedness over any other Junior Indebtedness, by reason of priority in their issue, sale, delivery date or otherwise, all as herein provided;

**PROVIDED, HOWEVER**, that if the Authority, its successors or assigns, shall well and truly pay, or cause to be paid, or provide for the payment, pursuant to the provisions of this Trust Agreement, of the principal of all Senior Lien Bonds, Senior Lien Parity Debt, Subordinate Lien Bonds, Subordinate Lien Parity Debt and Junior Indebtedness and the interest and any redemption premium due or to become due thereon and all Senior Lien Derivative Agreement Regularly Scheduled Payments and all Subordinate Lien Derivative Agreement Regularly Scheduled Payments, at the times and in the manner mentioned therein and in this Trust Agreement, according to the true intent and meaning hereof and thereof, and shall pay or cause to be paid to the Trustee all sums of money due or to become due to it in accordance with the terms and provisions hereof and perform all of its other obligations hereunder, then, upon such performance and payments, this Trust Agreement and the rights hereby granted shall cease, determine and become void, as provided in Article XII hereof; otherwise this Trust Agreement shall be and remain in full force and effect; and

**THIS TRUST AGREEMENT FURTHER WITNESSETH** and it is expressly declared that all Bonds issued and secured hereunder and any Senior Lien Parity Debt, Senior Lien Derivative Agreement Regularly Scheduled



Payments, Subordinate Lien Parity Debt, Subordinate Lien Derivative Agreement Regularly Scheduled Payments and Junior Indebtedness secured hereunder are to be issued, authenticated, delivered and dealt with, and all said property hereby given, granted, bargained, aliened, remised, released, conveyed, transferred, assigned, confirmed, set-over and pledged is to be dealt with and disposed of, under, upon and subject to the terms, conditions, stipulations, covenants, agreements, trusts, uses and purposes as hereinafter expressed, and the Authority has agreed and covenanted, and does hereby agree and covenant, with the Trustee and with the respective Owners, Holders, from time to time, of Bonds, Senior Lien Parity Debt, Subordinate Lien Parity Debt and Junior Indebtedness or any part thereof, and payee of any Senior Lien Derivative Agreement Regularly Scheduled Payments or Subordinate Lien Derivative Agreement Regularly Scheduled Payments, as follows:

## ARTICLE I

## DEFINITIONS; FINDINGS AND DETERMINATIONS

Section 101. Meaning of Words and Terms. In addition to words and terms elsewhere defined in this Trust Agreement, the following words and terms as used in this Trust Agreement shall have the following meanings, unless some other meaning is plainly intended:

"Accreted Amount" means (a) with respect to Capital Appreciation Bonds of any Series, the amount set forth in a Supplemental Agreement for such Bonds as the amount representing the initial principal amount, plus the accreted and compounded interest on such Capital Appreciation Bonds, and (b) with respect to Convertible CAB Bonds of any Series, the amount set forth in a Supplemental Agreement for such Bonds as the amount representing the initial principal amount, plus the accreted and compounded interest on such Convertible CAB Bonds up to the Convertible CAB Bond Conversion Date therefor and thereafter the Accreted Amount as of such Convertible CAB Bond Conversion Date; provided the determination of the Accreted Amount of a Bond during the period while interest thereon is compounded may be set forth in the respective Supplemental Agreement and the Accreted Amount of a Bond may never exceed the maturity amount of such Bond.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Act" means, collectively, Article 6H of Chapter 136 of the General Statutes of North Carolina, as amended, and Article 5 of Chapter 159 of the General Statutes of North Carolina, as amended.

"Additional Project" means any addition, acquisition, improvement, betterment, extension or equipping of or relating to the Initial Project as authorized

by the Act, or any previous Additional Project that has become part of the Triangle Expressway System and located within the geographic boundaries comprising the Capital Area Metropolitan Planning Organization and the Durham, Chapel Hill, Carrboro Metropolitan Planning Organization; provided, however, that the term "Additional Project" shall not include any Non-System Project unless the Authority specifically identifies such Non-System Project as an Additional Project upon compliance with the provisions of Section 715 and, if any TIFIA Indebtedness is Outstanding, the requirements of the TIFIA Loan Agreement. The 2019 Additional Project is an Additional Project which is part of the Triangle Expressway System. The Authority is planning a future Additional Project to continue the Triangle Expressway System to the east of the 2019 Additional Project.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Additional Projects Account" means an account in the Project Fund created and so designated by Section 401.

"Amended and Restated Trust Agreement" means this agreement amending and restating the June 2009 Trust Agreement as previously amended by the First Supplemental Trust Agreement, the Second Supplemental Trust Agreement and the Third Supplemental Trust Agreement and as concurrently amended pursuant to Article VII of the Fourth Supplemental Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Annual Budget" means the Authority's budget for the Triangle Expressway System for a Fiscal Year adopted pursuant to the Authority's bylaws, rules and regulations as in effect from time to time.

"Authority" means the North Carolina Turnpike Authority created by the Act, and any successor thereto.

"Authority Attorney" means the attorney or law firm designated by the Authority from time to time to perform the duties of counsel to the Authority under this Trust Agreement, including the Attorney General of the State or any assistant or deputy Attorney General of the State.

"Authority Board" means the Board of Directors of the Authority, as the governing body thereof.

"Authority Secretary" means the person appointed or employed by the Authority to perform the duties imposed on the Secretary of the Authority by this Trust Agreement, including the Secretary of the Authority Board or any assistant or deputy Secretary of the Authority Board.



"Authorized Denominations" means $5,000 or any whole multiple thereof (a) for Current Interest Bonds, calculated based on the principal amount of such Bonds, and (b) for Convertible CAB Bonds and Capital Appreciation Bonds, calculated based on the maturity amount of such Bonds.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Authorized Officer" means the Executive Director, the Chief Financial Officer and any other person authorized by resolution of the Authority Board to perform the duties imposed on an Authorized Officer by this Trust Agreement whose name and specimen signature is filed pursuant to an Officer's Certificate with the Trustee for such purpose.

"Balloon Long-Term Indebtedness" means fixed or variable rate Long-Term Indebtedness 25% or more of the principal payments of which are due in a single twelve-month period which portion of the principal is not required by the documents pursuant to which such Indebtedness is incurred to be amortized by redemption or prepayment prior to the expiration of such period.

"Bankruptcy Related Event" means (a) an involuntary proceeding shall be commenced or an involuntary petition shall be filed seeking (i) liquidation, reorganization or other relief in respect of the Authority or any of its debts, or of a substantial part of the assets of the Authority, under any Insolvency Law, or (ii) the appointment of a receiver, trustee, liquidator, custodian, sequestrator, conservator or similar official for the Authority for a substantial part of the assets of the Authority, and, in any case referred to in the foregoing subclauses (i) and (ii), such proceeding or petition shall continue undismissed for 60 days or an order or decree approving or ordering any of the foregoing shall be entered; or (b) the Authority shall (i) apply for or consent to the appointment of a receiver, trustee, liquidator, custodian, sequestrator, conservator or similar official for the Authority or for a substantial part of the assets of the Authority, or (ii) generally not be paying its debts with respect to the Triangle Expressway System as they become due unless such debts are the subject of a bona fide dispute, or become unable to pay its debts generally as they become due, or (iii) fail to make two (2) consecutive payments of TIFIA Debt Service in accordance with the provisions of the TIFIA Loan Agreement, or (iv) make a general assignment for the benefit of creditors, or (v) consent to the institution of, or fail to contest in a timely and appropriate manner to, any proceeding or petition with respect to it described in clause (a) of this definition, or (vi) commence a voluntary proceeding under any Insolvency Law, or file a voluntary petition seeking liquidation, reorganization, an arrangement with creditors or an order for relief under any Insolvency Law, or (vii) file an answer admitting the material allegations of a petition filed against it in any proceeding referred to in the foregoing subclauses (i) through (vi), inclusive, of this clause (b), or (viii) take any action for the purpose of effecting any of the foregoing; or

(c) commence a process pursuant to which (i) all or a substantial part of the Triangle Expressway System or the Trust Estate may be sold or otherwise disposed of in a public or private sale or disposition pursuant to a foreclosure of any liens or security interest thereon securing the Senior Lien Indebtedness, or (ii) all or a substantial part of the Triangle Expressway System or the Trust Estate may be transferred pursuant to a sale or disposition in lieu of foreclosure.

*The preceding definition was revised pursuant to Section 701(b) of the Third Supplemental Trust Agreement.*

"Bond" or "Bonds" means, collectively, the Senior Lien Bonds and the Subordinate Lien Bonds.

"Bond Insurance Policy" means a municipal bond insurance policy or similar arrangement permitted by the Act and obtained or established in connection with the incurrence of any Bonds or other.

"Bond Insurer" means the Person providing a Bond Insurance Policy.

"Bond Registrar" means, with respect to any Series of Bonds, the Bond Registrar at the time serving as such under the Supplemental Agreement relating to such Series, whether the original or a successor Bond Registrar.

"Business Day" means any day other than a Saturday, a Sunday or a day on which offices of the United States Government or the State are authorized to be closed or on which commercial banks are authorized or required by law, regulation or executive order to be closed in New York, New York, in Raleigh, North Carolina or in the city where the principal or designated office of the Trustee is located.

"Capital Appreciation Bonds" means Bonds the interest on which is compounded at the rates and on the dates set forth in a Supplemental Agreement and is payable upon redemption or on the maturity date of such Bonds; provided, however, that nothing in this Trust Agreement shall prohibit the Authority from designating in the appropriate Supplemental Agreement any such Bonds by a name other than Capital Appreciation Bonds.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Capital Improvements Budget" for any Fiscal Year means the budget for capital improvements adopted by the Authority in accordance with Section 705.

"Capitalized Interest Account" means the respective accounts in the Senior Lien Debt Service Fund and the Subordinate Lien Debt Service Fund created and so designated by Section 501.



"Chief Financial Officer" means the person appointed or employed by the Authority to perform the duties imposed on the Chief Financial Officer by this Trust Agreement.

"Complete 540 Phase 2 Project" means the NCDOT STIP Project R-2829 being the extension of the Triangle Expressway System for the 10.8 miles from east of US 70 (Clayton Bypass) just east of I-40 to the US 64/US 264 Bypass (I-87) in Knightdale. Complete 540 Phase 2 will complete the Outer Loop around the greater Raleigh area.

"Completion Date" means the date of acquisition or completion of the Initial Project and any Additional Project, or of any segment of the foregoing, as the case may be, as certified by the Authority pursuant to Section 406.

"Completion Indebtedness" means any Long-Term Indebtedness incurred for the purpose of financing the completion of the Initial Project or any Additional Project for which Long-Term Indebtedness has theretofore been incurred in accordance with the provisions hereof, to the extent necessary to complete the Initial Project or such Additional Project, in the manner and scope contemplated at the time that such Long-Term Indebtedness theretofore incurred was originally incurred, and, to the extent the same shall be applicable, in accordance with the general plans and specifications for the Initial Project or such Additional Project, as originally prepared with only such changes as have been made in conformance with the documents pursuant to which such Long-Term Indebtedness theretofore incurred was originally incurred; provided, however, that such Long-Term Indebtedness shall not exceed 5% of the aggregate principal amount of the Long-Term Indebtedness originally incurred by the Authority to finance the costs of the Initial Project or any Additional Project.

"Construction and Renewal and Replacement Agreement" means (a) the Construction Completion Assurance and Standby Renewal and Replacement Funding Agreement, dated as of April 15, 2009, between the Authority and NCDOT, including any supplement or amendment thereto, and (b) NCDOT's obligations under Sections 402 and 512.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Convertible CAB Bond Conversion Date" or "Dates" means the conversion dates identified for particular Convertible CAB Bonds in a Supplemental Agreement for such Bonds.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Convertible CAB Bonds" means Bonds the interest on which is compounded at the rates and on the dates set forth in a Supplemental Agreement for such Bonds until the Convertible CAB Bond Conversion Date for such Bonds, with interest payable semiannually thereafter on each Interest Payment Date at such rates, with the accreted interest through the Convertible CAB Bond Conversion Date for such Bonds treated as principal on such Bonds thereafter, and with the principal of such Bonds payable upon redemption or on the maturity date of such Bonds; provided, however, that nothing in this Trust Agreement shall prohibit the Authority from designating in the appropriate Supplemental Agreement any such Bonds by a name other than Convertible CAB Bonds.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Cost," as applied to the Initial Project or any Additional Project, means, without intending thereby to limit or restrict any proper definition of such word under the provisions of the Act or this Trust Agreement, all items of cost which are set forth in Section 403.

"Credit Facility" means a line of credit, letter of credit, standby bond purchase agreement or similar liquidity or credit facility permitted by the Act (but excluding a Bond Insurance Policy) and established or obtained in connection with the incurrence of any Indebtedness.

"Credit Provider" means the Person providing a Credit Facility. If and to the extent permitted by law, the Authority may be a Credit Provider for the sole purpose of providing liquidity support for Indebtedness.

"Current Interest Bonds" means Bonds (other than TIFIA Indebtedness) the interest on which is payable on the Interest Payment Dates provided therefor in any Supplemental Agreement, including Convertible CAB Bonds after the applicable Convertible CAB Bond Conversion Date.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Default" means any Event of Default and any event that, after notice or lapse of time or both, would become an Event of Default.

"Defaulted Interest" means Defaulted Interest as defined in Section 202.

"Defeasance Obligations" means noncallable (a) Government Obligations and (b) Defeased Municipal Obligations.

"Defeased Municipal Obligations" means obligations of state or local government municipal bond issuers which are rated the highest rating category by



S&P, Fitch or Moody's, respectively, provision for the payment of the principal of, premium, if any, and interest on which shall have been made by deposit with a trustee or escrow agent of Government Obligations, the maturing principal of and interest on which, when due and payable, shall provide sufficient money to pay the principal of, premium, if any, and interest on such obligations of state or local government municipal bond issuers. References in this definition to state or local government bond issuers shall mean the State of North Carolina and North Carolina local government bond issuers, and, to the extent permitted by law, states other than the State of North Carolina and local government bond issuers other than North Carolina local government bond issuers.

"Depositary" means the State Treasurer of the State and one or more banks or trust companies or other institutions, including the Trustee, duly authorized by law to engage in the banking business and designated by the Authority as a depositary of moneys under this Trust Agreement.

"Derivative Agreement" means an interest rate swap, cap, collar, floor, forward, option, put, call or other agreement, arrangement or security however denominated, entered into in order to hedge interest rate fluctuations on all or a portion of any Indebtedness or to provide debt management by changing payments to be made by the Authority with respect to all or a portion of any Indebtedness.

"Derivative Agreement Additional Payments" means payments required to be paid by the Authority under a Derivative Agreement other than Derivative Agreement Regularly Scheduled Payments, including termination payments required to be paid in connection with the termination of a Derivative Agreement, whether voluntarily or upon the occurrence of an event of default, termination event or similar event thereunder.

"Derivative Agreement Regularly Scheduled Payments" means regularly scheduled payments required to be paid by the Authority under a Derivative Agreement that are based upon a fixed or variable imputed rate on a notional amount set forth in the Derivative Agreement and which are intended by the Authority to correspond to interest payments on the underlying Derivative Indebtedness.

"Derivative Indebtedness" means the portion of any Indebtedness meeting the requirements set forth in clauses (a) and (b) below:

(a) in connection with such Indebtedness, the Authority shall have entered into a Derivative Agreement in respect of all or a portion of such Indebtedness, and

(b) (i) if such Indebtedness bears interest at a variable rate, such Derivative Agreement provides that during the Derivative Period, the Authority shall pay to the provider of the Derivative Agreement a fixed rate (the "Synthetic Fixed Rate") and the provider of the Derivative Agreement shall pay to the

Authority a variable rate on a notional amount equal to all or a portion of the Outstanding principal amount of such Indebtedness, or (ii) if such Indebtedness bears interest at a fixed rate, such Derivative Agreement provides that during the Derivative Period, the Authority shall pay to the provider of the Derivative Agreement a variable rate (the "Synthetic Variable Rate") and the provider of the Derivative Agreement shall pay to the Authority a fixed rate on a notional amount equal to all or a portion of the Outstanding principal amount of such Indebtedness.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Derivative Period" means the period during which a Derivative Agreement is in effect.

"Eminent Domain" means the eminent domain or condemnation power by which all or any part of the Triangle Expressway System may be taken for another public use or any agreement that is reached in lieu of proceedings to exercise such power.

"Event of Default" means each of those events of default set forth in Section 802.

"First Supplemental Trust Agreement" means the First Supplemental Trust Agreement dated as of July 1, 2009, between the Authority and the Trustee, supplementing the June 2009 Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Fiscal Year" means the period commencing on the first day of July of any year and ending on the last day of June of the following year.

"Fitch" means Fitch Inc., a corporation organized and existing under the laws of the State of Delaware, its successors and assigns, and if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "Fitch" shall be deemed to refer to any other nationally recognized securities rating agency designated by the Authority by notice to the Trustee.

"Fourth Supplemental Trust Agreement" means the Fourth Supplemental Trust Agreement dated as of December 1, 2019, between the Authority and the Trustee, supplementing the Prior Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*



"General Engineering Consultant" means any engineer or firm of engineers of favorable reputation for skill and experience in performing the duties for which such consultant is required to be employed pursuant to the provisions of this Trust Agreement.

"General Reserve Fund" means the fund created and designated the North Carolina Turnpike Authority Triangle Expressway General Reserve Fund by Section 501.

"Government Obligations" means direct obligations of, or obligations the principal of and the interest on which are fully and unconditionally guaranteed by, the United States of America in either certificated or book-entry form, including (a) stripped Government Obligations stripped by the United States Treasury itself and (b) interest only portions of obligations issued by the Resolution Funding Corporation.

"Grant Anticipation Notes" means any grant anticipation notes issued by the Authority in compliance with the provisions of Section 212.

"Guarantee Repayments" means the obligated repayment by the Authority to NCDOT from Receipts of certain amounts paid into this Trust Agreement pursuant to the Construction and Renewal and Replacement Agreement and Sections 402, 511 and 512, with interest thereon at the rate provided for in Section 136-176(b) of the NCGS, as described in Section 520.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Hedging Acquisition Account" means the account in the Senior Lien Debt Service Fund created and so designated by Section 501.

"Hedging Acquisition Account Requirement" means the amount to be deposited from time to time to the credit of the Hedging Acquisition Account in accordance with the requirements of the TIFIA Loan Agreement. The Hedging Acquisition Account Requirement, if any, shall be computed by the Authority at the beginning of each Fiscal Year, subject to the approval of USDOT, and shall be funded during that Fiscal Year pursuant to Section 503.

"Holder" means the holder or owner of Senior Lien Parity Debt, Subordinate Lien Parity Debt or Junior Indebtedness.

"Indebtedness" means all obligations incurred or assumed by the Authority in connection with the ownership or operation of the Triangle Expressway System:

(a) for payments of principal and interest with respect to borrowed money, including any obligation to repay a Credit Provider for moneys drawn to pay and

retire or purchase Indebtedness and including the continuing obligation to pay principal and interest with respect to any Bonds pursuant to the subrogation provisions of a Bond Insurance Policy following the payment to the Owner of such Bonds of the insured principal and interest from amounts paid by the Bond Insurer under such Bond Insurance Policy; and

(b) for payments under leases which are required to be capitalized in accordance with generally accepted accounting principles and under installment or lease purchase or conditional sale contracts;

provided, however, that (i) Indebtedness shall include only such obligations as are secured by the Trust Estate, (ii) Indebtedness shall not include any State Appropriation Revenue Bonds, and (iii) any obligation to pay a Credit Provider for moneys drawn to purchase, but not pay and retire, Indebtedness shall constitute Indebtedness only to the extent such payments are in excess of any scheduled payments of principal and interest required to be made to such Credit Provider as an Owner or Holder of such Indebtedness.

"Initial Project" means the land, easements, rights of way, capital improvements and equipment financed with the proceeds of the Series 2009 Bonds, the State Appropriation Revenue Bonds and the TIFIA Series 2009 Bond, as more particularly described in the Supplemental Agreement for the Series 2009 Bonds and the TIFIA Loan Agreement.

"Initial Project Account" means the account in the Project Fund created and so designated by Section 401.

"Insolvency Laws" means the United States Bankruptcy Code, 11 U.S.C. §101 et seq., as from time to time amended and in effect, and any state bankruptcy, insolvency, receivership, conservatorship or similar law now or hereafter in effect.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Insurance and Condemnation Award Fund" means the fund created and designated the North Carolina Turnpike Authority Triangle Expressway Insurance and Condemnation Award Fund by Section 501.

"Insurance Consultant" means any Person or firm having a favorable reputation in the State for skill and experience in dealing with the insurance requirements of road and highway systems similar to the Triangle Expressway System and in performing the duties to be imposed upon the Insurance Consultant by this Trust Agreement, including, without limitation, the Risk Manager for the State Department of Insurance.



"Interest Account" means the respective accounts in the Senior Lien Debt Service Fund, the Subordinate Lien Debt Service Fund and the Junior Indebtedness Debt Service Fund and, with respect to any TIFIA Indebtedness, the TIFIA Interest Account created and so designated by Section 501.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Interest Payment Date" means, with respect to any Series of Bonds, each of the interest payment dates provided for in the Supplemental Agreement relating to such Series, and with respect to any Parity Debt or Junior Indebtedness, each of the interest payment dates provided for in the Parity Debt Resolution or Junior Indebtedness Agreement relating to such Parity Debt or Junior Indebtedness.

"Investment Obligations" means, to the extent permitted by law, any investment authorized by Section 159-30 of the General Statutes of North Carolina, as such statute may be amended from time to time, or any successor statute.

"June 2009 Trust Agreement" means the Trust Agreement dated as of June 1, 2009, between the Authority and the Trustee.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Junior Indebtedness" means Indebtedness or obligations of the Authority secured by Revenues on a priority after Senior Lien Indebtedness and Subordinate Lien Indebtedness. No Junior Indebtedness, other than the TIFIA Series 2019 Bond, may be created except in compliance with Section 213. Junior Indebtedness is not secured by the Senior Lien Reserve Fund or the Subordinate Lien Reserve Fund.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Junior Indebtedness Agreement" means the agreement or other document governing the issuance or incurrence of Junior Indebtedness, including in the case of TIFIA Indebtedness, the TIFIA Loan Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Junior Indebtedness Debt Service Fund" means the fund created and designated the North Carolina Turnpike Authority Triangle Expressway Junior Indebtedness Debt Service Fund by Section 501.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Junior Indebtedness Debt Service Reserve Account" means the special account in the Junior Indebtedness Debt Service Fund created and so designated by Section 501.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Junior Indebtedness Debt Service Reserve Account Requirement" means the amount required to be placed or maintained in the Junior Indebtedness Debt Service Reserve Account as may be required by any Junior Indebtedness Agreement. The Junior Indebtedness Debt Service Reserve Account Requirement may be composed of cash, Investment Obligations or Reserve Alternative Instruments, or any combination of the foregoing, as the Authority may determine.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Loan Life Coverage Ratio" shall have the meaning set forth in the TIFIA 2019 Loan Agreement.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Local Government Commission" means the Local Government Commission, a division of the Department of the State Treasurer of the State.

"Long-Term Debt Service Requirement" means, for any period of twelve (12) consecutive calendar months for which such determination is made, the aggregate of the required deposits to be made in respect of Principal and interest (whether or not separately stated) on Outstanding Long-Term Indebtedness during such period, also taking into account:

(a) with respect to Balloon Long-Term Indebtedness, the amount of principal which would be payable in such period if such principal were amortized from the date of incurrence thereof over a period of twenty (20) years (or the actual number of years over which such Balloon Long-Term Indebtedness is being amortized, if greater than twenty (20) years, but in no event greater than forty (40) years) on a level debt service basis at an interest rate equal to the current market rate for an obligation with such assumed amortization as set forth in an opinion of a banking institution, a registered municipal advisor or an investment banking institution knowledgeable in financing of Triangle Expressway System delivered to the Trustee as the interest rate at which the Authority could reasonably expect to borrow the same by incurring Indebtedness with the same term as assumed above;



provided, however, in the case of the Phase I BANs intended to be paid with proceeds of a draw on the TIFIA 2019 Loan Agreement, the payment terms contained in the TIFIA 2019 Loan Agreement shall be utilized for purposes of calculating the Long-Term Debt Service Requirement with respect to the Phase I BANs;

*The preceding subsection was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

(b) with respect to Long-Term Indebtedness which is Variable Rate Indebtedness, the interest on such Indebtedness shall be calculated at the rate which is equal to the average of the actual interest rates which were in effect (weighted according to the length of the period during which each such interest rate was in effect) for the most recent twelve (12) month period immediately preceding the date of calculation for which such information is available (or shorter period if such information is not available for a twelve (12) month period), except that with respect to new Variable Rate Indebtedness proposed to be incurred, the interest rate for such Variable Rate Indebtedness shall be equal to the running average of the SIFMA Municipal Index for the most recent 52 weeks immediately preceding the date of calculation for which such information is available;

(c) with respect to any Credit Facility, (i) to the extent that such Credit Facility has not been used or drawn upon, the principal and interest relating to such Credit Facility shall not be included in the Long-Term Debt Service Requirement and (ii) to the extent that the Authority has reimbursed a Credit Provider for a drawing on a Credit Facility to pay principal or interest on Indebtedness that is already included in the Long-Term Debt Service Requirement, only the portion of the reimbursement payment that is in excess of the payment of principal and interest paid from the drawing shall be included in the Long-Term Debt Service Requirement; and

(d) with respect to Derivative Indebtedness, during any Derivative Period and for so long as the provider of the Derivative Agreement has not defaulted on its payment obligations under the Derivative Agreement, the amount of interest payable on such Derivative Indebtedness shall be calculated as follows:

(i) for any historical computation of the Long-Term Debt Service Requirement:

(A) if such Derivative Indebtedness bears interest at a variable rate, the amount derived by adding (1) the amount of interest paid by the Authority on such Derivative Indebtedness at such variable rate (calculated at provided in subparagraph (b) above) and (2) the amount paid by the Authority to the provider of the Derivative Agreement relating to such Derivative Indebtedness at the Synthetic

Fixed Rate, and subtracting (3) the amount received by the Authority from the provider of such Derivative Agreement at the variable rate specified in the Derivative Agreement (calculated as provided in subparagraph (b) above); and

(B) if such Derivative Indebtedness bears interest at a fixed rate, the amount derived by adding (1) the amount of interest paid by the Authority on such Derivative Indebtedness at such fixed rate and (2) the amount paid by the Authority to the provider of the Derivative Agreement relating to such Derivative Indebtedness at the Synthetic Variable Rate (calculated at provided in subparagraph (b) above) and subtracting (3) the amount received by the Authority from the provider of such Derivative Agreement at the fixed rate specified in the Derivative Agreement; and

(ii) for any projected computation of the Long-Term Debt Service Requirement:

(A) if such Derivative Indebtedness bears interest at a variable rate, at the Synthetic Fixed Rate; and

(B) if such Derivative Indebtedness bears interest at a fixed rate, at the Synthetic Variable Rate (calculated as provided in subparagraph (b ) above);

provided, however, that notwithstanding the foregoing, (a) accrued and capitalized interest shall be excluded from the determination of Long-Term Debt Service Requirement to the extent the same is provided from the proceeds of the Long-Term Indebtedness or otherwise provided so as to be available for deposit into an account for capitalized interest or similar account not later than the date of delivery of and payment for such Long-Term Indebtedness; (b) the aggregate amount of payments made with respect principal or interest on Outstanding Long-Term Indebtedness shall not include principal or interest payable from investment earnings on the Senior Lien Debt Service Fund, the Subordinate Lien Debt Service Fund, any Senior Lien Special Reserve Account, any Subordinate Lien Special Reserve Account or any other fund or account established by the Authority that are required to be used to pay the principal of or interest on Indebtedness; and (c) the aggregate of the payments to be made with respect to principal and interest on Outstanding Long-Term Indebtedness shall not include principal or interest payable from Qualified Escrow Funds; and

(e) the deposits required to be made for any period in respect of interest on any Outstanding Senior Lien Bonds, Subordinate Lien Bonds or Junior Indebtedness issued or incurred hereunder shall be reduced by the amount of any investment earnings on the accounts created in the Senior Lien Debt Service Fund,



the Subordinate Lien Debt Service Fund and the Junior Indebtedness Debt Service Fund, respectively.

"Long-Term Indebtedness" means all Indebtedness for any of the following:

(a) money borrowed for an original term, or renewable at the option of the Authority for a period from the date originally incurred, of longer than one year;

(b) leases which are required to be capitalized in accordance with generally accepted accounting principles having an original term, or renewable at the option of the Authority for a period from the date originally incurred, of longer than one year; and

(c) installment purchase, installment financing or conditional sale contracts having an original term in excess of one year.

Long-Term Indebtedness shall include Short-Term Indebtedness if a Credit Facility exists to provide financing to retire such Short-Term Indebtedness and such Credit Facility provides for the repayment of principal on terms which would, if such commitment were implemented, constitute Long-Term Indebtedness. Long-Term Indebtedness shall also include the current portion of Long-Term Indebtedness. Long-Term Indebtedness shall only include the obligations described in (a), (b) and (c) to the extent that such obligations are Indebtedness, as herein defined.

"Maximum Long-Term Debt Service Requirement" means the highest Long-Term Debt Service Requirement for the present and any succeeding Fiscal Year.

"Moody's" means Moody's Investors Service, Inc., a corporation organized and existing under the laws of the State of Delaware, its successors and assigns, and if such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "Moody's" shall be deemed to refer to any other nationally recognized securities rating agency designated by the Authority by notice to the Trustee.

"NCDOT" means the North Carolina Department of Transportation, a department of the State, and any successor to its functions.

"NCGS" means the North Carolina General Statutes, as amended.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Net Eminent Domain Proceeds" means the gross proceeds paid to the Authority or NCDOT as a final award for the taking by Eminent Domain of any of the Triangle Expressway System less payment of attorneys' and other fees and expenses properly incurred in the collection of such gross proceeds.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Net Insurance Proceeds" means the gross proceeds paid to the Authority or NCDOT as a result of any casualty insurance policy with respect to the Triangle Expressway System or as a result of any liability insurance policy less payment of attorneys' and other fees and expenses properly incurred in the collection of such gross proceeds.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Non-System Project" means any additions, acquisitions, improvements, betterments, land, buildings, structures or other facilities, including equipment, acquired or constructed, and the preparation and grading of land, relating to the Triangle Expressway System but which are specifically designated by resolution of the Authority Board as not being part of the Triangle Expressway System and are not otherwise thereafter designated as an Additional Project pursuant to Section 715 and, if any TIFIA Indebtedness is Outstanding, the requirements of the TIFIA Loan Agreement.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Officer's Certificate" means a certificate signed by an Authorized Officer.

"O&M Guaranty Agreement" means (a) the Operating and Maintenance Expense Guaranty Agreement, dated as of August 20, 2008, between the Authority and NCDOT, including any supplement or amendment thereto, and (b) NCDOT's obligations under Section 511.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Operating Advance" means any payment received by the Authority from NCDOT pursuant to the terms of the O&M Guaranty Agreement to replenish amounts drawn from the Operating Reserve Fund pursuant to Section 509.

"Operating Expenses" means the Authority's current expenses for the operation, maintenance and repair of the Triangle Expressway System as determined in accordance with generally accepted accounting principles, except as modified by this definition, including, without limiting the generality of the foregoing:

(a) all ordinary and usual expenses of operation, toll collection, maintenance and repair, which may include expenses not annually recurring;



(b) direct administrative expenses;

(c) salaries, benefits and other compensation;

(d) operating lease payments;

(e) payments to any pension or retirement plan or plans properly chargeable to the Authority;

(f) insurance premiums and expenses;

(g) engineering and architectural expenses relating to the operation, maintenance or repair of the Triangle Expressway System;

(h) fees and expenses of the Trustee or its counsel, any Bond Registrar, Depositary, Traffic Consultant, tender agent, paying agent or Bond Insurer, fees and expenses payable to USDOT pursuant to the terms of any Junior Indebtedness Agreement, legal expenses, Credit Facility fees, remarketing fees and fees of consultants or professionals; and

(i) any other similar-type operating expenses required to be paid by the Authority under this Trust Agreement or by law;

but Operating Expenses shall not include:

(a) any reserves for extraordinary replacements or repairs;

(b) any allowance for depreciation or any amortization of financing expense;

(c) any deposits to any fund, account and subaccount created under this Trust Agreement or any Supplemental Agreement, Parity Debt Resolution or Junior Indebtedness Agreement and payments of principal, premium, if any, and interest on Indebtedness from such funds, accounts and subaccounts;

(d) any debt service payments or reserves or deposits for debt service payments in respect of Indebtedness or any lease-purchase or installment financing contracts or any other indebtedness of the Authority not secured by a pledge of and lien on the Receipts or all or any portion of the Trust Estate; or

(e) any payments made under any Derivative Agreement, whether regularly scheduled payments, termination payments or other payments.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Operating Reserve Fund" means the fund created and designated the North Carolina Turnpike Authority Triangle Expressway Operating Reserve Fund by Section 501.

"Operating Reserve Fund Requirement" means one-fourth (1/4) of the total budgeted Operating Expenses of the Triangle Expressway System for the current Fiscal Year, as set forth in the Annual Budget; provided if the Annual Budget for the next succeeding Fiscal Year has been adopted by the Authority, the Operating Reserve Fund Requirement shall be the greater of (i) one-fourth (1/4) of the total budgeted Operating Expenses of the Triangle Expressway System for the succeeding Fiscal Year or (ii) one-fourth (1/4) of the total budgeted Operating Expenses of the Triangle Expressway System for the current Fiscal Year.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Operations and Maintenance Expense Fund" means the fund created and designated the North Carolina Turnpike Authority Triangle Expressway Operations and Maintenance Expense Fund by Section 501.

"Original Trust Agreement" means the June 2009 Trust Agreement as supplemented by the First Supplemental Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Outstanding" when used with reference to Bonds means, as of a particular date, all Bonds theretofore authenticated and delivered under this Trust Agreement, except:

(a) Bonds theretofore canceled by the Bond Registrar or delivered to the Bond Registrar for cancellation;

(b) Bonds deemed to be no longer Outstanding pursuant to Section 304;

(c) Bonds in exchange for or in lieu of which other Bonds have been authenticated and delivered under this Trust Agreement;

(d) Bonds deemed to have been paid in accordance with Article XII;

(e) Bonds constituting Put Indebtedness deemed to have been purchased in accordance with the provisions of the applicable Supplemental Agreement in lieu of which other Bonds have been delivered under such Supplemental Agreement; and



(f) For purposes of exercising rights under the TIFIA Loan Agreement, Bonds held by or for the benefit of the Authority or NCDOT.

When used with reference to Parity Debt or Junior Indebtedness, "Outstanding" means, as of a particular date, all Parity Debt and Junior Indebtedness except:

(a) Parity Debt and Junior Indebtedness theretofore canceled by the Authority;

(b) Parity Debt and Junior Indebtedness for the payment or redemption of which money, Defeasance Obligations, or a combination of both, in an amount sufficient to pay on the date when such Parity Debt and Junior Indebtedness is to be paid or redeemed the principal amount of or Redemption Price of, and the interest accruing to such date on, the Parity Debt and Junior Indebtedness to be paid or redeemed, has been deposited with an escrow agent in trust for the Holders of such Parity Debt and Junior Indebtedness; Defeasance Obligations shall be deemed to be sufficient to pay or redeem Parity Debt and Junior Indebtedness on a specified date if the principal and the interest on such Defeasance Obligations, when due, together with any money left uninvested, will be sufficient to pay on such date the principal amount of or Redemption Price of, and the interest accruing on, such Parity Debt and Junior Indebtedness to such date;

(c) Parity Debt and Junior Indebtedness in exchange for or in lieu of which other Parity Debt or Junior Indebtedness has been delivered under the documentation securing such Parity Debt or Junior Indebtedness;

(d) Parity Debt and Junior Indebtedness deemed to have been paid in accordance with the defeasance or like provisions of the Parity Debt Resolution or Junior Indebtedness Agreement;

(e) Parity Debt and Junior Indebtedness constituting Put Indebtedness deemed to have been purchased in accordance with the provisions of the applicable Parity Debt Resolution or Junior Indebtedness Agreement in lieu of which other Parity Debt or Junior Indebtedness has been incurred under the Parity Debt Resolution or Junior Indebtedness Agreement; and

(f) For purposes of exercising rights under a Parity Debt Resolution or Junior Indebtedness Agreement, Parity Debt or Junior Indebtedness held by or for the benefit of the Authority or NCDOT.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Owner" means a Person in whose name a Bond is registered in the registration books provided for in Section 205.

"Parity Debt" means, collectively, Senior Lien Parity Debt and Subordinate Lien Parity Debt.

"Parity Debt Resolution" means the resolution and any other documentation adopted or executed and delivered by the Authority providing for the incurrence of Parity Debt. If any Senior Lien Indebtedness is to be the subject of a Credit Facility providing for repayments for draws under the Credit Facility on a parity basis with such Senior Lien Indebtedness, then the term Parity Debt Resolution shall include any reimbursement agreement or similar repayment agreement executed and delivered by the Authority in connection with the provision of a Credit Facility for such Senior Lien Indebtedness. If any Subordinate Lien Indebtedness is to be the subject of a Credit Facility providing for repayments for draws under the Credit Facility on a parity basis with such Subordinate Lien Indebtedness, then the term Parity Debt Resolution shall include any reimbursement agreement or similar repayment agreement executed and delivered by the Authority in connection with the provision of a Credit Facility for such Subordinate Lien Indebtedness.

"Permitted Encumbrances" means in addition to any charge created or permitted by this Trust Agreement upon the Triangle Expressway System or any part thereof or on the Trust Estate:

(a) liens for taxes or other governmental charges or levies not delinquent or that are being contested in good faith by the Authority;

(b) (i) covenants, easements, encumbrances, defects of title, reservations, restrictions and conditions existing at the time of delivery of the Series 2009 Bonds and (ii) defects, irregularities, encumbrances, easements, including easements for roads and public utilities and similar easements, rights of way, mineral conveyances, mineral reservations, and clouds on title, none of which materially impairs the use of the property affected thereby for its intended purposes;

(c) mechanics', workers', repairmen's, architects', engineers', surveyors', or carriers' liens or other similar liens provided that the same shall be discharged in the ordinary course of business and without undue delay or the validity of the same shall be contested in good faith with any pending execution thereof appropriately stayed;

(d) other liens, charges and encumbrances that, in the written opinion of the Authority Attorney, a copy of which is filed with the Trustee, do not prevent or materially impair the use of the Triangle Expressway System (the Authority Attorney may rely upon a certificate of any engineer or any architect as to whether such liens, charges and encumbrances prevent or materially impair the use of the Triangle Expressway System);

(e) liens on any Non-System Projects;



(f) encumbrances on property, plant and equipment comprising a part of the Triangle Expressway System to the extent permitted by Section 711;

(g) the pledge of State Appropriated Revenues under the State Appropriation Revenue Bond Trust Agreement to secure the State Appropriation Revenue Bonds; and

(h) any contracts, leases or other agreements to the extent permitted by Section 714.

"Person" includes corporations, firms, associations, partnerships, joint ventures, joint stock companies, trusts, unincorporated organizations, and public bodies, as well as natural persons.

"Phase I BANs" means Revenue Bond Anticipation Notes issued to pay costs of the 2019 Additional Project which are intended to be paid by a draw on the TIFIA Series 2019 Bond.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Predecessor Bonds" of any particular Bond means every previous Bond evidencing all or a portion of the same debt as that evidenced by such particular Bond; and, for purposes of this definition, any Bond authenticated and delivered under Section 210 in lieu of a lost, destroyed or stolen Bond shall be deemed to evidence the same debt as the lost, destroyed or stolen Bond.

"Principal" has the ordinary meaning for such term, except in the following contexts: (a) with respect to any Capital Appreciation Bond, "Principal" refers to the Accreted Amount thereof (the difference between the stated amount to be paid at maturity and the Accreted Amount being deemed unearned interest) except as used in connection with the authorization and issuance of Bonds and with the order of priority of payments of Bonds after an Event of Default, in which case "Principal" means the initial public offering price of a Capital Appreciation Bond and the difference between the Accreted Amount and the initial public offering price shall be deemed to be interest, (b) with respect to any Current Interest Bond, "Principal" refers to the principal amount of such Bond or Indebtedness payable at maturity or in satisfaction of a Sinking Fund Requirement, if applicable, (c) with respect to any Convertible CAB Bond, "Principal" refers to the Accreted Amount thereof through and after the respective Convertible CAB Bond Conversion Date except as used in connection with the authorization and issuance of Bonds and with the order of priority of payments of Bonds after an Event of Default, in which cases "Principal" or "principal" means, if on or before the Convertible CAB Bond Conversion Date, the initial principal amount of a Convertible CAB Bond and the difference between the Accreted Amount and the initial principal amount shall be deemed to be interest, or, if after the Convertible CAB Bond Conversion Date, the Accreted Amount as of

such Convertible CAB Bond Conversion Date, and (d) with respect to the TIFIA Series 2019 Bond, "Principal" refers to the principal portions of the TIFIA Mandatory Debt Service and the TIFIA Scheduled Debt Service.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Principal Account" means the respective accounts in the Senior Lien Debt Service Fund, the Subordinate Lien Debt Service Fund and the Junior Indebtedness Debt Service Fund and, with respect to TIFIA Indebtedness, the TIFIA Principal Account created and so designated by Section 501.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Principal Payment Date" means any date established by any Supplemental Agreement, Parity Debt Resolution or Junior Indebtedness Agreement for the payment of principal of Bonds, Parity Debt or Junior Indebtedness, whether at maturity or pursuant to an amortization requirement or otherwise.

"Prior Trust Agreement" means the Original Trust Agreement as supplemented and amended by the Second Supplemental Trust Agreement and the Third Supplemental Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Project Fund" means the fund created and designated the North Carolina Turnpike Authority Triangle Expressway Project Fund by Section 401.

"Put Indebtedness" means fixed or variable rate Long-Term Indebtedness 25% or more of the principal of which may, at the option of the Owner or Holder thereof, be tendered to the Authority, the Trustee, a Depositary or a paying agent or other fiduciary, or an agent of any of the foregoing, for payment or purchase at one time.

"Qualified Escrow Funds" means amounts deposited in a segregated escrow fund or other similar fund or account in connection with the issuance of Long-Term Indebtedness which fund or account is required by the documents establishing such fund or account to be applied toward the Authority's payment obligations with respect to principal or interest on (a) the Long-Term Indebtedness which is incurred under the documents establishing such fund or account or (b) Long-Term Indebtedness which is incurred prior to the establishment of such fund or account.



"Receipts" means all receipts, revenues, income, proceeds and money received in any period by or for the Authority in respect of the Triangle Expressway System, including, but without limiting the generality of the foregoing:

(a) all toll revenues, payments, proceeds, fees, charges, rents and all other income derived by or for the Authority from the ownership and operation of the Triangle Expressway System, and all other income derived by the Authority from the operation or ownership of the Triangle Expressway System, and all rights to receive the same, whether in the form of accounts receivable, contract rights or other rights, and the proceeds of such rights whether now owned or held or hereafter coming into existence;

(b) proceeds of use and occupancy or business interruption insurance and amounts received by the Authority from any contractor as liquidated damages for failures of such contractor to complete its contractual commitment in accordance with the terms of the contract;

(c) proceeds of any appropriation made by the federal government or any agency or instrumentality thereof or the State or any agency, instrumentality or political subdivision thereof for use in connection with the Triangle Expressway System, to the extent such proceeds are deposited in the Revenue Fund and are available for use in the same manner as other Receipts under the provisions of this Trust Agreement, including, without limitation, the State Appropriated Revenues; provided, however, that State Appropriated Revenues shall not constitute Receipts hereunder until such time as such amounts are withdrawn from the State Appropriation Revenue Bond Trust Agreement and deposited to the Revenue Fund;

(d) any Derivative Agreement Regularly Scheduled Payments or Derivative Agreement Additional Payments received by the Authority under any Derivative Agreement; and

(e) the investment income realized on, and the income and gains realized upon the maturity or sale of, securities held by or on behalf of the Authority in the Revenue Fund, provided, however, there shall not be included in the calculation of Receipts for purposes of the Rate Covenant (as defined in the TIFIA 2019 Loan Agreement) or the test with respect to the issuance of additional Indebtedness such amounts;

but there shall not be included in "Receipts":

(i) the proceeds of any gifts, grants, bequests, contributions or donations (except as provided in clause (c) above in this definition);

(ii) the proceeds from the sale or disposition of all or any part of the Triangle Expressway System;

(iii) reimbursements received by the Authority of advances made by it in respect of the Initial Project, any Additional Project, any refinancing of Indebtedness and any capital improvements;

(iv) the investment income realized on, and the income and gains realized upon the maturity or sale of, securities held by or on behalf of the Authority in any funds, accounts and subaccounts established pursuant to this Trust Agreement (other than the Revenue Fund), except to the extent that such investment income is transferred by the Authority to the Revenue Fund.

(v) any payments received or revenues derived from the ownership or operation of any Non-System Project, except to the extent expressly included as a Receipt by resolution adopted by the Authority Board;

(vi) Net Insurance Proceeds or Net Eminent Domain Proceeds other than the net proceeds of any use and occupancy or business interruption insurance;

(vii) proceeds of any appropriation made by the federal government or any agency or instrumentality thereof or the State or any agency, instrumentality or political subdivision thereof to the extent the use of such funds is limited to a use that is inconsistent with their use as Receipts under the provisions of this Trust Agreement;

(viii) the income from the investment of Qualified Escrow Funds to the extent such income is applied to the payment of the principal of or the interest on Long-Term Indebtedness which is excluded from the determination of the Long-Term Debt Service Requirement; and

(ix) the proceeds of any indebtedness of the Authority.

*Clause (e) of the preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Redemption Account" means the respective accounts in the Senior Lien Debt Service Fund and the Subordinate Lien Debt Service Fund created and so designated by Section 501.

"Redemption Price" means, with respect to any Indebtedness or portion thereof, the principal amount of such Indebtedness or portion called for redemption plus the applicable premium, if any, payable upon redemption thereof.

"Regular Record Date" means, with respect to any Series of Bonds, the regular record date, if any, provided for in the Supplemental Agreement relating to such Series.



"Renewal and Replacement Expenses" means all expenses, on a cash basis, incurred or to be incurred by the Authority relating to all reasonably necessary periodic major overhaul and repair (excluding Operating Expenses and any other maintenance or repair of a routine or ordinary course nature) of the Triangle Expressway System, including the equipment and systems of the Triangle Expressway System and any expenditures and liabilities incurred for the acquisition of any assets, improvements or replacements thereof that have a useful life of more than one (1) year and that are capitalized in accordance with generally accepted accounting principles. "Renewal and Replacement Expenses" do not include costs of the 2019 Additional Project or any other Additional Project paid or to be paid with the proceeds of Bonds.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Renewal and Replacement Fund" means the fund created and designated the North Carolina Turnpike Authority Triangle Expressway Renewal and Replacement Fund by Section 501.

"Renewal and Replacement Fund Requirement" means for each Fiscal Year commencing in the first full Fiscal Year after the Substantial Completion Date, an amount equal to (a) one hundred percent (100%) of the total Renewal and Replacement Expenses for the Triangle Expressway System set forth in the Annual Budget for the current Fiscal Year plus (b) one-tenth (1/10) of the total budgeted Renewal and Replacement Expenses for the Triangle Expressway System for each of the next succeeding nine Fiscal Years as set forth in (i) if the TIFIA Series 2019 Bond remains Outstanding, the Financial Plan (as defined in the TIFIA 2019 Loan Agreement) and (ii) if the TIFIA Series 2019 Bond is no longer Outstanding, the Annual Budget and Capital Improvement Plan adopted by the Authority.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Reserve Alternative Instrument" means an unconditional insurance policy or surety bond or irrevocable letter of credit or guaranty deposited in the Senior Lien Parity Reserve Account, a Senior Lien Special Reserve Account, the Subordinate Lien Parity Reserve Account, a Subordinate Lien Special Reserve Account or the Junior Indebtedness Debt Service Reserve Account in lieu of or in partial substitution for the deposit of cash and Investment Obligations in satisfaction of all or a portion of the Senior Lien Parity Reserve Account Requirement, a Senior Lien Special Reserve Account Requirement, the Subordinate Lien Parity Reserve Account Requirement, a Subordinate Lien Special Reserve Account Requirement or the Junior Indebtedness Debt Service Reserve Account Requirement. The Reserve Alternative Instrument shall be payable (upon the giving of notice as required thereunder) to remedy any deficiency in the appropriate subaccounts in the Interest

Account, the Principal Account and the Sinking Fund Account of the Senior Lien Debt Service Fund, the Subordinate Lien Debt Service Fund or the Junior Indebtedness Debt Service Fund, as the case may be, in order to provide for the timely payment of interest and principal (whether at maturity or pursuant to Sinking Fund Requirements therefor). Except as may be provided in a Senior Lien Resolution providing for a Senior Lien Special Reserve Account, in a Subordinate Lien Resolution providing for a Subordinate Lien Special Reserve Account or in a Junior Indebtedness Agreement providing for a Junior Indebtedness special debt service reserve account, the provider of a Reserve Alternative Instrument shall be (a) an insurer that has been assigned either (A) one of the two highest policyholder ratings accorded insurers by A. M. Best & Co. or any comparable service or (B) for bonds insured by the provider of the Reserve Alternative Instrument, a rating by Fitch, Moody's or S&P in one of the two highest rating categories (without regard to gradations within such categories) or (b) a commercial bank, insurance company or other financial institution the bonds payable or guaranteed by which have been assigned a rating by either Fitch, Moody's or S&P in one of the two highest rating categories (without regard to gradations within such categories). In addition, if any TIFIA Indebtedness is Outstanding, USDOT consent with respect to the use of an Alternative Reserve Instrument may be required pursuant to Section 723(b)(ii).

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Restricted Account" means the account within the General Reserve Fund created and so designated the Restricted Account by Section 501.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Revenue Bond Anticipation Notes" means any revenue bond anticipation notes issued by the Authority in compliance with the provisions of Section 211.

"Revenue Fund" means the fund created and designated the North Carolina Turnpike Authority Triangle Expressway Revenue Fund by Section 501.

"Revenues" means revenues of the Triangle Expressway System, as determined in accordance with generally accepted accounting principles; provided, however, that revenues shall include, without limiting the generality of the foregoing:

(a) proceeds of use and occupancy or business interruption insurance; and

(b) proceeds of any appropriation made by the federal government or any agency or instrumentality thereof or the State or any agency, instrumentality or political subdivision thereof for use in connection with the Triangle Expressway System, to the extent such proceeds are deposited in the Revenue Fund and are



available for use in the same manner as other Receipts under the provisions of this Trust Agreement, including, without limitation, the State Appropriated Revenues; provided, however, that State Appropriated Revenues shall not constitute Revenues hereunder until such time as such amounts are withdrawn from the State Appropriation Revenue Bond Trust Agreement and deposited to the Revenue Fund; and

(c) the investment income realized on, and the income and gains realized upon the maturity or sale of, securities held by or on behalf of the Authority in the Revenue Fund;

but there shall not be included in "Revenues":

(i) the proceeds of any gifts, grants, bequests, contributions or donations (except as provided in clause (b) above in this definition);

(ii) the proceeds from the sale or disposition of all or any part of the Triangle Expressway System;

(iii) reimbursements received by the Authority of advances made by it in respect of (i) the Initial Project, (ii) any Additional Project, (iii) any refinancing of Indebtedness and (iv) any capital improvements;

(iv) the investment income realized on, and the income and gains realized upon the maturity or sale of, securities held by or on behalf of the Authority in any funds, accounts and subaccounts established pursuant to this Trust Agreement (other than the Revenue Fund), except to the extent that such investment income is transferred by the Authority to the Revenue Fund.

(v) any payments received or revenues derived from the ownership or operation of any Non-System Project, except to the extent expressly included as a Receipt by resolution adopted by the Authority Board;

(vi) Net Insurance Proceeds or Net Eminent Domain Proceeds other than the net proceeds of any use and occupancy or business interruption insurance;

(vii) proceeds of any appropriation made by the federal government or any agency or instrumentality thereof or the State or any agency, instrumentality or political subdivision thereof to the extent the use of such funds is limited to a use that is inconsistent with their use as Receipts under the provisions of this Trust Agreement;

(viii) the income from the investment of Qualified Escrow Funds to the extent such income is applied to the payment of the principal of or the

interest on Long-Term Indebtedness which is excluded from the determination of the Long-Term Debt Service Requirement;

(ix) any payments received by the Authority under any Derivative Agreement;

(x) the proceeds of any security deposits or moneys received to make refunds to users of the Triangle Expressway System; and

(xi) the proceeds of any indebtedness of the Authority.

*Clause (b) of the preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"S&P" means Standard & Poor's Ratings Services, a Division of The McGraw-Hill Companies, Inc., and its successors and assigns, and if such entity shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "S&P" shall be deemed to refer to any other nationally recognized securities rating agency designated by the Authority by notice to the Trustee.

"Second Supplemental Trust Agreement" means the Second Supplemental Trust Agreement dated as of March 1, 2017, between the Authority and the Trustee, supplementing the Original Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Securities Depository" means the Depository Trust Company, New York, New York, or any other recognized securities depository selected by the Authority, which maintains a book-entry system in respect of a Series of Bonds, and shall include any substitute for or successor to the securities depository initially acting as Securities Depository.

"Securities Depository Nominee" means, as to any Securities Depository, such Securities Depository or the nominee of such Securities Depository in whose name there shall be registered on the registration books maintained by the Bond Registrar the Bond certificates to be delivered to and immobilized at such Securities Depository during the continuation with such Securities Depository of participation in its book-entry system.

"Senior Lien Bonds" means any Bonds secured on a parity with each other and any Senior Lien Parity Debt and Senior Lien Derivative Agreement Regularly Scheduled Payment by this Trust Agreement, including, upon the occurrence of a Bankruptcy Related Event, the TIFIA Series 2019 Bond.



*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Senior Lien Debt Service Fund" means the fund created and designated the North Carolina Turnpike Authority Triangle Expressway Senior Lien Debt Service Fund by Section 501.

"Senior Lien Derivative Agreement Regularly Scheduled Payments" means any Derivative Agreement Regularly Scheduled Payments with respect to Derivative Indebtedness constituting Senior Lien Indebtedness.

"Senior Lien Indebtedness" means, collectively, the Senior Lien Bonds and Senior Lien Parity Debt.

"Senior Lien Parity Debt" means all Indebtedness incurred by the Authority in respect of the Triangle Expressway System and not evidenced by Bonds which is secured on a parity (as so designated in the Parity Debt Resolution) with the Senior Lien Bonds by a pledge, charge and lien upon the Trust Estate as provided in this Trust Agreement, including, without limiting the generality of the foregoing, Section 518.

"Senior Lien Parity Reserve Account" means the account in the Senior Lien Debt Service Fund created and so designated by Section 501.

"Senior Lien Parity Reserve Account Requirement" means 50% of the least of (i) the Maximum Long-Term Debt Service Requirement for all Senior Lien Bonds and Senior Lien Parity Debt secured by the Senior Lien Parity Reserve Account, (ii) 125% of the average annual Long-Term Debt Service Requirement for all Senior Lien Bonds and Senior Lien Parity Debt secured by the Senior Lien Parity Reserve Account and (iii) 10% of the stated principal amount of all Senior Lien Bonds and Senior Lien Parity Debt secured by the Senior Lien Parity Reserve Account; provided, however, that if any Series of Senior Lien Bonds or Senior Lien Parity Debt secured by the Senior Lien Parity Reserve Account has original issue discount or premium that exceeds 2% of the stated redemption price at maturity plus any original issue premium attributable exclusively to underwriter's compensation, the initial offering prices to the public shall be used in lieu of the stated principal amount for purposes of the 10% limitation. The Senior Lien Parity Reserve Account Requirement may be composed of cash, Investment Obligations or Reserve Alternative Instruments, or any combination of the foregoing, as the Authority may determine.

*The preceding definition was revised pursuant to Section 702(b) of the Third Supplemental Trust Agreement.*

"Senior Lien Resolution" means any Supplemental Agreement for Senior Lien Bonds or Parity Debt Resolution for Senior Lien Parity Debt, or both, as the case

may be, authorizing the issuance of a Series of Senior Lien Bonds or the incurrence of Senior Lien Parity Debt.

"Senior Lien Special Reserve Account" means a special debt service reserve account, if any, created by a Senior Lien Resolution as a debt service reserve account only for the particular Senior Lien Indebtedness authorized thereby.

"Senior Lien Special Reserve Account Requirement" means the amount required to be placed or maintained in a Senior Lien Special Reserve Account as may be required by the Senior Lien Resolution creating such account. The Senior Lien Special Reserve Account Requirement may be composed of cash, Investment Obligations or Reserve Alternative Instruments or any combination of the foregoing, as the Authority may determine.

"Serial Bonds" means the Bonds of any Series that are stated to mature in consecutive annual installments.

"Series", whenever used herein with respect to Bonds, means all of the Bonds designated as being of the same series.

"Series 2009 Bonds" means the Series 2009A Bonds and the Series 2009B Bonds.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Series 2009A Bonds" means the North Carolina Turnpike Authority Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2009A, issued pursuant to the Original Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Series 2009B Bonds" means the North Carolina Turnpike Authority Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2009B, issued pursuant to the Original Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Series 2017 Bonds" means the North Carolina Turnpike Authority Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2017, issued pursuant to the Original Trust Agreement and the Second Supplemental Trust Agreement.



*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Series 2018 Bonds" means the North Carolina Turnpike Authority Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2018, issued pursuant to the Prior Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Series 2019 Bonds" means the North Carolina Turnpike Authority Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2019, issued pursuant to the Prior Trust Agreement and the Fourth Supplemental Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Short-Term Indebtedness" means all Indebtedness incurred for borrowed money other than the current portion of Long-Term Indebtedness for any of the following:

(a) money borrowed for an original term, or renewable at the option of the Authority for a period from the date originally incurred, of one year or less;

(b) leases which are capitalized in accordance with generally accepted accounting principles having an original term, or renewable at the option of the lessee for a period from the date originally incurred, of one year or less; and

(c) installment purchase, installment financing or conditional sale contracts having an original term of one year or less.

*Clause (a) of the preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"SIFMA Municipal Index" means The Securities Industry and Financial Markets Association Municipal Swap Index or such other weekly, high-grade index comprised of seven-day, tax-exempt multi-modal notes produced by Municipal Market Data, Inc., or its successor, or as otherwise designated by The Securities Industry and Financial Markets Association; provided, however, that if such index is no longer produced by Municipal Market Data, Inc. or its successor, then "SIFMA Municipal Index" means such other reasonably comparable index selected by the Authority.

"Sinking Fund Account" means the respective accounts in the Senior Lien Debt Service Fund and the Subordinate Lien Debt Service Fund created and so designated by the provisions of Section 501.

"Sinking Fund Requirement" means, with respect to any Series of Bonds, the Sinking Fund Requirement provided in the Supplemental Agreement relating to such Series.

"Special Record Date" means a date fixed by the Trustee for determining the Owner of Bonds for the payment of Defaulted Interest pursuant to Section 202.

"Special Redemption Arrangement" means, when used for allocating amounts for the redemption or other payment of Indebtedness for purposes of Sections 503(o) and 709(b), a pro rata allocation method pursuant to which the total amount will be split in proportion to the Principal amount Outstanding for all TIFIA Indebtedness and Senior Lien Parity Debt (other than TIFIA Indebtedness); with the TIFIA Indebtedness to be prepaid pursuant to the TIFIA Loan Agreement and the Senior Lien Parity Debt to be redeemed or paid as determined in the discretion of the Authority, including that such Senior Lien Parity Debt may be purchased and canceled or defeased and cease to be Outstanding.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"State" means the State of North Carolina.

"State Appropriated Revenues" means any funds appropriated by the State pursuant to Section 136-176 of the NCGS or other legislation enacted by the General Assembly of the State providing for the annual appropriation of funds to the Authority to pay debt service on bonds or other indebtedness issued or incurred to finance the Triangle Expressway System or to fund debt service reserves, operating reserves or similar reserves in connection therewith.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"State Appropriation Revenue Bonds" means the bonds issued by the Authority under the State Appropriation Revenue Bond Trust Agreement.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"State Appropriation Revenue Bond Trust Agreement" means the Trust Agreement dated as of June 1, 2009, between the Authority and the Trustee as trustee thereunder, authorizing, among other things, the issuance of revenue bonds



thereunder secured by the State Appropriated Revenues to pay a portion of the costs of the Initial Project.

"Subordinate Lien Bonds" means any bonds issued under the provisions of Section 208 and secured on a parity with each other and any Subordinate Lien Parity Debt and Subordinate Lien Derivative Agreement Regularly Scheduled Payment by this Trust Agreement.

"Subordinate Lien Debt Service Fund" means the fund created and designated the North Carolina Turnpike Authority Triangle Expressway Subordinate Lien Debt Service Fund by Section 501.

"Subordinate Lien Derivative Agreement Regularly Scheduled Payments" means any Derivative Agreement Regularly Scheduled Payments with respect to Derivative Indebtedness constituting Subordinate Lien Indebtedness.

"Subordinate Lien Indebtedness" means, collectively, the Subordinate Lien Bonds and Subordinate Lien Parity Debt.

"Subordinate Lien Parity Debt" means all Indebtedness incurred by the Authority in respect of the Triangle Expressway System and not evidenced by Subordinate Lien Bonds which is secured on a parity (as so designated in the Parity Debt Resolution) with the Subordinate Lien Bonds by a pledge, charge and lien upon the Trust Estate as provided in this Trust Agreement, including, without limiting the generality of the foregoing, Section 518.

"Subordinate Lien Parity Reserve Account" means the account in the Senior Lien Debt Service Fund created and so designated by Section 501.

"Subordinate Lien Parity Reserve Account Requirement" means the amount required to be placed or maintained in a Subordinate Lien Parity Reserve Account as may be required by the Subordinate Lien Resolution first providing for the funding of the Subordinate Lien Parity Reserve Account. The Subordinate Lien Parity Reserve Account Requirement may be composed of cash, Investment Obligations or Reserve Alternative Instruments, or any combination of the foregoing, as the Authority may determine.

"Subordinate Lien Resolution" means any Supplemental Agreement for Subordinate Lien Bonds or Parity Debt Resolution for Subordinate Lien Parity Debt, or both, as the case may be, authorizing the issuance of a Series of Subordinate Lien Bonds or the incurrence of Subordinate Lien Parity Debt.

"Subordinate Lien Special Reserve Account" means a special debt service reserve account, if any, created by a Subordinate Lien Resolution as a debt service reserve account only for the particular Subordinate Lien Indebtedness authorized thereby.

"Subordinate Lien Special Reserve Account Requirement" means the amount required to be placed or maintained in a Subordinate Lien Special Reserve Account as may be required by the Subordinate Lien Resolution creating such account. The Subordinate Lien Special Reserve Account Requirement may be composed of cash, Investment Obligations or Reserve Alternative Instruments or any combination of the foregoing, as the Authority may determine.

"Substantial Completion Date" means, as applicable, the date on which the Initial Project, the 2019 Additional Project and any other Additional Project is open to vehicular or passenger traffic.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Supplemental Agreement" means an order or resolution of the Authority authorizing any particular Series of Bonds or TIFIA Indebtedness, together with a supplemental trust agreement executed and delivered by the Authority in connection with the issuance of such Series of Bonds or TIFIA Indebtedness that is required to be executed and delivered by this Trust Agreement prior to the issuance of any such Series or TIFIA Indebtedness.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Synthetic Fixed Rate" means Synthetic Fixed Rate as defined in the definition of Derivative Indebtedness.

"Synthetic Variable Rate" means Synthetic Variable Rate as defined in the definition of Derivative Indebtedness.

"Term Bonds" means the Bonds of any Series, other than Serial Bonds, that are designated as such in the Supplemental Agreement for such Series.

"Third Supplemental Trust Agreement" means the Third Supplemental Trust Agreement dated as of December 1, 2018, between the Authority and the Trustee, supplementing the Original Trust Agreement and the Second Supplemental Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA Debt Service" means, collectively, TIFIA Mandatory Debt Service and TIFIA Scheduled Debt Service.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*



"TIFIA Debt Service Reserve Account" means the special account in the Junior Indebtedness Debt Service Fund created and so designated by Section 501.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA Debt Service Reserve Account Requirement" means an amount determined pursuant to the terms of the TIFIA Loan Agreement related to such TIFIA Indebtedness.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA Indebtedness" means, if Outstanding, the TIFIA Series 2009 Bond, the TIFIA Series 2019 Bond and any additional bonds or other secured loan from USDOT, as lender, to the Authority, as borrower, pursuant the TIFIA Loan Agreement and to the Transportation Infrastructure Finance and Innovation Act of 1998, as codified as 23 U.S.C. §601 *et seq.*, as the same may be amended from time to time, with respect to the Triangle Expressway System, and secured by the pledge, charge and lien on the Trust Estate in the manner provided in Section 503.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA Interest Account" means the special account in the Junior Indebtedness Debt Service Fund created and so designated by Section 501.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA Loan Agreement" means the TIFIA 2009 Loan Agreement, the TIFIA 2019 Loan Agreement and any other comparable agreement between the Authority and USDOT, so long as the TIFIA Indebtedness related thereto is Outstanding. The TIFIA Series 2009 Bond is not Outstanding as of the date of this Amended and Restated Trust Agreement, and the TIFIA 2009 Loan Agreement has been terminated.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA Mandatory Debt Service" shall have the meaning set forth in the TIFIA 2019 Loan Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA Principal Account" means the special account in the Junior Indebtedness Debt Service Fund created and so designated by Section 501.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA Scheduled Debt Service" shall have the meaning set forth in the TIFIA 2019 Loan Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA Series 2009 Bond" means the North Carolina Turnpike Authority Triangle Expressway Revenue Bond, TIFIA Series 2009, issued by the Authority to USDOT pursuant to Section 213 of the Original Trust Agreement to evidence the obligation of the Authority to pay the loan repayments to USDOT, or its assigns, pursuant to the TIFIA 2009 Loan Agreement.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA Series 2019 Bond" means the North Carolina Turnpike Authority Triangle Expressway Revenue Bond, TIFIA Series 2019, to evidence the obligation of the Authority to repay the loan under the TIFIA 2019 Loan Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA 2009 Loan Agreement" means the loan agreement entered into between USDOT and the Authority, including any supplements or amendments thereto, with respect to the TIFIA Series 2009 Bond.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"TIFIA 2019 Loan Agreement" means the loan agreement entered into between USDOT and the Authority, including any supplements or amendments thereto, with respect to the TIFIA Series 2019 Bond.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Traffic Consultant" means any traffic and revenue consultant or firm of traffic and revenue consultants of favorable reputation for skill and experience in performing the duties for which such consultant is required to be employed pursuant to the provisions of this Trust Agreement.



"Triangle Expressway System" means, collectively, the Initial Project and any Additional Projects, including the 2019 Additional Project.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Trust Agreement" means this Amended and Restated Trust Agreement and any supplements and amendments hereto permitted hereby; provided, however, that the Trust Agreement shall not include any Supplemental Agreement executed and delivered by the Authority and the Trustee with respect to a particular Series of Bonds or TIFIA Indebtedness to the extent provided in Section 1105.

*The preceding definition was revised pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Trust Estate" has the meaning set forth in Section 518 hereof.

"Trustee" means the Trustee serving as such under this Trust Agreement, whether original or successor.

"Unrestricted Account" means the account within the General Reserve Fund created and so designated the Unrestricted Account by Section 501.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"Unrestricted Account Deposit" has the meaning set forth in Section 514 hereof.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

"USDOT" means the United States Department of Transportation.

"Variable Rate Indebtedness" means any portion of Indebtedness the interest rate on which is not established at the time of incurrence at a fixed or constant rate.

"2019 Additional Project" is defined in Section 207 of the Fourth Supplemental Trust Agreement.

*The preceding definition was added pursuant to Section 701(b) of the Fourth Supplemental Trust Agreement.*

Section 102. Findings and Determinations. The Authority does hereby find and determine as follows:

(a) The Authority will own and operate the Triangle Expressway System, which comprises the Initial Project.

(b) The Authority has determined to provide in this Trust Agreement for the issuance of revenue bonds for financing and refinancing the cost of various projects authorized by the Act.

(c) The Authority has determined, for purposes of the Act, to combine the Initial Project and all Additional Projects, other than its existing and future Non-System Projects, into one integral combined system of facilities designated as the Triangle Expressway System for purposes of this Trust Agreement.

(d) Under the Constitution and laws of the State, particularly the Act, the Authority is authorized and empowered:

(i) to acquire, construct, reconstruct, extend, improve, maintain, better and operate the Triangle Expressway System, which may include roads, bridges or tunnel projects and other structures and equipment necessary or convenient for the use and operation of the Triangle Expressway System in a manner consistent with the Act;

(ii) to establish, maintain, revise, charge and collect rates, fees, rentals or other charges for the use, services, facilities and commodities of or furnished by the Triangle Expressway System;

(iii) to borrow money for the purpose of acquiring, constructing, reconstructing, extending, bettering, improving or otherwise paying the cost of projects authorized by the Act and to issue its revenue bonds or bond anticipation notes therefor;

(iv) to pledge to the payment of such bonds or notes and interest thereon revenues from the Triangle Expressway System; and

(v) to enter into contracts with any person, firm or corporation, public or private, on such terms as the Authority may determine, with respect to the acquisition, construction, reconstruction, extension, betterment, improvement, maintenance or operation of such projects.

(e) The Authority has determined to provide in this Trust Agreement for the issuance of revenue bonds for the purpose of financing and refinancing various improvements to the Triangle Expressway System or to anyone or more components of the Triangle Expressway System as the Authority may determine from time to time in its discretion.



Section 103. Rules of Construction.

(a) Words of the masculine gender shall be deemed and construed to include correlative words of the feminine and neuter genders. Unless the context shall otherwise indicate, words used herein shall include the plural as well as the singular number.

(b) References herein to particular articles or sections are references to articles or sections of this Trust Agreement unless some other reference is indicated.

(c) References herein to specific sections or chapters of the General Statutes of North Carolina or to specific legislative acts are intended to be references to these sections, chapters or acts as amended and as they may be amended from time to time by the General Assembly of North Carolina, or any successor statute.

(d) Provisions calling for the redemption of Bonds or Parity Debt or the calling of Bonds or Parity Debt for redemption do not mean or include the payment of Bonds or Parity Debt at a stated maturity or maturities.

## ARTICLE II

## DETAILS OF BONDS, PARITY DEBT AND JUNIOR INDEBTEDNESS

Section 201. Limitation on Issuance of Bonds, Parity Debt and Junior Indebtedness. No Bonds, Parity Debt or Junior Indebtedness may be issued or incurred under this Trust Agreement except in accordance with the provisions of this Article. The principal of, the interest on and the redemption premium, if any, on all Bonds, Parity Debt and Junior Indebtedness issued or incurred under the provisions of this Trust Agreement shall be payable solely from the moneys and assets pledged by this Trust Agreement and the respective Supplemental Agreements for their payment. All covenants, agreements and provisions of this Trust Agreement shall be for the benefit and security of all present and future Owners of Bonds and Holders of Parity Debt without preference, priority or distinction as to lien or otherwise, except as otherwise hereinafter provided or as provided in any Supplemental Agreement or Parity Debt Resolution, of (a) any one Senior Lien Bond or Senior Lien Parity Debt over any other Senior Lien Bond or Senior Lien Parity Debt, (b) any one Subordinate Lien Bond or Subordinate Lien Parity Debt over any other Subordinate Lien Bond or Subordinate Lien Parity Debt or (c) any Junior Indebtedness over any other Junior Indebtedness, in each case by reason of priority in the issue, sale or negotiation thereof, or otherwise.

*Section 201 was revised pursuant to Section 701(ee) of the Fourth Supplemental Trust Agreement.*

Section 202. Details of Bonds. Bonds authorized hereunder may be issued in one or more Series that may be delivered from time to time. The Authority shall by Supplemental Agreement authorize such Series and shall specify, to the extent appropriate, (a) the authorized principal amount of such Series; (b) the Initial Project or Additional Project to be financed from the Bonds or other indebtedness to be refunded or refinanced with the proceeds thereof, including costs of issuance; (c) whether such Bonds shall constitute Senior Lien Bonds or Subordinate Lien Bonds; (d) the creation or funding of a debt service reserve fund for such Series, if any; (e) the date and terms of maturity or maturities of the Bonds of such Series, or the dates of payment of the Bonds on the demand of the Owner; (f) the interest rate or rates of the Bonds of such Series, which may include variable, adjustable, convertible or other rates, original issue discount, Capital Appreciation Bonds ,Convertible CAB Bonds, municipal multipliers or other deferred interest arrangements and zero interest rate Bonds, provided that the interest cost of such Series shall never exceed for such Series the maximum interest rate, if any, permitted by law in effect at the time such Series is issued; (g) the Interest Payment Dates for such Series of Bonds; (h) the denominations, numbering, lettering and series designation of such Series of Bonds; (i) the Bond Registrar or paying agents and place or places of payment of such Bonds; (j) the redemption dates and Redemption Prices for such Series of Bonds and any terms of redemption not inconsistent with the provisions of this Trust Agreement, which may include mandatory redemption at the election of the Owner thereof to the extent permitted by law; (k) the terms of any optional or mandatory tender requirement, if any, for such Series of Bonds; (l) the use to be made of proceeds of such Series of Bonds, including, without limitation, deposits required to be made into the appropriate account or subaccount of the Project Fund, the Senior Lien Debt Service Fund, the Subordinate Lien Debt Service Fund, the Senior Lien Parity Reserve Account, any Senior Lien Special Reserve Account, the Subordinate Lien Parity Reserve Account or any Subordinate Lien Special Reserve Account; and (m) any other terms or provisions applicable to the Series of Bonds not inconsistent with the provisions of this Trust Agreement or the Act. All of the foregoing may be added by Supplemental Agreements adopted at any time or from time to time prior to the issuance of such Series of Bonds.

*The preceding paragraph was revised pursuant to Section 701(ff) of the Fourth Supplemental Trust Agreement.*

Each Current Interest Bond shall bear interest from the Interest Payment Date next preceding the date on which it is authenticated unless it is (a) authenticated upon an Interest Payment Date, in which event it shall bear interest from such Interest Payment Date, or (b) authenticated prior to the first Interest Payment Date, in which event it shall bear interest from its date or such later date as is specified in a Supplemental Agreement providing for its issuance, or (c) authenticated prior to the first Interest Payment Date after the applicable Convertible CAB Bond Conversion Date, in which event it shall bear interest from



such Convertible CAB Bond Conversion Date or such later date as is specified in a Supplemental Agreement providing for its issuance; provided, however, that if at the time of authentication of any Bond interest is in default, such Bond shall bear interest from the date to which interest has been paid.

*The preceding paragraph was revised pursuant to Section 701(f) of the Fourth Supplemental Trust Agreement.*

Unless provided to the contrary in a Supplemental Agreement, and as permitted by law, the principal of and the interest and premium, if any, on the Bonds shall be payable in any coin or currency of the United States of America that is legal tender for the payment of public and private debts on the respective dates of payment thereof. The payment of interest on each Bond shall be made (a) by the Bond Registrar on each Interest Payment Date to the person appearing on the registration books of the Bond Registrar as the registered owner thereof as of the Regular Record Date by check mailed to the registered owner at his address as it appears on such registration books, or (b) by such additional or alternative means as is provided in any Supplemental Agreement providing for the issuance of such Bond. Unless otherwise provided in a Supplement Agreement, payment of the principal of all Bonds shall be made upon the presentation and surrender of such Bonds at the designated corporate trust office of the Bond Registrar as the same become due and payable (whether at maturity, by redemption or otherwise).

Any interest on any Bond of any Series which is payable, but is not punctually paid or duly provided for, on any Interest Payment Date (herein called "Defaulted Interest") shall forthwith cease to be payable to the Owner on the relevant Regular Record Date solely by virtue of such Owner having been such Owner; and such Defaulted Interest may be paid by the Authority, at its election in each case, as provided in Subsection A or B below:

A. The Authority may elect to make payment of any Defaulted Interest on the Bonds of any Series to the persons in whose names such Bonds (or their respective Predecessor Bonds) are registered at the close of business on a Special Record Date for the payment of such Defaulted Interest, which shall be fixed in the following manner. The Authority shall notify the Trustee in writing of the amount of Defaulted Interest proposed to be paid on each Bond and the date of the proposed payment (which date shall be such as will enable the Trustee to comply with the next sentence hereof), and at the same time, the Authority shall deposit with the Trustee an amount of money equal to the aggregate amount proposed to be paid in respect of such Defaulted Interest or shall make arrangements satisfactory to the Trustee for such deposit prior to the date of the proposed payment, such money when deposited to be held in trust for the benefit of the persons entitled to such Defaulted Interest as in this Subsection provided. Thereupon, the Trustee shall fix a Special Record Date for the payment of such Defaulted Interest which shall be not more than fifteen (15) nor less than ten (10) days prior to the date of the proposed

payment and not less than ten (10) days after the receipt by the Trustee of the notice of the proposed payment. The Trustee shall promptly notify the Authority of such Special Record Date and, in the name and at the expense of the Authority, such expense to be paid solely from Receipts, shall cause notice of the proposed payment of such Defaulted Interest and the Special Record Date therefor to be mailed, first-class postage prepaid, to each Owner at his address as it appears in the registration books maintained under Section 206 not less than ten (10) days prior to such Special Record Date. The Trustee may, in its discretion, in the name and at the expense of the Authority, such expense to be paid solely from Receipts, cause a similar notice to be published at least once in (i) a financial journal distributed in the Borough of Manhattan, City and State of New York, and (ii) a newspaper of general circulation in Wake County, North Carolina, but such publication shall not be a condition precedent to the establishment of such Special Record Date. Notice of the proposed payment of such Defaulted Interest and the Special Record Date therefor having been mailed as aforesaid, such Defaulted Interest shall be paid to the persons in whose names the Bonds (or their respective Predecessor Bonds) are registered on such Special Record Date and shall no longer be payable pursuant to the following subsection B below.

B. The Authority may make payment of any Defaulted Interest on the Bonds of any Series in any other lawful manner not inconsistent with the requirements of any securities exchange on which such Bonds may be listed and upon such notice as may be required by such exchange, if, after notice given by the Authority to the Trustee of the proposed payment pursuant to this Subsection, such method of payment shall be deemed practicable by the Trustee.

Subject to the foregoing provisions of this Section, each Bond delivered under this Trust Agreement upon transfer of or in exchange for or in lieu of any other Bond shall carry all the rights to interest accrued and unpaid, and to accrue, which were carried by such other Bond and each such Bond shall bear interest from such date, that neither gain nor loss in interest shall result from such transfer, exchange or substitution.

Section 203. Execution and Form of Bonds. The Bonds shall be signed by, or bear the facsimile signatures of, the Chairman, the Vice Chairman or the Executive Director of the Authority and the Authority Secretary or such other officers of the Authority as may be designated by the Authority Board and the official seal of the Authority shall be impressed, or a facsimile thereof imprinted, on the Bonds. In case any officer whose signature or a facsimile of whose signature appears on any Bonds ceases to be such officer before the delivery of such Bonds, such signature or such facsimile nevertheless shall be valid and sufficient for all purposes the same as if he had remained in office until such delivery, and any Bond may bear the facsimile signature of, or may be signed by, such persons as at the actual time of the execution of such Bond are the proper officers to execute such



Bond although at the date of such Bond such persons may not have been such officers.

The definitive Bonds are issuable as permitted or required by the respective Supplemental Agreement providing for the issuance of Bonds of any Series. Bonds may be issued under a book-entry system and held by a Securities Depository. All Bonds may have endorsed thereon such legends or text as may be necessary or appropriate to conform to the applicable rules and regulations of any governmental authority or any securities exchange on which the Bonds may be listed or to any requirement of law with respect thereto.

Section 204. Exchange of Bonds. Bonds, upon surrender thereof at the designated corporate trust office of the Bond Registrar, together with an assignment duly executed by the Owner or his attorney or legal representative, or legal representative of his estate if the Owner is deceased, in such form as shall be satisfactory to the Bond Registrar, may, at the option of the Owner thereof, be exchanged for an equal aggregate principal amount of Bonds of the same Series and maturity, of any denomination or denominations authorized by the Supplemental Agreement pursuant to which such Bonds were issued, bearing interest at the same rate and in the same form as the Bonds surrendered for exchange.

The Authority shall make provision for the exchange of Bonds at the designated corporate trust office of the Bond Registrar.

Section 205. Transfer and Registration of Transfer of Bonds. Unless provided to the contrary in a Supplemental Agreement, and as permitted by law, the Bond Registrar shall keep books for the registration and the registration of transfer of the Series of Bonds as to which it is Bond Registrar as provided in this Trust Agreement. The registration books shall be available at all reasonable times for inspection by the Authority and any Owner of such Bonds and may be copied by either of the foregoing and their agents or representatives.

The Bond Registrar shall evidence acceptance of the duties, responsibilities and obligations of the Bond Registrar under this Trust Agreement and the applicable Supplemental Agreement by the execution of the certificate of authentication on the related Series of Bonds.

The transfer of any Bond may be registered only upon the books kept for the registration and registration of transfer of Bonds upon presentation thereof to the Bond Registrar together with an assignment duly executed by the Owner or his attorney or legal representative, or legal representative of his estate if the Owner is deceased, in such form as shall be satisfactory to the Bond Registrar. No transfer of any Bond shall alter the ownership of such Bond for purposes of this Trust Agreement unless such transfer is registered with the Bond Registrar. Upon any such registration of transfer, the Authority shall, if necessary, execute and the Bond

Registrar shall authenticate and deliver in exchange for such Bond a new Bond or Bonds, registered in the name of the transferee, of any denomination or denominations authorized by the Supplemental Agreement pursuant to which such Bond was issued, in the aggregate principal amount equal to the principal amount of such Bond surrendered or exchanged, of the same maturity and bearing interest at the same rate.

In all cases in which Bonds shall be exchanged or the transfer of Bonds shall be registered hereunder, the Authority shall, if necessary, execute and the Bond Registrar shall authenticate and deliver at the earliest practicable time Bonds in accordance with the provisions of this Trust Agreement. All Bonds surrendered in any such exchange or registration of transfer shall forthwith be canceled by the Bond Registrar. No service charge shall be made for any registration, transfer or exchange of Bonds, but the Authority and the Bond Registrar may require payment of a sum sufficient to cover any tax or other governmental charge that may be imposed in connection with any transfer or exchange of Bonds. Unless otherwise required by the applicable Supplemental Agreement, neither the Authority nor the Bond Registrar shall be required (a) to issue, transfer or exchange Bonds during a period beginning at the opening of business fifteen (15) days before the day of the mailing of a notice of redemption of Bonds and ending at the close of business on the day of such mailing or (b) to transfer or exchange any Bond so selected for redemption in whole or in part.

Section 206. Ownership of Bonds. The Authority, the Trustee, the Bond Registrar and any agent of the Authority, the Trustee or the Bond Registrar, may treat the person in whose name any Bond is registered, including, without limitation, any Securities Depository Nominee, as the Owner of such Bond for the purpose of receiving payment of principal of and premium, if any, and interest on such Bond, and for all other purposes whatsoever, whether or not such Bond be overdue, and, to the extent permitted by law, neither the Authority, the Trustee, the Bond Registrar nor any such agent shall be affected by notice to the contrary.

Section 207. Authentication of Bonds. Only such Bonds as have endorsed thereon a certificate of authentication substantially in the form set forth in the Supplemental Agreement pursuant to which such Bonds are issued, duly executed as provided in the Supplemental Agreement, shall be entitled to any benefit or security under this Trust Agreement. No Bond shall be valid or obligatory for any purpose unless and until such certificate of authentication on the Bond has been duly executed and dated as provided in the Supplemental Agreement, and such certificate upon any such Bond shall be conclusive evidence that such Bond has been duly authenticated and delivered under this Trust Agreement. The certificate of authentication on any Bond shall be deemed to have been duly executed and dated if signed by an authorized officer of the party authorized under the Supplemental Agreement but it shall not be necessary that the same officer sign the



certificate of authentication on all of the Bonds or any Series thereof that may be issued hereunder at any one time.

Section 208. Terms and Conditions for Issuance of Bonds. Before any Bonds shall be issued, the Authority shall adopt and execute and deliver a Supplemental Agreement authorizing the issuance of such Bonds, fixing the amount and the details thereof as provided in Section 202 and describing in brief and general terms the purpose for issuing such Bonds. Bonds may be issued for the purpose of providing funds for paying, together with any other available funds,

(a) all or any part of the Cost of the Initial Project or any Additional Project,

(b) all or any part of completing payment of the Cost of the Initial Project or any Additional Project, and

(c) the cost (including financing costs) of refunding any Bonds, Parity Debt or any other indebtedness of the Authority.

The Supplemental Agreement for Senior Lien Bonds may determine to use the Senior Lien Parity Reserve Account or to establish a Senior Lien Special Reserve Account for such Series of Bonds and fix the provisions with respect thereto or not to establish any debt service reserve account. Unless named otherwise in the Supplemental Agreement, the Senior Lien Bonds of each Series shall be designated "Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series __ " (inserting the year such Bonds are issued and any other distinctive letter or number), shall be stated to mature, subject to the right of prior redemption as therein set forth, on the date or dates specified therein, in such year or years not later than forty (40) years from their date, shall bear interest at a rate or rates not exceeding the maximum rate then permitted by law, shall be numbered and shall have such redemption provisions (subject to the provisions of Article III), all as provided in the Supplemental Agreement. Except as to any differences in the maturities thereof or in the rate or rates of interest or the provisions for redemption or the provisions regarding the respective subaccounts within the Interest Account, the Principal Account, the Sinking Fund Account and the Redemption Account of the Senior Lien Debt Service Fund, and any provisions with respect to the Senior Lien Parity Reserve Account or a Senior Lien Special Reserve Account, all such Senior Lien Bonds shall be payable on a parity with each other and any Senior Lien Parity Debt and Senior Lien Derivative Agreement Regularly Scheduled Payments and shall be entitled to the same benefit and security of this Trust Agreement, including, in particular, the pledge, charge and lien upon the Receipts in the priority and manner provided herein.

The Supplemental Agreement for Subordinate Lien Bonds may determine to use the Subordinate Lien Parity Reserve Account or to establish a Subordinate Lien

Special Reserve Account for such Series of Bonds and fix the provisions with respect thereto or not to establish any debt service reserve account. Unless named otherwise in the Supplemental Agreement, the Subordinate Lien Bonds of each Series shall be designated "Triangle Expressway System Subordinate Lien Turnpike Revenue Bonds, Series __ " (inserting the year such Bonds are issued and any other distinctive letter or number), shall be stated to mature, subject to the right of prior redemption as therein set forth, on the date or dates specified therein, in such year or years not later than forty (40) years from their date, shall bear interest at a rate or rates not exceeding the maximum rate then permitted by law, shall be numbered and shall have such redemption provisions (subject to the provisions of Article III), all as provided in the Supplemental Agreement. Except as to any differences in the maturities thereof or in the rate or rates of interest or the provisions for redemption or the provisions regarding the respective subaccounts within the Interest Account, the Principal Account, the Sinking Fund Account and the Redemption Account of the Subordinate Lien Debt Service Fund, and any provisions with respect to the Subordinate Lien Parity Reserve Account or a Subordinate Lien Special Reserve Account, all such Subordinate Lien Bonds shall be payable on a parity with each other and any Subordinate Lien Parity Debt and Subordinate Lien Derivative Agreement Regularly Scheduled Payments and shall be entitled to the same benefit and security of this Trust Agreement, including, in particular, the pledge, charge and lien upon the Receipts in the priority and manner provided herein.

The Bonds shall be executed substantially in the form and in the manner hereinabove set forth and shall be deposited with the Bond Registrar for authentication, but before the Bonds shall be authenticated and delivered to the purchasers thereof, there shall be filed with the Trustee the following:

(i) an executed copy of this Trust Agreement;

(ii) an executed copy of the Supplemental Agreement adopted or executed and delivered by the Authority for the particular Series of Bonds;

(iii) evidence of the approval of the Bonds by the Local Government Commission as required by Section 159-86 of the General Statutes of North Carolina;

(iv) if the TIFIA Series 2019 Bond remains Outstanding, evidence of compliance with Section 17(a) of the TIFIA 2019 Loan Agreement;

(v) a copy, certified by the Authority Secretary, of the resolution of the Authority (which resolution may be incorporated in the Supplemental Agreement for the particular Series of Bonds), approving the award of the Bonds and directing the authentication and delivery of such Bonds to or upon



the order of the purchasers therein named upon payment of the purchase price therein set forth plus the accrued interest thereon;

(vi) for any Series of Senior Lien Bonds other than the Series 2009 Bonds, evidence of compliance with the provisions of Section 716, or for any Series of Subordinate Lien Bonds, evidence of compliance with the provisions of Section 717; and

(vii) such other documents as are required to be delivered to the Trustee pursuant to the Supplemental Agreement.

*The preceding subsection (iv) was added and subsections (v) through (vii) were renumbered to reflect this addition pursuant to Section 701(gg) of the Fourth Supplemental Trust Agreement.*

When the documents mentioned in subsections (i) to (vii), inclusive, of this Section shall have been filed with the Trustee and when the Bonds shall have been executed and authenticated as required by this Trust Agreement, the Trustee shall deliver the Bonds at one time to or upon the order of the purchasers named in the resolution mentioned in subsection (v) of this Section, but only upon payment to the Trustee of the purchase price of the Bonds and the accrued interest, if any, thereon to the date of delivery. The Trustee shall be entitled to rely upon the resolutions and documents mentioned in subsections (i) to (vii) of this Section as to all matters stated therein.

*The preceding paragraph was revised pursuant to Section 701(gg) of the Fourth Supplemental Trust Agreement.*

The proceeds (including accrued interest) of the Bonds shall be applied by the Trustee simultaneously with the delivery of the Bonds as provided in the Supplemental Agreement.

Section 209. Temporary Bonds. Until the definitive Bonds of any Series are ready for delivery, there may be executed, and upon direction of the Authority, the Bond Registrar shall deliver, in lieu of definitive Bonds and subject to the same limitations and conditions, except as to identifying numbers, printed, engraved, lithographed or typewritten temporary Bonds in denominations permitted by the applicable Supplemental Agreement for the definitive Bonds, substantially of the tenor hereinabove set forth, with such appropriate omissions, insertions and variations as may be required. The Authority shall cause the definitive Bonds to be prepared and to be executed and delivered to the Bond Registrar, and the Bond Registrar, upon presentation to it of any temporary Bond, shall cancel the same or cause the same to be canceled and shall authenticate and deliver, in exchange therefor, at the place designated by the Owner, without expense to the Owner, a definitive Bond or Bonds of the same Series and in the same aggregate principal amount, maturing on the same date and bearing interest at the same rate as the

temporary Bond surrendered. Until so exchanged, the temporary Bonds shall be entitled to the same benefit of this Trust Agreement, as the definitive Bonds to be issued and authenticated hereunder, including the privilege of registration if so provided. Until definitive Bonds are ready for exchange, interest on temporary Bonds shall be paid when due and notation of such payment shall be endorsed thereon.

Section 210. Mutilated, Destroyed, Lost or Stolen Bonds. The Authority shall cause to be executed, and the Bond Registrar shall authenticate and deliver a new Bond of like date, number and tenor in exchange and substitution for and upon the cancellation of any mutilated Bond, or in lieu of and in substitution for any destroyed, lost or stolen Bond, and the Owner shall pay the reasonable expenses and charges of the Authority in connection therewith. Prior to the delivery of a substitute Bond, the Owner of any Bond which was destroyed, lost or stolen shall file with the Bond Registrar evidence satisfactory to it of the destruction, loss or theft of such Bond and of the Owner's ownership thereof and shall furnish to the Authority and to the Bond Registrar such security or indemnity as may be required by them to save each of them harmless from all risks, however remote.

Every Bond issued pursuant to the provisions of this Section in exchange or substitution for any Bond which is mutilated, destroyed, lost or stolen shall constitute an additional contractual obligation of the Authority, whether or not the destroyed, lost or stolen Bonds are found at any time or are enforceable by anyone, and shall be entitled to all the benefits and security hereof equally and proportionately with any and all other Bonds of the same Series duly issued under this Trust Agreement.

Section 211. Revenue Bond Anticipation Notes. Revenue Bond Anticipation Notes may be issued by the Authority from time to time for any purpose for which Bonds may be issued under Section 208. Revenue Bond Anticipation Notes may be issued as Senior Lien Indebtedness or Subordinate Lien Indebtedness and, except to the extent otherwise expressly provided in this Trust Agreement, shall be issued in compliance, to the extent applicable, with the provisions of Section 208 setting forth certain terms and conditions for the issuance of Bonds.

Revenue Bond Anticipation Notes may be issued provided the following conditions are met:

(a) The Authority Board shall adopt a resolution authorizing the issuance of such Revenue Bond Anticipation Notes and setting forth the amount and details thereof, which resolution shall designate such Revenue Bond Anticipation Notes as Senior Lien Indebtedness or Subordinate Lien Indebtedness. The maximum aggregate principal amount of Revenue Bond Anticipation Notes of an issue at any one time Outstanding shall not exceed the aggregate principal amount of Senior



Lien Indebtedness or Subordinate Lien Indebtedness allowed by subsection (d) of this Section.

(b) The Revenue Bond Anticipation Notes shall be issued pursuant to the provisions of the Act.

(c) The interest on and the principal of any such Revenue Bond Anticipation Notes may be made payable from Receipts in the manner provided in Section 503 or from the proceeds of other Revenue Bond Anticipation Notes, Senior Lien Indebtedness or other Subordinate Lien Indebtedness or any other legally available source.

(d) Prior to or simultaneously with the delivery of and payment for any such Revenue Bond Anticipation Notes then proposed to be issued, there shall be filed with the Trustee evidence, based on the assumptions hereinafter mentioned in this paragraph, of compliance with the provisions of Section 716 in the case the Revenue Bond Anticipation Notes are issued as Senior Lien Indebtedness or of compliance with the provisions of Section 717 in the case the Revenue Bond Anticipation Notes are issued as Subordinate Lien Indebtedness. In showing compliance with the provisions of Section 716 or Section 717, as the case may be, the principal amount of such assumed Senior Lien Indebtedness or Subordinate Lien Indebtedness shall be deemed to be equal to the principal amount of such Revenue Bond Anticipation Notes being issued, and the Authority shall be entitled to assume that such Senior Lien Indebtedness or Subordinate Lien Indebtedness will mature at such times and in such principal amounts as if such principal were amortized from the date of incurrence thereof over a period of forty (40) years on a level debt service basis and bear such interest rates as it may in its best judgment determine. The Traffic Consultant shall be entitled in his or her best judgment to make such other assumptions as may be necessary in respect of matters that cannot be otherwise ascertained at such time in order to determine whether or not the assumed Senior Lien Indebtedness or Subordinate Lien Indebtedness could be incurred at such time. Any assumptions made by the Traffic Consultant to show compliance with this paragraph shall be binding and conclusive upon the Trustee and any Owner of Bonds and Holders of Parity Debt or the providers of any Derivative Agreements.

Notwithstanding anything else herein to the contrary, Phase I BANs may be issued without meeting the requirements of subsection (d) other than to file evidence that such Revenue Bond Anticipation Notes will be Senior Lien Indebtedness or Subordinate Lien Indebtedness, provided that the Phase I BANs shall be assumed to amortize over the same period and in the same amounts as the TIFIA Series 2019 Bond.

*The preceding paragraph was added pursuant to Section 701(p) of the Fourth Supplemental Agreement.*

Section 212. Grant Anticipation Notes. Grant Anticipation Notes may be issued by the Authority from time to time for any purpose for which Bonds may be issued under Section 208 in anticipation of the receipt of moneys from firm grant commitments for such purpose from the State or the United States or any agencies of either. Grant Anticipation Notes shall constitute Subordinate Lien Indebtedness and, except to the extent otherwise expressly provided in this Trust Agreement, shall be issued in compliance, to the extent applicable, with the provisions of Section 208 setting forth certain terms and conditions for the issuance of Bonds.

Grant Anticipation Notes may be issued provided the following conditions are met:

(a) The Authority shall adopt a resolution authorizing the issuance of the Grant Anticipation Notes and setting forth the amount and details thereof.

(b) The Grant Anticipation Notes shall be issued pursuant to the provisions of the Act.

(c) The interest on and the principal of the Grant Anticipation Notes may be made payable from Receipts the manner provided in Section 503 or from the proceeds of the grant, other Grant Anticipation Notes, Senior Lien Indebtedness or Subordinate Lien Indebtedness or any other legally available source.

(d) The maximum aggregate principal amount of the Grant Anticipation Notes at any time Outstanding shall not exceed the maximum amount of the grant.

(e) Grant Anticipation Notes may be issued without showing compliance with the appropriate provisions of Section 717.

(f) A copy of the resolution of the Authority authorizing the issuance of the Grant Anticipation Notes shall be filed with the Trustee.

(g) Evidence of the firm grant commitment.

*The preceding subsection (g) was added pursuant to Section 701(c) of the Fourth Supplemental Trust Agreement.*

Section 213. Parity Debt and Junior Indebtedness.

(a) Senior Lien Parity Debt, Subordinate Lien Parity Debt and Junior Indebtedness may be incurred by the Authority from time to time for any purpose for which Bonds may be issued under Section 208; provided if TIFIA Indebtedness is Outstanding, written consent of USDOT is required for the issuance of (i) any Subordinate Lien Parity Debt (other than Phase I BANs) and (ii) any other Junior Indebtedness.



(b) Parity Debt or Junior Indebtedness may be incurred provided the following conditions are met:

(i) The Authority shall adopt a resolution authorizing the incurrence of any such Parity Debt or Junior Indebtedness and setting forth the amount and details thereof.

(ii) Any such Parity Debt or Junior Indebtedness shall be incurred pursuant to the provisions of the Act.

(iii) The interest on and the principal of any such Parity Debt or Junior Indebtedness shall be made payable from Receipts in the manner provided in Section 503.

(iv) There shall be filed with the Trustee evidence of compliance with the appropriate provisions of Section 716, in the case of Senior Lien Parity Debt, or Section 717, in the case of Subordinate Lien Parity Debt.

(c) Subordinate Lien Indebtedness shall be secured by and payable from the Trust Estate on a junior and subordinated basis to Senior Lien Indebtedness and shall be paid in the manner set forth in Section 503, subject to the provisions of the succeeding paragraph.

In the event (i) of any Bankruptcy Related Event relative to the Authority or to the Triangle Expressway System or (ii) any Event of Default under this Trust Agreement shall occur and be continuing and (A) written notice of such default shall have been given to the Authority and (B) judicial proceedings shall be commenced in respect of such Event of Default within 180 days in the case of a default in payment of principal or interest on Senior Lien Indebtedness and within 90 days in the case of any other default after the giving of such notice, then, for so long as any action described in clause (i) or (ii) above shall not have been remedied or cured, the Owners or Holders of Senior Lien Indebtedness shall be entitled to receive payment in full from Receipts of all principal, premium and interest on all Senior Lien Indebtedness (whether or not then due and payable) before the Owners or Holders of the Subordinate Lien Indebtedness are entitled to receive any payment from Receipts on account of principal of or interest on the Subordinate Lien Indebtedness, and to that end the Owners or Holders of Senior Lien Indebtedness shall be entitled to receive for application in payment thereof any payment or distribution of any kind of character, whether in cash or property or securities, which may be payable or deliverable in any such proceedings in respect of the Subordinate Lien Indebtedness after giving effect to any concurrent payment or distribution in respect to such Senior Lien Indebtedness. Notwithstanding the foregoing, the Owners or Holders of Subordinate Lien Indebtedness shall be entitled, subject to the rights of the Owners of any Senior Lien Indebtedness, to exercise any of its rights in and to any other collateral securing such Subordinate

Lien Indebtedness other than Receipts, and the proceeds derived therefrom shall be distributed in the manner set forth in the Subordinate Lien Resolution and shall not be subject to the provisions of this paragraph. Notwithstanding the foregoing, no acceleration of payment of principal of or interest on any Bonds, Parity Debt or Junior Indebtedness is permitted under this Trust Agreement.

(d) Junior Indebtedness may be secured by and payable from the Trust Estate on a basis junior and subordinate to both Senior Lien Indebtedness and Subordinate Lien Indebtedness and shall be paid in the manner set forth in Section 503, subject to the provisions of the succeeding paragraph.

In the event any Event of Default (except for a Bankruptcy Related Event) under this Trust Agreement shall occur and be continuing and (i) written notice of such default shall have been given to the Authority and (ii) judicial proceedings shall be commenced in respect of such Event of Default within 180 days in the case of a default in payment of principal or interest on Senior Lien Indebtedness or Subordinate Lien Indebtedness and within 90 days in the case of any other default after the giving of such notice, then, for so long as any action described above shall not have been remedied or cured, the Owners and Holders of Senior Lien Indebtedness and Subordinate Lien Indebtedness shall be entitled to receive payment in full from Revenues of all principal, premium and interest on all Senior Lien Indebtedness and Subordinate Lien Indebtedness (whether or not then due and payable) before the Holders of the Junior Indebtedness are entitled to receive any payment from Revenues on account of principal of or interest on such Junior Indebtedness, and to that end the Owners or Holders of Senior Lien Indebtedness and Subordinate Lien Indebtedness shall be entitled to receive for application in payment thereof any payment or distribution of any kind of character, whether in cash or property or securities, which may be payable or deliverable in any such proceedings in respect of such Junior Indebtedness after giving effect to any concurrent payment or distribution in respect to such Senior Lien Indebtedness and Subordinate Lien Indebtedness. Notwithstanding the foregoing, the Holders of such Junior Indebtedness shall be entitled, subject to the rights of the Owners of any Senior Lien Indebtedness or Subordinate Lien Indebtedness, to exercise any of its rights in and to any other collateral securing such Junior Indebtedness than Revenues, and the proceeds derived therefrom shall be distributed in the manner set forth in the agreement providing for such Junior Indebtedness and shall not be subject to the provisions of this paragraph. Notwithstanding the foregoing, no acceleration of payment of principal of or interest on any Bonds, Parity Debt or Junior Indebtedness is permitted under this Trust Agreement.

(e) In order to evidence the obligation of the Authority to pay the loan payments incurred pursuant to the TIFIA Loan Agreement, there shall be issued under a Supplemental Agreement a bond of the Authority designated "North Carolina Turnpike. Authority Triangle Expressway Revenue Bond, TIFIA Series ____."



TIFIA Indebtedness shall be issued as Junior Indebtedness and shall be secured and payable as Junior Indebtedness until and upon the occurrence of a Bankruptcy Related Event, in which case, any Outstanding TIFIA Indebtedness shall automatically and without notice become a Senior Lien Bond, provided that, regardless of the status of its lien, the TIFIA Indebtedness shall be payable from and secured by the TIFIA Interest Account, the TIFIA Principal Account and the TIFIA Debt Service Reserve Account.

The Holder of TIFIA Indebtedness that has become a Senior Lien Bond shall be entitled to all rights of a Holder of a Senior Lien Bond, except that the Holders of TIFIA Indebtedness shall have no rights in, or claim to, any amounts held in the Interest Account and the Principal Account in the Senior Lien Debt Service Fund (other than the TIFIA Interest Account and the TIFIA Principal Account), the Senior Lien Parity Reserve Account or any Senior Lien Special Reserve Account. Upon the occurrence of a Bankruptcy Related Event, the TIFIA Interest Account, the TIFIA Principal Account and the TIFIA Debt Service Reserve Account will be moved to the Senior Lien Debt Service Fund and funded on a parity with the Interest Account and the Principal Account of the Senior Lien Debt Service Fund, the Senior Lien Parity Reserve Account and any Senior Lien Special Reserve Account in accordance with Sections 503(a) and (c).

*The preceding Section was pursuant to Section 701(d) of the Fourth Supplemental Trust Agreement.*

Section 214. Additional Restrictions. A Senior Lien Resolution, a Subordinate Lien Resolution or a Junior Indebtedness Agreement may establish restrictions and covenants, in addition to those established in this Trust Agreement, including, without limiting the generality of the foregoing, additional restrictions on the incurrence of Indebtedness beyond those set forth in Sections 716 and 717.

*The preceding Section was revised pursuant to Section 701(e) of the Fourth Supplemental Trust Agreement.*

## ARTICLE III

## REDEMPTION

Section 301. Redemption Generally. The Bonds of any Series issued under this Trust Agreement may be made subject to redemption, at such times and prices, as may be provided by the Supplemental Agreement authorizing the issuance of such Bonds.

Section 302. Selection of Bonds or Portions Thereof to be Redeemed. The Bond Registrar shall select the Bonds or portions thereof to be redeemed in accordance with the terms and provisions of this Trust Agreement and the Supplemental Agreement relating to such Bonds.

Section 303. Redemption Notice. The requirements for notice of redemption shall be set forth in the Supplemental Agreement for each Series of Bonds.

Section 304. Effect of Calling for Redemption. On or before the date upon which Bonds are to be redeemed, the Authority shall deposit with the Trustee or Bond Registrar money or Defeasance Obligations, or a combination of both, that will be sufficient to pay on the redemption date the Redemption Price of and interest accruing on the Bonds to be redeemed on such redemption date.

On the date fixed for redemption, notice having been given in the manner and under the conditions hereinabove provided, the Bonds or portions thereof called for redemption shall be due and payable at the Redemption Price provided therefor, plus accrued interest to such date, and if moneys sufficient to pay the Redemption Price of the Bonds or portions thereof to be redeemed plus accrued interest thereon to the date of redemption are held by the Trustee or Bond Registrar in trust for the Owners of Bonds to be redeemed, interest on the Bonds or portions thereof called for redemption shall cease to accrue; such Bonds or portions thereof shall cease to be entitled to any benefits or security under this Trust Agreement or to be deemed Outstanding; and the Owners of such Bonds or portions thereof shall have no rights in respect thereof except to receive payment of the Redemption Price thereof, plus accrued interest to the date of redemption.

Bonds and portions of Bonds for which irrevocable instructions to pay on one or more specified dates or to call for redemption on anyone or more dates as determined by the Authority have been given to the Trustee or Bond Registrar in form satisfactory to it shall not thereafter be deemed to be Outstanding under this Trust Agreement and shall cease to be entitled to the security of or any rights under this Trust Agreement, and the Owners shall have no rights in respect of the same other than to receive payment of the principal or Redemption Price thereof and accrued interest thereon, to be given notice of redemption in the manner provided in Section 303, and to the extent hereinafter provided, to receive Bonds for any unredeemed portions of Bonds if money or Defeasance Obligations (that have maturity dates or redemption dates which, at the option of the holder of such Defeasance Obligations, shall not be later than the date or dates on which moneys will be required to effect such payment or redemption), or a combination of both, sufficient to pay the principal or Redemption Price of such Bonds or portions thereof, together with accrued interest thereon to the date upon which such Bonds are to be paid or redeemed, are held in separate accounts by the Trustee or Bond Registrar in trust for the Owners of such Bonds.

Any Supplemental Agreement may provide that any notice of redemption, except a notice of redemption in respect of a Sinking Fund Requirement, may state that the redemption to be effected is conditioned upon the receipt by the Trustee or Bond Registrar on or prior to the redemption date of moneys sufficient to pay the principal of and premium, if any, and interest on the Bonds to be redeemed, and



that if such moneys are not so received, such notice shall be of no force or effect and such Bond shall not be required to be redeemed. In the event that such notice contains such a condition and moneys or Defeasance Obligations sufficient to pay the Redemption Price and interest on such Bonds are not received by the Trustee or Bond Registrar on or prior to the redemption date, the redemption shall not be made and the Trustee or Bond Registrar shall within a reasonable time thereafter give notice, in the manner in which the notice of redemption was given, that such moneys were not so received. The Supplemental Agreement may also provide for the giving of notice of insufficient money prior to the redemption date and such other provisions as the Authority may determine.

Section 305. Redemption of a Portion of Bonds. If less than all of an Outstanding Bond is selected for redemption, the Owner thereof or his attorney or legal representative, or legal representative of his estate if the Owner is deceased, shall present and surrender such Bond to the Bond Registrar for payment of the principal amount thereof so called for redemption, and the redemption premium, if any, on such principal amount, and the Authority shall, if necessary, execute and the Bond Registrar shall authenticate and deliver to or upon the order of such Owner or his attorney or legal representative, without charge, for the unredeemed portion of the principal amount of the Bond so surrendered, a new Bond of the same Series and maturity, bearing interest at the same rate and of any denomination or denominations authorized by Supplemental Agreement for such Bond.

Section 306. Cancellation. Bonds presented and surrendered in accordance with the provisions of this Article shall be canceled upon the surrender thereof.

## ARTICLE IV

## PROJECT FUND

Section 401. Project Fund; Initial Deposit to Project Fund. A special fund is hereby established with the Trustee and designated the "North Carolina Turnpike Authority Triangle Expressway Project Fund" and within the Project Fund there are hereby established two special accounts designated the "Initial Project Account" and the "Additional Projects Account," respectively. The proceeds of Bonds to be used for payment of the Costs of the Initial Project shall be deposited by the Trustee in the Initial Project Account. Unless otherwise provided in a Supplemental Agreement, the proceeds of any Series of Bonds to be used for providing any Additional Project shall be deposited upon the delivery of such Series of Bonds into a separate subaccount in the Additional Projects Account to be created by the Supplemental Agreement providing for the issuance of the Bonds financing such Additional Project.

The money in the Project Fund shall be held by the Trustee in trust and, pending application to the payment of the refinancing of, the reimbursement for or

the Costs of the Initial Project or the Cost of any Additional Project, as the case may be, or transfer as provided herein or in the Supplemental Agreement, shall, to the extent permitted by law, be subject to a lien and charge in favor of the Owners of Bonds issued with respect to the Initial Project or Additional Project and Outstanding under this Trust Agreement and the applicable Supplemental Agreement and shall be held for the security of such Owners; provided, however, that any moneys on deposit in the Project Fund allocable to proceeds of TIFIA Indebtedness shall, to the extent permitted by law, be subject to a lien and charge in favor of USDOT as Holder of such TIFIA Indebtedness issued with respect to the Initial Project or Additional Project and Outstanding under this Trust Agreement and the applicable Supplemental Agreement and shall be held for the security of USDOT.

*The preceding paragraph was revised pursuant to Section 701(hh) of the Fourth Supplemental Trust Agreement.*

Upon the execution and delivery of this Trust Agreement, the Authority arranged for an initial deposit with the Trustee of $25,000,000, such amount comprising the State Appropriated Revenues for the State's fiscal year ending June 30, 2009. Such amount was deposited by the Trustee upon receipt to the credit of the Initial Project Account.

Section 402. Payments from Project Fund. Payments to accomplish the refinancing of, the reimbursement for or for the Costs of the Initial Project shall be made from the Initial Project Account and payment of the Costs of any Additional Project shall be made from the applicable subaccount within the Additional Projects Account. All payments from the Project Fund shall be subject to the provisions and restrictions set forth in this Article, and the Authority shall not cause or agree to permit to be paid from the Project Fund any sums except in accordance with such provisions and restrictions.

In order to assure that the Authority will have sufficient funds to provide for the completion of the Triangle Expressway System, including the 2019 Additional Project, NCDOT hereby agrees that in the event the Authority determines the proceeds of debt issued therefor and any investment earnings thereon will not be sufficient for such purpose, NCDOT will deposit to the Additional Projects Account in the Project Fund amounts to make the aggregate therein, when combined with amounts yet to be drawn under the TIFIA Loan Agreement, sufficient for such purpose. In the event that funds from NCDOT are required to complete the Triangle Expressway System, the Authority will provide to NCDOT and USDOT (a) a report by the General Engineering Consultant that the amount to be deposited by NCDOT, together with amounts then available in the Additional Projects Account in the Project Fund and amounts to be drawn under the TIFIA Loan Agreement, if any, will be sufficient to complete the Triangle Expressway System, and (b) such notices, financial information and additional documentation as may be needed or



requested to provide for the timely payment by NCDOT of the amounts needed to complete the Triangle Expressway System. Such payments shall be deposited as received to the Additional Projects Account in the Project Fund and applied to pay Costs of the Triangle Expressway System in accordance with the provisions of this Article IV.

*The preceding paragraph was revised pursuant to Section 701(g) of the Fourth Supplemental Trust Agreement.*

If the proceeds of the Series 2019 Bonds and the TIFIA Series 2019 Bond, with other funds scheduled to be used, and investment earnings thereon, are not sufficient to provide for completion of the 2019 Additional Project, the Authority shall not take any action to issue Completion Indebtedness unless the Authority first takes all actions required to obtain additional funding from NCDOT under the prior paragraph and fails to receive such funding from NCDOT. So long as the TIFIA Series 2019 Bond remains Outstanding, no Completion Indebtedness may be issued for the 2019 Additional Project without the prior consent of USDOT.

*The preceding paragraph was revised pursuant to Section 701(g) of the Fourth Supplemental Trust Agreement.*

Section 403. Cost of Project and Additional Projects. For the purpose of this Trust Agreement, the Costs of the Initial Project or any Additional Project, as the case may be, shall include such costs as are eligible costs within the purview of the Act, and, without intending to limit or restrict any proper definition of such Cost, shall include the following:

(a) obligations incurred for labor, materials, services provided by contractors, builders and materialmen in connection with the construction, acquisition, and equipping of the Initial Project or Additional Projects, machinery and equipment, for the restoration of property damaged or destroyed in connection with such construction and acquisition, for the demolition, removal or relocation of any structures and for the clearing of lands;

(b) interest accruing upon any Bonds prior to the commencement of and during construction or for any additional period as may be authorized by law and provided in the Supplemental Agreement authorizing the issuance of such Bonds;

(c) the cost of acquiring by purchase, and the amount of any award or final judgment in any proceeding to acquire by Eminent Domain, such land, structures and improvements, property, property rights, rights-of-way, franchises, easements and other interests in lands as may be deemed necessary or convenient in connection with such construction or operation of the Triangle Expressway System;

(d) expenses of administration properly chargeable to such construction or acquisition, legal, trustee, architectural and engineering expenses and fees, cost of audits and of preparing and issuing the Bonds, fees and expenses of consultants, financing charges, premiums of insurance in connection with construction, bond insurance premiums, the cost of funding any debt service reserve account requirements, and all other items of expense not elsewhere in this Section specified that are incident to the financing, construction or acquisition of the Initial Project or any Additional Projects and the placing of the same in operation; and

(e) reimbursement of any obligation or expense incurred by the Authority for any of the foregoing purposes prior to the date of delivery of the Bonds, including reimbursement to any Persons for advances made to the Authority, and also including the cost of materials, supplies or equipment furnished by the Authority in connection with the construction of the Initial Project or any Additional Project and paid for by the Authority out of funds other than money in the Project Fund.

Section 404. Requisitions from Project Fund. Payments from the Project Fund shall be made in accordance with the provisions of this Section.

Upon receipt of a requisition of the Authority signed by an Authorized Officer, the Trustee shall pay from the appropriate account or subaccount of the Project Fund to the Authority at one time or from time to time, a sum or sums aggregating at any point in time not more than $500,000 (or such greater or lesser amount as shall be specified in the applicable Supplemental Agreement), exclusive of reimbursements as hereinafter authorized in this Section, to be used by the Authority as a revolving fund for the payment of items of Cost referred to in Section 403 which cannot conveniently be paid as herein otherwise provided in this Section. Such money shall be deemed to be a part of the Project Fund until paid out by the Trustee. The Trustee shall apply money in the Project Fund to reimburse the revolving fund from time to time for items of Cost paid with money in the revolving fund upon receipt of a requisition, in substantially the form set forth in Exhibit A, signed by an Authorized Officer for reimbursement of items of Cost referred to in Section 403, which requisition (1) shall specify the amount and the purpose by general classification of each payment from the revolving fund for which such reimbursement is requested and state that each such item of cost so paid was a necessary item of Cost within Section 403, was not previously requisitioned and was a proper charge against the Project Fund and (2) shall make the certifications required by (f) and (g) below.

Upon request of the Authority, the Trustee shall pay Costs directly from the Project Fund, but before any payment shall be made there shall be filed with the Trustee a requisition, in substantially the form set forth in Exhibit A, signed by an Authorized Officer, stating:

(a) the Requisition number;



(b) the name of the person to whom such payment is due;

(c) the amount to be paid;

(d) the purpose for which the obligation to be paid was incurred;

(e) that the obligation in the stated amount has been incurred by the Authority, is presently due and payable and is a proper charge against the Project Fund that has not been paid;

(f) that no notice of any lien, right to lien or attachment upon, or claim affecting the right of any such Person to receive payment of, the amount stated in such requisition has been filed or attached or, if any of the foregoing has been filed or attached, that the same either has been or will be satisfied or discharged or that provisions have been made (which shall be specified) to protect adequately the Trustee and the Owners from incurring any loss as a result of the same;

(g) that such requisition contains no item representing payment on account of any retainage to which the Authority is entitled at the date of such requisition;

(h) the account or subaccount from which such Cost shall be paid; and

(i) to the extent that such requisition contains any payment of the purchase price or cost of any lands, property, property rights, rights-of-way, easements, franchises or interests in or relating to lands, that such lands, property, property rights, rights-of-way, easements, franchises or interests are being acquired by the Authority in furtherance of the construction or acquisition of the Initial Project or any Additional Project.

Upon receipt of each requisition, the Trustee shall pay the obligations set forth in such requisition out of money in the applicable account or subaccount in the Project Fund, and each such obligation shall be paid by check or wire transfer. If for any reason the Authority should decide prior to the payment of any item in a requisition not to pay such item, it shall give written notice of such decision to the Trustee, and thereupon the Trustee shall not make such payment.

Notwithstanding the remainder of this Section, when amounts being requisitioned are from the proceeds of the TIFIA Loan Agreement, such amounts may be requisitioned by the Authority from the Initial Project Account or the Additional Projects Account, as applicable, by filing copies of the evidence submitted to the TIFIA Lender for approval of such disbursement under the TIFIA Loan Agreement.

*The preceding paragraph was revised pursuant to Section 701(t) of the Fourth Supplemental Trust Agreement.*

Section 405. Reliance upon Requisitions. All requisitions, opinions and notices received by the Trustee as conditions of payment from the Project Fund may be relied upon by the Trustee. Such requisitions, opinions and notices shall be retained by the Trustee for so long as the Bonds are Outstanding and shall be subject at all reasonable times to examination by the Authority and the Owners of Bonds then Outstanding.

Section 406. Progress Reports. The Authority covenants that at least quarterly during the construction of the Initial Project and any Additional Project, it will cause a General Engineering Consultant to prepare a progress report in connection with such construction with respect to:

(a) the date on which the Initial Project or such Additional Project, as the case may be, is expected to be opened for traffic unless such project has been opened for traffic prior to the date of such report;

(b) the date on which the construction of the Initial Project or such Additional Project, as the case may be, is expected to be substantially completed; and

(c) the amount of funds required each six months during the remaining estimated period of construction to pay the Costs of the Initial Project or Additional Project, as the case may be, exclusive of construction contingencies, and accompanied by a progress schedule for such construction, and further including, as to construction, comparisons between actual times elapsed and the actual costs and the original estimates of such time and costs.

A copy of such report shall be filed with the Trustee, provided to any Owner who requests a copy thereof and, upon the request of the Local Government Commission, filed with the Local Government Commission.

Section 407. Completion of Initial Project or any Additional Project and Disposition of Project Fund Balance. The Completion Date for the Initial Project or any Additional Project, or any segment thereof, shall be evidenced to the Trustee by an Officer's Certificate (a) setting forth the Cost of the Initial Project or the Additional Project, or such segment, whichever is applicable, and stating that, except for amounts not then due and payable or the liability for the payment of which is being contested or disputed by the Authority, which amounts shall be set forth in such Officer's Certificate, all costs and expenses incurred in connection therewith have been paid, and (b) stating that (i) the acquisition, construction and equipping of the Initial Project or the Additional Project, or such segment, whichever is applicable, have been completed substantially in accordance with the plans and specifications therefor and the Cost of the same has been paid and (ii) all other facilities necessary in connection with the Additional Project, or such segment, have been acquired, constructed and installed in accordance with the



plans and specifications therefor. Notwithstanding the foregoing, such certificate shall state that it is given without prejudice to any rights against third parties that exist at the date of such certificate or that may subsequently come into being. The Authority shall supply such certificate within sixty (60) days after the facts justifying such certification exist.

Upon the later of (a) the receipt of such certificate or (b) the date of final disbursement of the TIFIA Loan (as defined in the TIFIA 2019 Loan Agreement), the Trustee shall withdraw all money then remaining in the relevant account or subaccount in the Project Fund in excess of the amount then needed for completion of the remainder of the Initial Project or the Additional Project and apply the same, subject to Section 604, upon direction of the Authority, to the Restricted Account of the General Reserve Fund or to the Senior Lien Debt Service Fund.

*The preceding paragraph was revised pursuant to Section 701(u) of the Fourth Supplemental Trust Agreement.*

Section 408. Application of Proceeds of TIFIA Indebtedness. Proceeds of TIFIA Indebtedness shall be applied to pay costs of the Triangle Expressway System in accordance with the terms of the TIFIA Loan Agreement. The Authority shall submit requisitions and such supporting documentation as shall be required by the TIFIA Loan Agreement in order to assure that proceeds of the TIFIA Indebtedness, together with other available funds, shall be available to pay such costs as the same are required to be funded.

## ARTICLE V

## RECEIPTS AND FUNDS

Section 501. Establishment of Funds. In addition to the Project Fund, there are hereby established the following funds:

(a) North Carolina Turnpike Authority Triangle Expressway Revenue Fund;

(b) North Carolina Turnpike Authority Triangle Expressway Senior Lien Debt Service Fund, in which there are established seven special accounts to be known as the Capitalized Interest Account, the Interest Account, the Principal Account, the Sinking Fund Account, the Redemption Account, the Senior Lien Parity Reserve Account and the Hedging Acquisition Account, provided that, if a Bankruptcy Related Event has occurred, the TIFIA Interest Account, the TIFIA Principal Account and the TIFIA Debt Service Reserve Account shall be moved to the Senior Lien Debt Service Fund;

(c) North Carolina Turnpike Authority Triangle Expressway Subordinate Lien Debt Service Fund, in which there are established six special accounts to be

known as the Capitalized Interest Account, the Interest Account, the Principal Account, the Sinking Fund Account, the Redemption Account and the Subordinate Lien Parity Reserve Account;

(d) North Carolina Turnpike Authority Triangle Expressway Renewal and Replacement Fund;

(e) North Carolina Turnpike Authority Triangle Expressway Junior Indebtedness Debt Service Fund, in which there are established six special accounts to be known as the Interest Account, the Principal Account, the Junior Indebtedness Debt Service Reserve Account, the TIFIA Interest Account, the TIFIA Principal Account and the TIFIA Debt Service Reserve Account, provided that, if a Bankruptcy Related Event has occurred, the TIFIA Interest Account, the TIFIA Principal Account and the TIFIA Debt Service Reserve Account shall be moved to the Senior Lien Debt Service Fund;

*The preceding subsection was revised pursuant to Section 701(w) of the Fourth Supplemental Trust Agreement.*

(f) North Carolina Turnpike Authority Triangle Expressway Operations and Maintenance Expense Fund;

(g) North Carolina Turnpike Authority Triangle Expressway Operating Reserve Fund;

(h) North Carolina Turnpike Authority Triangle Expressway General Reserve Fund, in which there are established two accounts to be known as the Restricted Account and the Unrestricted Account; and

*The preceding subsection was revised pursuant to Section 701(ii) of the Fourth Supplemental Trust Agreement.*

(i) North Carolina Turnpike Authority Triangle Expressway Insurance and Condemnation Award Fund.

The Revenue Fund, the Senior Lien Debt Service Fund, the Subordinate Lien Debt Service Fund, the Junior Indebtedness Debt Service Fund, the Renewal and Replacement Fund and the General Reserve Fund and the accounts and subaccounts therein and the Insurance and Condemnation Award Fund shall be established with and held by the Trustee. The Operations and Maintenance Expense Fund and the Operating Reserve Fund shall be established with and held by a Depositary selected by the Authority.

A Senior Lien Resolution may provide for the creation of a Senior Lien Special Reserve Account for the Senior Lien Indebtedness authorized by such Senior Lien Resolution and for the deposit of moneys to and withdrawal of moneys from



such Account. A Senior Lien Special Reserve Account created for any Series of Bonds shall be held and maintained by the Trustee; provided, however, that if a Series of Bonds is placed with the purchaser thereof and not publicly offered, then such purchaser or a Depositary may hold the Senior Lien Special Reserve Account created for such Senior Lien Indebtedness as provided for in the Senior Lien Resolution authorizing such Senior Lien Indebtedness.

A Subordinate Lien Resolution may provide for the creation of a Subordinate Lien Special Reserve Account for the Subordinate Lien Indebtedness authorized by such Subordinate Lien Resolution and for the deposit of moneys to and withdrawal of moneys from such Account. A Subordinate Lien Special Reserve Account created for any Series of Bonds shall be held and maintained by the Trustee; provided, however, that if a Series of Bonds is placed with the purchaser thereof and not publicly offered, then such purchaser or a Depositary may hold the Subordinate Lien Special Reserve Account created for such Subordinate Lien Indebtedness as provided for in the Subordinate Lien Resolution authorizing such Subordinate Lien Indebtedness.

A Junior Indebtedness Agreement may provide for the creation of a Junior Indebtedness special debt service reserve account for the Junior Indebtedness authorized by such Junior Indebtedness Agreement and for the deposit of moneys to and withdrawal of moneys from such account. Additional provisions with respect to such account shall be set forth in the Junior Indebtedness Agreement.

A Senior Lien Resolution may also provide for the creation of such other funds and accounts, as the Authority may determine, for the Senior Lien Indebtedness authorized by such Senior Lien Resolution. A Subordinate Lien Resolution may also provide for the creation of such other funds and accounts, as the Authority may determine, for the Subordinate Lien Indebtedness authorized by such Subordinate Lien Resolution. A Junior Indebtedness Agreement may also provide for the creation of such other funds and accounts, as the Authority may determine, for the Junior Indebtedness authorized thereby.

The money in all of the funds, accounts and subaccounts established with and held by the Trustee pursuant to this Article shall be held in trust and applied as hereinafter provided and, pending such application, the money in such funds, accounts and subaccounts therein shall be subject to a pledge, charge and lien in favor of the Owners of the respective Series of Bonds issued and Outstanding under this Trust Agreement and for the further security of such Owners, except as otherwise provided herein or in any Supplemental Agreement.

Each Supplemental Agreement shall provide, to the extent applicable, for the creation of a separate subaccount within the Capitalized Interest Account, the Interest Account, the Principal Account, the Redemption Account and the Sinking Fund Account of the Senior Lien Debt Service Fund, the Subordinate Lien Debt

Service Fund or the Junior Indebtedness Debt Service Fund, as the case may be, with respect to each Series of Bonds or any TIFIA Indebtedness, which subaccounts shall bear the designation of such Series of Bonds or TIFIA Indebtedness. A Supplemental Agreement for Senior Lien Bonds may provide that such Senior Lien Bonds authorized thereby may be additionally secured by the Senior Lien Parity Reserve Account or a Senior Lien Special Reserve Account or it may provide that there shall not be any debt service reserve fund in respect of such Series of Bonds. If a Series of Senior Lien Bonds is secured by a Senior Lien Special Reserve Account or is not secured by any debt service reserve fund, such Series of Senior Lien Bonds shall have no claim on the Senior Lien Parity Reserve Account or any other Senior Lien Special Reserve Account established for other Senior Lien Indebtedness. A Supplemental Agreement for Subordinate Lien Bonds may provide that such Subordinate Lien Bonds authorized thereby may be additionally secured by the Subordinate Lien Parity Reserve Account or a Subordinate Lien Special Reserve Account or it may provide that there shall not be any debt service reserve fund in respect of such Series of Bonds. If a Series of Subordinate Lien Bonds is secured by a Subordinate Lien Special Reserve Account or is not secured by any debt service reserve fund, such Series of Subordinate Lien Bonds shall have no claim on the Subordinate Lien Parity Reserve Account or any other Subordinate Lien Special Reserve Account established for other Subordinate Lien Indebtedness. A Supplemental Agreement for TIFIA Indebtedness may provide that such TIFIA Indebtedness authorized thereby may be additionally secured by the TIFIA Debt Service Reserve Account or it may provide that there shall not be any debt service reserve fund in respect of such TIFIA Indebtedness. TIFIA Indebtedness shall have no claim on the Junior Indebtedness Debt Service Reserve Account.

Each Parity Debt Resolution for Senior Lien Parity Debt may provide for the creation of such funds and accounts as it may determine, including, without limiting the generality of the foregoing, an account for the payment of interest as mentioned in Section 503(a), an account or accounts for the payment of principal, whether at maturity or pursuant to an amortization requirement, as mentioned in Section 503(b). A Parity Debt Resolution for Senior Lien Parity Debt may provide that the Senior Lien Parity Debt authorized thereby may be additionally secured by the Senior Lien Parity Reserve Account or a Senior Lien Special Reserve Account or it may provide that there shall not be any debt service reserve account in respect of such Senior Lien Parity Debt. If Senior Lien Parity Debt is secured by a Senior Lien Special Reserve Account or is not secured by any debt service reserve account, such Senior Lien Parity Debt shall have no claim on the Senior Lien Parity Reserve Account.

Each Parity Debt Resolution for Subordinate Lien Parity Debt may provide for the creation of such funds and accounts as it may determine, including, without limiting the generality of the foregoing, an account for the payment of interest as mentioned in Section 503(d), an account or accounts for the payment of principal, whether at maturity or pursuant to an amortization requirement, as mentioned in



Section 503(e). A Parity Debt Resolution for Subordinate Lien Parity Debt may provide that the Subordinate Lien Parity Debt authorized thereby may be additionally secured by the Subordinate Lien Parity Reserve Account or a Subordinate Lien Special Reserve Account or it may provide that there shall not be any debt service reserve account in respect of such Subordinate Lien Parity Debt. If Subordinate Lien Parity Debt is secured by a Subordinate Lien Special Reserve Account or is not secured by any debt service reserve account, such Subordinate Lien Parity Debt shall have no claim on the Subordinate Lien Parity Reserve Account.

Each Junior Indebtedness Agreement may provide for the creation of such funds and accounts as it may determine, including, without limiting the generality of the foregoing, an account for the payment of interest and an account or accounts for the payment of principal, whether at maturity or pursuant to an amortization requirement. A Junior Indebtedness Agreement may provide that the Junior Indebtedness (other than TIFIA Indebtedness) authorized thereby may be additionally secured by the Junior Indebtedness Debt Service Reserve Account or a Junior Indebtedness special debt service reserve account or it may provide that there shall not be any debt service reserve account in respect of such Junior Indebtedness. If Junior Indebtedness is secured by a Junior Indebtedness special debt service reserve account or is not secured by any debt service reserve account, such Junior Indebtedness shall have no claim on the Junior Indebtedness Debt Service Reserve Account.

The Authority shall provide to the Trustee a certified or otherwise authentic copy of each Parity Debt Resolution, each Junior Indebtedness Agreement and each Derivative Agreement adopted or entered into by the Authority and shall otherwise provide the Trustee with such information and documents as the Trustee shall request to assure that the Trustee is advised of the payments to be made pursuant to such Parity Debt Resolutions, Junior Indebtedness Agreements and Derivative Agreements as provided in Section 503.

*The preceding paragraphs following subsection (i) above were revised and expanded pursuant to Section 701(jj) of the Fourth Supplemental Trust Agreement.*

Section 502. Funds Received by the Authority. Except as otherwise expressly provided for herein, all Receipts shall be deposited on a daily basis when received in the Revenue Fund.

All Derivative Agreement Regularly Scheduled Payments received by the Authority shall be deposited in the Revenue Fund upon receipt. Any Derivative Agreement Additional Payments received by the Authority from any counterparty under a Derivative Agreement shall be deposited in the General Reserve Fund upon receipt. The Authority shall provide the Trustee with written schedules of all

Derivative Agreement Regularly Scheduled Payments prior to any such deposits in the Reserve Fund.

The Authority is issuing the State Appropriation Revenue Bonds pursuant to the State Appropriation Revenue Bond Trust Agreement to pay certain Costs of the Triangle Expressway System not being funded with the proceeds of Bonds and Parity Debt issued hereunder. Pursuant to the State Appropriation Revenue Bond Trust Agreement, the Authority has provided that all State Appropriated Revenues shall be deposited as received in the Revenue Fund of the State Appropriation Revenue Bond Trust Agreement to be used to pay principal and interest on the State Appropriation Revenue Bonds. The State Appropriation Revenue Bond Trust Agreement further provides that amounts in excess of the amount needed to pay such debt service is to be withdrawn from the State Appropriation Revenue Bond Trust Agreement and deposited to the Revenue Fund hereunder. Upon such deposit, but not prior to such deposit, such State Appropriated Revenues shall constitute "Revenues" and "Receipts" for all purposes of this Trust Agreement including being subject to the lien and pledge of the Trust Estate as provided herein.

In order to assure that the Authority will have sufficient funds to pay Operating Expenses as the same become due, the Authority and NCDOT have entered into the O&M Guaranty Agreement, pursuant to which NCDOT has agreed to provide additional funding for the deposits to be made to the Operating Reserve Fund in the event the Receipts are not sufficient to make the deposits thereto as provided in Section 503(k). In the event that funds from NCDOT are required to make the deposit to the Operating Reserve Fund, the Authority will provide such notices, financial information and additional documentation to NCDOT as may be needed or requested by NCDOT to provide for the timely payment by NCDOT of the amounts needed to fund such deposit. Such payments shall be deposited as received to the Operating Reserve Fund and applied as provided in Section 511.

*In the preceding paragraph, a cross reference to a subsection of Section 503 was modified pursuant to Section 701(b) of the Third Supplemental Trust Agreement.*

In order to assure that the Authority will have sufficient funds to maintain the quality and sustainability of the Triangle Expressway System, the Authority and NCDOT have entered into the Construction and Renewal and Replacement Agreement, pursuant to which NCDOT has agreed to provide additional funding for the deposits to be made to the Renewal and Replacement Fund in the event the Receipts are not sufficient to make the deposits thereto as provided in Section 503(l). In the event that funds from NCDOT are required to make the deposit to the Renewal and Replacement Fund, the Authority will provide such notices, financial information and additional documentation to NCDOT as may be needed or requested to NCDOT to provide for the timely payment by NCDOT of the



amounts needed to fund the deposit. Such payments shall be deposited as received to the Renewal and Replacement Fund and applied as provided in Section 512.

*In the preceding paragraph, a cross reference to a subsection of Section 503 was modified pursuant to Section 701(b) of the Third Supplemental Trust Agreement.*

Section 503. Application of Money in Revenue Fund. On the last Business Day of each month, the Trustee shall withdraw all Receipts and other amounts held in the Revenue Fund and apply the same in the following manner and order:

(a) (1) for deposit in the appropriate subaccounts of the Interest Account of the Senior Lien Debt Service Fund (including the TIFIA Interest Account if a Bankruptcy Related Event has occurred) an amount equal to the amount of interest payable on each Series of Senior Lien Bonds on the next Interest Payment Date for each such Series of Senior Lien Bonds (if such Interest Payment Date is within seven months of such deposit) divided by the number of deposits to be made to such subaccounts with respect to interest on such Senior Lien Bonds on or prior to the next Interest Payment Date for each such Series of Senior Lien Bonds; (2) to the Persons entitled thereto an amount equal to the amount of interest payable on each issue of Senior Lien Parity Debt on the next Interest Payment Date for each such issue of Senior Lien Parity Debt (if such Interest Payment Date is within seven months of such payment) divided by the number of such payments to be made to such Persons with respect to interest on such Senior Lien Parity Debt on or prior to the next Interest Payment Date for each such issue of Senior Lien Parity Debt; and (3) to the Persons entitled thereto the amount of any Senior Lien Derivative Agreement Regularly Scheduled Payments required by a Derivative Agreement to be paid by the Authority on or prior to the last Business Day of the next succeeding month; provided, however, that if there shall not be sufficient Receipts to satisfy all such deposits and payments, such deposits and payments shall be made to the Trustee and to each appropriate Person designated in such Senior Lien Parity Debt Resolutions or Derivative Agreements ratably according to the amount so required to be deposited or paid;

*The preceding subsection was revised pursuant to Section 701(x) of the Fourth Supplemental Trust Agreement.*

(b) (1) for deposit in the appropriate subaccounts of the Principal Account (including the TIFIA Principal Account if a Bankruptcy Related Event has occurred) and the Sinking Fund Account of the Senior Lien Debt Service Fund an amount equal to the amount of Principal payable on each Series of Senior Lien Bonds on the next Principal Payment Date for each such Series of Senior Lien Bonds (if such Principal Payment Date is within thirteen months of such deposit) divided by the number of deposits to be made to such subaccounts with respect to Principal on such Senior Lien Bonds on or prior to the next Principal Payment Date for each

such Series of Senior Lien Bonds; and (2) to the Persons entitled thereto an amount equal to the amount of Principal payable on each issue of Senior Lien Parity Debt on the next Principal Payment Date for each such issue of Senior Lien Parity Debt (if such Principal Payment Date is within thirteen months of such payment) divided by the number of such payments to be made to such Persons with respect to Principal on such Senior Lien Parity Debt on or prior to the next Principal Payment Date for each such issue of Senior Lien Parity Debt; provided, however, that if there shall not be sufficient Receipts to satisfy all such deposits and payments, such deposits and payments shall be made to the Trustee and to each appropriate Person designated in such Senior Lien Parity Debt Resolutions ratably according to the amount so required to be deposited or paid;

*The preceding subsection was revised pursuant to Section 701(y) of the Fourth Supplemental Trust Agreement.*

(c) if the amount in the Senior Lien Parity Reserve Account is less than the Senior Lien Parity Reserve Account Requirement, the amount in any Senior Lien Special Reserve Account is less than the applicable Senior Lien Special Reserve Account Requirement or, if a Bankruptcy Related Event has occurred, the TIFIA Debt Service Reserve Account is less than the TIFIA Debt Service Reserve Account Requirement, (1) one-twelfth (1/12) of the amount required to make up any deficiency in the Senior Lien Parity Reserve Account as provided in Section 507 for deposit in the Senior Lien Parity Reserve Account, (2) to the Trustee or other Person holding a Senior Lien Special Reserve Account, one-twelfth (1/12) of the amount required to make up any deficiencies in any Senior Lien Special Reserve Account as provided in the Supplemental Agreement or Parity Debt Resolution creating any Senior Lien Special Reserve Accounts for deposit in such Senior Lien Special Reserve Accounts and (3) if a Bankruptcy Related Event has occurred, one-twelfth (1/12) of the amount required to make up any deficiency in the TIFIA Debt Service Reserve Account for deposit in the TIFIA Debt Service Reserve Account; provided, however, that if there shall not be sufficient Receipts to satisfy all such deposits and payments, such deposits and payments shall be made for deposit to the Senior Lien Parity Reserve Account, each Senior Lien Special Reserve Account and, if a Bankruptcy Related Event has occurred, the TIFIA Debt Service Reserve Account ratably according to the amount so required to be deposited or paid;

*The preceding subsection was revised pursuant to Section 701(kk) of the Fourth Supplemental Trust Agreement.*

(d) (1) for deposit in the appropriate subaccounts of the Interest Account of the Subordinate Lien Debt Service Fund an amount equal to the amount of interest payable on each Series of Subordinate Lien Bonds on the next Interest Payment Date for each such Series of Subordinate Lien Bonds (if such Interest Payment Date is within seven months of such deposit) divided by the number of deposits to be made to such subaccounts with respect to interest on such Subordinate Lien Bonds



on or prior to the next Interest Payment Date for each such Series of Subordinate Lien Bonds; (2) to the Persons entitled thereto an amount equal to the amount of interest payable on each issue of Subordinate Lien Parity Debt on the next Interest Payment Date for each such issue of Subordinate Lien Parity Debt (if such Interest Payment Date is within seven months of such payment) divided by the number of such payments to be made to such Persons with respect to interest on such Subordinate Lien Parity Debt on or prior to the next Interest Payment Date for each such issue of Subordinate Lien Parity Debt; and (3) to the Persons entitled thereto the amount of any Subordinate Lien Derivative Agreement Regularly Scheduled Payments required by a Derivative Agreement to be paid by the Authority on or prior to the last Business Day of the next succeeding month; provided, however, that if there shall not be sufficient Receipts to satisfy all such deposits and payments, such deposits and payments shall be made to the Trustee and to each appropriate Person designated in such Subordinate Lien Parity Debt Resolutions or Derivative Agreements ratably according to the amount so required to be deposited or paid;

(e) (1) for deposit in the appropriate subaccounts of the Principal Account and the Sinking Fund Account of the Subordinate Lien Debt Service Fund an amount equal to the amount of Principal payable on each Series of Subordinate Lien Bonds on the next Principal Payment Date for each such Series of Subordinate Lien Bonds (if such Principal Payment Date is within thirteen months of such deposit) divided by the number of deposits to be made to such subaccounts with respect to Principal on such Subordinate Lien Bonds on or prior to the next Principal Payment Date for each such Series of Subordinate Lien Bonds; and (2) to the Persons entitled thereto an amount equal to the amount of Principal payable on each issue of Subordinate Lien Parity Debt on the next Principal Payment Date for each such issue of Subordinate Lien Parity Debt (if such Principal Payment Date is within thirteen months of such payment) divided by the number of such payments to be made to such Persons with respect to Principal on such Subordinate Lien Parity Debt on or prior to the next Principal Payment Date for each such issue of Subordinate Lien Parity Debt; provided, however, that if there shall not be sufficient Receipts to satisfy all such deposits and payments, such deposits and payments shall be made to the Trustee and to each appropriate Person designated in such Subordinate Lien Parity Debt Resolutions ratably according to the amount so required to be deposited or paid;

(f) if the amount in the Subordinate Lien Parity Reserve Account is less than the Subordinate Lien Parity Reserve Account Requirement or the amount in any Subordinate Lien Special Reserve Account is less than the applicable Subordinate Lien Special Reserve Account Requirement, (1) one-twelfth (1/12) of the amount required to make up any deficiency in the Subordinate Lien Parity Reserve Account as provided in the Supplemental Agreement or Parity Debt Resolution providing for the initial funding of the Subordinate Lien Parity Reserve Account for deposit in the Subordinate Lien Parity Reserve Account and (2) to the

Trustee or other Person holding a Subordinate Lien Special Reserve Account, one-twelfth (1/12) of the amount required to make up any deficiencies in any Subordinate Lien Special Reserve Account as provided in the Supplemental Agreement or Parity Debt Resolution creating any Senior Lien Special Reserve Account for deposit in such Subordinate Lien Special Reserve Accounts; provided, however, that if there shall not be sufficient Receipts to satisfy all such deposits and payments, such deposits and payments shall be made for deposit to the Subordinate Lien Parity Reserve Account and each Subordinate Lien Special Reserve Account ratably according to the amount so required to be deposited or paid;

(g) to the credit of the Junior Indebtedness Debt Service Fund, an amount (in equal monthly installments) equal to the sum of (i) the amount of interest payable on any Outstanding Junior Indebtedness on the next Interest Payment Date for such Junior Indebtedness and (ii) principal as due pursuant to the applicable Junior Indebtedness Agreement(s), provided that, with respect to any TIFIA Indebtedness, if no Bankruptcy Related Event has occurred, there shall be transferred the following amounts (in equal monthly installments) with respect to such TIFIA Indebtedness and in the following order of priority (w) to the TIFIA Interest Account, the interest portion of TIFIA Mandatory Debt Service then due (or the accrual of appropriate amounts in advance thereof), (x) to the TIFIA Principal Account, the principal portion of TIFIA Mandatory Debt Service then due (or the accrual of appropriate amounts in advance thereof), (y) to the TIFIA Interest Account, the interest portion of the TIFIA Scheduled Debt Service then due, and (z) to the TIFIA Principal Account, the principal portion of the TIFIA Scheduled Debt Service then due;

*Subsection (g) was revised pursuant to Section 701(a) of the Third Supplemental Trust Agreement and further revised pursuant to Section 701(ll) of the Fourth Supplemental Trust Agreement.*

(h) (1) if the amount in the Junior Indebtedness Debt Service Reserve Account is less than the Junior Indebtedness Debt Service Reserve Account Requirement, to the credit of the Junior Indebtedness Debt Service Reserve Account, one-twelfth (1/12) of the amount required to make up any deficiency in the Junior Indebtedness Debt Service Reserve Account and (2) if no Bankruptcy Related Event has occurred and the amount in the TIFIA Debt Service Reserve Account is less than the TIFIA Debt Service Reserve Account Requirement, to the credit of the TIFIA Debt Service Reserve Account, one-sixth (1/6) of the amount required to make up any deficiency in the TIFIA Debt Service Reserve Account for deposit in the TIFIA Debt Service Reserve Account, provided that, if there shall not be sufficient Receipts to satisfy all such deposits and payments, such deposits and payments shall be made for deposit to the Junior Indebtedness Debt Service Reserve Account and the TIFIA Debt Service Reserve Account ratably according to the amount so required to be deposited or paid;



*Subsection (h) was revised pursuant to Section 701(z) of the Fourth Supplemental Trust Agreement.*

(i) to a Bond Insurer for Insured Bonds, including the Series 2017 Bond Insurer, the Series 2018 Bond Insurer and the Series 2019 Bond Insurer, any fees and interest, including Excess Interest, due to such Bond Insurer in excess of the amount of principal and interest paid by it with respect to such Insured Bonds, to any provider of a Reserve Alternative Instrument, including the Series 2017 Debt Service Reserve Policy, the Series 2018 Debt Service Reserve Policy and the Series 2019 Debt Service Reserve Policy, any fees and interest payable to such provider in excess of the amount paid to it from the applicable Senior Lien Parity Reserve Account, Senior Lien Special Reserve Account, Subordinate Lien Parity Reserve Account or Subordinate Lien Special Reserve Account, and to any Credit Provider of a Credit Facility other than a Bond Insurance Policy or a Reserve Alternative Instrument, any fees and interest payable to such Credit Provider in excess of the amount paid to it directly or indirectly from subsection (a) through (h) above, provided that, to the extent there are insufficient amounts available pursuant to this subsection for all amounts due hereunder, amounts due relating to Senior Lien Bonds shall be paid first;

*Subsection (i) was revised pursuant to Section 701(ooo) of the Fourth Supplemental Trust Agreement.*

(j) to the credit of the Hedging Acquisition Account, one-twelfth (1/12) of the amount, to be deposited in the Fiscal Year to the Hedging Acquisition Account so that the Account equals the current Hedging Acquisition Account Requirement;

(k) to the credit of the Operations and Maintenance Expense Fund, an amount equal to the next succeeding month's budgeted Operating Expenses as set forth in the Annual Budget;

(l) to the credit of the Operating Reserve Fund, such amount as necessary so that the balance equals the Operating Reserve Fund Requirement;

(m) to the credit of the Renewal and Replacement Fund, such amount as necessary so that the balance equals the Renewal and Replacement Fund Requirement;

(n) subject to the provision set forth in the third paragraph following subsection (p) below, to NCDOT, the Guarantee Repayments;

(o) for so long as the TIFIA Series 2019 Bond remains Outstanding, in the event that the Authority has failed to comply with the Rate Coverage Test set forth in Section 16(m)(i) of the TIFIA 2019 Loan Agreement for thirty (30) consecutive months, to the mandatory prepayment of the TIFIA Series 2019 Bond and any

Senior Lien Indebtedness in accordance with the Special Redemption Arrangement; and

(p) after all deposits are made in accordance with subsections (a) through (o) above, any remaining moneys shall be deposited in the General Reserve Fund, provided, however, that for so long as the TIFIA Series 2019 Bond is Outstanding, all remaining moneys shall be deposited in accordance with the requirements of Section 514(b).

*Subsections (h) through (o) were added and revised pursuant to Section 702(d) of the Third Supplemental Trust Agreement. Subsections (l), (m), (n) and (o) were revised and subsection (p) was added pursuant to Section 701(mm) of the Fourth Supplemental Trust Agreement.*

The Authority shall provide to the Trustee such certifications, documentation, agreements and other information as may be necessary for the Trustee to determine the amounts required to be deposited or paid as provided above in this Section.

With respect to any deposits or credits due pursuant to subsections (g) through (p) above, the Authority shall provide the Trustee with specific written direction as to the amounts to be paid or credited to such accounts, and the Trustee shall be permitted to conclusively rely on such direction by the Authority.

*The preceding paragraph was revised pursuant to Section 701(ppp) of the Fourth Supplemental Trust Agreement.*

With respect to the mandatory prepayments required by paragraph (o) above, the Authority shall provide to USDOT a certificate demonstrating satisfaction of the requirements for such prepayment set forth in Section 8(d) of the TIFIA 2019 Loan Agreement.

*The preceding paragraph was added pursuant to Section 701(nn) of the Fourth Supplemental Trust Agreement.*

There shall be credited against the amounts required to be deposited or paid as provided in subsection (a) and (d) above any amounts transferred or to be transferred from the Capitalized Interest Account of the Senior Lien Debt Service Fund or the Subordinate Lien Debt Service Fund or otherwise set aside for payment of interest on Bonds or Parity Debt, all as may be provided in a Supplemental Agreement or a Parity Debt Resolution.

On or before the 45th day next preceding any date on which Serial Bonds are to mature or Term Bonds are to be redeemed pursuant to Sinking Fund Requirements therefor or are to mature, the Authority may satisfy all or a portion of its obligation to make the payments required by subsections (a)(1) and (b)(1) or by



subsections (d)(1) and (e)(1) of this Section by delivering to the Trustee Serial Bonds maturing or Term Bonds maturing or required to be redeemed on such date. The price paid to purchase any such Bond, including accrued interest to the date of purchase, shall not exceed the principal or Redemption Price plus accrued interest to the date of purchase. Upon such delivery, the Authority shall receive a credit against amounts required to be deposited into the Interest Account, the Principal Account or Sinking Fund Account, as the case may be, on account of such Bonds with respect to all interest payments for the remainder of the Fiscal Year and in the amount of 100% of the principal amount of any such Serial Bonds or Term Bonds so delivered.

On or before the 45th day next preceding any date on which Parity Debt is to mature or is to be redeemed pursuant to an amortization requirement, the Authority may satisfy all or a portion of its obligation to make the payments required by subsections (a)(2) and (b)(2) or by subsections (d)(2) and (e)(2) of this Section by delivering to the Trustee Parity Debt maturing or required to be so redeemed on such date. The price paid to purchase any such Parity Debt, including accrued interest to the date of purchase, shall not exceed the principal or Redemption Price plus accrued interest to date of purchase. Upon such delivery, the Authority shall receive a credit against amounts required to be deposited or paid with respect to interest or principal on account of such Parity Debt with respect to all interest payments for the remainder of the Fiscal Year and in the amount of 100% of the principal amount of any such Parity Debt so delivered.

Section 504. Application of Money in Interest Accounts and Capitalized Interest Accounts. Not later than 10:00 A.M. on each Interest Payment Date, date for the payment of Defaulted Interest or date upon which Bonds are to be redeemed, or on such other date as may be specified in the applicable Supplemental Agreement, the Trustee shall withdraw from the applicable subaccount in the respective Interest Accounts and wire transfer to the Bond Registrar, in federal reserve or other immediately available funds, the amounts required for paying interest on the respective Bonds on such Interest Payment Date. The Bond Registrar shall remit or otherwise set aside the amount due and payable to the Owners as provided in the Supplemental Agreements.

Unless otherwise provided by a Supplemental Agreement, on the date of issuance of any Series of Bonds, an Authorized Officer shall deliver to the Trustee a schedule of transfers to be made from the applicable subaccount in the respective Capitalized Interest Accounts to the applicable subaccount of the respective Interest Accounts. The Trustee shall make such transfers as required by the schedule of an Authorized Officer.

If the Authority fails to deposit with the Trustee the amounts required to be deposited in the applicable subaccount of the respective Interest Accounts as provided in Section 503, or if the balance in the applicable subaccount of the

respective Interest Accounts on the Business Day next preceding an Interest Payment Date is insufficient to pay interest coming due on the Bonds or any Junior Indebtedness on such Interest Payment Date, the Trustee shall notify the Authority of the amount of the deficiency and request the Authority to immediately cure such deficiency. Upon failure of the Authority to cure such deficiency and in any event not later than such Interest Payment Date, the Trustee shall transfer an amount sufficient to cure the same, drawing only upon funds (a) in the case of Senior Lien Bonds secured by the Senior Lien Parity Reserve Account, from the Senior Lien Parity Reserve Account, (b) in the case of Senior Lien Bonds secured by a Senior Lien Special Reserve Account, from such Senior Lien Special Reserve Account, if any, securing such Series of Senior Lien Bonds, (c) in the case of Subordinate Lien Bonds secured by the Subordinate Lien Parity Reserve Account, from the Subordinate Lien Parity Reserve Account, (d) in the case of Subordinate Lien Bonds secured by a Subordinate Lien Special Reserve Account, from such Subordinate Lien Special Reserve Account, if any, securing such Series of Subordinate Lien Bonds, (e) in the case of TIFIA Indebtedness secured by the TIFIA Debt Service Reserve Account, from the TIFIA Debt Service Reserve Account, (f) in the case of Junior Indebtedness secured by the Junior Indebtedness Debt Service Reserve Account, from the Junior Indebtedness Debt Service Reserve Account and (g) in the case of Junior Indebtedness secured by a Junior Indebtedness special debt service reserve account, from such Junior Indebtedness special debt service reserve account.

*The preceding paragraph was revised pursuant to Section 701(oo) of the Fourth Supplemental Trust Agreement.*

Section 505. Application of Money in Principal Account. Not later than 10:00 A.M. on each Principal Payment Date, the Trustee shall withdraw from the applicable subaccount in the respective Principal Accounts and wire transfer to the Bond Registrar, in federal reserve or other immediately available funds, the amount necessary to pay the principal of the respective Bonds at their respective maturities. The Bond Registrar shall remit or otherwise set aside the amount due and payable to the Owners as provided in the Supplemental Agreements.

If on any date there is money in the Principal Account of the Senior Lien Debt Service Fund and no Serial Bonds are then Outstanding or if on any Principal Payment Date money remains therein after the payment of the principal of Serial Bonds then due, the Trustee shall withdraw such money therefrom and shall apply the same in the following order: (a) deposit into the Sinking Fund Account of the Senior Lien Debt Service Fund the amount then required to be paid thereto by the Authority pursuant to Section 503, (b) deposit, if and to the extent determined by the Authority, into the Senior Lien Parity Reserve Account or any Senior Lien Special Reserve Account such amounts as may be determined by the Authority in order to make the amounts on deposit therein equal to the Senior Lien Parity Reserve Account Requirement or the Senior Lien Special Reserve Account



Requirement, as the case may be, and (c) otherwise make the deposits required by Section 503.

If on any date there is money in the Principal Account of the Subordinate Lien Debt Service Fund and no Serial Bonds are then Outstanding or if on any Principal Payment Date money remains therein after the payment of the principal of Serial Bonds then due, the Trustee shall withdraw such money therefrom and shall apply the same in the following order: (a) deposit into the Sinking Fund Account of the Subordinate Lien Debt Service Fund the amount then required to be paid thereto by the Authority pursuant to Section 503, (b) deposit, if and to the extent determined by the Authority, into the Subordinate Lien Parity Reserve Account or any Subordinate Lien Special Reserve Account such amounts as may be determined by the Authority in order to make the amounts on deposit therein equal to the Subordinate Lien Parity Reserve Account Requirement or the Subordinate Lien Special Reserve Account Requirement, as the case may be, and (c) otherwise make the deposits required by Section 503.

If the Authority fails to deposit with the Trustee the amounts required to be deposited in the applicable subaccounts of the respective Principal Accounts as provided in Section 503, or if the balance in the applicable subaccount of the respective Principal Accounts on the Business Day next preceding a Principal Payment Date is insufficient to pay the Principal coming due on the Bonds or any Junior Indebtedness on such Principal Payment Date, the Trustee shall notify the Authority of the amount of the deficiency and request the Authority to immediately cure such deficiency. Upon failure of the Authority to cure such deficiency and in any event not later than such Principal Payment Date, the Trustee shall transfer an amount sufficient to cure the same, drawing only upon funds (a) in the case of Senior Lien Bonds secured by the Senior Lien Parity Reserve Account, from the Senior Lien Parity Reserve Account, (b) in the case of Senior Lien Bonds secured by a Senior Lien Special Reserve Account, from such Senior Lien Special Reserve Account, if any, securing such Series of Senior Lien Bonds, (c) in the case of Subordinate Lien Bonds secured by the Subordinate Lien Parity Reserve Account, from the Subordinate Lien Parity Reserve Account, (d) in the case of Subordinate Lien Bonds secured by a Subordinate Lien Special Reserve Account, from such Subordinate Lien Special Reserve Account, if any, securing such Series of Subordinate Lien Bonds, (e) in the case of TIFIA Indebtedness secured by the TIFIA Debt Service Reserve Account, from the TIFIA Debt Service Reserve Account, (f) in the case of Junior Indebtedness secured by the Junior Indebtedness Debt Service Reserve Account, from the Junior Indebtedness Debt Service Reserve Account and (g) in the case of Junior Indebtedness secured by a Junior Indebtedness special debt service reserve account, from such Junior Indebtedness special debt service reserve account.

*The preceding paragraph was revised pursuant to Section 701(pp) of the Fourth Supplemental Trust Agreement.*

Section 506. Application of Money in Sinking Fund Account. Money held for the credit of the subaccounts in the Sinking Fund Account shall be applied to the retirement, purchase, redemption or payment of Term Bonds in the manner provided in the applicable Supplemental Agreement.

If the Authority fails to deposit with the Trustee the amounts required to be deposited in the applicable subaccounts of the respective Sinking Fund Accounts as provided in Section 503, or if the balance in the applicable subaccount of the respective Sinking Fund Accounts on the Business Day next preceding a Principal Payment Date is insufficient to pay the Principal coming due on the Bonds on such Principal Payment Date, the Trustee shall notify the Authority of the amount of the deficiency and request the Authority to immediately cure such deficiency. Upon failure of the Authority to cure such deficiency and in any event not later than such Principal Payment Date, the Trustee shall transfer an amount sufficient to cure the same, drawing only upon funds (a) in the case of Senior Lien Bonds secured by the Senior Lien Parity Reserve Account, from the Senior Lien Parity Reserve Account, (b) in the case of Senior Lien Bonds secured by a Senior Lien Special Reserve Account, from such Senior Lien Special Reserve Account, if any, securing such Series of Senior Lien Bonds, (c) in the case of Subordinate Lien Bonds secured by the Subordinate Lien Parity Reserve Account, from the Subordinate Lien Parity Reserve Account and (d) in the case of Subordinate Lien Bonds secured by a Subordinate Lien Special Reserve Account, from such Subordinate Lien Special Reserve Account, if any, securing such Series of Subordinate Lien Bonds. Similar provisions may be established for any Junior Indebtedness in the applicable Junior Indebtedness Agreement.

*The preceding paragraph was revised pursuant to Section 701(qq) of the Fourth Supplemental Trust Agreement.*



Section 507. Deposit and Application of Money in Senior Lien Parity Reserve Account, any Senior Lien Special Reserve Account, Subordinate Lien Parity Reserve Account and any Subordinate Lien Special Reserve Account; Determination of Deficiencies.

(a) If a Senior Lien Resolution provides that the Senior Lien Indebtedness incurred thereunder is to be secured by the Senior Lien Parity Reserve Account, the Authority must fund, from the proceeds of such Senior Lien Indebtedness or from any other available sources, concurrently with the delivery of and payment for such Senior Lien Indebtedness, the Senior Lien Parity Reserve Account in an amount equal to the Senior Lien Parity Reserve Account Requirement. If a Senior Lien Resolution provides that the Senior Lien Indebtedness incurred thereunder is to be secured by a Senior Lien Special Reserve Account, the Authority must fund, from the proceeds of such Senior Lien Indebtedness or from any other available sources, at the time or times and in the manner specified in the applicable Senior Lien Resolution, such Senior Lien Special Reserve Account in an amount equal to the Senior Lien Special Reserve Account Requirement for such Senior Lien Indebtedness.

If a Subordinate Lien Resolution provides that the Subordinate Lien Indebtedness incurred thereunder is to be secured by the Subordinate Lien Parity Reserve Account, the Authority must fund, from the proceeds of such Subordinate Lien Indebtedness or from any other available sources, concurrently with the delivery of and payment for such Subordinate Lien Indebtedness, the Subordinate Lien Parity Reserve Account in an amount equal to the Subordinate Lien Parity Reserve Account Requirement. If a Subordinate Lien Resolution provides that the Subordinate Lien Indebtedness incurred thereunder is to be secured by a Subordinate Lien Special Reserve Account, the Authority must fund, from the proceeds of such Subordinate Lien Indebtedness or from any other available sources, at the time or times and in the manner specified in the applicable Subordinate Lien Resolution, such Subordinate Lien Special Reserve Account in an amount equal to the Subordinate Lien Special Reserve Account Requirement for such Subordinate Lien Indebtedness.

(b) The Trustee shall use amounts in the Senior Lien Parity Reserve Account to make transfers, or use moneys provided under a Reserve Alternative Instrument to make deposits, in the order specified in Section 503, in respect of all Senior Lien Indebtedness secured by the Senior Lien Parity Reserve Account, to the appropriate subaccounts of the Interest Account, the Principal Account and the Sinking Fund Account of the Senior Lien Debt Service Fund to remedy any deficiency therein as of any Interest Payment Date or Principal Payment Date (or any earlier date as set forth in a Senior Lien Resolution), or to pay the interest on or the principal of or amortization requirements in respect of any Senior Lien Parity Debt secured by the Senior Lien Parity Reserve Account when due, whenever and to the extent the money on deposit for such purposes is insufficient. The Trustee shall

use amounts in the Subordinate Lien Parity Reserve Account to make transfers, or use moneys provided under a Reserve Alternative Instrument to make deposits, in the order specified in Section 503, in respect of all Subordinate Lien Indebtedness secured by the Subordinate Lien Parity Reserve Account, to the appropriate subaccounts of the Interest Account, the Principal Account and the Sinking Fund Account of the Subordinate Lien Debt Service Fund to remedy any deficiency therein as of any Interest Payment Date or Principal Payment Date (or any earlier date as set forth in a Subordinate Lien Resolution), or to pay the interest on or the principal of or amortization requirements in respect of any Subordinate Lien Parity Debt secured by the Subordinate Lien Parity Reserve Account when due, whenever and to the extent the money on deposit for such purposes is insufficient. Moneys or Investment Obligations on deposit in the Senior Lien Parity Reserve Account, the Subordinate Lien Parity Reserve Account, any Senior Lien Special Reserve Account or any Subordinate Lien Special Reserve Account shall be used to satisfy deficiencies prior to any draw on a Reserve Alternative Instrument.

(c) The Trustee shall use amounts in any Senior Lien Special Reserve Account held by it to make transfers or use moneys provided under a Reserve Alternative Instrument to make deposits, in the order specified in Section 503, in respect of the particular Senior Lien Indebtedness secured by such Senior Lien Special Reserve Account, to the appropriate subaccounts of the Interest Account, the Principal Account and the Sinking Fund Account of the Senior Lien Debt Service Fund to remedy any deficiency therein as of any Interest Payment Date or Principal Payment Date (or any earlier date as set forth in a Senior Lien Resolution) or to pay the interest on or the principal of or amortization requirement in respect thereof on Senior Lien Parity Debt secured by such Senior Lien Special Reserve Account when due, whenever and to the extent the money on deposit for such purposes is insufficient. The Trustee shall use amounts in any Subordinate Lien Special Reserve Account held by it to make transfers or use moneys provided under a Reserve Alternative Instrument to make deposits, in the order specified in Section 503, in respect of the particular Subordinate Lien Indebtedness secured by such Subordinate Lien Special Reserve Account, to the appropriate sub accounts of the Interest Account, the Principal Account and the Sinking Fund Account of the Subordinate Lien Debt Service Fund to remedy any deficiency therein as of any Interest Payment Date or Principal Payment Date (or any earlier date as set forth in a Subordinate Lien Resolution) or to pay the interest on or the principal of or amortization requirement in respect thereof on Subordinate Lien Parity Debt secured by such Subordinate Lien Special Reserve Account when due, whenever and to the extent the money on deposit for such purposes is insufficient.

(d) Any deficiency in the Senior Lien Parity Reserve Account, the Subordinate Lien Parity Reserve Account, any Senior Lien Special Reserve Account and any Subordinate Lien Special Reserve Account resulting from the withdrawal of moneys therein shall be made up over the twelve-month period immediately following the month in which such withdrawal is made by monthly deposits of one-



twelfth (1/12) of the amount of such deficiency, such deposits to be made pursuant to Section 503(c) or Section 503(f), as applicable. Any deficiency resulting from a draw on a Reserve Alternative Instrument shall be made up as provided in such Reserve Alternative Instrument or documentation relating thereto, but any such deficiency must be made up by not later than the final date when such deficiency would have been required to be made up if there had been a withdrawal of moneys from the Senior Lien Parity Reserve Account, the Subordinate Lien Parity Reserve Account, any Senior Lien Special Reserve Account or any Subordinate Lien Special Reserve Account rather than a draw on a Reserve Alternative Instrument. Deficiencies may be satisfied through the deposit of additional moneys or the providing of an additional, or increase in a, Reserve Alternative Instrument.

(e) Unless a Reserve Alternative Instrument shall be in effect, if on any date of valuation pursuant to Section 603, the amount on deposit in the Senior Lien Parity Reserve Account is less than 90% of the Senior Lien Parity Reserve Account Requirement, the Authority shall deposit into the Senior Lien Parity Reserve Account monthly one-twelfth (1/12) of the amount required as of such date to bring the amount then on deposit in the Senior Lien Parity Reserve Account up to the Senior Lien Parity Reserve Account Requirement. Any such deficiency may be satisfied through the deposit of additional moneys or the providing of an additional, or increase in a, Reserve Alternative Instrument. Any deficiency in the Subordinate Lien Parity Reserve Account or any Senior Lien Special Reserve Account or Subordinate Lien Special Reserve Account resulting from a valuation of the Investment Obligations therein pursuant to Section 603 shall be made up as provided in the relevant Senior Lien Resolution or Subordinate Lien Resolution.

Section 508. Application of Money in the Redemption Account. The Trustee shall apply money in the respective Redemption Accounts of the Senior Lien Debt Service Fund and the Subordinate Lien Debt Service Fund, as the case may be, for the purchase or redemption of Senior Lien Bonds or Subordinate Lien Bonds, as applicable, as follows:

(a) Subject to the provisions of subsection (c) of this Section, and if instructed to do so in writing by an Authorized Officer, the Trustee shall endeavor to purchase and cancel Bonds or portions thereof, whether or not such Bonds or portions thereof are then subject to redemption, at the written direction of an Authorized Officer, provided that the purchase price of each Bond, plus accrued interest to the date of purchase, shall not exceed the Redemption Price that would be payable on the next redemption date to the Owners of such Bonds under the provisions of the applicable Supplemental Agreement plus accrued interest to the redemption date if such Bond or such portion thereof were called for redemption on such redemption date from the money in the applicable subaccount of the Redemption Account. The Trustee shall pay the interest accrued on such Bonds or portions thereof to the date of settlement from the applicable subaccount of the respective Interest Account and the purchase price from the applicable subaccount

of the respective Redemption Account, but no such purchase shall be made by the Trustee from money in the applicable subaccount of the respective Redemption Account within the period of forty-five (45) days immediately preceding any date on which such Bonds or portions thereof are to be redeemed except from moneys other than the moneys set aside in the applicable subaccount of the respective Redemption Account for the redemption of Bonds.

(b) Subject to the provisions of subsection (c) of this Section, the Trustee shall call for redemption on a date permitted by the applicable Supplemental Agreement such amount of Bonds or portions thereof as, with the redemption premium, if any, will exhaust the moneys then held in the applicable subaccount of the respective Redemption Account as nearly as may be; provided, however, that not less than Fifty Thousand Dollars ($50,000) principal amount of Bonds shall be called for redemption at any one time unless the Trustee is so instructed in writing by the Authority. The Trustee shall pay the accrued interest on the Bonds or portions thereof to be redeemed to the date of redemption from the applicable subaccount of the respective Interest Account or any other available funds of the Authority and the Redemption Price of such Bonds or portions thereof from the applicable subaccount of the respective Redemption Account. On or before the redemption date, the Trustee shall withdraw from the applicable subaccounts of the respective Redemption Account and the Interest Account, as applicable, and transfer to the Bond Registrar the respective amounts required to pay the Redemption Price and accrued interest to the redemption date of the Bonds or portions thereof so called for redemption.

(c) Money in the respective Redemption Accounts may be applied by the Trustee in each Fiscal Year to the purchase or the redemption of Bonds of anyone or more Series then Outstanding in accordance with the latest Officer's Certificate filed with the Trustee (i) designating one or more Series of Bonds to be purchased or redeemed, (ii) if more than one Series of Bonds is so designated, setting forth the aggregate principal amount of Bonds of each Series to be purchased or redeemed, and (iii) unless the Supplemental Agreement relating to the Bonds to be redeemed specifies the order of redemption, designating the Bonds to be redeemed within each Series, and if such Bonds are Term Bonds, the years in which future Sinking Fund Requirements are to be reduced as a result of such redemption and the amount of such reduction in each such year. In the event no such certificate is filed and unless the Supplemental Agreement relating to the Bonds to be redeemed specifies otherwise, (A) the Trustee shall apply such money to the purchase of one or more Series of Bonds as it shall determine or to the redemption of Bonds bearing the highest rate of interest, (B) if Bonds of more than one maturity bear the same interest rate, the Trustee will redeem such Bonds in the inverse order of maturities, and (C) if the Bonds bearing the highest rate of interest are Term Bonds, the Trustee will reduce Sinking Fund Requirements for such Term Bonds in inverse order of the scheduled redemption of such Term Bonds. All Bonds shall be redeemed as provided in the applicable Supplemental Agreement.



Money held for the credit of the applicable subaccounts in the respective Redemption Accounts shall be applied to the purchase or redemption of Bonds in the manner provided in the applicable Supplemental Agreement.

Similar provisions may be established for any Junior Indebtedness in the applicable Junior Indebtedness Agreement.

*The preceding paragraph was added pursuant to Section 701(rr) of the Fourth Supplemental Trust Agreement.*

Section 509. Application of Money in TIFIA Interest Account, TIFIA Principal Account and TIFIA Debt Service Reserve Account.

(a) Moneys held for the credit of the TIFIA Interest Account shall be applied to pay the interest on any Outstanding TIFIA Indebtedness in the manner set forth in the applicable TIFIA Loan Agreement.

(b) Moneys held for the credit of the TIFIA Principal Account shall be applied to pay the principal of any Outstanding TIFIA Indebtedness in the manner set forth in the applicable TIFIA Loan Agreement.

(c) In the event of a deficiency in the TIFIA Interest Account or the TIFIA Principal Account, the Trustee shall use amounts in the TIFIA Debt Service Reserve Account to make transfers to the TIFIA Interest Account and the TIFIA Principal Account, as applicable, to pay the scheduled interest on or the principal of TIFIA Indebtedness in accordance with the requirements of the TIFIA Loan Agreement.

*The preceding Section was revised pursuant to Section 701(ss) of the Fourth Supplemental Trust Agreement.*

Section 510. Application of Money in Operations and Maintenance Expense Fund. Moneys held for the credit of the Operations and Maintenance Expense Fund shall be used by the Authority only to pay all or a portion of the cost of any Operating Expenses in accordance with the applicable procedures used in the payment of Operating Expenses.

Section 511. Application of Money in Operating Reserve Fund. Moneys held for the credit of the Operating Reserve Fund shall be used by the Authority only to pay all or a portion of the cost of any Operating Expenses in accordance with the applicable procedures used in the payment of Operating Expenses or as provided in the Capital Improvements Budget, but only to the extent that amount held in the Operations and Maintenance Expense Fund are not sufficient for such purpose. Subject to the availability of funds as described in Section 520, NCDOT will pay to the Trustee for deposit to the Operating Reserve Fund amounts equal to (i) the amount necessary to replenish the Operating Reserve Fund for any transfer

so made up to the Operating Reserve Fund Requirement at the time the transfer is so made and (ii) the amount required to be transferred from the Operating Reserve Fund to the Operations and Maintenance Expense Fund to the extent that there are not sufficient Revenues held in the Operating Reserve Fund for such purpose.

*Section 511 was modified pursuant to Section 701(b) of the Third Supplemental Trust Agreement and then completely revised pursuant to Section 701(i) of the Fourth Supplemental Trust Agreement.*

Section 512. Application of Money in Renewal and Replacement Fund. (a) Moneys held for the credit of the Renewal and Replacement Fund shall be used by the Authority only for the following:

(i) to pay Renewal and Replacement Expenses in accordance with the applicable procedures used in the payment of Operating Expenses or as provided in the Capital Improvements Budget;

(ii) in the Authority's sole discretion, (A) to make deposits to the appropriate subaccounts in the Interest Account, the Principal Account and the Sinking Fund Account of the Senior Lien Debt Service Fund or the Subordinate Lien Debt Service Fund or the Junior Indebtedness Debt Service Fund (including the TIFIA Interest Account and the TIFIA Principal Account) to remedy any deficiency therein, (B) to make any required deposits or pay interest on or the principal of or amortization requirements in respect of any Senior Lien Parity Debt or Subordinate Lien Parity Debt when due or (C) to make any Senior Lien Derivative Agreement Regularly Scheduled Payments or Subordinate Lien Derivative Agreement Regularly Scheduled Payments when due, whenever moneys are insufficient for such purposes, provided that amounts paid by NCDOT to the Authority pursuant to subsection (b) below may not be used for the purposes described in this subsection (ii); and

(iii) if an Event of Default has occurred, to make payments in accordance with Article VIII, provided that amounts paid by NCDOT to the Authority pursuant to subsection (b) may not be used for the purposes described in this subsection (iii).

(b) If at any time the amounts in the Renewal and Replacement Fund shall not be equal to the Renewal and Replacement Fund Requirement, then subject to the availability of funds as described in Section 520, upon request of the Authority, NCDOT will pay the amount necessary so that amounts in the Renewal and Replacement Fund shall be equal to the Renewal and Replacement Fund Requirement. If at any time the amounts in the Renewal and Replacement Fund are in excess of the Renewal and Replacement Fund Requirement, then, upon



delivery of an Officer's Certificate making a request therefor, such excess shall be transferred to the Revenue Fund.

(c) For purposes of this Section, the portion of moneys on deposit in the Renewal and Replacement Fund allocable to payments from NCDOT under subsection (b), if any, shall be determined as follows. To the extent any payments from NCDOT pursuant to subsection (b) hereof have not been repaid in full in accordance with Section 520, an amount equal to the outstanding balance owed to NCDOT shall be deemed to have been provided by NCDOT and not available for the purposes set forth in subsections (a)(ii) and (iii) above. The Authority shall provide a statement of such outstanding balance, if any, as requested by the Trustee.

*The preceding Section was revised pursuant to Section 701(j) of the Fourth Supplemental Trust Agreement.*

Section 513. Insurance and Condemnation Award Fund. The Trustee shall deposit Net Insurance Proceeds or Net Eminent Domain Proceeds into the Insurance and Condemnation Award Fund when and as received by the Trustee from the Authority, and they shall be disbursed pursuant to the provisions of Section 709.

Section 514. General Reserve Fund. (a) Subject to the limitations set forth below, moneys held for the credit of the General Reserve Fund shall be used for any legally available purpose, including, without limitation, the payment of Operating Expenses, the payment of capital improvements, payment of any Guarantee Repayments owed to NCDOT, the funding of any Non-System Project and the payment of any Derivative Agreement Additional Payments.

(b) For so long as the TIFIA Series 2019 Bond remains Outstanding and in accordance with Section 503(p), moneys shall be deposited to the General Reserve Fund in accordance with the following provisions:

(i) except as provided in subsection (iii) below, prior to the Substantial Completion Date for the Complete 540 Phase 2 Project, all remaining moneys shall be deposited to the Restricted Account of the General Reserve Fund;

(ii) except as provided in subsection (iii) below, on and after the Substantial Completion Date for the Complete 540 Phase 2 Project, all remaining moneys shall be allocated between the Complete 540 Phase 2 Project and the other portions of the Triangle Expressway System pro rata based on the percentage of Receipts generated in each such portion and (A) the remaining moneys allocable to the Complete 540 Phase 2 Project shall be deposited in the Unrestricted Account of the General Reserve Fund and (B) the remaining moneys allocable to the other portions of the Triangle

Expressway System shall be deposited in the Restricted Account of the General Reserve Fund; and

(iii) if no Additional Projects are identified in either (A) the most recent metropolitan transportation improvement program adopted by the Capital Area Metropolitan Planning Organization or (B) the State transportation plan, all remaining moneys shall be allocated between the Complete 540 Phase 2 Project and the other portions of the Triangle Expressway System pro rata based on the percentage of Receipts generated in each such portion and (X) the remaining moneys allocable to the Complete 540 Phase 2 Project shall be deposited in the Unrestricted Account of the General Reserve Fund and (Y)(I) half of the remaining moneys allocable to the other portions of the Triangle Expressway System shall be transferred to the TIFIA Interest Account and the TIFIA Principal Account for application in accordance with Sections 504, 505 and 509 and (II) the other half shall be deposited in the Unrestricted Account of the General Reserve Fund.

Notwithstanding any other limitations on, or requirements for, withdrawals from the General Reserve Fund, the securities and cash on deposit therein on the date before the issuance of the Series 2019 Bonds (having a market value of $84,114,643.68) (the "Unrestricted Account Deposit") will be deposited in the Unrestricted Account. Interest earnings on the Unrestricted Account Deposit shall be held in the Unrestricted Account within the General Reserve Fund but not credited to the Unrestricted Account Deposit.

For so long as the TIFIA Series 2019 Bond remains Outstanding, amounts on deposit in the Restricted Account and the Unrestricted Account shall be disbursed and applied in accordance with the provisions of the TIFIA 2019 Loan Agreement.

(c) With respect to any amounts to be deposited or credited to, or paid or transferred from, the General Reserve Fund, the Authority shall provide the Trustee with specific written direction as to the amounts to be so deposited, credited, paid or transferred, and the Trustee shall be permitted to conclusively rely on such direction by the Authority.

*This Section was revised pursuant to Section 701(q) of the Fourth Supplemental Trust Agreement. Additional paragraphs in Section 514 were altered pursuant to Section 701 of the Second Supplemental Trust Agreement and subsequently deleted by Section 702(g) of the Third Supplemental Trust Agreement.*

Section 515. Escheat. All money that the Trustee shall have withdrawn from the Senior Lien Debt Service Fund or the Subordinate Lien Debt Service Fund shall have received from any other source and set aside or delivered to the Bond Registrar for the purpose of paying any of the Bonds hereby secured, either at



maturity or by purchase or call for redemption, shall be held in trust for the respective Owners.

Any money that is so set aside and that remains unclaimed by the Owners for a period of five (5) years after the date on which such Bonds have become payable shall be treated as abandoned property pursuant to the provisions of Section 116B-53 of the General Statutes of North Carolina, and the Trustee or the Bond Registrar shall report and remit this property to the Escheat Fund established by, according to the requirements of Chapter 116B of the General Statutes of North Carolina, and thereafter the Owners shall look only to the Escheat Fund for payment and then only to the extent of the amounts so received, without any interest thereon, and the Trustee, the Bond Registrar and the Authority shall have no responsibility with respect to such money.

Section 516. Cancellation of Bonds. Upon receipt of the same, the Bond Registrar shall cancel all Bonds paid, redeemed or purchased by the Trustee or purchased by the Authority and delivered to the Bond Registrar, and all Bonds delivered to the Bond Registrar in exchange for other Bonds or delivered to the Bond Registrar upon the transfer of any Bond if a new Bond is delivered upon such transfer. The Bond Registrar shall certify to the Authority the details of all Bonds so canceled. All Bonds canceled under any of the provisions of this Trust Agreement either shall be delivered to the Authority or destroyed by the Bond Registrar, as the Authority directs. Upon destruction of any Bonds, the Bond Registrar shall execute a certificate in duplicate, describing the Bonds so destroyed; and one executed certificate shall be filed with the Authority and the other executed certificate shall be retained by the Bond Registrar.

Section 517. Disposition of Fund Balances. After provision is made for the payment of all Outstanding Senior Indebtedness, Subordinate Lien Indebtedness and Junior Indebtedness, including the interest thereon, and for the payment of all and Senior Lien Derivative Agreement Regularly Scheduled Payments, Subordinate Lien Derivative Agreement Regularly Scheduled Payments and all other obligations, expenses and charges required to be paid under or in connection with this Trust Agreement, and receipt by the Trustee of an Officer's Certificate to the effect that there are no other indentures, resolutions, bond orders, Supplemental Agreements, Parity Debt Resolutions, Subordinate Lien Resolutions, Junior Indebtedness Agreements, Derivative Agreements or other agreements that impose a continuing lien on the balances hereinafter mentioned, the Trustee shall pay all amounts in any fund, account or subaccount then held by it under this Trust Agreement to the Authority as directed in writing by the Authority. If a continuing lien has been imposed on such balance by another resolution, bond order, any other agreement, by court order or decree, or by law, the Trustee shall pay such balance to such person as is entitled to receive the same by law or under the terms of such resolution, bond order, agreement, court order, or decree.

*The preceding Section was revised pursuant to Section 701(uu) of the Fourth Supplemental Trust Agreement.*

Section 518. Security. As security for the payment of all Indebtedness issued or incurred hereunder and the interest thereon, and as security for the payments of amounts due under any Derivative Agreement, but in each case solely as provided herein, the Authority hereby grants to the Trustee, for the benefit of the Owners and Holders of such Indebtedness and the counterparty to any such Derivative Agreement, a pledge, charge and lien upon (a) the money and Investment Obligations in the Project Fund (to the extent provided in Section 401), the Revenue Fund, the Senior Lien Debt Service Fund, the Subordinate Lien Debt Service Fund, the Junior Indebtedness Debt Service Fund, the Insurance and Condemnation Award Fund, the Renewal and Replacement Fund and the General Reserve Fund under this Trust Agreement and Accounts established under the Supplemental Agreements relating to their issuance, except that the Senior Lien Parity Reserve Account shall be held solely for the benefit of the Senior Lien Parity Debt secured thereby notwithstanding the last paragraph of Section 213 hereof, the Subordinate Lien Parity Reserve Account shall be held solely for the benefit of the Subordinate Lien Parity Debt secured thereby, the Junior Indebtedness Debt Service Reserve Account shall be held for the benefit of the Junior Indebtedness secured thereby, the TIFIA Debt Service Reserve Account shall be held solely for the benefit of the TIFIA Indebtedness secured thereby and any fund or account created by a Supplemental Agreement to the extent such Supplemental Agreement expressly excludes such fund or account, (b) the Receipts and the right to receive the same, except upon the disbursement of Receipts for deposit or credit to NCDOT or for deposit or credit to the Operations and Maintenance Expense Fund or the Operating Reserve Fund, (c) unless otherwise provided in a Supplemental Agreement, the rights to the amounts payable to the Authority under any Credit Facility, (d) the rights to amounts payable to the Authority or the Trustee pursuant to any Derivative Agreement, (e) proceeds of the sale or disposition of assets of the Triangle Expressway System, and (f) Net Insurance Proceeds and Net Eminent Domain Proceeds (collectively, the "Trust Estate").

*The preceding paragraph was revised pursuant to Section 701(r) of the Fourth Supplemental Trust Agreement.*

Any Receipts disbursed by the Trustee for deposit in the Operations and Maintenance Expense Fund, the Operating Reserve Fund or the Renewal and Replacement Fund, and any Receipts disbursed to NCDOT pursuant to this Trust Agreement, shall no longer constitute Receipts within the meaning of this Trust Agreement and shall no longer be subject to the pledge, charge and lien upon the Trust Estate created by this Trust Agreement.

The pledge, charge and lien upon the Trust Estate shall be effective and operate immediately, without any recording or filing of any financing statement or



other notice, and the Trustee shall have the right to collect and receive the Receipts in accordance with the provisions hereof at all times during the period from and after the date of delivery of the Series 2009 Bonds issued hereunder until all Bonds, Parity Debt, Senior Lien Derivative Agreement Regularly Scheduled Payments, Subordinate Lien Derivative Agreement Regularly Scheduled Payments and Junior Indebtedness have been fully paid and discharged, including, without limitation, at all times after the institution and during the pendency of bankruptcy or similar proceedings.

The aforementioned pledge, charge and lien upon the Trust Estate shall not inhibit the sale or disposition of any portion of the Triangle Expressway System in accordance with this Trust Agreement and the TIFIA 2019 Loan Agreement and shall not impair or restrict the ability of the Authority to invest in securities and other forms of investment, subject to the provisions of this Trust Agreement.

*The preceding paragraph was revised pursuant to Section 701(r) of the Fourth Supplemental Trust Agreement.*

The pledge, charge and lien upon the Trust Estate shall be (1) first for the security for the payment of the Owners or Holder of Senior Lien Indebtedness (including TIFIA Indebtedness during any period where any TIFIA Indebtedness has become a Senior Lien Bond pursuant to Section 213 hereof), including the interest thereon, and the payment of any Senior Lien Derivative Agreement Regularly Scheduled Payments, (2) second for the security for the payment of the Subordinate Lien Bonds and Subordinate Lien Parity Debt, including the interest thereon, and the payment of all Subordinate Lien Derivative Agreement Regularly Scheduled Payments, for which such pledge, charge and lien upon the Trust Estate is junior and subordinate to the pledge, charge and lien upon the Trust Estate securing the Senior Lien Bonds, the Senior Lien Parity Debt and the Senior Lien Derivative Agreement Regularly Scheduled Payments and (3) third, for the security for the payment of the Junior Indebtedness, including the interest thereon, which (other than during any period where any TIFIA Indebtedness shall become a Senior Lien Bond pursuant to Section 213 hereof) is junior and subordinate to the pledge, charge and lien upon the Trust Estate securing the Senior Lien Bonds, the Senior Lien Parity Debt, the Senior Lien Derivative Agreement Regularly Scheduled Payments, the Subordinate Lien Bonds, the Subordinate Lien Parity Debt and the Subordinate Lien Derivative Agreement Regularly Scheduled Payments.

*The preceding paragraph was revised pursuant to Section 701(r) of the Fourth Supplemental Trust Agreement.*

Section 519. Use of Available Funds. Nothing in this Trust Agreement shall be construed to prevent the Authority from (a) paying all or any part of the Operating Expenses in accordance with Sections 503 and 510 hereof, (b) depositing in any fund or account created under, or subaccount created pursuant to, the

provisions of this Trust Agreement, any Supplemental Agreement or any Parity Debt Resolution, (c) paying the principal of, premium, if any, and interest on Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness or (d) from making any payment required by a Derivative Agreement from any moneys available to the Authority for such purpose, except to the extent the Authority is prohibited from making such payment or deposit by this Trust Agreement, any Senior Lien Resolution, any Subordinate Lien Resolution or any Junior Indebtedness Agreement or otherwise.

*The preceding Section was revised pursuant to Section 701(vv) of the Fourth Supplemental Trust Agreement.*

Section 520. NCDOT Contingent Guarantees; Repayments Thereof. The obligation of NCDOT in Section 511 is to be funded from amounts in the State Highway Fund and the obligations of NCDOT in Sections 402 and 512 are to be funded from the State Highway Fund or the State Highway Trust Fund. Each such payment is subject to appropriation by the State and the availability of amounts in the respective source fund. All such payments shall be repaid by the Authority to NCDOT as Guarantee Repayments in accordance with Section 503(n). All amounts so repaid, as a part of the obligated Guarantee Repayments, shall include simple interest calculated at the rate determined pursuant to Section 136-176(b) of the NCGS. Any repayments made which are less than all of the Guarantee Repayments shall be credited to principal and interest components of Guarantee Repayments in proportion to the total of principal and interest owed on the date of repayment.

*The preceding Section was added pursuant to Section 701(l) of the Fourth Supplemental Trust Agreement.*

## ARTICLE VI

## DEPOSITARIES OF MONEY, SECURITY FOR DEPOSITS, INVESTMENT OF FUNDS AND COVENANT AS TO ARBITRAGE

Section 601. Security for Deposits. Any and all money received by the Authority under the provisions of this Trust Agreement shall be deposited as received with the Trustee or one or more other Depositaries as provided in this Trust Agreement, and all money so deposited with the Trustee shall be trust funds under the terms hereof, and, to the extent permitted by law in the case of the Project Fund, shall not be subject to any lien or attachment by any creditor of the Authority.

All money deposited with the Trustee or any Depositary hereunder in excess of the amount guaranteed by the Federal Deposit Insurance Corporation or other federal agency shall be continuously secured, for the benefit of the Authority and



the Owners and Holders of Bonds and Senior Lien Parity Debt, either (a) by lodging with a bank or trust company chosen by the Trustee or Depositary or, if then permitted by law, by setting aside under control of the trust department of the bank or trust company holding such deposit, as collateral security, Government Obligations or other marketable securities eligible as security for the deposit of trust funds under regulations of the Comptroller of the Currency of the United States or applicable State law or regulations, having a market value (exclusive of accrued interest) not less than the amount of such deposit, or (b) if the furnishing of security as provided in clause (a) above is not permitted by applicable law, then in such other manner as may then be required or permitted by applicable State or federal laws and regulations regarding the security for, or granting a preference in the case of, the deposit of trust funds; provided, however, that it shall not be necessary for the Trustee or any Depositary to give security for the deposit of any money with it for the payment of the principal of or the redemption premium or the interest on any Bonds, or for the Trustee or any Depositary to give security for any money that shall be represented by Investment Obligations purchased under the provisions of this Article as an investment of such money.

All money deposited with the Trustee or any Depositary shall be credited to the particular fund, account or subaccount to which such money belongs.

Section 602. Investment of Money. Money held for the credit of all funds, accounts and subaccounts shall be continuously invested and reinvested by the Trustee or the Depositaries, whichever is applicable, in Investment Obligations or held as cash to the extent investment or reinvestment in Investment Obligations is not practicable. Except as hereinafter provided in this Section with respect to the disposition of investment income, the particular investments to be made and other related matters in respect of investments may, as to each Series of Bonds, be provided in the applicable Supplemental Agreement.

Except otherwise provided in (a) this Section with respect to the Senior Lien Parity Reserve Account, Subordinate Lien Parity Reserve Account, Junior Indebtedness Debt Service Reserve Account and TIFIA Debt Service Reserve Account and (b) if the TIFIA Series 2019 Bond is Outstanding, Section 16(k)(iv) of the TIFIA 2019 Loan Agreement, Investment Obligations shall mature or be redeemable at the option of the holder thereof not later than the respective dates when the money held for the credit of such funds, accounts and subaccounts will be required for the purposes intended.

*The preceding paragraph was revised pursuant to Section 701(ww) of the Fourth Supplemental Trust Agreement.*

Investment Obligations in the Senior Lien Parity Reserve Account, Subordinate Lien Parity Reserve Account, Junior Indebtedness Debt Service Reserve Account or TIFIA Debt Service Reserve Account shall (a) mature or (b) be

redeemable at the option of the holder of such Investment Obligation so that all such Investment Obligations shall have an average life of not more than ten (10) years after the date of such investment.

*The preceding paragraph was revised pursuant to Section 701(ww) of the Fourth Supplemental Trust Agreement.*

Notwithstanding the forgoing, no Investment Obligations pertaining to any Series in any fund, account or subaccount shall mature on a date beyond the latest maturity date of the respective Series of Bonds Outstanding at the time such Investment Obligations are deposited. For purposes of this Section, the maturity date of any repurchase agreement shall be deemed to be the stated maturity date of such agreement and not the maturity dates of the underlying obligations.

An Authorized Officer or his designee shall give to the Trustee or any Depositary written directions respecting the investment of any money required to be invested hereunder, subject, however, to the provisions of this Article, and the Trustee or such Depositary shall then invest such money as so directed. The Trustee or any Depositary may request additional direction or authorization from the Authorized Officer or his designee in writing with respect to the proposed investment of money under the provisions of this Trust Agreement. Upon receipt of such directions, the Trustee or any Depositary shall invest, subject to the provisions of this Article, such money in accordance with such directions. If no such directions are given, then any uninvested funds shall be invested by the Trustee in Government Obligations having the shortest maturity available, but in no event exceeding a maturity of thirty (30) days from the date of investment in the case of funds held in the Project Fund, and the date funds are required to be used to pay debt service on Bonds, Parity Debt or Junior Indebtedness in the case of funds held in the Senior Lien Debt Service Fund, the Subordinate Lien Debt Service Fund or the Junior Indebtedness Debt Service Fund. The Trustee or any Depositary shall have no liability for investments made in accordance with this Section.

*The preceding paragraph was revised pursuant to Section 701(ww) of the Fourth Supplemental Trust Agreement.*

Investment Obligations acquired with money in or credited to any fund, account or subaccount established under this Trust Agreement shall be deemed at all times to be part of such fund, account or subaccount. Any loss realized upon the disposition or maturity of such Investment Obligations shall be charged against such funds, accounts or subaccounts. The interest accruing on any such Investment Obligations and any profit realized upon the disposition or maturity of such Investment Obligations shall be credited to the particular fund, account or subaccount to which such Investment Obligation relates (and, if such account is part of the Trust Estate, shall be subject to the pledge of the Trust Estate in accordance with Section 518) except as follows:



Any investment earnings received on amounts deposited in the Senior Lien Debt Service Fund (including the Senior Lien Parity Reserve Account, to the extent that the amount on deposit in the Senior Lien Parity Reserve Account is equal to the Senior Lien Parity Reserve Account Requirement), shall be transferred to the Interest Account of the Senior Lien Debt Service Fund. Any investment earnings received on amounts deposited in the Subordinate Lien Debt Service Fund shall be transferred to the Interest Account of the Subordinate Lien Debt Service Fund. Any investment earnings received on amounts deposited in the Subordinate Lien Parity Reserve Account, to the extent that the amount on deposit in the Subordinate Lien Parity Reserve Account is equal to the Subordinate Lien Parity Reserve Account Requirement, shall be transferred to the Revenue Fund. Any investment earnings received on amounts deposited in the Junior Indebtedness Debt Service Fund shall be transferred to the Interest Account of the Junior Indebtedness Debt Service Fund. Any investment earnings received on amounts deposited in the Junior Indebtedness Debt Service Reserve Account, to the extent that the amount on deposit in the Junior Indebtedness Debt Service Reserve Account is equal to the Junior Indebtedness Debt Service Reserve Account Requirement, shall be transferred to the Revenue Fund. Any investment earnings received on amounts deposited in the TIFIA Interest Account and the TIFIA Principal Account shall be transferred to the Interest Account of the TIFIA Lien Debt Service Fund. Any investment earnings received on amounts deposited in the TIFIA Debt Service Reserve Account, to the extent that the amount on deposit in the TIFIA Debt Service Reserve Account is equal to the TIFIA Debt Service Reserve Account Requirement, shall be transferred to the Revenue Fund. Any investment earnings on any Special Reserve Account shall be transferred or deposited in the manner specified in the Supplemental Agreement or Parity Debt Resolution establishing such Special Reserve Account.

*The preceding paragraph was revised pursuant to Section 701(ww) of the Fourth Supplemental Trust Agreement.*

Any such interest accruing and any such profit realized shall not be credited or transferred to any other fund, account or subaccount unless there shall be no deficiency in the respective fund, account or subaccount. If there shall be a deficiency in any fund, account or subaccount, any such interest or profit shall remain in such fund, account or subaccount until such deficiency has been made up.

Any such interest accruing and any such profit realized that is required to be transferred to any other fund, account or subaccount shall be transferred upon the receipt thereof by the Depositaries or the Trustee, as the case may be, pursuant to the provisions of this Trust Agreement.

The Trustee shall sell or reduce to cash a sufficient amount of such Investment Obligations whenever it is necessary to do so to provide money to make any payment from any such fund, account or subaccount in accordance with the

provisions of this Trust Agreement. The Trustee shall not be liable or responsible for any loss resulting from any such action.

Whenever a transfer of money between two or more of the funds, accounts or subaccounts established under this Trust Agreement is permitted or required, such transfer may be made as a whole or in part by transfer of one or more Investment Obligations at a value determined at the time of such transfer in accordance with this Article, provided that the Investment Obligations transferred are those in which money of the receiving fund, account or subaccount could be invested at the date of such transfer.

For purposes of making any investment hereunder, the Trustee or any Depositary may consolidate money held by it in any fund, account or subaccount with money in any other fund, account or subaccount. Transfers from any fund, account or subaccount to the credit of any other fund, account or subaccount provided for in this Trust Agreement may be effectuated on the books and records of the Trustee, the Authority or any Depositary without any actual transfer of funds or liquidation of investments. Investment Obligations purchased with consolidated funds shall be allocated to each fund, account or subaccount on a pro rata basis in accordance with the initial amount so invested from each such fund, account or subaccount.

Unless otherwise directed by the Authority, Investment Obligations may be purchased by the Trustee or any Depositary through its own investment division or other bank facilities established for such purpose.

Section 603. Valuation. For the purpose of determining the amount on deposit in any fund, account or subaccount, Investment Obligations in which money in such fund, account or subaccount is invested shall be valued by the Trustee (a) at face value if such Investment Obligations mature within twelve (12) months from the date of valuation thereof and (b) if such Investment Obligations mature more than twelve (12) months after the date of valuation thereof, at the price at which such Investment Obligations are redeemable by the holder at its option, if so redeemable, or, if not so redeemable, at the lesser of (i) the cost of such Investment Obligations minus the amortization of any premium or plus the amortization of any discount thereon and (ii) the market value of such Investment Obligations.

All Investment Obligations in all of the funds, accounts and subaccounts created hereunder, except the Renewal and Replacement Fund, the Operating Reserve Fund, the Operations and Maintenance Expense Fund and the General Reserve Fund, shall be valued as of the last day of each Fiscal Year. When a valuation is made by the Trustee, the Trustee shall report the result of such valuation to the Authority within thirty (30) days after such valuation. In addition, Investment Obligations shall be valued at any time requested by the Authority on reasonable notice to the Trustee (which period of notice may be waived or reduced



by the Trustee); provided, however, that the Trustee shall not be required to value Investment Obligations more than once in any calendar month.

Whenever, following a valuation on the last day of each Fiscal Year as described above, the value of the cash and Investment Obligations in the Senior Lien Parity Reserve Account held by the Trustee, plus accrued interest to the date of valuation, is less than 90% of the Senior Lien Parity Reserve Account Requirement, the Trustee shall compute the amount by which the Senior Lien Parity Reserve Account Requirement exceeds the balance in the Senior Lien Parity Reserve Account and shall immediately give the Authority notice of such deficiency and the amount necessary to cure the same in accordance with Section 507.

Whenever the value of the cash and Investment Obligations in the Senior Lien Parity Reserve Account held by the Trustee, plus accrued interest to the date of valuation, is greater than the Senior Lien Parity Reserve Account Requirement, the Trustee shall compute the amount by which the balance in the Senior Lien Parity Reserve Account exceeds the Senior Lien Parity Reserve Account Requirement, and the Authority shall be entitled to transfer such excess to the credit of the Interest Account of the Senior Lien Debt Service Fund or to pay interest on Senior Lien Bonds or Senior Lien Parity Debt secured by the Senior Lien Parity Reserve Account in the manner directed by the Authority in an Officer's Certificate filed with the Trustee; provided, however, that nothing herein shall require the Authority to liquidate or sell any Investment Obligation held in the Senior Lien Parity Reserve Account for purposes of making such transfer.

Whenever the value of the cash and Investment Obligations in the Subordinate Lien Parity Reserve Account held by the Trustee, plus accrued interest to the date of valuation, is greater than the Subordinate Lien Parity Reserve Account Requirement, the Trustee shall compute the amount by which the balance in the Subordinate Lien Parity Reserve Account exceeds the Subordinate Lien Parity Reserve Account Requirement, and the Authority shall be entitled to transfer such excess to the credit of the Interest Account of the Subordinate Lien Debt Service Fund or to pay interest on Subordinate Lien Bonds or Subordinate Lien Parity Debt secured by the Subordinate Lien Parity Reserve Account in the manner directed by the Authority in an Officer's Certificate filed with the Trustee; provided, however, that nothing herein shall require the Authority to liquidate or sell any Investment Obligation held in the Subordinate Lien Parity Reserve Account for purposes of making such transfer.

Whenever the value of the cash and Investment Obligations in the Junior Indebtedness Debt Service Reserve Account held by the Trustee, plus accrued interest to the date of valuation, is greater than the Junior Indebtedness Debt Service Reserve Account Requirement, the Authority shall be entitled to transfer such excess to the credit of the Interest Account of the Junior Indebtedness Debt Service Fund or to pay interest on Junior Indebtedness secured by the Junior

Indebtedness Debt Service Reserve Account in the manner directed by the Authority in an Officer's Certificate filed with the Trustee; provided, however, that nothing herein shall require the Authority to liquidate or sell any Investment Obligation held in the Junior Indebtedness Debt Service Reserve Account for purposes of making such transfer.

*The preceding paragraph was added pursuant to Section 701(aa) of the Fourth Supplemental Trust Agreement.*

Whenever the value of the cash and Investment Obligations in the TIFIA Debt Service Reserve Account held by the Trustee, plus accrued interest to the date of valuation, is greater than the TIFIA Debt Service Reserve Account Requirement, the Authority shall be entitled to transfer such excess to the subaccount for the TIFIA Series 2019 Bond within the Interest Account of the Senior Lien Debt Service Fund (if a Bankruptcy Related Event has occurred) or the subaccount for the TIFIA Series 2019 Bond within the TIFIA Interest Account of the Junior Indebtedness Debt Service Fund (if no Bankruptcy Related Event has occurred); provided, however, that nothing herein shall require the Authority to liquidate or sell any Investment Obligation held in the TIFIA Debt Service Reserve Account for purposes of making such transfer.

*The preceding paragraph was added pursuant to Section 701(aa) of the Fourth Supplemental Trust Agreement.*

Section 604. Covenant as to Arbitrage. The Authority covenants that so long as any of the Bonds remain Outstanding, money on deposit in any fund, account or subaccount maintained in connection with the Bonds, regardless of whether such money was derived from the proceeds of the sale of the Bonds or from any other sources, will not be used in a manner that would cause any of the Bonds to be "arbitrage bonds" within the meaning of Section 148 of the Internal Revenue Code of 1986, as amended (the "Code"), and applicable regulations promulgated from time to time thereunder, except for moneys on deposit in such funds, accounts or subaccounts with respect to any Series of Bonds not intended to be tax-exempt under the provisions of the Code. The Authority further covenants and agrees to comply with the requirements of Section 148 of the Code and applicable regulations promulgated from time to time thereunder with respect to any Series of Bonds intended to be tax-exempt under the provisions of the Code.

## ARTICLE VII

## GENERAL COVENANTS AND REPRESENTATIONS

Section 701. Payment of Principal, Interest, Premium and Other Amounts. The Authority shall cause to be paid, when due, the principal of (whether at maturity, by redemption or otherwise) and the premium, if any, and interest on the



Bonds, Parity Debt and Junior Indebtedness and the Derivative Agreement Regularly Scheduled Payments at the places, on the dates and in the manner provided herein and in the Bonds, Parity Debt and Junior Indebtedness and the documentation authorizing and securing such Bonds, Parity Debt and Junior Indebtedness and in any Derivative Agreement, according to the true intent and meaning thereof.

The Bonds, Parity Debt and Junior Indebtedness are special obligations of the Authority payable solely from the Trust Estate, including Receipts, the Authority's right to receive the same, and money, Investment Obligations and Reserve Alternative Instruments held in the applicable funds, accounts and subaccounts created hereunder for each such Series of Bonds and any Parity Debt and Junior Indebtedness and the income from Investment Obligations in such funds, accounts and subaccounts. The Bonds, Parity Debt and Junior Indebtedness shall be secured as provided in Section 518. The Bonds, Parity Debt and Junior Indebtedness shall not be deemed to a debt, liability or obligation of the State or of any other public body in the State secured by a pledge of the faith and credit of the State or of any other public body in the State, respectively, but shall be payable solely from the Trust Estate. The Authority shall not be obligated to pay the principal of, premium, if any, or interest on the Bonds, Parity Debt and Junior Indebtedness except from the Trust Estate, and neither the faith and credit nor the taxing power of the State or of any other public body in the State, including the Authority, is pledged for the payment of the principal of, premium, if any, or interest on the Bonds, Parity Debt and Junior Indebtedness. The Authority has no taxing power.

*The preceding paragraph was revised pursuant to Section 701(xx) of the Fourth Supplemental Trust Agreement.*

Section 702. Acquisition, Construction and Equipping of the Initial Project and Additional Projects. The Authority shall acquire, construct and equip the Initial Project and any Additional Project for which Bonds, Parity Debt or Junior Indebtedness are issued or for which money repayable from the proceeds of Bonds, Parity Debt or Junior Indebtedness are advanced by the Authority for such purpose. The Authority covenants to acquire, construct, equip and complete the Initial Project and any Additional Project in conformity with applicable law and all other requirements of all governmental authorities having jurisdiction thereover, and that the Authority will complete the acquisition, construction and equipping of the Initial Project and any Additional Project with all expedition practicable. The Authority also covenants to take all action reasonably necessary to enforce the Authority's right to receive advances from NCDOT pursuant to the Construction and Renewal and Replacement Agreement.

*The preceding paragraph was revised pursuant to Section 701(k) of the Fourth Supplemental Trust Agreement.*

The Authority shall require each person, firm or corporation with whom it may contract for such construction to (a) furnish a payment and performance bond in the full amount of any contract or (b) deposit with an Authorized Officer marketable securities that are eligible as security for the deposit of trust funds as provided in Section 601 in the full amount of any contract. The proceeds of any such payment or performance bond or securities shall be deposited in the applicable account or subaccount of the Project Fund and applied toward the completion of the Initial Project or Additional Project in connection with which such payment or performance bond or securities are furnished. The Authority shall diligently exercise its rights for the enforcement of any such payment and performance bond.

Section 703. Maintenance of Existence: Operation of the Triangle Expressway System.

(a) The Authority shall take all actions within its power to maintain its existence as a body corporate and politic and public instrumentality under the laws of the State.

(b) The Authority shall establish and enforce reasonable rules and regulations governing the operation and use of the Triangle Expressway System, operate the Triangle Expressway System in an efficient and economical manner, maintain the properties constituting the Triangle Expressway System in good repair and in sound operating condition for so long as the same are necessary for the operation of the Triangle Expressway System, and comply with all valid acts, rules, regulations, orders and directions of any legislative, executive, administrative or judicial body that are applicable to the Triangle Expressway System. The Authority's obligation to maintain and operate the Triangle Expressway System is an obligation only upon the Trust Estate, and no Owner or Holder of Indebtedness has the right to compel the exercise of the taxing power by the State or any other public body in the State, including the Authority, or the forfeiture of any of their respective property in connection with any such obligation except as herein provided. The Authority also covenants to take all action reasonably necessary to enforce the Authority's rights to receive Operating Advances from NCDOT pursuant to the O&M Guaranty Agreement and advances from NCDOT under the Construction and Renewal and Replacement Agreement.

(c) The Authority covenants that it will serve as the exclusive procuring agent for the acquisition, installation, operation and maintenance of all property, plant and equipment designed to calculate the tolls to be charged to users of the Initial Project and any Additional Project and that it will institute such administrative procedures and enter into such agreements with third party service providers as shall be necessary to assure that the tolls so charged are collected to the extent reasonably practicable. Notwithstanding the foregoing, in selecting the toll identification and collection technology to be utilized, the equipment and service vendors to utilize, the technology hardware and software to be utilized, including all



processes used for revenue collection, the Authority may take into consideration such factors as the Authority shall determine to be necessary, such as compatibility of the systems used for the Initial Project and Additional Projects with the systems used elsewhere by the Authority and other toll road operators, emerging technologies and the adaptability of the systems utilized to emerging technologies, customer costs associated with the systems selected, the accuracy of the systems selected in computing and assessing tolls and such other factors and the Authority shall determine relevant.

Section 704. Rate Covenant.

(a) The Authority covenants to fix, charge and collect tolls, fees, rentals and other charges for the use of and for services furnished or to be furnished by the Triangle Expressway System, and that from time to time and as often as it shall appear necessary, to revise such tolls, fees, rentals and other charges as may be necessary or appropriate, in order that for each Fiscal Year, beginning with the first full Fiscal Year in which the Initial Project is in operation, the Revenues in such Fiscal Year will not be less than 130% of the Long-Term Debt Service Requirement for Senior Lien Indebtedness only for such Fiscal Year.

(b) The Authority covenants to fix, charge and collect tolls, fees, rentals and other charges for the use of and for services furnished or to be furnished by the Triangle Expressway System, and that from time to time and as often as it shall appear necessary, to revise such tolls, fees, rentals and other charges as may be necessary or appropriate, in order that for each Fiscal Year, beginning with the first full Fiscal Year in which the Initial Project is in operation, the Revenues in such Fiscal Year will not be less than 110% of (i) the Long-Term Debt Service Requirement for Senior Lien Indebtedness, Subordinate Lien Indebtedness and Junior Indebtedness for such Fiscal Year and (ii) the deposits to be made to the Senior Lien Parity Reserve Account, Subordinate Lien Parity Reserve Account, the Junior Indebtedness Debt Service Reserve Account and the TIFIA Debt Service Reserve Account for such Fiscal Year.

(c) In addition to the covenants set forth in subsections (a) and (b) of this Section, the Authority also covenants to fix, charge and collect tolls, fees, rentals and other charges for the use of and for services furnished or to be furnished by the Triangle Expressway System, and that from time to time and as often as it shall appear necessary, to revise such tolls, fees, rentals and other charges as may be necessary or appropriate, in order that the Receipts will be sufficient in each Fiscal Year to make all of the deposits required by Section 503(a) through (n), inclusive.

(d) The Authority covenants that all users will pay for use of and services furnished by the Triangle Expressway System at the tolls, rates, fees and charges established by the Authority from time to time in accordance with the Authority's customary tolling and billing practices and policies.

(e) If the Authority fails to comply with the covenants set forth in subsections (a), (b) and (c) above, it shall, within thirty (30) days of the receipt by the Authority of the audit report required by Section 706, request a Traffic Consultant to make its recommendations, if any, as to a revision of the Authority's tolls, fees, rentals and charges, its Operating Expenses or the method of operation of the Triangle Expressway System in order to satisfy the foregoing requirements of this Section. Copies of such request and of the recommendations of the Traffic Consultant, if any, shall be filed by the Authority with the Trustee. Promptly upon its receipt of the recommendations of the Traffic Consultant, the Authority shall, after giving due consideration to the recommendations, revise its tolls, fees, rentals and charges or its Operating Expenses or alter its methods of operation, which revisions or alterations need not comply with the Traffic Consultant's recommendations but which are projected by the Authority to result in compliance with the covenants set forth in subsections (a), (b) and (c) of this Section. The Authority and the Traffic Consultant shall advise the Trustee of the actions taken by the Authority with respect to the recommendations of the Traffic Consultant. If the Authority shall comply with all of the recommendations of the Traffic Consultant, failure to comply with the provisions of subsections (a), (b) and (c) above shall not constitute an Event of Default under the provisions of clause (h) of Section 802. Compliance with all of the recommendations of the Traffic Consultant shall have no effect on any Event of Default other than an Event of Default under the provisions of clause (h) of Section 802. In the event of any failure to comply with the provisions of subsections (a), (b) and (c) above and the failure of the Authority to comply with all of the recommendations of the Traffic Consultant, and in addition to the remedies elsewhere provided in this Trust Agreement, the Trustee or the Owners or Holders of not less than 25% in aggregate principal amount of the Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness then Outstanding may, and the Trustee shall, upon the request of the Owners or Holders of not less than 25% in aggregate principal amount of the Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness then Outstanding and upon being indemnified to its satisfaction, institute and prosecute in a court of competent jurisdiction an appropriate action to compel the Authority to comply with all of the recommendations of the Traffic Consultant in order to satisfy the foregoing requirements of this Section. The Authority covenants that it will adopt and charge tolls, fees, rentals and charges and revise its Operating Expenses or the method of operation of the Triangle Expressway System in compliance with any final order, decree or judgment entered in any such proceeding or modification thereof.

(f) Subject to the provisions of Section 714, the Authority may enter into contracts or agreements or amend or rescind existing contracts or agreements for the use of the Triangle Expressway System on such terms and for such periods of time as the Authority shall determine to be proper.



(g) The Authority also covenants to fix and charge tolls, fees, rentals and charges for each component of the Triangle Expressway System which tolls, fees, rentals and charges shall be reasonable and non-discriminatory.

(h) Nothing contained in this Section shall obligate the Authority to take any action in violation of any applicable requirements imposed by law.

(i) Pursuant to Section 723, for so long as the TIFIA Series 2019 Bond is Outstanding, the Authority also agrees to comply with the rate covenant set forth in the TIFIA 2019 Loan Agreement.

*The references to subsections of Section 503 in the preceding Section were revised pursuant to Section 701(b) of the Third Supplemental Trust Agreement. Section 704 was then replaced by Section 701(bb) of the Fourth Supplemental Trust Agreement.*

Section 705. Budgets and Covenant as to Operating Expenses. The Authority shall adopt an Annual Budget for the Triangle Expressway System for each Fiscal Year. To the extent possible, the Authority shall prepare its Annual Budget so that it will be possible to determine from such Annual Budget (a) the amount of State Appropriated Revenues budgeted for deposit in the Revenue Fund during such Fiscal Year, (b) the amount of Receipts budgeted for deposit in the Revenue Fund during such year, (c) the amounts to be deposited or paid under Section 503, including the Operating Expenses, (d) the amount of Operating Expenses budgeted to be paid from NCDOT pursuant to the O&M Guaranty Agreement, (e) the amount of any deposits to be made to the Renewal and Replacement Fund from Receipts and (f) the amount of any deposits to be made to the Renewal and Replacement Fund pursuant to the Construction and Renewal and Replacement Agreement. In preparing its Annual Budget, the Authority shall give due consideration to the provisions of Section 704.

The Authority shall also adopt a Capital Improvements Budget for the Triangle Expressway System for each Fiscal Year which will show, in addition to such other matters as the Authority may determine to include, (a) the amounts, if any, to be expended during such Fiscal Year from moneys, if any, deposited to the credit of the Project Fund, the Renewal and Replacement Fund or the General Reserve Fund, together with a statement of the purposes for which such amounts are to be expended in each case and (b) the amount estimated by the Authority to be necessary for the renovation, extension, improvement, enlargement, renewal or replacement of the Triangle Expressway System, whether the same are to be commenced, continued or completed during such Fiscal Year or thereafter. The Capital Improvements Budget may be part of the Annual Budget. The Authority shall file copies of any Capital Improvements Budget and its Annual Budget promptly upon availability with the Trustee and together with such budgets the

Authority shall provide the Trustee with calculations for any required deposits pursuant to Section 503(k), (l) and (m).

*In the preceding paragraph, cross references to subsections of Section 503 was modified pursuant to Section 701(b) of the Third Supplemental Trust Agreement.*

Section 706. Records, Accounts and Audits. The Authority shall keep the funds, accounts, subaccounts, money and investments of the Triangle Expressway System separate from all other funds, accounts, money and investments, if any, of the Authority and shall keep accurate records and accounts of all items of costs and of all expenditures relating to the Triangle Expressway System and of the revenues collected and the application of such revenues. Such records and accounts shall be open to the inspection of the Trustee.

The Authority shall cause its accountant, which may be the State Auditor, to prepare and deliver to the Authority within 180 days after the close of each Fiscal Year an audit of the Authority's books and accounts relating to the Triangle Expressway System. Reports of each such audit shall be filed with the Trustee, the Local Government Commission and USDOT, and copies of each such report shall be mailed by the Authority to any person requesting the same in writing and shall be made available for inspection at the office of the Chief Financial Officer. Each such audit report shall be accompanied by an opinion of the accountant stating that the examination of the financial statements was conducted in accordance with generally accepted auditing standards and stating whether such financial statements present fairly the financial position of the Triangle Expressway System and the results of its operations and a statement of cash flows for the period covered by such audit report in conformity with generally accepted accounting principles applied on a consistent basis.

If for any reason beyond its control, the Authority is unable to obtain the foregoing opinion as to compliance with generally accepted accounting principles, the Authority shall be deemed to be in compliance with this Section if it is taking all reasonable and feasible action to obtain such opinion in subsequent Fiscal Years, and if, in lieu of a statement as to compliance and conformity, such opinion states the reasons for such noncompliance or non-conformity.

Each audit report shall contain data setting forth in respect of said Fiscal Year a calculation to determine compliance with Section 704.

There shall also be filed with the Trustee within sixty (60) days after the end of each Fiscal Year an Officer's Certificate stating to the best of such person's knowledge, (i) whether there existed at the end of the Fiscal Year, any violation of any covenants or agreements herein contained and (ii) whether at any time during the Fiscal Year, any Default occurred, and if so, the nature of such Default.



Section 707. Insurance.

(a) The Authority covenants that it will maintain or cause to be maintained a practical insurance program, with reasonable terms, conditions, provisions and costs, which the Authority determines (i) will afford adequate protection against loss caused by damage to or destruction of the Triangle Expressway System or any part thereof and (ii) will provide the Authority reasonable protection from liability for bodily injury and property damage resulting from the construction or operation of the Triangle Expressway System. Furthermore, the Authority covenants that it will maintain use and occupancy insurance covering loss of Receipts by reason of necessary interruption, total or partial, in the use of the facilities of the Triangle Expressway System, due to loss or damage to any such facility in such amount as an Insurance Consultant determines will provide income during a period of interruption of not less than six months and computed on the basis of Revenues for the preceding Fiscal Year (or the estimated Revenues for the current Fiscal Year as estimated by the Insurance Consultant if the Triangle Expressway System was not in operation during the preceding Fiscal Year.

All insurance policies shall be carried by a responsible insurance company or companies, whose claims paying ability is rated at least "A" by S&P, authorized and qualified to assume the risks thereof, or by the North Carolina Department of Insurance. The Authority may also participate in self-insurance programs (except with respect to use and occupancy insurance) so long as the types and levels of such self-insurance programs are determined in writing by an Insurance Consultant to be adequate coverage for the Authority.

(b) Any insurance coverage pursuant to this Section may be subject to such deductible limitations as the Authority shall deem appropriate, or may be pursuant to a program whereby the Authority self-insures against certain losses up to a stated loss amount, and retains excess coverage from an insurer meeting the requirements of this Section.

(c) All such policies shall be for the benefit of the Authority, shall be made payable to the Authority and shall remain with the Authority, and the Authority shall have the sole right to receive the proceeds of such insurance and to collect and receipt for claims thereunder. Net Insurance Proceeds shall be applied as provided in Section 709.

(d) Within sixty (60) days of the end of each Fiscal Year, an Authorized Officer shall file with the Trustee a report listing the policies of insurance, State insurance programs or self-insurance programs currently in force, the names of any companies issuing such insurance, the amounts and expiration date or dates of such insurance, the risks covered thereby, that such insurance complies with the provisions of this Section, whether an Insurance Consultant was employed during

such Fiscal Year and a copy of all such reports filed by the Insurance Consultant. Any such report may be relied upon by the Trustee as' conclusive.

(e) Notwithstanding any of the foregoing provisions of this Section, the Authority shall not be required to amend or otherwise change any of the insurance provisions of its contracts, leases and other agreements in effect on the date of the issuance of the Series 2009 Bonds for the purpose of complying with the provisions of this Section and, with respect to any contract, lease or other agreement entered into by the Authority after the date of the issuance of the Series 2009 Bonds, the Authority may provide for policies which are payable to the parties of such contract, lease or other agreement as their interests may appear and may provide that the proceeds be applied in such manner as the Authority, in its opinion, believes to be in the best interest of the Authority. The Authority may require evidence of the existence of such policies and notice of cancellation in lieu of the possession of such policies.

Section 708. Notice of Taking; Cooperation of Parties. If any public authority or entity attempts to take all or any part of the Triangle Expressway System through Eminent Domain proceedings, the Authority shall take prompt and appropriate measures to protect and enforce its rights and interests and those of the Trustee and the Owners and Holders of Bonds, Parity Debt and Junior Indebtedness and in connection with such proceedings. Upon receiving notice of the institution of Eminent Domain proceedings by any public instrumentality, body, agency or officer, the Authority shall deliver written notice thereof to the Trustee.

The Net Eminent Domain Proceeds shall be applied in accordance with the provisions of Section 709.

Section 709. Insurance and Eminent Domain Proceeds.

(a) If, as a result of any casualty occurring to any part of the Triangle Expressway System or as a result of any taking by Eminent Domain of any part of the Triangle Expressway System, the revenue-producing capabilities of the Triangle Expressway System will, in the opinion of an Authorized Officer of the Authority, be materially impaired for a period in excess of one hundred twenty (120) consecutive days, all Net Insurance Proceeds received by the Authority and all Net Eminent Domain Proceeds received by the Authority, as the case may be, shall be delivered to the Trustee for deposit in the Insurance and Condemnation Award Fund and shall be applied, to the extent permitted by law, at the election of the Authority:

(i) to replace, repair, rebuild or restore the Triangle Expressway System to substantially the same condition as that which existed prior to such damage, destruction or taking, with such alterations and additions as the Authority may determine and as will not impair or otherwise adversely affect the revenue-producing capability of the Triangle Expressway System,



provided that prior to the commencement of such replacement, repair, rebuilding or restoration, the Authority shall deliver to the Trustee a report of a licensed architect or engineer employed by the Authority setting forth (A) an estimate of the total cost of the same, (B) the estimated date upon which such replacement, repair, rebuilding or restoration will be substantially completed, and (C) a statement to the effect that Net Insurance Proceeds or Net Eminent Domain Proceeds, as the case may be, together with other funds made available or to be made available by the Authority, are projected to be sufficient to pay the costs of the replacement, repair, rebuilding or restoration of the Triangle Expressway System; or

(ii) first, to the redemption or prepayment of Senior Lien Indebtedness, if any, pro rata to the extent practicable in the manner provided in the Senior Lien Resolutions; second, to the redemption or prepayment of Subordinate Lien Indebtedness, if any, pro rata to the extent practicable in the manner provided in the Subordinate Lien Resolutions; and third, to the redemption or prepayment of Junior Indebtedness, if any, pro rata to the extent practicable in the manner provided in the TIFIA 2019 Loan Agreement; provided, however, that Senior Lien Indebtedness, Subordinate Lien Indebtedness and Junior Indebtedness may be redeemed or prepaid only if (A) the Triangle Expressway System has not been restored to substantially the same condition as prior to such damage, destruction or taking or (B) the licensed architect or engineer employed by the Authority has been unable to make the statement required by subsection (a)(i)(C) of this Section; or

(iii) to transfer to any fund or account designated by the Authority if the Triangle Expressway System, as evidenced by a report of a licensed architect or engineer employed by the Authority, has been restored to substantially the same condition as prior to such damage, destruction or taking with other funds of the Authority or made available to the Authority which were not subject to the lien in favor of the Owners and Holders of Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness.

*Subsection (a)(ii) was revised pursuant to Section 701(aaa) of the Fourth Supplemental Trust Agreement.*

(b) All Net Insurance Proceeds and all Net Eminent Domain Proceeds which the Authority is not required to pay to the Trustee pursuant to the foregoing provisions of this Section shall be applied to the redemption or prepayment of Senior Lien Indebtedness which may then be redeemed or prepaid without payment of a premium, if any, and, if Outstanding, the TIFIA Series 2019 Bond, in accordance with the Special Redemption Arrangement to the extent practicable.

If the Authority elects to redeem Bonds, the Authority shall direct the Trustee to redeem Bonds in accordance with Article III of this Trust Agreement and the Supplemental Agreement for any such Bonds and to transfer from the Insurance and Condemnation Award Fund to the applicable subaccounts of the Redemption Account an amount sufficient to pay the Redemption Price of the Bonds to be redeemed and to the applicable subaccounts of the respective Interest Accounts an amount that, together with amounts then on deposit therein, is sufficient to pay interest accruing on the Bonds to be redeemed to the date fixed for redemption. If the Authority elects to redeem or prepay Parity Debt or Junior Indebtedness, the Authority shall follow the requirements for such redemption or prepayment as set forth in the applicable Parity Debt Resolution or Junior Indebtedness Agreement for such Parity Debt or Junior Indebtedness.

*The preceding subsection was revised pursuant to Section 701(cc) of the Fourth Supplemental Trust Agreement.*

(c) Any Net Insurance Proceeds and Net Eminent Domain Proceeds received by NCDOT shall be transferred to the Authority and applied in accordance with the provisions of this Section.

*The preceding subsection (c) was added pursuant to Section 701(bbb) of the Fourth Supplemental Trust Agreement.*

Section 710. Compliance with Applicable Law. So long as any Bond, Parity Debt or Junior Indebtedness is Outstanding, the Authority shall comply or cause there to be compliance with all applicable laws, orders, rules, regulations and requirements of any municipal or other governmental authority relating to the construction, use and operation of the Triangle Expressway System. Nothing contained in this Section shall prevent the Authority from contesting in good faith the applicability or validity of any law, ordinance, order, rules regulation, or requirement so long as its failure to comply with the same during the period of such contest will not materially impair the operation or revenue-producing capability of the Triangle Expressway System.

Section 711. Payment of Charges and Covenant Against Encumbrances. Except as otherwise provided in this Trust Agreement, the Authority shall not create or suffer to be created any lien or charge upon the Triangle Expressway System or any part thereof, or on the Receipts, except for Permitted Encumbrances. The Authority shall discharge or cause to be discharged, or shall make adequate provision to satisfy and discharge, within sixty (60) days after the same become due and payable, all lawful costs, expenses, liabilities and charges relating to the maintenance, repair, replacement or improvement of the properties constituting the Triangle Expressway System and the operation of the Triangle Expressway System and lawful claims and demands for labor, materials, supplies or other objects that might by law become a lien upon the Triangle Expressway System or Receipts if



unpaid. Nothing contained in this Section shall require the Authority to pay or cause to be discharged, or make provision for the payment, satisfaction and discharge of, any lien, charge, cost, liability, claim or demand so long as the validity thereof is contested in good faith and by appropriate legal proceedings.

Section 712. Covenant Against Sale or Disposition and Exceptions Thereto. (a) The Authority covenants that, except as permitted in this Section or Section 714, it will not sell, exchange or otherwise dispose of the Triangle Expressway System or any part thereof.

(b) The Authority may from time to time sell, exchange or otherwise dispose of any equipment, motor vehicles, machinery, fixtures, apparatus, tools, instruments or other movable property if it determines that such articles are no longer needed or are no longer useful in connection with the Triangle Expressway System, and the proceeds thereof may be used for any lawful purpose determined by the Authority.

(c) The Authority may from time to time sell, exchange or otherwise dispose of (but not lease, contract or agree for the use thereof except as permitted under Section 714) any other property of the Triangle Expressway System if it determines by resolution:

(i) that the sale, exchange or other disposition thereof would not materially adversely affect the operating efficiency of the Triangle Expressway System and would not materially reduce Receipts; or

(ii) that the sale, exchange or other disposition thereof would not materially adversely affect the ability of the Authority to comply with the rate covenant set forth in Section 704 for the current and next succeeding Fiscal Year.

If the fair market value of any item of real or personal property to be sold, exchanged or otherwise disposed of in any Fiscal Year in accordance with the provisions of this Section shall be in excess of 3% of net property, plant and equipment of the Triangle Expressway System calculated in accordance with generally accepted accounting principles, or if the fair market value of any such item together with the fair market value of all other such items so disposed of in such Fiscal Year shall aggregate in excess of 3% of net property, plant and equipment of the Triangle Expressway System calculated in accordance with generally accepted accounting principles, then no such disposal shall be effected without first obtaining the written approval of a Traffic Consultant of the determinations to be made by the Authority with respect to such disposition under the provisions of this Section.

(d) Any proceeds received by NCDOT from the sale of any Authority property pursuant to this Section shall be transferred to the Authority and applied in accordance with the provisions of this Section.

*The preceding section was revised and expanded pursuant to Section 701(ccc) of the Fourth Supplemental Trust Agreement.*

Section 713. Additional Projects: Additions to the Triangle Expressway System. All buildings, structures and items of personal property that are constructed, placed or installed in or upon the properties constituting the Triangle Expressway System as an addition or improvement to, as a substitute for, or in renewal, replacement or alteration of, any buildings, structures, and personal property constituting part of the Triangle Expressway System, and all real property acquired as an addition to, in replacement of, or as a substitute for real property constituting a part of the Triangle Expressway System shall thereupon become part of the Triangle Expressway System.

Section 714. Contracts, Leases and Other Agreements. The Authority may lease, as lessor, all or any part of the Triangle Expressway System, or contract or agree for the performance by others, of operations or services on or in connection with the Triangle Expressway System or any part thereof, for any lawful purpose, provided, that:

(a) the Authority shall remain fully obligated and responsible under this Trust Agreement to the same extent as if such lease, contract or agreement, or any amendment or rescission thereof, had not been executed, and

(b) the obligation of the Authority under such lease, contract or agreement shall not impair the performance of the Authority's obligations under this Trust Agreement.

Section 715. Financing of Non-System Projects, Addition of Non-System Projects to the Triangle Expressway System. Nothing in this Trust Agreement expressed or implied shall be construed as prohibiting the Authority, if then authorized or permitted by law, from financing the acquisition or construction of any Non-System Project in accordance with the provisions of this Section.

No Non-System Projects shall be financed by the Authority unless there shall be filed with the Authority and the Trustee:

(a) an opinion of counsel to the Authority to the effect that the Non-System Project or the indebtedness or other obligations incurred to finance such Non-System Project are not, directly or indirectly, secured by or payable from Receipts or issued under or secured by the provisions of this Trust Agreement and that the financing of the Non-System Project will not materially conflict with or



constitute on the part of the Authority a breach of or default under any of the covenants or provisions of this Trust Agreement,

(b) a statement, signed by a Traffic Consultant, to the effect that in its opinion the acquisition or construction of such Non-System Project will not materially adversely affect the Receipts or Revenues or impair the operating efficiency of the Triangle Expressway System, and

(c) a statement, signed by a Traffic Consultant, to the effect that in its opinion the estimated gross revenues to be received from the operation of the Non-System Project will be sufficient to pay the estimated operating and maintenance expenses of such Non-System Project, any debt service or reserve requirements with respect thereto and any other necessary related costs and expenses.

If Non-System Projects are financed by the Authority, the Authority shall put in place necessary measures in order to account for, and keep separate and apart from Receipts and Operating Expenses, the gross revenues received from the operation of such Non-System Projects, as well as the operating and maintenance expenses of such Non-System Projects, any debt service or reserve requirements with respect thereto and any other necessary related costs and expenses.

Upon compliance with the following conditions, the Authority may determine that a Non-System Project shall be redesignated as an Additional Project within the meaning of this Trust Agreement upon which such Non-System Project shall become a part of the Triangle Expressway System:

(i) the Authority Board shall adopt a resolution redesignating such Non-System Project as an Additional Project and a part of the Triangle Expressway System;

(ii) there shall be filed with the Trustee a certificate or report of a Traffic Consultant stating that for the last succeeding Fiscal Year for which audited financial statements are available, the revenues received by the Authority with respect to such Non-System Project (to the extent that such revenues would have constituted Revenues if such Non-System Project were part of the Triangle Expressway System) equaled or exceeded for such period the sum of (A) the operating expenses paid by the Authority with respect to such Non-System Project (to the extent that such operating expenses would have constituted Current Expenses if such Non-System Project were part of the Triangle Expressway System), (B) any additional Current Expenses that would have been incurred by the Authority if such Non-System Project had been a part of the Triangle Expressway System (as estimated by the Traffic Consultant)and (C) a reasonable renewal and replacement reserve deposit with respect to such Non-System Project, as determined by such Traffic Consultant; and

(iii) an Officer's Certificate stating that any outstanding indebtedness relating to such Non-System Project has been duly paid or defeased; provided, however, that the Authority may incur Senior Lien Indebtedness or Subordinate Lien Indebtedness for the purpose of refinancing any outstanding indebtedness incurred to finance a Non-System Project upon compliance with the provisions of Section 716 or Section 717, as applicable.

Section 716. Limitation on Senior Lien Indebtedness. Subject to the conditions hereinafter provided, the Authority shall have the right to incur Senior Lien Indebtedness for any purpose for which Bonds may be issued under Section 208, as provided in this Section.

(a) Long-Term Indebtedness constituting Senior Lien Indebtedness may be incurred if prior to incurrence there is delivered to the Trustee:

(i) an Officer's Certificate certifying that the Authority was in compliance with the covenants set forth in Section 704(a), (b) and (c) for the most recent Fiscal Year for which audited financial statements are available;

*In the preceding subsection, a cross reference to subsections of Section 704 was modified pursuant to Section 701(yy) of the Fourth Supplemental Trust Agreement.*

(ii) a report of a Traffic Consultant stating that for each Fiscal Year next succeeding the date on which such Long-Term Indebtedness is incurred through the final maturity date of any Long-Term Indebtedness, the forecasted Revenues in each such Fiscal Year are at least 140% of the Long-Term Debt Service Requirement with respect to all Outstanding Long-Term Indebtedness constituting Senior Lien Indebtedness (excluding any Long-Term Indebtedness constituting Senior Lien Indebtedness to be refunded by the Long-Term Indebtedness to be incurred) and the Long-Term Indebtedness proposed to be incurred;

(iii) a report of a Traffic Consultant stating that (x) for each Fiscal Year next succeeding the date on which such Long-Term Indebtedness is incurred through the final maturity date of any Long-Term Indebtedness, the forecasted Revenues are at least 130% of the sum of (1) the Long-Term Debt Service Requirement with respect to all Outstanding Senior Lien Indebtedness, Subordinate Lien Indebtedness and TIFIA Indebtedness (excluding any Long-Term Indebtedness to be refunded by the Long-Term Indebtedness to be incurred) and the Long-Term Indebtedness to be incurred and (2) the amounts to be deposited in such Fiscal Year to the Senior Lien Parity Reserve Account, the Subordinate Lien Parity Reserve Account and the TIFIA Debt Service Reserve Account, and (y) the Loan Life Coverage Ratio is a least 130%;



(iv) a report of a Traffic Consultant showing that (1) for each Fiscal Year next succeeding the date on which such Long-Term Indebtedness is incurred through the final maturity date of any Long-Term Indebtedness, the forecasted Receipts in each Fiscal Year will be sufficient to make all of the deposits in each such Fiscal Year required by clauses (a) through (j) of Section 503 and (2) that all Outstanding TIFIA Indebtedness will be fully retired by its final maturity date; and

*In the preceding subsection, a cross reference to a subsection of Section 503 was modified pursuant to Section 701(b) of the Third Supplemental Trust Agreement.*

(v) evidence that such Senior Lien Indebtedness will be rated at an investment grade rating by Fitch, Moody's or S&P.

(b) Completion Indebtedness constituting Senior Lien Indebtedness may be incurred in an amount not exceeding 5% of the aggregate principal amount of the Long-Term Indebtedness constituting Senior Lien Indebtedness originally incurred by the Authority to finance the costs of the Initial Project or any Additional Project; provided, however, that prior to the incurrence of such Completion Indebtedness, the Authority shall furnish to the Trustee (i) a certificate of a licensed architect or engineer estimating the costs of completing the facilities for which such Completion Indebtedness is to be incurred and (ii) an Officer's Certificate certifying that the amount of such Completion Indebtedness to be incurred will be sufficient, together with other funds, if applicable, to complete construction of the facilities as estimated by the architect or engineer in respect of which such Completion Indebtedness is to be incurred and (iii) evidence that such Senior Lien Indebtedness will be rated at an investment grade rating by such credit rating agency.

(c) Long-Term Indebtedness constituting Senior Lien Indebtedness may be incurred for the purpose of refunding all or any part of any Outstanding Long-Term Indebtedness constituting Senior Lien Indebtedness so as to render it no longer Outstanding if prior to incurrence thereof, an Officer's Certificate is delivered to the Trustee (i) stating that the proceeds of such Long-Term Indebtedness, together with interest earnings on the Defeasance Obligations to be acquired and other available funds, will be sufficient to pay the principal of and interest and any premium on the Long-Term Indebtedness to be refunded to the redemption or maturity date or dates and the expenses incident to the refunding, and (ii) stating that either (A) the Long-Term Debt Service Requirement for any Fiscal Year thereafter on account of all Long-Term Indebtedness constituting Senior Lien Indebtedness to be Outstanding after the incurrence of such Long-Term Indebtedness to accomplish the refunding and after the refunding of such Long-Term Indebtedness will not be greater than (1) for Fiscal Years ending prior to the maturity of all TIFIA Indebtedness, the Long-Term Debt Service Requirement on account of all Long-Term Indebtedness constituting Senior Lien Indebtedness

Outstanding immediately prior to the incurrence of such Long-Term Indebtedness to accomplish such refunding, including the Long-Term Indebtedness to be refunded and (2) for Fiscal Years ending after the maturity of all TIFIA Indebtedness, 110% of the Long-Term Debt Service Requirement on account of all Long-Term Indebtedness constituting Senior Lien Indebtedness Outstanding immediately prior to the incurrence of such Long-Term Indebtedness to accomplish such refunding, including the Long-Term Indebtedness to be refunded, provided that there is no limit for Fiscal Years beginning after the final maturity date of all Long-Term Indebtedness Outstanding prior to the proposed refunding or (B) the incurrence of such Long-Term Indebtedness to accomplish the refunding will satisfy the requirements of subsection (a) of this Section and (iii) evidence that such Senior Lien Indebtedness will be rated at an investment grade rating by at least one nationally recognized securities credit rating agency.

(d) Short-Term Indebtedness constituting Senior Lien Indebtedness may be incurred if, (i) immediately after the incurrence of such Short-Term Indebtedness, the Outstanding principal amount of all Short-Term Indebtedness constituting Senior Lien Indebtedness does not exceed $5,000,000; provided, however, that for a period of twenty (20) consecutive calendar days in each Fiscal Year, no such Short-Term Indebtedness shall be Outstanding, (ii) the proceeds of the Short-Term Indebtedness are to be used to pay Operating Expenses, (iii) the Authority is then current in the payment of all debt service then due with respect to all TIFIA Indebtedness and (iv) evidence that such Senior Lien Indebtedness will be rated at an investment grade rating by Fitch, Moody's or S&P nationally recognized securities credit rating agency.

(e) Put Indebtedness constituting Senior Lien Indebtedness may be incurred if prior to the incurrence of such Put Indebtedness (i) the conditions described in subsections (a), (b) or (c) of this Section are met and (ii) a Credit Facility exists to provide financing sufficient to pay the purchase price or principal of such Put Indebtedness on any date on which the Owner or Holder of such Put Indebtedness may demand payment thereof pursuant to the terms of such Put Indebtedness.

Whenever subsection (a) requires a certification for the most recent Fiscal Year preceding the date of incurrence of the Senior Lien Indebtedness in question for which audited financial statements are available, the Authority may, in its discretion, provide a certificate, opinion or report of an independent accountant, in lieu of the audit for such Fiscal Year, on financial statements covering twelve (12) consecutive calendar months of the eighteen (18) full consecutive calendar months preceding the date of incurrence of the Senior Lien Indebtedness in question.

The Authority may enter into Derivative Agreements with respect to Derivative Indebtedness constituting Senior Lien Indebtedness and providing for Derivative Agreement Regularly Scheduled Payments to be made as Senior Lien



Derivative Agreement Regularly Scheduled Payments without compliance with any of the provisions of this Section 716.

Notwithstanding the remainder of this Section, so long as any TIFIA Indebtedness is Outstanding, the issuance of additional Senior Lien Indebtedness is also subject to the requirements of the definition of "Additional Secured Indebtedness" in clauses (b), (c) and (e) thereof in the TIFIA 2019 Loan Agreement.

*The preceding paragraph was added pursuant to Section 701(s) of the Fourth Supplemental Trust Agreement.*

Section 717. Limitation on Subordinate Lien Indebtedness. Subject to the conditions hereinafter provided, the Authority shall have the right to incur Subordinate Lien Indebtedness for any purpose for which Bonds may be issued under Section 208, as provided in this Section.

(a) Long-Term Indebtedness constituting Subordinate Lien Indebtedness may be incurred if prior to incurrence there is delivered to the Trustee:

(i) an Officer's Certificate certifying that the Authority was in compliance with the covenants set forth in Section 704(a), (b) and (c) for the most recent Fiscal Year for which audited financial statements are available;

*In the preceding subsection, a cross reference to subsections of Section 704 was modified pursuant to Section 701(yy) of the Fourth Supplemental Trust Agreement.*

(ii) a report of a Traffic Consultant stating that for each Fiscal Year next succeeding the date on which such Long-Term Indebtedness is incurred through the final maturity date of any Long-Term Indebtedness, the forecasted Revenues in each such Fiscal Year is at least 120% the Long-Term Debt Service Requirement with respect to all Outstanding Senior Lien Indebtedness, Subordinate Lien Indebtedness and TIFIA Indebtedness (excluding any Long-Term Indebtedness to be refunded by the Long-Term Indebtedness to be incurred) and the Long-Term Indebtedness to be incurred and that the Loan Life Coverage Ratio is a least 130%; and

(iii) a report of a Traffic Consultant stating that (1) for each Fiscal Year next succeeding the date on which such Long-Term Indebtedness is incurred through the final maturity date of any Long-Term Indebtedness, the forecasted, the projected Receipts in each Fiscal Year will be sufficient to make all of the deposits in each such Fiscal Year required by clauses (a) through (j) of Section 503 and (2) that all Outstanding TIFIA Indebtedness will be fully retired by its final maturity date.

*In the preceding subsection, a cross reference to a subsection of Section 503 was modified pursuant to Section 701(b) of the Third Supplemental Trust Agreement.*

(b) Completion Indebtedness constituting Subordinate Lien Indebtedness may be incurred in an amount not exceeding 5% of the aggregate principal amount of the Long-Term Indebtedness constituting Subordinate Lien Indebtedness originally incurred by the Authority to finance the costs of the Initial Project or any Additional Project; provided, however, that prior to the incurrence of such Completion Indebtedness, the Authority shall furnish to the Trustee (i) a certificate of a licensed architect or engineer estimating the costs of completing the facilities for which such Completion Indebtedness is to be incurred and (ii) an Officer's Certificate certifying that the amount of such Completion Indebtedness to be incurred will be sufficient, together with other funds, if applicable, to complete construction of the facilities as estimated by the architect or engineer in respect of which such Completion Indebtedness is to be incurred.

(c) Long-Term Indebtedness constituting Subordinate Lien Indebtedness may be incurred for the purpose of refunding all or any part of any Outstanding Long-Term Indebtedness constituting Senior Lien Indebtedness or Subordinate Lien Indebtedness so as to render it no longer Outstanding if prior to incurrence thereof, an Officer's Certificate is delivered to the Trustee (i) determining that the proceeds of such Long-Term Indebtedness, together with interest earnings on the Defeasance Obligations to be acquired and other available funds, will be sufficient to pay the principal of and interest and any premium on the Long-Term Indebtedness to be refunded to the redemption or maturity date or dates and the expenses incident to the refunding, and (ii) stating that either (A) the Long-Term Debt Service Requirement for any Fiscal Year thereafter on account of all Long-Term Indebtedness to be Outstanding after the incurrence of such Long-Term Indebtedness to accomplish the refunding and after the refunding of such Long-Term Indebtedness will not be greater by more than 10% than the Long-Term Debt Service Requirement on account of all Long-Term Indebtedness Outstanding immediately prior to the incurrence of such Long-Term Indebtedness to accomplish such refunding, including the Long-Term Indebtedness to be refunded, or (B) the incurrence of such Long-Term Indebtedness to accomplish the refunding will satisfy the requirements of subsection (a) of this Section.

(d) Short-Term Indebtedness constituting Subordinate Lien Indebtedness may be incurred if, immediately after the incurrence of such Short-Term Indebtedness, the Outstanding principal amount of all Short-Term Indebtedness constituting Subordinate Lien Indebtedness does not exceed 25% of the General Reserve Fund balance at the end of the most recent Fiscal Year preceding the date of incurrence of such Short-Term Indebtedness for which audited financial statements are available; provided, however, that for a period of twenty (20)



consecutive calendar days in each Fiscal Year, no such Short-Term Indebtedness shall be Outstanding.

(e) Put Indebtedness constituting Subordinate Lien Indebtedness may be incurred if prior to the incurrence of such Put Indebtedness (i) the conditions described in subsections (a), (b) or (c) of this Section are met and (ii) a Credit Facility exists to provide financing sufficient to pay the purchase price or principal of such Put Indebtedness on any date on which the Owner or Holder of such Put Indebtedness may demand payment thereof pursuant to the terms of such Put Indebtedness.

Whenever subsection (a) requires a certification for the most recent Fiscal Year preceding the date of incurrence of the Subordinate Lien Indebtedness in question for which audited financial statements are available, the Authority may, in its discretion, provide a certificate, opinion or report of an independent accountant, in lieu of the audit for such Fiscal Year, on financial statements covering twelve (12) consecutive calendar months of the eighteen (18) full consecutive calendar months preceding the date of incurrence of the Subordinate Lien Indebtedness in question.

Notwithstanding the foregoing, the Authority may enter into Derivative Agreements with respect to Derivative Indebtedness constituting Subordinate Lien Indebtedness and providing for Derivative Agreement Regularly Scheduled Payments to be made as Subordinate Lien Derivative Agreement Regularly Scheduled Payments without compliance with any of the provisions of this Section.

The Authority agrees that it will not incur any Subordinate Lien Indebtedness while any TIFIA Indebtedness is Outstanding without the consent of USDOT unless the TIFIA Loan Agreement permits the incurrence of such Subordinate Lien Indebtedness without the consent of USDOT.

*The preceding paragraph was revised pursuant to Section 701(ddd) of the Fourth Supplemental Trust Agreement.*

Section 718. Employment of Consultants. For the purpose of performing and carrying out the duties imposed upon an Insurance Consultant under this Trust Agreement, the Authority shall from time to time employ an Insurance Consultant. A signed copy of any reports of any Insurance Consultant required hereby shall be filed with the Authority and the Trustee. Except for any fees and expenses incurred under the provisions of Section 403, the cost of employing any Insurance Consultant shall be treated as an Operating Expense of the Triangle Expressway System.

For the purpose of causing to be performed and carried out the duties imposed on the Traffic Consultant or General Engineering Consultant under this Trust Agreement, the Authority will employ one or more such consultants having a favorable repute for skill and experience for such work. Except for any fees and expenses incurred under the provisions of Section 403, the cost of employing any

Traffic Consultant or General Engineering Consultant shall be treated as an Operating Expense of the Triangle Expressway System.

The Insurance Consultant, Traffic Consultant and General Engineering Consultant shall at all times have free access to all properties constituting the Triangle Expressway System for the purposes of inspection and examination, and the books, public records and accounts of the Authority relating to the Triangle Expressway System may be examined by such consultants at all reasonable times.

Section 719. Further Instruments and Actions. The Authority shall, from time to time, execute and deliver such further instruments or take such further actions as may be required to carry out the purposes of this Trust Agreement.

Section 720. Use of Receipts and Inconsistent Actions. The Authority covenants and agrees that, so long as any of the Bonds, Parity Debt or Junior Indebtedness secured hereby are Outstanding or any Derivative Agreement relating to Bonds or Parity Debt is in effect, none of the Receipts will be used for any purpose other than as provided in this Trust Agreement; and that no contract or contracts will be entered into or any action taken by which the rights of Owners or Holder of Bonds, Parity Debt or Junior Indebtedness or the payee of any such Derivative Agreement Regularly Scheduled Payments might be impaired or diminished.

Section 721. State Appropriated Revenues. The Authority covenants that as part its preparation of the next fiscal year's Annual Budget it will budget, subject to receipt, for debt service on Indebtedness issued or incurred hereunder, the amount of the State Appropriated Revenues expected to be deposited to the Revenue Fund from the State Appropriation Revenue Bond Trust Agreement.

Section 722. Calculations with respect to Capital Appreciation Bonds, Convertible CAB Bonds and the TIFIA Series 2019 Bond. Whenever in this Trust Agreement a vote or percentage test is applied to the principal amount of Outstanding Bonds, the Accreted Amount of each Outstanding Capital Appreciation Bond and Convertible CAB Bond shall be used as its principal amount. The Outstanding TIFIA Loan Balance (as defined in the TIFIA 2019 Loan Agreement) shall be used as the principal amount of the TIFIA Series 2019 Bond.

*The preceding Section was added pursuant to Section 701(m) of the Fourth Supplemental Trust Agreement.*

Section 723. Special TIFIA Provisions. Terms not defined in this Section or in Section 101 shall have the meanings therefor set forth in the TIFIA 2019 Loan Agreement so long as the TIFIA Series 2019 Bond remains Outstanding. In addition, for so long as the TIFIA Series 2019 Bond remains Outstanding, the



Authority shall comply with the provisions of the TIFIA 2019 Loan Agreement, including, but not limited to, the following:

(a) Required Notifications Prior to Changes. The Authority shall provide USDOT with the following notifications:

(i) The retention by the Authority of any General Engineering Consultant other than HNTB North Carolina, P.C., will not be effective if objected to by USDOT within fifteen (15) Business Days after receiving notice from the Authority of the name of the proposed General Engineering Consultant, together with supporting information regarding the qualifications of the proposed firm; and

(ii) The retention by the Authority of any firm as Traffic Consultant other than CDM Smith will not be effective if objected to by USDOT within fifteen (15) Business Days after receiving notice from the Authority of the name of the proposed Traffic Consultant, together with supporting information regarding the qualifications of the proposed firm.

(b) Required Approvals. The prior written approval of USDOT shall be required as follows:

(i) For the issuance or incurrence of any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Lien Indebtedness, as described in or otherwise permitted in the definition of "Additional Secured Indebtedness" in the TIFIA 2019 Loan Agreement;

(ii) For the use of any Reserve Alternative Instrument, provided that such approval shall not be required in connection with (A) any Reserve Alternative Instrument relating to Existing Senior Bonds (as defined in the TIFIA 2019 Loan Agreement), including any endorsement thereto or policy in replacement thereof which increases the stated policy limit or extends the termination date, or (B) any Reserve Alternative Instrument delivered in connection with the issuance of Senior Lien Bonds if (1) the proceeds of such Senior Lien Bonds will be used to pay costs of the Complete 540 Phase 2 Project and (2) such Reserve Alternative Instrument is substantially similar in form to the Reserve Alternative Instrument securing Existing Senior Bonds;

(iii) For any Credit Facility, other than any Bond Insurance Policy or Reserve Alternative Instrument provided in connection with the Series 2019 Bonds or any Senior Lien Bonds issued by the Authority and otherwise meeting the requirements of this Trust Agreement and the TIFIA 2019 Loan Agreement;

(iv) For any Derivative Agreement;

(v) The method of calculation of debt service on any Additional Bonds, Parity Debt or other Indebtedness including but not limited to Derivative Indebtedness, Grant Anticipation Notes, Long-Term Indebtedness, Put Indebtedness, Revenue Bond Anticipation Notes, Short-Term Indebtedness, and Variable Rate Indebtedness to be used when calculating debt service or determining reserve requirements or compliance with the covenants contained herein and in the TIFIA 2019 Loan Agreement;

(vi) The method of calculating payment obligations with respect to Derivative Agreement Additional Payments, Derivative Agreement Regularly Scheduled Payments, Reserve Alternative Instruments and Credit Facilities to be used when calculating debt service or determining reserve requirements or compliance with the covenants contained herein and in the TIFIA 2019 Loan Agreement;

(vii) The redesignation of a Non-System Project as an Additional Project under Section 715 unless the Authority demonstrates compliance with Section 17(f) of the TIFIA 2019 Loan Agreement; and

(viii) The amendment or modification of this Trust Agreement Documents or the Authority's organizational documents (other than any amendment or modification that is of a ministerial nature).

(c) Controlling Provisions.

(i) In addition to the covenants set forth in Article VII of this Trust Agreement, including but not limited to Section 704, the Authority must comply also with the covenants set forth in the TIFIA 2019 Loan Agreement, including in Section 16 and 17 of the TIFIA 2019 Loan Agreement.

(ii) Investment Obligations only meet the definition of Investment Obligations if they are permitted by the TIFIA 2019 Loan Agreement and authorized by Section 159-30 of the NCGS.

(iii) Permitted Encumbrances means "Permitted Liens" as defined in the TIFIA 2019 Loan Agreement.

(iv) The TIFIA Series 2019 Bond may not be defeased without the prior written consent of USDOT.

(v) To the extent any term or provision in this Trust Agreement relating to the TIFIA Series 2019 Bond is in conflict with terms or provisions in the TIFIA 2019 Loan Agreement, then the terms and provisions in the TIFIA 2019 Loan Agreement shall control unless such action would have a material adverse effect upon the security for, or the timing or amount of payments to be made to, holders of any Secured Indebtedness (as defined in



the TIFIA 2019 Loan Agreement) or the methodology for remedies and payments resulting therefrom set forth in this Trust Agreement.

*The preceding Section was added pursuant to Section 701(dd) of the Fourth Supplemental Trust Agreement.*

## ARTICLE VIII

## REMEDIES

Section 801. Extension of Interest Payment. If the time for the payment of the interest on any Bond, Parity Debt or Junior Indebtedness is extended, whether or not such extension is by or with the consent of the Authority, such interest so extended shall not be entitled in case of default hereunder to the benefit or security of this Trust Agreement and in such case the Owner of the Bond, Parity Debt or Junior Indebtedness for which the time for payment of interest was extended shall be entitled only to the payment in full of the principal of all Bonds, Parity Debt and Junior Indebtedness then Outstanding and of interest for which the time for payment shall not have been extended. The time for the payment of the interest on any Bond or Parity Debt shall not be extended in respect of any Bond or Parity Debt covered by a Bond Insurance Policy or Credit Facility without the consent of the Bond Insurer or the Credit Provider.

Section 802. Events of Default. Each of the following events is hereby declared an Event of Default:

(a) payment of the principal of and the redemption premium, if any, on any of the Bonds, is not made when the same are due and payable, either at maturity or by redemption or otherwise;

(b) payment of the interest on any of the Bonds is not made when the same is due and payable;

(c) final judgment for the payment of money in excess of $1,000,000 is rendered against the Triangle Expressway System as a result of the ownership, control or operation of the Triangle Expressway System, and any such judgment is not discharged within one hundred twenty (120) days from the entry thereof or an appeal is not taken therefrom or from the order, decree or process upon which or pursuant to which such judgment shall have been granted or entered, in such manner as to stay the execution of or levy under such judgment, order, decree or process or the enforcement thereof;

(d) the occurrence of a Bankruptcy Related Event;

(e) receipt by the Trustee of written notice from the Holder of any Parity Debt or Junior Indebtedness that any event of default has occurred and is continuing under such Parity Debt or Parity Debt Resolution or such Junior

Indebtedness or Junior Indebtedness Agreement, including the failure to pay when due and payable the principal of, premium, if any, and interest on such Parity Debt or Junior Indebtedness;

*The preceding subsection (e) was revised pursuant to Section 701(tt) of the Fourth Supplemental Trust Agreement.*

(f) the failure of the State to appropriate the State Appropriation Revenues or a failure of NCDOT to pay a payment required to be paid by NCDOT under the O&M Guaranty Agreement or the Construction and Renewal and Replacement Agreement;

(g) receipt by the Trustee of written notice from the counterparty under any Derivative Agreement that the Authority has failed to make any Senior Lien Derivative Agreement Regularly Scheduled Payment or Subordinate Lien Derivative Agreement Regularly Scheduled Payment when due; and

(h) the Authority defaults in the due and punctual performance of any other of the covenants, conditions, agreements and provisions contained in the Bonds or this Trust Agreement, including any Supplemental Agreement, and such default continues for thirty (30) days after receipt by the Authority of a written notice from the Trustee specifying such default and requesting that it be corrected, provided that if prior to the expiration of such 30-day period the Authority institutes action reasonably designed to cure such default, no "Event of Default" shall be deemed to have occurred upon the expiration of such 30-day period for so long as the Authority pursues such curative action with reasonable diligence.

Section 803. No Acceleration of Maturities. Notwithstanding anything in this Trust Agreement or in any Supplemental Agreement, Parity Debt Resolution or Junior Indebtedness Agreement to the contrary, in no event shall there be any acceleration of payment of principal of or interest on any Bonds, Parity Debt or Junior Indebtedness as a result of the occurrence of any Event of Default under Section 802 or otherwise.

Section 804. Remedies. Upon the happening and continuance of any Event of Default specified in Section 802, then and in every such case the Trustee may, and upon the written request of the Owners or Holders of not less than 25% in aggregate principal amount of the Bonds, Parity Debt and Junior Indebtedness then Outstanding shall, proceed (subject to the provisions of Section 902) to protect and enforce its rights and the rights of the Owners or Holders of the Bonds, Parity Debt and Junior Indebtedness under applicable laws and under this Trust Agreement by such suits, actions or special proceedings in equity or at law, or by proceedings in the office of any board or officer having jurisdiction, either for the specific performance of any covenant or agreement contained herein or in aid or execution of any power herein granted or for the enforcement of any proper legal or equitable



remedy, as the Trustee, being advised by counsel, chosen by the Trustee, shall deem most effectual to protect and enforce such rights.

In the enforcement of any remedy under this Trust Agreement, the Trustee shall be entitled to sue for, enforce payment of and receive any and all amounts then or during any Event of Default becoming, and at any time remaining, due from the Authority for principal, interest or otherwise under any of the provisions of this Trust Agreement or of the Bonds, Parity Debt and Junior Indebtedness and unpaid, with interest on overdue payments of principal at the rate or rates of interest specified in such Bonds, Parity Debt and Junior Indebtedness, together with any and all costs and expenses of collection and of all proceedings hereunder and under such Bonds, Parity Debt and Junior Indebtedness, without prejudice to any other right or remedy of the Trustee or of the Owners or Holders of the Bonds, Parity Debt and Junior Indebtedness (except to the extent provided in this Trust Agreement), and to recover and enforce any judgment or decree against the Authority, but solely as provided herein and in such Bonds, Parity Debt and Junior Indebtedness, for any portion of such amounts remaining unpaid and interest, costs and expenses as above provided, and to collect (but solely from moneys in the funds and accounts pledged to secure the Bonds, Parity Debt and Junior Indebtedness under the provisions of this Trust Agreement and any Supplemental Agreement, Parity Debt Resolution or Junior Indebtedness Agreement and any other moneys available for such purpose) in any manner provided by law, the moneys adjudged or decreed to be payable.

If an Event of Default shall occur and be continuing, then, unless the same shall then be prohibited under applicable law, a court of competent jurisdiction may appoint a receiver to administer and operate the Triangle Expressway System on behalf of the Authority, with full power to pay and to provide for the payment of principal of and interest on the Bonds, Parity Debt and Junior Indebtedness and Derivative Agreement Regularly Scheduled Payments as the same shall become due, whether at maturity, pursuant to mandatory sinking fund redemption or otherwise, out of the funds and accounts available therefor, and the Operating Expenses of the Triangle Expressway System, to apply Receipts derived from such operation in accordance with the provisions of this Trust Agreement and any Supplemental Agreement, Parity Debt Resolution, Junior Indebtedness Agreement or Derivative Agreement, to apply other available moneys in the Trust Estate in accordance with the provisions of this Trust Agreement and any Supplemental Agreement, Parity Debt Resolution, Junior Indebtedness Agreement or Derivative Agreement and to take such action to the extent permitted by law to cause to be remedied any Event of Default which shall occur or shall have occurred and be continuing; and with such other powers, subject to the direction of said court, as are accorded to receivers in general equity cases and under the applicable provisions of the laws of North Carolina; provided, that the power of such receiver to make provisions for the payment of principal of and interest on Bonds, Parity Debt, Junior Indebtedness and Derivative Agreement Regularly Scheduled Payments as

aforesaid shall not be construed as including the power to pledge the general credit of the Authority to such payments. Any appointment of a receiver under the foregoing provision shall not, by itself, constitute a separate Event of Default under Section 802.

*The preceding paragraph was revised pursuant to Section 701(ggg) of the Fourth Supplemental Trust Agreement.*

Section 805. Pro Rata Application of Funds.

(a) Anything in this Trust Agreement to the contrary notwithstanding, if at any time the money in the Interest Account, the Principal Account and the Sinking Fund Account of the Senior Lien Debt Service Fund or, if a Bankruptcy Related Event has occurred, in the TIFIA Interest Account and the TIFIA Principal Account, as applicable, is not sufficient to pay the interest on or the principal of the Senior Lien Indebtedness or, if a Bankruptcy Related Event has occurred, the TIFIA Indebtedness, as the same become due and payable, such money, together with any money then available or thereafter becoming available for such purposes (except for such money that has already been deposited in subaccounts of the Interest Account, Principal Account or Sinking Fund Account for a particular Series of Senior Lien Indebtedness or any TIFIA Indebtedness pursuant to the provisions of Section 503), whether through the exercise of the remedies provided for in this Article or otherwise, shall be applied, after payment of the reasonable fees and expenses of the Trustee in exercising its rights and remedies hereunder:

first: to the payment to the persons entitled thereto of all installments of interest on Senior Lien Indebtedness and TIFIA Indebtedness then due and payable in the order in which such installments became due and payable and, if the amount available shall not be sufficient to pay in full any particular installment, then to the payment, ratably according to the amounts due on such installment, to the persons entitled thereto, without any discrimination or preference except as to any difference in the respective rates of interest specified in such Senior Lien Indebtedness and TIFIA Indebtedness;

second: to the payment to the persons entitled thereto of the unpaid principal of any Senior Lien Indebtedness and TIFIA Indebtedness that shall have become due and payable (other than Senior Lien Indebtedness or TIFIA Indebtedness deemed to have been paid pursuant to the provisions of Section 1201 of this Trust Agreement), in the order of their due dates, with interest on the overdue principal at a rate equal to the rate on such Senior Lien Indebtedness or TIFIA Indebtedness, and, if the amount available shall not be sufficient to pay in full all of the amounts due on the



Senior Lien Indebtedness and the TIFIA Indebtedness on any date, together with such interest, then to the payment ratably according to the amount of such principal due on such date, to the persons entitled thereto, without any discrimination or preference; and

third: to the payment of the interest on and the principal of Senior Lien Indebtedness and TIFIA Indebtedness, to the purchase and retirement of Senior Lien Indebtedness and TIFIA Indebtedness, and to the redemption of Senior Lien Indebtedness and TIFIA Indebtedness, all in accordance with the provisions of this Trust Agreement.

Notwithstanding the foregoing, no acceleration of payment of principal of or interest on any Bonds, Parity Debt or Junior Indebtedness is permitted under this Trust Agreement.

(b) Anything in this Trust Agreement to the contrary notwithstanding, if at any time the money in the Interest Account, the Principal Account and the Sinking Fund Account of the Subordinate Lien Debt Service Fund is not sufficient to pay the interest on or the principal of the Subordinate Lien Indebtedness as the same become due and payable, such money, together with any money then available or thereafter becoming available for such purposes (except for such money that has already been deposited in subaccounts of the Interest Account, Principal Account or Sinking Fund Account for a particular Series of Subordinate Lien Indebtedness pursuant to the provisions of Section 503), whether through the exercise of the remedies provided for in this Article or otherwise, shall be applied, after payment of the reasonable fees and expenses of the Trustee in exercising its rights and remedies hereunder:

first: to the payment to the persons entitled thereto of all installments of interest on Subordinate Lien Indebtedness then due and payable in the order in which such installments became due and payable and, if the amount available shall not be sufficient to pay in full any particular installment, then to the payment, ratably according to the amounts due on such installment, to the persons entitled thereto, without any discrimination or preference except as to any difference in the respective rates of interest specified in such Subordinate Lien Indebtedness;

second: to the payment to the persons entitled thereto of the unpaid principal of any Subordinate Lien Indebtedness that shall have become due and payable (other than Subordinate Lien Indebtedness deemed to have been paid pursuant to the provisions of Section 1201 of this Trust Agreement), in the order of their due dates, with interest on

the overdue principal at a rate equal to the rate on such Subordinate Lien Indebtedness, and, if the amount available shall not be sufficient to pay in full all of the amounts due on the Subordinate Lien Indebtedness on any date, together with such interest, then to the payment ratably according to the amount of such principal due on such date, to the persons entitled thereto, without any discrimination or preference; and

third: to the payment of the interest on and the principal of Subordinate Lien Indebtedness, to the purchase and retirement of Subordinate Lien Indebtedness, and to the redemption of Subordinate Lien Bonds, all in accordance with the provisions of this Trust Agreement.

Notwithstanding the foregoing, no acceleration of payment of principal of or interest on any Bonds, Parity Debt or Junior Indebtedness is permitted under this Trust Agreement.

(c) Anything in this Trust Agreement to the contrary notwithstanding, if at any time the money in the Junior Indebtedness Debt Service Fund or, if no Bankruptcy Related Event has occurred, the TIFIA Interest Account and the TIFIA Principal Account is not sufficient to pay the interest on or the principal of all Junior Indebtedness (including any TIFIA Indebtedness) as the same become due and payable, such money, together with any money then available or thereafter becoming available for such purposes, whether through the exercise of the remedies provided for in this Article or otherwise, shall be applied, after payment of the reasonable fees and expenses of the Trustee in exercising its rights and remedies hereunder:

first: to the payment of all installments of interest on the Junior Indebtedness (including any TIFIA Indebtedness) then due and payable in the order in which such installments became due and payable and, if the amount available shall not be sufficient to pay in full any particular installment, then to the payment, ratably according to the amounts due on such installment, to the persons entitled thereto, without any discrimination or preference except as to any difference in the respective rates of interest specified in such Junior Indebtedness;

second: to the payment to the persons entitled thereto of the unpaid principal of any Junior Indebtedness (including any TIFIA Indebtedness) that shall have become due and payable (other than Junior Indebtedness deemed to have been paid pursuant to the provisions of Section 1201), in the order of their due dates, with interest on the overdue principal at a rate equal to the rate on such



Junior Indebtedness, and, if the amount available shall not be sufficient to pay in full all of the amounts due on the Junior Indebtedness on any date, together with such interest, then to the payment ratably according to the amount of such principal due on such date, to the persons entitled thereto, without any discrimination or preference.

(d) Whenever money is to be applied by the Trustee pursuant to the provisions of this Section 805, (i) such money shall be applied by the Trustee at such times and from time to time as the Trustee in its sole discretion shall determine, having due regard for the amount of money available for such application and the likelihood of additional money becoming available for such application in the future, (ii) setting aside such money as provided herein in trust for the proper purpose shall constitute proper application by the Trustee and (iii) the Trustee shall incur no liability whatsoever to the Authority, to any Owner or to any other person for any delay in applying any such money so long as the Trustee acts with reasonable diligence, having due regard for the circumstances, and ultimately applies the same in accordance with such provisions of this Trust Agreement as may be applicable at the time of application by the Trustee. Whenever the Trustee exercises such discretion in applying such money, it shall fix the date (which shall be an Interest Payment Date unless the Trustee shall deem another date more suitable) upon which such application is to be made and upon such date interest on the amounts of principal to be paid on such date shall cease to accrue. The Trustee shall give such notice as it may deem appropriate of the fixing of any such date and shall not be required to make payment to the Owner of any Bond, Parity Debt or Junior Indebtedness until such Bond, Parity Debt or Junior Indebtedness is surrendered to the Trustee for appropriate endorsement or for cancellation if fully paid.

*All of Section 805 was replaced by Section 702 of the Second Supplemental Trust Agreement. Section 805 was then revised pursuant to Section 701(hhh) of the Fourth Supplemental Trust Agreement.*

Section 806. Effect of Discontinuance of Proceedings. If any proceeding taken by the Trustee or Owners or Holders of Bonds, Parity Debt or Junior Indebtedness on account of any Event of Default is discontinued or abandoned for any reason, then and in every such case, the Authority, the Trustee and the Owners and the Holders of Bonds, Parity Debt and Junior Indebtedness shall be restored to their former positions and rights hereunder, and all rights, remedies, powers and duties of the Trustee shall continue as though no proceedings had been taken.

Section 807. Control of Proceedings. Anything in this Trust Agreement to the contrary notwithstanding, the Owners or Holders of a majority in aggregate principal amount of Bonds, Parity Debt and Junior Indebtedness at any time Outstanding shall have the right, subject to the provisions of Section 902, by an instrument or concurrent instruments in writing executed and delivered to the

Trustee, to direct the method and place of conducting all remedial proceedings to be taken by the Trustee hereunder, provided that such direction shall be in accordance with law and the provisions of this Trust Agreement.

Section 808. Restrictions Upon Action. Except as provided in Section 813, no Owner or Holder of Bonds, Parity Debt or Junior Indebtedness shall have any right to institute any suit, action or proceeding in equity or at law on any Bonds, Parity Debt or Junior Indebtedness or for the execution of any trust hereunder or for any other remedy hereunder unless such Owner or Holder of Bonds, Parity Debt or Junior Indebtedness previously shall (a) have given to the Trustee written notice of the Event of Default on account of which suit, action or proceeding is to be instituted, (b) have requested the Trustee to take action after the right to exercise such powers or right of action, as the case may be, shall have accrued, (c) have afforded the Trustee a reasonable opportunity either to proceed to exercise the powers hereinabove granted or to institute such action, suit or proceedings in its or their name, and (d) have offered to the Trustee reasonable security and satisfactory indemnity against the costs, expenses and liabilities to be incurred therein or thereby, and the Trustee shall have refused or neglected to comply with such request within a reasonable time. Such notification, request and offer of indemnity are hereby declared in every such case, at the option of the trustee, to be conditions precedent to the execution of the powers and trusts of this Trust Agreement or to any other remedy hereunder. Notwithstanding the foregoing provisions of this Section and without complying therewith, the Owners or Holders of not less than 25% in aggregate principal amount of Bonds, Parity Debt and Junior Indebtedness then Outstanding may institute any such suit, action or proceeding in their own names for the benefit of all Owners or Holders of Bonds, Parity Debt and Junior Indebtedness. It is understood and intended that, except as otherwise above provided, no one or more Owners or Holders of Bonds, Parity Debt or Junior Indebtedness shall have any right in any manner whatsoever by his or their action to affect, disturb or prejudice the security of this Trust Agreement or to enforce any right hereunder except in the manner provided, that all proceedings at law or in equity shall be instituted, had and maintained in the manner herein provided and for the benefit of all Owners and Holders of Bonds, Parity Debt and Junior Indebtedness and that any individual rights of action or other right given to one or more of such Owners or Holders by law are restricted by this Trust Agreement to the rights and remedies herein provided.

Section 809. Enforcement of Rights of Action. All rights of action (including the right to file proof of claim) under this Trust Agreement or under any Bonds, Parity Debt and Junior Indebtedness may be enforced by the Trustee without the possession of any Bonds, Parity Debt or Junior Indebtedness or the production thereof in any proceedings relating thereto, and any such suit or proceedings instituted by the Trustee shall be brought in its name as Trustee, without the necessity of joining as plaintiffs or defendants any Owners or Holders of Bonds, Parity Debt or Junior Indebtedness, and any recovery of judgment shall be for the



equal benefit of the Owners or Holders of Bonds, Parity Debt and Junior Indebtedness, subject to the provisions of this Trust Agreement.

Section 810. No Remedy Exclusive. No remedy herein conferred upon or reserved to the Trustee or to the Owners or Holders of Bonds, Parity Debt and Junior Indebtedness is intended to be exclusive of any other remedy or remedies herein provided, and each and every such remedy shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing at law or in equity.

Section 811. Delay Not a Waiver. No delay or omission by the Trustee or of any Owner or Holder of Bonds, Parity Debt or Junior Indebtedness in the exercise of any right or power accruing upon any default shall impair any such right or power or shall be construed to be a waiver of any such default or any acquiescence therein, and every power or remedy given by this Trust Agreement to the Trustee and to the Owners or Holders of Bonds, Parity Debt or Junior Indebtedness may be exercised from time to time and as often as may be deemed expedient.

The Trustee may, and upon written request of the Owners or Holder of not less than a majority in principal amount of the Bonds, Parity Debt and Junior Indebtedness then Outstanding shall, waive any Event of Default which in its opinion has been remedied before the entry of final judgment or decree in any suit, action or proceeding instituted by it under the provisions of this Trust Agreement or before the completion of the enforcement of any other remedies under this Trust Agreement, but no such waiver shall extend to or affect any other existing or subsequent Event of Default or impair any rights or remedies consequent thereon.

Section 812. Notice of Default. The Trustee shall mail to (a) all Owners of Bonds at their addresses as they appear on the registration books and (b) all Holders of Parity Debt or Junior Indebtedness and counterparties under Derivative Agreements providing for Derivative Agreement Regularly Scheduled Payments who shall have filed their name with the Trustee for such purpose, written notice of the occurrence of any Event of Default within thirty (30) days after the Trustee has notice of the same pursuant to the provisions of Section 908 that any such Event of Default shall have occurred; provided, however, that in no event shall the Trustee waive the occurrence of an event of default under the TIFIA Loan Agreement without the prior written consent of USDOT. The Trustee shall not be subject to any liability to any such Owner, Holder or Derivative Agreement counterparty by reason of its failure to mail any such notice.

*The preceding Section was revised pursuant to Section 701(iii) of the Fourth Supplemental Trust Agreement.*

Section 813. Right to Enforce Pavement of Bonds Unimpaired. Nothing in this Article shall affect or impair the right of any Owner or Holder of Bonds, Parity

Debt or Junior Indebtedness to enforce the payment of the principal of and interest on his Bond, Parity Debt or Junior Indebtedness or the obligation of the Authority to pay the principal of and interest on each Bond, Parity Debt or Junior Indebtedness to the Owner or Holder thereof at the time and place specified in said Bond Parity Debt or Junior Indebtedness.

## ARTICLE IX

## THE TRUSTEE AND BOND REGISTRARS

Section 901. Acceptance of Trusts. The Trustee by execution hereof accepts and agrees to fulfill the trusts imposed upon it by this Trust Agreement, but only upon the terms and conditions set forth in this Article and subject to the provisions of this Trust Agreement, to all of which the Authority, the Trustee and the respective Owners of the Bonds and any Holders of Parity Debt or Junior Indebtedness and Derivative Agreement counterparties agree. Prior to the occurrence of any Event of Default and after the curing of all such Events of Default that may have occurred, the Trustee shall perform such duties and only such duties of the Trustee as are specifically set forth in this Trust Agreement. Upon the occurrence and during the continuation of any Event of Default, the Trustee shall use the same degree of care and skill in their exercise as a prudent person would exercise or use under the circumstances in the conduct of such person's own affairs.

No provision of this Trust Agreement or any Indebtedness or Derivative Agreement shall be construed to relieve the Trustee from liability for its own negligent action, its own negligent failure to act, or its own willful misconduct, except that:

(a) prior to any such Event of Default hereunder, and after the curing of any Event of Default that may have occurred:

(i) the duties and obligations of the Trustee shall be determined solely by the express provisions of this Trust Agreement, and the Trustee shall not be liable except for the performance of such duties and obligations of the Trustee as are specifically set forth in this Trust Agreement, and no implied covenants or obligations shall be read into this Trust Agreement against the Trustee and no permissive right of the Trustee under this Trust Agreement shall impose any duty on the Trustee to take such action, and

(ii) in the absence of willful misconduct on its part, the Trustee may conclusively rely, as to the accuracy of the statements and the correctness of the opinions expressed therein, upon any certificate or opinion furnished to it conforming to the requirements of this Trust Agreement, but in the case of any such certificate or opinion by which any provision hereof is specifically required to be furnished to the Trustee, the Trustee shall be under a duty to



examine the same to determine whether or not on its face it conforms to the requirements of this Trust Agreement; and

(b) at all times, regardless of whether or not any such Event of Default shall exist:

(i) the Trustee shall not be liable for any error of judgment made in good faith by a responsible officer or officers of the Trustee unless it shall be proved that the Trustee was negligent in ascertaining the pertinent facts, and

(ii) the Trustee shall not be liable with respect to any action taken or omitted to be taken by it in accordance with the direction of the Owners and Holders of not less than 25% or a majority, as this Trust Agreement shall require, in aggregate principal amount of the Bonds, Parity Debt and Junior Indebtedness then Outstanding relating to the time, method and place of conducting any proceeding for any remedy available to the Trustee, or exercising any power conferred upon the Trustee under this Trust Agreement.

None of the provisions contained in this Trust Agreement shall require the Trustee to expend or risk its own funds or otherwise incur individual financial liability in the performance of any of its duties or in the exercise of any of its rights or powers.

Section 902. Indemnification of Trustee as Condition for Remedial Action. The Trustee shall be under no obligation to institute any suit or to take any remedial proceeding (including, but not limited to, the appointment of a receiver) or to enter any appearance or in any way defend in any suit in which it may be made defendant, or to take any steps in the execution of any of the trusts hereby created or in the enforcement of any rights and powers hereunder, until it shall be indemnified to its satisfaction against any and all costs and expenses, outlays and counsel fees and other reasonable disbursements, and against all liability. The Trustee nevertheless may begin suit, or appear in and defend suit, or do anything else in its judgment proper to be done by it as such Trustee, without indemnity, and in such case the Authority, at the request of the Trustee, shall reimburse the Trustee from Receipts for all costs, expenses, outlays and counsel fees and other reasonable disbursements properly incurred in connection therewith. If the Authority shall fail to make such reimbursement, the Trustee may reimburse itself from any money in its possession under the provisions of this Trust Agreement and shall be entitled to a preference therefor over any Indebtedness Outstanding.

Section 903. Limitations on Obligations and Responsibilities of Trustee. The Trustee shall be under no obligation to effect or maintain insurance or to renew any policies of insurance or to inquire as to the sufficiency of any policies of

insurance carried by the Authority, or to report, or make or file claims or proof of loss for, any loss or damage insured against or that may occur, or to keep itself informed or advised as to the payment of any taxes or assessments, or to require any such payment to be made. Except as to the acceptance of the trusts under this Trust Agreement, the Trustee shall have no responsibility in respect of the validity or sufficiency of this Trust Agreement, or in respect of the validity of Bonds, Parity Debt and Junior Indebtedness or the due issuance or execution and delivery thereof. The Trustee shall be under no obligation to see that any duties herein imposed upon the Authority, any Bond Registrar, any consultant, any Depositary (other than a Depositary in which money shall have been deposited by the Trustee under the provisions of this Trust Agreement) or any party other than itself, or any covenants herein contained on the part of any party other than itself to be performed, shall be done or performed, and the Trustee shall be under no obligation for failure to see that any such duties or covenants are so done or performed.

Section 904. Trustee Not Liable for Failure of Authority to Act. The Trustee shall not be liable or responsible because of the failure of the Authority or of any of its employees or agents to make any collections or deposits or to perform any act herein required of the Authority or because of the loss of any money arising through the insolvency or the act or default or omission of any Depositary (other than the Trustee or a Depositary in which such money shall have been deposited by the Trustee under the provisions of this Trust Agreement). The Trustee shall not be responsible for the application of any of the proceeds of Bonds or any other money deposited with it and invested, paid out, withdrawn or transferred hereunder if such application, investment, payment, withdrawal or transfer shall be made in accordance with the provisions of this Trust Agreement. The immunities and exemptions from liability of the Trustee hereunder shall extend to its directors, officers, employees and agents.

Section 905. Compensation and Indemnification of Trustee and Bond Registrar. Subject to the provisions of any contract between the Authority and the Trustee or any Bond Registrar relating to the compensation of the Trustee or such Bond Registrar, the Authority shall pay to the Trustee and each Bond Registrar from Receipts reasonable compensation for all services performed by them hereunder and also all their reasonable expenses, charges and other disbursements and those of their attorneys, agents and employees incurred in and about the administration and the performance of their powers and duties hereunder and, to the extent permitted by law, shall indemnify and save the Trustee and each Bond Registrar harmless against any liabilities that they may incur in the proper exercise and performance of their powers and duties hereunder. If the Authority shall fail to cause any payment required by this Section to be made, the Trustee and each Bond Registrar may make such payment from any money in its possession under the provisions of this Trust Agreement and shall be entitled to a preference therefor over any Bonds, Parity Debt and Junior Indebtedness Outstanding hereunder. The Authority covenants that it shall promptly deposit or cause to be deposited to the



credit of the respective fund or account the amount withdrawn therefrom by the Trustee to make any such payment.

Section 906. Monthly Statements from Trustee. It shall be the duty of the Trustee, on or before the 15th day of each month, to file with the Authority a statement setting forth in respect of the preceding calendar month:

(a) the amount withdrawn or transferred by it and the amount deposited with it on account of each fund, account or subaccount held by it under the provisions of this Trust Agreement or any Supplemental Agreement,

(b) the amount on deposit with it at the end of such month in each such fund, account or subaccount,

(c) a brief description of all obligations held by it as an investment of money in each such fund, account or subaccount,

(d) the amount applied to the payment, purchase or redemption of Bonds, Parity Debt and Junior Indebtedness under the provisions of Article V and a description of the Bonds or portions thereof so paid, purchased or redeemed, and

(e) any other information that the Authority may reasonably request.

All records and files pertaining to Bonds, Parity Debt and Junior Indebtedness and the Triangle Expressway System in the custody of the Trustee not otherwise restricted or excluded from disclosure by the terms of this Trust Agreement, including, without limitation, Section 1002, shall be open at all reasonable times to the inspection of the Authority and its agents and representatives.

Section 907. Trustee May Rely on Certificates. If at any time it shall be necessary or desirable for the Trustee to make any investigation respecting any fact preparatory to taking or not taking any action or doing or not doing anything as such Trustee, and in any case in which this Trust Agreement provides for permitting or taking any action, the Trustee may rely upon any certificate required or permitted to be filed with it under the provisions of this Trust Agreement, and any such certificate shall be evidence of such fact or protect the Trustee in any action that it may or may not take or in respect of anything it may or may not do, in absence of willful misconduct, by reason of the supposed existence of such fact. Except as otherwise provided in this Trust Agreement, any request, notice, certificate or other instrument from the Authority to the Trustee shall be deemed to have been signed by the proper party or parties if signed by any Authorized Officer, and the Trustee may accept and rely upon a certificate signed by any Authorized Officer as to any action taken by the Authority.

Section 908. Notice of Default. Except upon the happening of any Event of Default specified in subsections (a), (b), (e) or (f) of Section 802 or the explicit report of an Event of Default pursuant to the final paragraph of Section 706, the Trustee shall not be obliged to take notice or be deemed to have notice of any Event of Default under this Trust Agreement unless specifically notified in writing of such Event of Default by the Authority or the Owners and Holders of not less than 25% in aggregate principal amount of Bonds, Parity Debt and Junior Indebtedness then Outstanding.

*The preceding Section was revised pursuant to Section 701(jjj) of the Fourth Supplemental Trust Agreement.*

Section 909. Trustee Not Responsible for Recitals. The recitals, statements and representations contained herein and in the Bonds shall be taken and construed as made by and on the part of the Authority and not by the Trustee, and the Trustee assumes and shall be under no responsibility for the correctness of the same.

Section 910. Trustee Protected in Relying on Certain Documents. The Trustee shall be protected and shall incur no liability in acting or proceeding, or in not acting or not proceeding, in absence of willful misconduct, reasonably and in according with the terms of this Trust Agreement, upon any resolution, order, notice, request, consent, waiver, certificate, statement, affidavit, requisition, bond or other paper or document that it shall in good faith reasonably believe to be genuine and to have been adopted or signed by the proper board or person or to have been prepared and furnished pursuant to any of the provisions of this Trust Agreement, or upon the written opinion of any attorney, engineer or accountant believed by the Trustee to be qualified in relation to the subject matter, and the Trustee shall be under no duty to make any investigation or inquiry as to any statements contained or matters referred to in any such instrument. The Trustee shall not be under any obligation to see to the recording or filing of this Trust Agreement or otherwise to the giving to any person of notice of the provisions hereof.

Section 911. Trustee May Pay Taxes and Assessments. In case the Authority shall fail to pay or cause to be paid any lawful tax, assessment or governmental charge or other charge upon any part of the Authority to the extent, if any, that the Authority may be deemed by the Trustee liable for same, the Trustee may pay such tax, assessment or governmental charge, without prejudice, however, to any rights of the Trustee or the Owners or Holders of Bonds, Parity Debt and Junior Indebtedness arising in consequence of such failure; and any amount at any time so paid under this Section shall be repaid upon demand by the Trustee by the Authority, but the Trustee shall be under no obligation to make any such payment from sources provided in this Trust Agreement unless it shall have available or be provided with adequate funds for the purpose of such payment.



Section 912. Resignation and Removal of Trustee Subject to Appointment of Successor. No resignation or removal of the Trustee and no appointment of a successor Trustee pursuant to this Article shall become effective until the acceptance of appointment by the successor Trustee under Section 915.

Section 913. Resignation of Trustee. Subject to the provisions of Section 912, the Trustee may resign and thereby become discharged from the trusts hereby created, by notice in writing given to the Authority, and mailed, postage prepaid, at the Trustee's expense, to each Owner and Holder of Bonds, Senior Lien Parity Debt and Junior Indebtedness, not less than sixty (60) days before such resignation is to take effect, but such resignation shall take effect immediately upon the appointment of a new Trustee hereunder if such new Trustee shall be appointed before the time limited by such notice and shall then accept the trusts hereof.

*The preceding Section was revised pursuant to Section 701(kkk) of the Fourth Supplemental Trust Agreement.*

Section 914. Removal of Trustee. The Trustee may be removed at any time by an instrument or concurrent instruments in writing, (i) executed by the Owners and Holders of not less than a majority in aggregate principal amount of Bonds, Parity Debt and Junior Indebtedness then Outstanding and filed with the Authority, or (ii) executed by an Authorized Officer, so long as no Event of Default shall have occurred and be continuing, in either case not less than sixty (60) days before such removal is to take effect as stated in said instrument of instruments. A photographic copy of any order, instrument or instruments filed with the Authority under the provisions of this paragraph, duly certified by the Authority Secretary as having been received by the Authority, shall be delivered promptly by the Authority Secretary to the Trustee.

The Trustee may also be removed at any time for acting or proceeding in violation of, or for failing to act or proceed in accordance with, any provisions of this Trust Agreement with respect to the duties and obligations of the Trustee by any court of competent jurisdiction upon the application of the Authority or the Owners and Holders of not less than 25% in aggregate principal amount of Bonds, Parity Debt and Junior Indebtedness then Outstanding.

Section 915. Appointment of Successor Trustee. If at any time hereafter the Trustee shall resign, be removed, be dissolved or otherwise become incapable of acting, or the bank or trust company acting as Trustee shall be taken over by any governmental official, agency, department or board, the positions of Trustee shall thereupon become vacant. If the position of Trustee shall become vacant for any reason, the Authority shall appoint a Trustee to fill such vacancy. A successor Trustee shall not be required if the Trustee shall sell or assign substantially all of its trust business and the vendee or assignee shall continue in the trust business, or if a transfer of the trust department of the Trustee is required by operation of law,

provided that such vendee, assignee or transferee is (i) a bank or trust company within or without the State which is duly authorized to exercise corporate trust powers and subject to examination by federal or State authority, (ii) of good standing, and (iii) having a combined capital, surplus and undivided profits aggregating not less than One Hundred Million Dollars ($100,000,000). The Authority shall mail notice of any such appointment made by it, postage prepaid, to all Owners and Holders of Bonds, Parity Debt and Junior Indebtedness.

At any time within sixty (60) days after any such vacancy shall have occurred, the Owners and Holders of not less than 25% in principal amount of Bonds, Parity Debt and Junior Indebtedness then Outstanding, by an instrument or concurrent instruments in writing, executed by such Owners and filed with the Authority, may nominate a successor Trustee, which the Authority shall appoint and which shall supersede any Trustee theretofore appointed by the Authority. Photographic copies, duly certified by the Authority Secretary as having been received by the Authority, of each such instrument shall be delivered promptly by the Authority Secretary to the predecessor Trustee and to the Trustee so appointed by such Owners and Holders.

If no appointment of a successor Trustee shall be made pursuant to the foregoing provisions of this Section, any Owner or Holder of Bonds, Parity Debt or TIFIA Indebtedness or any retiring Trustee may apply to any court of competent jurisdiction to appoint a successor Trustee. Such court may thereupon, after such notice, if any, as such court may deem proper and prescribe, appoint a successor Trustee.

Any successor Trustee hereafter appointed shall be (i) a bank or trust company within or without the State which is duly authorized to exercise corporate trust powers and subject to examination by federal or State authority, (ii) of good standing and (iii) having a combined capital, surplus and undivided profits aggregating not less than One Hundred Million Dollars ($100,000,000).

Section 916. Vesting of Duties in Successor Trustee. Every successor Trustee appointed hereunder shall execute, acknowledge and deliver to its predecessor, and also to the Authority, an instrument in writing accepting such appointment hereunder, and thereupon such successor Trustee, without any further act, shall become fully vested with all the rights, immunities and powers, and subject to all the duties and obligations, of its predecessor; but such predecessor shall nevertheless, on the written request of its successor or of the Authority and upon payment of the expenses, charges and other disbursements of such predecessor that are payable pursuant to the provisions of Section 905, execute and deliver an instrument transferring to such successor Trustee all the rights, immunities and powers of such predecessor hereunder; and every predecessor Trustee shall deliver all property and money held by it hereunder to its successor. Should any instrument in writing from the Authority be required by any successor



Trustee for more fully and certainly vesting in such Trustee the rights, immunities, powers and trusts hereby vested or intended to be vested in the predecessor Trustee, any such instrument in writing shall and will, on request, be executed, acknowledged and delivered by the Authority.

Section 917. Removal and Resignation of Bond Registrar. A Bond Registrar may be removed at any time, with or without cause, by the Authority upon forty-five (45) days' written notice by the Authority to such Bond Registrar. A copy of such written notice shall be delivered promptly by the Authority to the Trustee. Upon receipt of such notice, the Trustee shall cause notice of such removal to be mailed, postage prepaid, to the Owners not less than thirty (30) days before such removal is to take effect. All costs in connection with such notice shall be borne by the Authority.

A Bond Registrar may resign and thereby become discharged from the duties, obligations and responsibilities of Bond Registrar under this Trust Agreement and the applicable Supplemental Agreement, by written notice delivered to the Authority and the Trustee. Upon receipt of such notice the Trustee shall cause notice of such resignation to be mailed, postage prepaid, at such Bond Registrar's expense, to the Owners not less than sixty (60) days before such resignation is to take effect, but such resignation shall take effect immediately upon the appointment of a new Bond Registrar hereunder if such new Bond Registrar shall be appointed before the time limited by such notice and shall then accept the duties, obligations and responsibilities of Bond Registrar under this Trust Agreement and the applicable Supplemental Agreement. If at any time thereafter a Bond Registrar shall resign, be removed, be dissolved or otherwise become incapable of acting, or the entity acting as Bond Registrar shall be taken over by any governmental official, agency, department or board, the position of Bond registrar shall thereupon become vacant. If the position of Bond Registrar shall become vacant for any reason, the Authority shall appoint a Bond Registrar to fill such vacancy. A successor Bond Registrar shall not be required if a Bond Registrar shall sell or assign substantially all of its business and the vendee or assignee shall be qualified in the sole judgment of the Authority to carry out the duties, obligations and responsibilities of Bond Registrar under this Trust Agreement. The Authority shall promptly deliver written notice of any such appointment by it to the Trustee and mail such notice, postage prepaid, to all Owners of the applicable Bonds.

Section 918. Co-Trustee. At any time, but subject to compliance with all applicable regulations, for the purpose of meeting any legal requirements of any jurisdiction in which any part of the trust estate may at the time be located, the Authority and the Trustee shall have power to appoint an additional institution or individual as a co-trustee or separate trustee, and upon the request of the Trustee or of 10% in aggregate principal amount of Bonds, Parity Debt and Junior Indebtedness then Outstanding the Authority shall for such purpose join with the Trustee in the execution, delivery and performance of all instruments and

agreements necessary or proper to appoint such institution or individual to act as co-trustee jointly with the Trustee or as a separate trustee of all or any part of the trust estate, and to vest in such person or institution, in such capacity, such title to the trust estate, or any part thereof, and such rights, powers, duties, trusts or obligations as the Authority and the Trustee may consider necessary or desirable, subject to the remaining provisions of this Section.

If the Authority shall not have made such appointment within 30 days after the receipt by it of a request so to do, or in case an Event of Default shall have occurred and be continuing, the Trustee alone shall have the power to make such appointment.

The Trustee and the Authority shall execute, acknowledge and deliver all such instruments as may be reasonably required by any such co-trustee or separate trustee for more fully confirming such title, rights, powers, trusts, duties and obligations to such co-trustee or separate trustee.

Every co-trustee or separate trustee shall, to the extent permitted by law, but to such extent only, be appointed subject to the following terms, namely:

(a) Bonds shall be authenticated and delivered, if applicable, and all rights, powers, trusts, duties and obligations by this Trust Agreement conferred upon the Trustee in respect of the custody, control or management of money, papers, securities and other personal property shall be exercised solely by the Trustee;

(b) all rights, powers, trusts, duties and obligations conferred or imposed upon the Trustee by this Trust Agreement shall be conferred or imposed upon or exercised or performed by the Trustee, or by the Trustee and such co-trustee, or separate trustee jointly, as shall be provided in the instrument appointing such co-trustee or separate trustee, except to the extent that under the law of any jurisdiction in which any particular act or acts are to be performed the Trustee shall be incompetent or unqualified to perform such act or acts, in which event such act or acts shall be performed by such co-trustee or separate trustee;

(c) any request in writing by the Trustee to any co-trustee or separate trustee to take or to refrain from taking any action hereunder shall be sufficient warrant for the taking or the refraining from taking of such action by such co-trustee or separate trustee;

(d) any co-trustee or separate trustee to the extent permitted by law may delegate to the Trustee the exercise of any right, power, trust, duty or obligation, discretionary or otherwise;

(e) the Trustee at any time by an instrument in writing with the concurrence of the Authority may accept the resignation of or remove any co-trustee



or separate trustee appointed under this Section and in case an event of default shall have occurred and be continuing, the Trustee shall have power to accept the resignation of or remove any such co-trustee or separate trustee without the concurrence of the Authority, and upon the request of the Trustee, the Authority shall join with the Trustee in the execution, delivery and performance of all instruments and agreements necessary or proper to effectuate such resignation or removal. A successor to any co-trustee or separate trustee so resigned or removed may be appointed in the manner provided in this Section;

(f) no Trustee hereunder shall be personally liable by reason of any act or omission of any other trustee hereunder;

(g) any demand, request, direction, appointment, removal, notice, consent, waiver or other action in writing executed by the Owners and Holders of Bonds and Senior Lien Parity Debt and delivered to the Trustee shall be deemed to have been delivered to each such co-trustee or separate trustee; and

(h) any money, papers, securities or other items of personal property received by any such co-trustee or separate trustee hereunder shall forthwith, so far as may be permitted by law, be turned over to the Trustee.

Upon the acceptance in writing of such appointment, any such co-trustee or separate trustee shall be vested with such title to the trust estate or any part thereof, and with such rights, powers, duties, trusts or obligations as shall be specified in the instrument of appointment jointly with the Trustee (except insofar as local law makes it necessary for any such co-trustee or separate trustee to act alone) subject to all the terms of this Trust Agreement. Every such acceptance shall be filed with the Trustee and the Authority.

In case any co-trustee or separate trustee shall die, become incapable of acting, resign or be removed, the title to the trust estate and all rights, powers, trusts, duties and obligations of said co-trustee or separate trustee shall, so far as permitted by law, vest in and be exercised by the Trustee unless and until a successor co-trustee or separate trustee shall be appointed in the manner herein provided.

## ARTICLE X

## EXECUTION OF INSTRUMENTS BY OWNERS AND HOLDERS, PROOF OF OWNERSHIP OF BONDS OR SENIOR LIEN PARITY DEBT, AND DETERMINATION OF CONCURRENCE OF OWNERS

Section 1001. Execution of Instruments. Any request, direction, consent or other instrument in writing required or permitted by this Trust Agreement to be signed or executed by any Owners or Holders of Bonds, Parity Debt or Junior Indebtedness may be in any number of concurrent instruments of similar tenor and

may be signed or executed by such Owners or Holders or their attorneys or legal representatives or legal representative of his estate if the Owner or Holder is deceased. Proof of the execution of any such instrument and of the ownership of Bonds, Parity Debt and Junior Indebtedness shall be sufficient for any purpose of this Trust Agreement and shall be conclusive in favor of the Trustee and the Authority with regard to any action taken by either under such instrument if made in the following manner:

(a) The fact and date of the execution by any person of any such instrument may be proved by the verification, by any officer in any jurisdiction who by the laws thereof has power to take affidavits within such jurisdictions, to the effect that such instrument was subscribed and sworn to before him or by an affidavit of a witness to such execution. Where such execution is on behalf of a person other than an individual, such verification or affidavit shall also constitute sufficient proof of the authority of the signer thereof.

(b) The ownership of Bonds shall be proved by the registration books kept under the provisions of Section 205. The ownership or holding of Parity Debt or Junior Indebtedness shall be proved as provided in the related Parity Debt Resolution or Junior Indebtedness Agreement, as the case may be.

Nothing contained in this Article shall be construed as limiting the Trustee to such proof, it being intended that the Trustee may accept any other evidence of the matters herein stated which it may deem sufficient. Any request or consent of any Owner or Holder of Bonds, Parity Debt or Junior Indebtedness shall bind every future Owner or Holder of the same Bonds, Parity Debt or Junior Indebtedness in respect of anything done by the Trustee in pursuance of such request or consent.

Notwithstanding any of the foregoing provisions of this Section and except for the TIFIA Series 2019 Bond, the Trustee shall not be required to recognize any person as an Owner or Holder of Bonds, Parity Debt or Junior Indebtedness or to take any action at such an Owner's or Holder's request unless such Bonds, Parity Debt or Junior Indebtedness shall be deposited with it. In the case of the TIFIA Series 2019 Bond, unless otherwise directed by the Authority and USDOT, USDOT shall be recognized as the Holder of the TIFIA Series 2019 Bond.

*The preceding paragraph was revised pursuant to Section 701(lll) of the Fourth Supplemental Trust Agreement.*

Section 1002. Preservation of Information: Communications.

(a) The Trustee shall preserve, in as current a form as is reasonably practicable, the names and addresses of Owners received by the Trustee from the Bond Registrar.



(b) If an Owner which is a Securities Depository Nominee or three or more Owners which are not Securities Depository Nominees (hereinafter collectively referred to as "applicants") apply in writing to the Trustee and furnish reasonable proof that each such applicant has owned a Bond for a period of at least six months preceding the date of such application, and such application states that the applicants desire to communicate with other Owners with respect to their rights under this Trust Agreement or under the Bonds and such application, at its election, either

(i) afford such applicants access to the information preserved at the time by the Trustee in accordance with subsection (a) of this Section, or

(ii) inform such applicants as to the approximate number of Owners whose names and addresses appear in the information preserved at the time by the Trustee in accordance with sub-Section (a) of this Section, and as to the approximate cost of mailing to such Owners the form of communication, if any, specified in such application.

If the Trustee shall elect not to afford such applicants access to such information, the Trustee shall, upon the written request of such applicants, mail to each Owner whose name and address appears in the information preserved at the time by the Trustee in accordance with subsection (a) of this Section a copy of the form of communication which is specified in such request, with reasonable promptness after a tender to the Trustee of the material to be mailed and of payment, or provision for the payment, of the reasonable expenses of mailing.

(c) Every Owner, by receiving and holding one or more Bonds, agrees with the Authority and the Trustee that neither the Authority nor the Trustee shall be held accountable by reason of the disclosure of any such information as to the names and addresses of the Owners in accordance with subsection (b) of this Section, regardless of the source from which such information was derived, and that the Trustee shall not be held accountable by reason of mailing any material pursuant to a request made under such subsection.

## ARTICLE XI

## SUPPLEMENTAL TRUST AGREEMENTS; AMENDMENT OF TIFIA LOAN AGREEMENTS

Section 1101. Supplemental Trust Agreement Without Consent. The Authority and the Trustee may, from time to time and at any time, execute and deliver supplemental trust agreements hereto (which supplemental trust agreements shall thereafter form a part hereof) as shall be substantially consistent with the terms and provisions of this Trust Agreement and, in the opinion of the

Trustee, who may rely upon a written opinion of legal counsel, shall not materially and adversely affect the interest of the Owners and Holders:

(a) to cure any ambiguity or formal defect or omission, to correct or supplement any provision herein that may be inconsistent with any other provision herein, to make any other provisions with respect to matters or questions arising under this Trust Agreement, or to modify, alter, amend, add to or rescind, in any particular, any of the terms or provisions contained in this Trust Agreement, or

(b) to grant or to confer upon the Trustee, for the benefit of the Owners or Holders, any additional rights, remedies, powers, authority or security that may lawfully be granted to or conferred upon the Owners, the Holders or the Trustee, or

(c) to add to the provisions of this Trust Agreement other conditions, limitations and restrictions thereafter to be observed, or

(d) to add to the covenants and agreements of the Authority in this Trust Agreement other covenants and agreements thereafter to be observed by the Authority or to surrender any right or power herein reserved to or conferred upon the Authority, or

(e) to permit the qualification of this Trust Agreement under any federal statute now or hereafter in effect or under any state blue sky law, and, in connection therewith, if the Authority so determines, to add to this Trust Agreement or any supplemental trust agreement such other terms, conditions and provisions as may be permitted or required by such federal statute or blue sky law.

At least thirty (30) days prior to the execution and delivery of any supplemental trust agreement for any of the purposes of this Section, the Trustee shall cause a notice of the proposed execution and delivery of such supplemental trust agreement to be mailed, postage prepaid, to all Owners of Bonds and Holders of Parity Debt and Junior Indebtedness. Such notice shall briefly set forth in the nature of the proposed supplemental trust agreement and shall state that copies thereof are on file at the designated corporate trust office of the Trustee for inspection by all Owners of Bonds and Holders of Parity Debt and Junior Indebtedness. A failure on the part of the Trustee to mail the notice required by this Section shall not affect the validity of such supplemental trust agreement.

Section 1102. Supplemental Trust Agreement with Consent. Subject to the terms and provisions contained in this Section, and not otherwise, the Owners and Holders of not less than a majority in aggregate principal amount of Senior Lien Indebtedness then Outstanding, the Owners and Holders of not less than a majority in aggregate principal amount of the Subordinate Lien Indebtedness then Outstanding and the Owners and Holders of not less than a majority in aggregate principal amount of the Junior Indebtedness then Outstanding shall have the right, from time to time, anything contained in this Trust Agreement to the contrary



notwithstanding, to consent to and approve the execution and delivery of such supplemental trust agreements as are deemed necessary or desirable by the Authority for the purpose of modifying, altering, amending, adding to or rescinding, in any particular, any of the terms or provisions contained in this Trust Agreement or in any supplemental trust agreement; provided, however, that nothing herein contained shall permit, or be construed as permitting (a) an extension of the maturity of the principal of or the interest on any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness without the consent of the Owner or Holder of such Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness, (b) a reduction in the principal amount of any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness or the redemption premium or the rate of interest on any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness without the consent of the Owner or Holder of such Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness, (c) the creation of a pledge, charge and lien upon the Receipts other than the pledge, charge and lien created by this Trust Agreement without the consent of all of the Owners and Holders of Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness then Outstanding, (d) a preference or priority of any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness over any other Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness except as expressly provided by this Trust Agreement without the consent of all of the Owners and Holders of Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness then Outstanding or (e) a reduction in the aggregate principal amount of any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness required for consent to such supplemental trust agreement without the consent of all of the Owners and Holders of Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness then Outstanding. For purposes of clauses (a) through (e) of this paragraph, notwithstanding any provisions herein or in any Supplemental Agreement or Parity Debt Resolution to the contrary, a Bond Insurer or Credit Provider shall not be deemed to be the Owner or Holder of Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness.

Nothing herein contained, however, shall be construed as making necessary the approval by Owners or Holders of Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness of the execution and delivery of any supplemental trust agreement as authorized in Section 1101. Furthermore, notwithstanding for the foregoing provisions of this Section, to the extent that the Holders or Owners of Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness, as the case may be, are not "affected" by the proposed supplemental trust agreement as provided in Section 1103, the consent of such Owners and Holders of not less than a majority in aggregate principal amount of Senior Lien Indebtedness, Subordinate Lien Indebtedness and Junior Indebtedness then Outstanding, as the case may be, shall not be required as provided in the preceding paragraph.

If at any time the Authority and the Trustee determines that it is necessary or desirable to execute and deliver any supplemental trust agreement for any of the purposes of this Section, the Trustee shall cause notice of the proposed supplemental trust agreement to be mailed, postage prepaid, to all Owners Bonds affected thereby at their addresses as they appear on the registration books and to all Holders of Parity Debt and Junior Indebtedness affected thereby in accordance with the related Parity Debt Resolution or Junior Indebtedness Agreement as of the date of mailing such notice. Such notice shall briefly set forth the nature of the proposed supplemental trust agreement and shall state that copies thereof are on file at the designated corporate trust office of the Trustee for inspection by all such Owners and Holders of Bonds, Parity Debt and Junior Indebtedness. The Trustee shall not, however, be subject to any liability to any Owner or Holder of Bonds, Parity Debt or Junior Indebtedness by reason of its failure to cause the notice required by this Section to be mailed, and any such failure to cause the notice required by this Section to be mailed and any such failure shall not affect the validity of such supplemental trust agreement when consented to and approved as provided in this Section.

Whenever, at any time within three (3) years after the date of the mailing of such notice, the Authority delivers to the Trustee an instrument or instruments in writing purporting to be executed by the Owners or Holders of not less than a majority in aggregate principal amount of Senior Lien Indebtedness, Subordinate Lien Indebtedness and Junior Indebtedness then Outstanding that are affected by a proposed supplemental trust agreement, which instrument or instruments shall refer to the proposed supplemental trust agreement described in such notice and shall specifically consent to and approve the execution and delivery thereof in substantially the form of the copy thereof referred to in such notice, thereupon, but not otherwise, the Authority and the Trustee may execute and deliver such supplemental trust agreement in substantially such form, without liability or responsibility to any Owner or Holder of any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness whether or not such Owner or Holder shall have consented thereto.

If the Owners or Holders of not less than a majority in aggregate principal amount of any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness then Outstanding at the time of the execution and delivery of such supplemental trust agreement and that are affected, as defined in Section 1103, by a proposed supplemental trust agreement have consented to and approved the execution and delivery thereof as herein provided, to the extent permitted by law, no Owner or Holder of any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness shall have any right to object to the execution and delivery of such supplemental trust agreement, to object to any of the terms and provisions contained therein or the operation thereof, to question the propriety of the execution and delivery thereof, or to enjoin or restrain the Authority and the



Trustee from executing and delivering the same or from taking any action pursuant to the provisions thereof.

Section 1103. Senior Lien Indebtedness, Subordinate Lien Indebtedness and Junior Indebtedness Affected. For purposes of this Trust Agreement, Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness shall be deemed to be "affected" by a supplemental trust agreement or an amendment, supplement or modification of the TIFIA Loan Agreement if the same adversely affects or diminishes the rights of the Owners or Holders of such Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness against the Authority or the rights of such Owners or Holders in the security for such Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness. The Trustee who may rely upon a written opinion of legal counsel, may in its discretion determine whether any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness would be affected by any supplemental trust agreement or any amendment, supplement or modification of the TIFIA Loan Agreement, and any such determination shall be conclusive upon the Owners and Holders of all Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Indebtedness, whether theretofore or thereafter issued or incurred. The Trustee shall not be liable for any such determination made in good faith. For so long as any TIFIA Indebtedness remains Outstanding, such TIFIA Indebtedness shall be deemed to be "affected" by any supplemental trust agreement.

*The preceding Section was revised pursuant to Section 701(mmm) of the Fourth Supplemental Trust Agreement.*

Section 1104. Supplemental Trust Agreements Part of Trust Agreement. Any supplemental trust agreement executed and delivered in accordance with the provisions of this Article shall thereafter form a part of this Trust Agreement, and this Trust Agreement shall be and be deemed to be modified and amended in accordance therewith. Thereafter the respective rights, duties and obligations under the Trust Agreement of the Authority, the Trustee and all Owners of Bonds and Holders of Parity Debt and Junior Indebtedness then Outstanding shall thereafter be determined, exercised and enforced in all respects under the provisions of this Trust Agreement as so modified and amended. If any supplemental trust agreement is executed and delivered, Bonds issued thereafter and Parity Debt and Junior Indebtedness incurred thereafter may contain an express reference to such supplemental trust agreement, if deemed necessary or desirable by the Authority.

Section 1105. Not a Supplemental Trust Agreement. For purpose of this Article and except as provided in Section 1103 with respect to TIFIA Indebtedness, a Supplemental Agreement, Parity Debt Resolution or Junior Indebtedness Agreement that relates only to a particular Series of Bonds issued hereunder or Parity Debt incurred under a Parity Debt Resolution or Junior Indebtedness

incurred under a Junior Indebtedness Agreement and that does not purport to alter or amend the rights or security of any Owners of any Bonds of any other Series issued hereunder or any Holder of any other Parity Debt or Junior Indebtedness incurred hereunder shall not be deemed or considered to be a supplemental trust agreement for purposes of this Article.

*The preceding Section was revised pursuant to Section 701(nnn) of the Fourth Supplemental Trust Agreement.*

Section 1106. Amendments to TIFIA Loan Agreement without Consent. The Authority, from time to time and at any time, may enter into such amendments, supplements or modifications of the TIFIA Loan Agreement as are substantially consistent with the terms and provisions of this Trust Agreement and, in the opinion of the Trustee, who may rely upon a written opinion of legal counsel, shall not materially and adversely affect the interest of the Owners and Holders.

*The preceding Section was revised pursuant to Section 701(zz) of the Fourth Supplemental Trust Agreement.*

## ARTICLE XII

## DEFEASANCE

Section 1201. Release of Trust Agreement. When:

(a) the Bonds, Parity Debt and Junior Indebtedness secured hereby shall have become due and payable in accordance with their terms or otherwise as provided in this Trust Agreement, and the whole amount of the principal and the interest and premium, if any, and other amounts so due and payable thereon shall be paid; and

(b) if the Bonds, Parity Debt and Junior Indebtedness shall not have become due and payable in accordance with their terms, the Trustee or any Bond Registrar shall hold, sufficient (i) money or (ii) Defeasance Obligations or a combination of (i) and (ii) of this clause (b), the principal of and the interest on which, when due and payable, will provide sufficient money to pay the principal of, and the interest and redemption premium, if any, on all Bonds, Parity Debt and Junior Indebtedness then Outstanding to the maturity date or dates of such Bonds, Parity Debt and Junior Indebtedness or to the date or dates specified for the redemption thereof, as verified by a verification agent acceptable to the Trustee; and

(c) if Bonds, Parity Debt or Junior Indebtedness are to be called for redemption or prepayment, irrevocable instructions to call the Bonds, Parity Debt or Junior Indebtedness for redemption or prepayment shall have been given by the Authority to the Trustee; and



(d) sufficient funds shall also have been provided or provision made for paying all other obligations payable hereunder by the Authority, including any Derivative Agreement Regularly Scheduled Payments;

then and in that case the right, title and interest of the Trustee in the funds, accounts and subaccounts mentioned in this Trust Agreement shall thereupon cease, determine and become void and, upon being furnished with an opinion, in form, and substance satisfactory to the Trustee, of counsel approved by the Trustee, to the effect that all conditions precedent to the release of this Trust Agreement have been satisfied, the Trustee shall release this Trust Agreement and shall execute such documents to evidence such release as may be required by such counsel, and the Trustee shall turn over to the Authority any surplus in, and all balances remaining in, all funds, accounts and subaccounts other than money held for the redemption or payment of Bonds, Parity Debt or Junior Indebtedness. Otherwise, this Trust Agreement shall be, continue and remain in full force and effect; provided, however, that in the event Defeasance Obligations shall be deposited with and held by the Trustee or the Bond Registrar as hereinabove provided, (i) in addition to the requirements set forth in Article III, the Trustee, within thirty (30) days after such Defeasance Obligations shall have been deposited with it, shall cause a notice signed by the Trustee to be mailed, postage prepaid, to all Owners and to all Holders of Bonds, Parity Debt and Junior Indebtedness, setting forth (a) the date or dates, if any, designated for the redemption of the Bonds, Parity Debt or Junior Indebtedness, (b) a description of the Defeasance Obligations so held by it, and (c) that this Trust Agreement has been released in accordance with the provisions of this Section, and (ii) (a) the Trustee shall nevertheless retain such rights, powers and privileges under this Trust Agreement as may be necessary and convenient in respect of the Bonds, Parity Debt and Junior Indebtedness for the payment of the principal, interest and any premium for which such Defeasance Obligations have been deposited and (b) each Bond Registrar shall retain such rights, powers and privileges under this Trust Agreement as may be necessary and convenient for the registration, transfer and exchange of Bonds; provided, however, that failure to mail such notice to any Owner or to the Owners, or to any such Holder or to such Holders, or any defect in such notice so mailed, shall not affect the validity of the release of this Trust Agreement.

All money and Defeasance Obligations held by the Trustee or any Bond Registrar pursuant to this Section shall be held in trust and applied to the payment, when due, of the obligations payable therewith.

## ARTICLE XIII

## MISCELLANEOUS PROVISIONS

Section 1301. Successorship of Authority. In the event the Authority for any reason shall be dissolved or its legal existence shall otherwise be terminated, all of

the covenants, stipulations, obligations and agreements contained in this Trust Agreement by or on behalf of or for the benefit of the Authority shall bind or inure to the benefit of the successor or Authority from time to time and any officer, board, commission, authority, agency or instrumentality to whom or to which any power or duty affecting such covenants, stipulations, obligations and agreements shall be transferred by or in accordance with law, and the term "Authority" as used in this Trust Agreement shall include such successor or successors.

Section 1302. Successorship of Depository and Bond Registrar. Any bank or trust company with or into which a Depositary or Bond Registrar may be merged or consolidated, or to which the assets and business of such Depositary or Bond Registrar may be sold, shall be deemed the successor of such Depositary or Bond Registrar for the purposes of this Trust Agreement. If the position of any Depositary shall become vacant for any reason or the position of Bond Registrar shall become vacant for any reason not provided for by Section 917, the Authority shall appoint a bank or trust company to fill such vacancy within 30 days thereafter; provided, however, that if the Authority shall fail to appoint such Depositary or Bond Registrar within such period, the Trustee shall make such appointment; provided, however, that the Trustee shall not be liable for the failure to make such appointment.

Section 1303. Manner of Giving Notice. All notices, demands and requests to be given to or made hereunder by the Authority or the Trustee shall be given or made in writing and shall be deemed to be properly given or made if sent by United States registered or certified mail, return receipt requested, postage prepaid, addressed as follows:

(a) As to the Authority –
North Carolina Turnpike Authority
1 South Wilmington Street
1578 Mail Service Center
Raleigh, NC 27699-1578

With a copy to –
NCDOT Secretary
1 South Wilmington Street
1501 Mail Service Center
Raleigh, NC 27699-1501

And to –
NCDOT CFO
1 South Wilmington Street
1514 Mail Service Center
Raleigh, NC 27699-1515



(b) As to the Trustee –
Wells Fargo Bank, N.A.
123 S. Broad Street, Suite 1500
Philadelphia, PA 19109
Attention: Cody Fedorishen, Corporate Trust Services
Phone: (215) 670-6573
Fax: (877) 775-7570
Email: cody.fedorishen@wellsfargo.com

(c) As to the Local Government Commission –
North Carolina Local Government Commission
3200 Atlantic Avenue
Raleigh, NC 27604
Attention: Secretary

*Contact information revised in Fourth Supplemental Trust Agreement.*

Any such notice, demand or request may also be transmitted to the appropriate abovementioned party by telegram or telephone and shall be deemed to be properly given or made at the time of such transmission if, and only if, such transmission of notice shall be confirmed in writing and sent as specified above.

Any of such addresses may be changed at any time upon written notice of such change sent by United States registered or certified mail, return receipt requested, postage prepaid, to the other parties by the party effecting the change.

All documents received by the Trustee under the provisions of this Trust Agreement, or photographic copies thereof, shall be retained in its possession until this Trust Agreement shall be released under the provisions of Section 1201, subject at all reasonable times to the inspection of the Authority, any Owner and the agents and representatives thereof.

Section 1304. Substitute Mailing. If, because of the temporary or permanent suspension of postal service, the Authority or the Trustee shall be unable to mail any notice required to be given by the provisions of this Trust Agreement, the Authority or the Trustee shall give notice in such other manner as in the judgment of the Authority or the Trustee shall most effectively approximate mailing, and the giving of notice in such manner shall for all purposes of this Trust Agreement be deemed to be in compliance with the requirement for the mailing thereof.

Section 1305. Parties, Bond Registrar, Owners and Holders Alone Have Rights under Trust Agreement. Except as herein or in a Supplemental Agreement otherwise expressly provided, nothing in this Trust Agreement, express or implied, is intended or shall be construed to confer upon any person, firm or corporation,

other than the Trustee, each Bond Registrar, the Authority, the Owners of Bonds and the Holders of Parity Debt and Junior Indebtedness, each Bond Insurer and the providers of any Derivative Agreement (but only to the extent provided in Section 1313) any right, remedy or claim, legal or equitable, under or by reason of this Trust Agreement or any provision being intended to be and being for the sole and exclusive benefit of the Trustee, the Authority, each Bond Registrar, the Owners of Bonds and the Holders of Parity Debt and Junior Indebtedness and the providers of any Derivative Agreement (but only to the extent provided in Section 1313).

Section 1306. Effect of Partial Invalidity. In case anyone or more of the provisions of this Trust Agreement, any Supplemental Agreement or any Parity Debt Resolution or Junior Indebtedness Agreement, or any Bonds or any Parity Debt or TIFIA Indebtedness, shall for any reason be held to be illegal or invalid, such illegality or invalidity shall not affect any other provisions of this Trust Agreement or such other documents or instruments, but this Trust Agreement and such other documents or instruments shall be construed and enforced as if such illegal or invalid provisions had not been contained therein. In case any covenant, stipulation, obligation or agreement contained in this Trust Agreement such other documents or instruments shall for any reason be held to be in violation of law, then such covenant, stipulation, obligation or agreement shall be deemed to be the covenant, stipulation, obligation or agreement of the Authority to the full extent permitted by law.

Section 1307. Effect of Covenants: Governing Law. All covenants, stipulations, obligations and agreements of the Authority contained in this Trust Agreement, any Supplemental Agreement or any Parity Debt Resolution or Junior Indebtedness Agreement shall be deemed to be covenants, stipulations, obligations and agreements of the Authority to the full extent permitted by the Constitution and laws of the State. This Trust Agreement is executed and delivered with the intent that the laws of the State shall govern its construction.

Section 1308. No Recourse Against Members, Officers or Employees of Authority. No recourse under, or upon, any statement, obligation, covenant or agreement contained in this Trust Agreement, or in any Bond, Parity Debt or Junior Indebtedness hereby secured, or in any document or certification whatsoever, or under any judgment obtained against the Authority, or by the enforcement of any assessment, or by any legal or equitable proceeding by virtue of any constitution or statute or otherwise or under any circumstances, shall be had against any member, officer or employee of the Authority, either directly or through the Authority for the payment for or to, the Authority or any receiver of the Authority, or for, or to, any Owner of Bonds or Holder of Parity Debt or Junior Indebtedness or otherwise, of any sum that may be due and unpaid upon any such Bond, Parity Debt or Junior Indebtedness. Any and all personal liability of every nature, whether at common law or in equity or by statute or by constitution or



otherwise, of any such member, officer or employee to respond by reason of any act or omission on his or her part or otherwise, for the payment for, or to, the Authority or any receiver of the Authority, or for, or to, any Owner of Bonds or Holder of Parity Debt or Junior Indebtedness or otherwise, of any sum that may remain due and unpaid upon the Bonds or any Parity Debt or Junior Indebtedness hereby secured or any of them, is hereby expressly waived and released as an express condition of, and in consideration for, the adoption of this Trust Agreement and the issuance of Bonds and the incurrence of Parity Debt or Junior Indebtedness.

Section 1309. Dealing in Bonds or Parity Debt. The Trustee and any Bond Registrar, and their directors, officers, employees or agents, and any officer, employee or agent of the Authority, may in good faith, buy, sell, own, hold and deal in any Bonds or Parity Debt and may join in any action which any Owner or Holder thereof may be entitled to take with like effects as if such Trustee were not a Trustee and such bank or trust company were not the Bond Registrar under this Trust Agreement or as if such officer, employee or agent of the Authority did not serve in such capacity.

Section 1310. Headings. Any heading preceding the text of the several articles hereof, any table of contents or marginal notes appended to copies hereof, shall be solely for convenience of reference and shall not constitute a part of this Trust Agreement, nor shall they affect its meaning, construction or effect.

Section 1311. Further Authority. The officers of the Authority, attorneys, engineers and other agents or employees of the Authority are hereby authorized to do all acts and things required of them by this Trust Agreement for the full, punctual and complete performance of all of the terms, covenants and agreements contained in the Bonds and this Trust Agreement.

Section 1312. Payment Due on Holidays. If the date for making any payment or the last day for performance of any act or the exercising of any right as provided in this Trust Agreement is not a Business Day, such payment may be made or act performed or right exercised on the next Business Day with the same force and effect as if done on the date provided in this Trust Agreement.

Section 1313. Treatment of Derivative Agreements. Anything in this Trust Agreement to the contrary notwithstanding, the counterparty under any Derivative Agreement providing for Senior Lien Derivative Agreement Regularly Scheduled Payments, Subordinate Lien Derivative Agreement Regularly Scheduled Payments or otherwise shall have no rights under this Trust Agreement to direct the method and place of conducting any remedial proceedings to be taken by the Trustee hereunder and shall have no voting rights with respect thereto or for any other purpose under this Trust Agreement, but shall only have the right to enforce those specific rights granted to such counterparties under this Trust Agreement, including, without limitation, those rights with respect to Section 503.

Section 1314. Multiple Counterparts. This Trust Agreement may be executed in multiple counterparts, each of which shall be regarded for all purposes as an original, and such counterparts shall constitute but one and the same instrument.



IN WITNESS WHEREOF, the Authority and the Trustee have caused this Trust Agreement to be executed in their respective names by their respective duly authorized representatives all as of the date first written above.

NORTH CAROLINA TURNPIKE AUTHORITY

[SEAL]

[redacted]

Attest:

[redacted]

WELLS FARGO BANK, N.A., as Trustee

[SEAL]

By:_____
Title:_____

Attest:

_____
Title:_____

*Reexecuted on December 17, 2019, pursuant to Section 701(a) of the Fourth Supplemental Trust Agreement*

IN WITNESS WHEREOF, the Authority and the Trustee have caused this Trust Agreement to be executed in their respective names by their respective duly authorized representatives all as of the date first written above.

NORTH CAROLINA TURNPIKE AUTHORITY

[SEAL]

By:_____
Executive Director

By:_____
Chairman

Attest:

_____
Secretary-Treasurer

WELLS FARGO BANK, N.A., as Trustee

[SEAL]

[redacted]

Attest:

[redacted]

*Reexecuted on December 17, 2019, pursuant to Section 701(a) of the Fourth Supplemental Trust Agreement*

[Signature Page to Amended and Restated Trust Agreement]

**Execution by Secretary of Transportation**

The undersigned Secretary of Transportation of the State of North Carolina is executing this Restated and Amended Trust Agreement to evidence the agreement of the North Carolina Department of Transportation to the contingent guarantees contained in Sections 402, 511 and 512 hereof and the transfer requirements contained in Sections 709 and 712 hereof, subject to the conditions stated herein and the other provisions of this Restated and Amended Trust Agreement, including Section 520.

SECRETARY OF TRANSPORTATION

[redacted]

*Executed on December 17, 2019, pursuant to Section 701(a) of the Fourth Supplemental Trust Agreement.*

**FIFTH SUPPLEMENTAL TRUST AGREEMENT**

Dated as of October 1, 2020

By and Between

**NORTH CAROLINA TURNPIKE AUTHORITY**

and

**WELLS FARGO BANK, N.A.,**
Trustee

Supplementing a Trust Agreement dated as of June 1, 2009, as Previously Supplemented by a First Supplemental Trust Agreement dated as of July 1, 2009, a Second Supplemental Trust Agreement dated as of March 1, 2017, a Third Supplemental Trust Agreement dated as of December 1, 2018, and a Fourth Supplemental Trust Agreement dated as of December 1, 2019, now compiled as an Amended and Restated Trust Agreement

Authorizing and Securing

$499,460,000
North Carolina Turnpike Authority
Triangle Expressway System Senior Lien Turnpike
Revenue Bond Anticipation Notes,
Series 2020

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EXHIBIT A FORM OF SERIES 2020 NOTES



This **FIFTH SUPPLEMENTAL TRUST AGREEMENT**, dated as of October 1, 2020 (the "Fifth Supplemental Trust Agreement"), between the **North Carolina Turnpike Authority**, a political subdivision within the Department of Transportation ("NCDOT") of the State of North Carolina (the "State"), duly existing under the laws of the State (the "Authority"), and **Wells Fargo Bank, N.A.,** a national banking association duly organized and existing under the laws of the United States of America and having a designated corporate trust office in Philadelphia, Pennsylvania, which is authorized under such laws to exercise trust powers, and from its office in Minneapolis, Minnesota acts in the capacity of bond and note registrar (the "Trustee"):

W I T N E S S E T H:

**WHEREAS**, the Authority and the Trustee have heretofore entered into the Amended and Restated Trust Agreement, dated as of December 1, 2019 (the "Amended and Restated Trust Agreement"), providing for, among other things, the issuance or incurrence thereunder of Revenue Bond Anticipation Notes, including but not limited to Phase I BANs, as defined in the Amended and Restated Trust Agreement, order to provide funds to finance, together with other available funds, costs of acquisition, construction, installation and equipping of the Triangle Expressway System, and financing related reserves and other costs;

**WHEREAS**, pursuant to the Amended and Restated Trust Agreement, the Fourth Supplemental Trust Agreement, dated as of December 1, 2019 (the "Fourth Supplemental Trust Agreement"), and a Bond Order adopted by the Authority, the Authority has issued its Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2019 (the "Series 2019 Bonds"), to provide funds, together with other available funds, to (a) pay the costs of land acquisition, design, construction and equipping of an extension of the existing Triangle Expressway System from its existing eastern termination point to intersect with I-40 (the "2019 Additional Project"), (b) pay interest on certain Series 2019 Bonds, (c) pay the premium on a bond insurance policy for the Series 2019 Bonds, (d) pay the premium for a debt service reserve insurance policy with respect to the Series 2019 Bonds, and (e) pay the costs incurred in connection with the issuance of the Series 2019 Bonds;

**WHEREAS**, pursuant to the Amended and Restated Trust Agreement, the Fourth Supplemental Trust Agreement and a Bond Order adopted by the Authority, the Authority has issued its Triangle Expressway System Revenue Bond, TIFIA Series 2019 (the "TIFIA Series 2019 Bond"), to evidence its obligation to repay a loan from the United States Department of Transportation ("USDOT"), in an original principal amount not to exceed $499,461,980, under the TIFIA Loan Agreement dated as of December 17, 2019, between the Authority and USDOT (the "TIFIA 2019 Loan Agreement"), pursuant to the Transportation Infrastructure Finance and Innovation Act of 1998 ("TIFIA"), to provide funds for the costs of the 2019 Additional Project;

**WHEREAS,** the Authority has determined to provide interim financing for the 2019 Additional Project by issuing its Triangle Expressway System Senior Lien Turnpike Revenue Bond Anticipation Notes, Series 2020 (the "Series 2020 Notes"), issued as Phase I BANs pursuant to the Amended and Restated Trust Agreement and this Fifth Supplemental Trust Agreement, in anticipation of disbursements to be received under the TIFIA 2019 Loan Agreement;

**WHEREAS,** the Authority will issue the Series 2020 Notes as Senior Lien Bonds secured in parity with the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2009B, the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2017, the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2018, and the Series 2019 Bonds; and

**WHEREAS,** the Authority expects to pay the principal of the Series 2020 Notes from disbursements under the TIFIA 2019 Loan Agreement and interest on the Series 2020 Notes from proceeds of the Series 2020 Notes retained as capitalized interest, will take all steps necessary to receive such disbursements and, if such disbursements cease to be so anticipated or if they are insufficient to pay in full the principal of the Series 2020 Notes, use its best efforts to otherwise provide for payment of the Series 2020 Notes; provided if alternative financing for payment of principal of the Series 2020 Notes is determined by the Authority to be available and economically preferable to using disbursements under the TIFIA 2019 Loan Agreement, such alternative financing may be entered into and so utilized;

**NOW, THEREFORE**, in consideration of the mutual covenants and contained herein, the parties hereto agree as follows:

## ARTICLE I

## DEFINITIONS

Section 101. Meaning of Words and Terms. Unless otherwise required by the context herein, in addition to the definitions in the introductory paragraphs hereto, words and terms used herein which are defined in the Amended and Restated Trust Agreement shall have the meanings assigned to them therein, and the following words and terms shall have the following meanings:

"Bond Order" means the Bond Order of the Authority with respect to the Series 2020 Notes adopted August 6, 2020.

"Bond Year" means the period commencing on January 1 of any year and ending on December 31 of the same year, provided that the first Bond Year shall begin on the date of issuance of the Series 2020 Notes.

"Closing" means the delivery of and payment for the Series 2020 Notes.



"Closing Date" means the date of the Closing.

"Fifth Supplemental Trust Agreement" means this Fifth Supplemental Trust Agreement, dated as of October 1, 2020, between the Authority and the Trustee, supplementing the Amended and Restated Trust Agreement.

"Initial Offering Price" means the price at which the Series 2020 Notes are offered for sale to the public or sold to the initial purchasers thereof at the time of sale thereof without reduction to reflect underwriter's discount.

"Interest Payment Date" means any January 1 or July 1, commencing January 1, 2021, and the date on which principal is to be paid at maturity.

"NCGS" means the North Carolina General Statutes, as amended.

"Note Registrar" means Wells Fargo Bank, N.A., as designated by Section 201.

"Regular Record Date" means the 15th day of the month preceding any Interest Payment Date, whether or not a Business Day.

"Series 2020 Cost of Issuance Fund" means the fund created and so designated by Section 401.

"Series 2020 Notes" means the North Carolina Turnpike Authority Triangle Expressway System Senior Lien Turnpike Revenue Bond Anticipation Notes, Series 2020, issued pursuant to this Fifth Supplemental Trust Agreement. "Phase I BANs" refers to the Series 2020 Notes.

"Series 2020 Subaccount of the Additional Projects Account" means the subaccount created and so designated by Section 401.

"Series 2020 Subaccount of the Capitalized Interest Account" means the subaccount created and so designated by Section 401.

"Series 2020 Subaccount of the Interest Account" means the subaccount created and so designated by Section 401.

"Series 2020 Subaccount of the Principal Account" means the subaccount created and so designated by Section 401.

"TIFIA 2019 Loan Agreement" means the TIFIA Loan Agreement, dated as of December 17, 2019, between the Authority and USDOT, pursuant to which USDOT made a loan to the Authority the repayment of which is evidenced by the TIFIA Series 2019 Bond.

"TIFIA Series 2019 Bond" means the North Carolina Turnpike Authority Triangle Expressway System Revenue Bond, TIFIA Series 2019, issued by the

Authority pursuant to the Fourth Supplemental Trust Agreement to evidence the obligation of the Authority to repay the loan under the TIFIA 2019 Loan Agreement.

"Trust Agreement" means the Amended and Restated Trust Agreement as supplemented by this Fifth Supplemental Trust Agreement.

"USDOT" means the United States Department of Transportation.

Section 102. Rules of Construction. (a) Words of the masculine gender shall be deemed and construed to include correlative words of the feminine and neuter genders. Unless the context shall otherwise indicate, words used herein shall include the plural as well as the singular number.

(b) References herein to particular articles or sections are references to articles or sections of this Fifth Supplemental Trust Agreement unless some other reference is indicated.

## ARTICLE II

## AUTHORIZATION, FORM, ISSUANCE, DELIVERY AND REGISTRATION OF THE SERIES 2020 NOTES

Section 201. Authorization and Issuance of the Series 2020 Notes. For the purpose of providing funds, together with any other available funds, to (a) pay or reimburse costs of the 2019 Additional Project, (b) pay capitalized interest on the Series 2020 Notes, and (c) pay costs incurred in connection with the issuance of the Series 2020 Notes, there shall be issued, under and pursuant to the Constitution and the laws of the State, including the Act, the Trust Agreement and the Bond Order, a series of Revenue Bond Anticipation Notes of the Authority designated "Triangle Expressway System Senior Lien Turnpike Revenue Bond Anticipation Notes, Series 2020" in the aggregate principal amount of $499,460,000 with an aggregate Initial Offering Price of $565,004,135.80. The Series 2020 Notes shall constitute Senior Lien Bonds under the Trust Agreement and are not secured by any Senior Lien Parity Reserve Account.

Wells Fargo Bank, N.A., as trustee acting from it office in Philadelphia, Pennsylvania, is hereby appointed Note Registrar for the Series 2020 Notes under this Fifth Supplemental Trust Agreement and will so act from its office in Minneapolis, Minnesota.

Section 202. Form of Series 2020 Notes. The definitive Series 2020 Notes are Current Interest Bonds, issuable in fully registered form in Authorized Denominations, shall be lettered "R-" and shall be numbered from 1 consecutively upward. The definitive Series 2020 Notes shall be substantially in the form set forth in Exhibit A attached hereto, with such appropriate variations, omissions and insertions as are permitted or required by the Trust Agreement.



Section 203. Details of Series 2020 Notes.

(a) The Series 2020 Notes (i) shall be dated the date of delivery thereof, (ii) shall be issued in the aggregate principal amount of $499,460,000, (iii) shall bear interest at the per annum rate of 5.000% (computed on the basis of a 360-day year consisting of twelve 30-day months) until their payment, such interest to the maturity thereof being payable on each Interest Payment Date beginning January 1, 2021, and (iv) shall mature on February 1, 2024.

(b) The Series 2020 Notes shall be issued by means of a book-entry system with no physical distribution of note certificates to be made except as hereinafter provided. One note certificate with respect to the Series 2020 Notes, in the aggregate principal amount of the Series 2020 Notes and registered in the name of Cede & Co., as nominee of The Depository Trust Company, New York, New York ("DTC"), will be issued and required to be deposited with DTC and immobilized in its custody. The book-entry system will evidence ownership of the Series 2020 Notes in the principal amount of $5,000 or any whole multiple thereof, with transfers of ownership effected on the records of DTC and its participants pursuant to rules and procedures established by DTC and its participants. The principal of each Series 2020 Note and interest with respect thereto shall be payable to Cede & Co. or any other person appearing on the registration books of the Authority as the registered owner of such Series 2020 Notes or its registered assigns or legal representatives. Transfer of principal and interest payments to participants of DTC will be the responsibility of DTC, and transfer of principal and interest payments to beneficial owners of the Series 2020 Notes by participants of DTC will be the responsibility of such participants and other nominees of such beneficial owners. The Authority, the Note Registrar and the Trustee will not be responsible or liable for such transfers of payments or for maintaining, supervising or reviewing records maintained by DTC, its participants or persons acting through such participants.

In the event that (1) DTC determines not to continue to act as Securities Depository for the Series 2020 Notes or (2) the Authority determines that continuation of the book-entry system of evidence and transfer of ownership of the Series 2020 Notes would adversely affect the interests of the beneficial owners of the Series 2020 Notes, the Authority will discontinue the book-entry system with DTC. If the Authority identifies another qualified Securities Depository to replace DTC, the Authority will make arrangements with DTC and such other Securities Depository to effect such replacement and deliver replacement notes registered in the name of such other Securities Depository or its Securities Depository Nominee in exchange for the outstanding Series 2020 Notes, and the references to DTC or Cede & Co. in this Fifth Supplemental Trust Agreement shall thereupon be deemed to mean such other Securities Depository or its Securities Depository Nominee. If the Authority fails to identify another qualified Securities Depository to replace DTC, the Authority will deliver replacement notes in the form of fully registered certificates in Authorized

Denominations in exchange for the outstanding Series 2020 Notes as required by DTC and others.

Section 204. Terms and Conditions for Issuance of the Series 2020 Notes.

(a) The Series 2020 Notes shall be executed substantially in the form and in the manner herein set forth and shall be deposited with the Note Registrar for authentication and delivery to the State Treasurer for redelivery to the purchasers thereof, but only upon the deposit with the Trustee of the purchase price of the Series 2020 Notes and the accrued interest thereon. The Series 2020 Notes are issued pursuant to the terms and conditions of Sections 211 and 716 of the Amended and Restated Trust Agreement, including the assumption for purposes of debt service coverage requirements upon issuance that, notwithstanding the actual maturity of the Series 2020 Notes, the Series 2020 Notes are assumed to be amortized over the same period, at the same interest rate and in the same amounts as the TIFIA Series 2019 Bond.

Simultaneously with the Closing and the deposit of the proceeds of the Series 2020 Notes with the Trustee, the Trustee shall apply the proceeds in the amount of $563,972,006.29 (representing $499,460,000.00, the principal amount of the Series 2020 Notes, plus original issue premium of $65,544,135.80, less an underwriters' discount of $1,032,129.51, to the Series 2020 Subaccount of the Additional Projects Account of the Project Fund, to the Series 2020 Subaccount of the Capitalized Interest Account and to the Series 2020 Cost of Issuance Fund, as directed by the Authority in an Officer's Certificate filed with the Trustee simultaneously with the issuance of the Series 2020 Notes.

(b) The Authority will draw upon the TIFIA loan from USDOT under the TIFIA 2019 Loan Agreement, deposit the amounts so drawn to the Series 2020 Subaccount of the Additional Projects Account, and then direct the Trustee to transfer an amount equal to the principal of the Series 2020 Notes from the Series 2020 Subccount of the Additional Projects Account to the Series 2020 Subaccount of the Principal Account and use the amounts in such subaccount to pay principal of the Series 2020 Notes at their maturity. At such time, the Trustee will pay interest on the Series 2020 Notes from the Series 2020 Subaccount of the Capitalized Interest Account.

The Authority will take all steps to satisfy the conditions set forth in the TIFIA 2019 Loan Agreement in order to timely receive the amounts necessary to pay principal of the Series 2020 Notes at their maturity. In the event the amounts received under the TIFIA 2019 Loan Agreement are insufficient to pay principal of the Series 2019 Notes in full at their maturity, the Authority will use its best efforts to find an alternative refinancing solution, which could include any or all of using amounts available to the Authority, issuing rollover bond anticipation notes or issuing other obligations secured by the Trust Estate.



(c) Notwithstanding the provisions of subsection (b), if alternative financing for payment of principal of the Series 2020 Notes is determined by the Authority to be available and economically preferable to using disbursements under the TIFIA 2019 Loan Agreement, such alternative financing may be entered into and so utilized.

Section 205. Series 2020 Notes Not Secured by Senior Lien Parity Reserve Account. The Series 2020 Notes shall not be secured by the Senior Lien Parity Reserve Account established under the Amended and Restated Trust Agreement.

## ARTICLE III

## REDEMPTION OF SERIES 2020 NOTES

Section 301. Redemption of Series 2020 Notes. The Series 2020 Notes shall not be subject to redemption prior to maturity.

## ARTICLE IV

## ACCOUNTS, SUBACCOUNTS, REVENUES AND FUNDS

Section 401. Establishment of Subaccounts and Account. The following Subaccounts of the accounts of the Senior Lien Debt Service Fund are hereby established:

(a) Series 2020 Subaccount of the Interest Account;

(b) Series 2020 Subaccount of the Capitalized Interest Account; and

(c) Series 2020 Subaccount of the Principal Account.

The Series 2020 Cost of Issuance Fund is hereby established. There is also hereby established a Series 2020 Subaccount of the Additional Projects Account in the Project Fund.

The fund and subaccounts mentioned above shall be established with and held by the Trustee pursuant to the Trust Agreement. The Series 2020 Cost of Issuance Fund, the Series 2020 Subaccount of the Capitalized Interest Account and the Series 2020 Subaccount of the Additional Projects Account shall be held solely for the benefit of the holders of the Series 2020 Notes.

On each Interest Payment Date, commencing January 1, 2021, the Trustee shall apply funds in the Series 2020 Subaccount of the Capitalized Interest Account for payment of interest due on the Series 2020 Notes on such Interest Payment Date. On any Interest Payment Date on which all or a portion of the funds then on deposit

in the Series 2020 Subaccount of the Capitalized Interest Account are not needed to pay accrued interest to final maturity, upon delivery of an Officer's Certificate requesting such transfer, such excess funds shall be transferred to the Series 2020 Subaccount of the Principal Account and applied to pay the principal of the Series 2020 Notes.

Amounts deposited in the Series 2020 Subaccount of the Additional Projects Account on the Closing Date shall be used to pay or reimburse costs of the 2019 Additional Project.

Upon delivery of an Officer's Certificate stating that all or a portion of the funds then on deposit in the Series 2020 Cost of Issuance Fund are not needed to pay the costs of issuance of the Series 2020 Notes, such excess funds shall be transferred to the Series 2020 Subaccount of the Additional Projects Account and applied to pay costs of the 2019 Additional Project.

Section 402. Receipts Received by the Authority.

(a) The Trustee shall deposit or cause to be deposited, from Receipts held in the Revenue Fund, to the various accounts and subaccounts specified herein the amounts provided by Section 503 of the Amended and Restated Trust Agreement, as amended by this Fifth Supplemental Trust Agreement.

(b) The Trustee shall deposit to the Series 2020 Subaccount of the Additional Projects Account as received from the Authority the amount of disbursements under the TIFIA 2019 Loan Agreement for Costs of the 2019 Additional Project. Immediately upon receipt thereof, the Trustee shall transfer an amount equal to the amount of principal due on the Series 2020 Notes prior to the maturity thereof to the Series 2020 Subaccount of the Principal Account.

(c) The Trustee acknowledges receipt of the direction dated September 9, 2020, delivered by the Executive Director of the Authority instructing the Trustee to transfer (i) $2,320,744.04 from the Unrestricted Account of the General Reserve Fund to the Series 2017 Subaccount of the Interest Account and (ii) $2,528,495.59 from the Unrestricted Account of the General Reserve Fund to the Series 2018 Subaccount of the Interest Account. The Trustee shall apply such amounts to the payment of interest on the Series 2017 Bonds and the Series 2018 Bonds, respectively, on January 1, 2021, and, pursuant to the fourth paragraph following subsection (p) of Section 503 of the Trust Agreement, correspondingly reduce the required deposits under Section 503(a) to such subaccounts by the respective amounts.

Section 403. Payment of Principal and Interest and Pledge of Receipts. The Authority covenants that it will promptly pay the principal of and the interest on every Series 2020 Note issued under the provisions of this Fifth Supplemental Trust Agreement at the places, on the dates and in the manner provided herein and in said Series 2020 Notes, according to the true intent and meaning thereof. The Authority



further covenants that it will faithfully perform at all times all of its covenants, undertakings and agreements contained in the Trust Agreement, or in any Series 2020 Note executed, authenticated and delivered hereunder or in any proceedings of the Authority pertaining thereto. The Authority shall apply amounts in the Series 2020 Subaccount of the Principal Account to make all payments of principal of the Series 2020 Notes and shall make all payments of interest on the Series 2020 Notes from transfers from the Series 2020 Subaccount of the Capitalized Interest Account to the Series 2020 Subaccount of the Interest Account.

The Authority represents and covenants that (a) it is duly authorized under the Constitution and laws of the State, particularly the Act, to issue the Series 2020 Notes as Senior Lien Bonds authorized by the Trust Agreement and to pledge the Receipts in the manner and to the extent herein and in the Trust Agreement set forth, (b) all action on its part for the issuance of the Series 2020 Notes has been duly and effectively taken and (c) such Series 2020 Notes in the hands of the Holders thereof are and will be valid and binding special obligations of the Authority payable according to their terms.

Section 404. Tax Covenant. The Authority covenants to do and perform all acts and things permitted by law in order to assure that interest paid on the Series 2020 Notes which was excludable from the gross income of their Holders for federal income taxes on the date of their issuance shall continue to be so excludable.

Section 405. Continuing Disclosure. The Authority hereby undertakes, for the benefit of the beneficial owners of the Series 2020 Notes, to provide to the Municipal Securities Rulemaking Board:

(a) by not later than seven months from the end of each Fiscal Year, commencing with the Fiscal Year ended June 30, 2020, audited financial statements of the Authority for such Fiscal Year, if available, prepared in accordance with Section 159-34 of the General Statutes of North Carolina, as it may be amended from time to time, or any successor statute, or, if such audited financial statements of the Authority are not available by seven months from the end of such Fiscal Year, unaudited financial statements of the Authority for such Fiscal Year to be replaced subsequently by audited financial statements of the Authority to be delivered within fifteen (15) days after such audited financial statements become available for distribution;

(b) by not later than seven months from the end of each Fiscal Year, commencing with the Fiscal Year ended June 30, 2020, (i) the financial and statistical data as of a date not earlier than the end of the preceding Fiscal Year evidencing compliance by the Authority with the Rate Covenant described under the heading "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2020 NOTES – Rate Covenant" in the Official Statement, dated October 15, 2020, relating to the Series 2020 Notes (the "Official Statement"), including the calculation of Revenues and

Long-Term Debt Service Requirement, to the extent that such items are not included in the financial statements referred to in (a) above;

(c) within ten (10) Business Days following the occurrence of an event, notice of any of the following events with respect to the Series 2020 Notes:

(i) principal and interest payment delinquencies;

(ii) unscheduled draws on debt service reserves reflecting financial difficulties;

(iii) unscheduled draws on credit enhancements reflecting financial difficulties;

(iv) substitution of credit or liquidity providers, or their failure to perform;

(v) issuance by the Internal Revenue Service of a proposed or final determination of taxability with respect to the Series 2020 Notes; a Notice of Proposed Issues on IRS Form 5701-TEB with respect to the Series 2020 Notes; adverse tax opinions, material notices or determinations with respect to the tax status of the Series 2020 Notes; or other event affecting the tax status of the Series 2020 Notes;

(vi) defeasances;

(vii) rating changes;

(viii) tender offers;

(ix) bankruptcy, insolvency, receivership or similar proceeding by the Authority; and

(x) default, event of acceleration, termination event, modification of terms, or other similar events under the terms of the financial obligation of the Authority, any of which reflect financial difficulties.

For purposes of the undertakings described in Section 406(c)(x) above and Section 406(d)(ix) below, "financial obligation" means (A) a debt obligation, (B) a derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation, or (C) a guarantee of either clause (A) or (B) above. The term "financial obligation" shall not include municipal securities as to which a final official statement has been provided to the Municipal Securities Rulemaking Board (the "MSRB") consistent with Rule 15c2-12, as hereinafter defined.



(d) within ten (10) Business Days following the occurrence of an event, notice of any of the following events with respect to the Series 2020 Notes, if material:

(i) non-payment related defaults;

(ii) modification to the rights of the beneficial owners of the Series 2020 Notes;

(iii) note calls, other than note calls relating to mandatory sinking fund redemption;

(iv) release, substitution or sale of any property securing repayment of the Series 2020 Notes;

(v) mergers, consolidations, acquisition and sales of assets (other than in the ordinary course of business);

(vi) appointment of a successor or additional trustee or a change in the name of the trustee;

(vii) legislation shall be filed with the North Carolina General Assembly by the Governor of North Carolina or legislation is reported out of a committee in either body of the General Assembly which, if adopted in the form so filed or reported, would result in a reduction or delay in the receipt of $25 million for the Triangle Expressway System in State Appropriated Revenues in any Bond Year;

(viii) an administrative action is taken by the Governor of North Carolina, NCDOT or any other agency or authority of the State which will result in a reduction or delay in the receipt of $25 million for the Triangle Expressway System in State Appropriated Revenues in any Bond Year; and

(ix) incurrence of a financial obligation of the Authority, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a financial obligation of the Authority, any of which affect security holders, if material.

(e) within ten (10) Business Days following the occurrence of a failure, notice of a failure of the Authority to provide required annual financial information described in (a) or (b) above on or before the date specified.

The Authority may meet the continuing disclosure filing requirements described above by (1) providing the required information directly through the MSRB's Electronic Municipal Marketplace Access (EMMA) System, or (2) complying with any other procedure the MSRB or the United States Securities and Exchange Commission implements.

If the Authority fails to comply with the undertaking described above, any beneficial owner of or the Series 2020 Notes may take action to protect and enforce the rights of all beneficial owners with respect to such undertaking, including an action for specific performance; provided, however, that failure to comply with such undertaking shall not be an Event of Default under the Amended and Restated Trust Agreement. All actions shall be instituted, had and maintained in the manner provided in this paragraph for the benefit of all beneficial owners of the Series 2020 Notes.

The Authority reserves the right to modify from time to time the information to be provided to the extent necessary or appropriate in the judgment of the Authority, provided that:

(1) any such modification may only be made in connection with a change in circumstances that arises from a change in legal requirements, change in law, or change in the identity, nature or status of the Authority;

(2) the information to be provided, as modified, would have complied with the requirements of Rule 15c2-12 issued under the Securities Exchange Act of 1934 ("Rule 15c2-12") as of the date of the Official Statement, after taking into account any amendments or interpretations of Rule 15c2-12, as well as any changes in circumstances; and

(3) any such modification does not materially impair the interests of the Holders of the Series 2020 Notes, as determined by the Trustee or bond counsel to the Authority, or by approving vote of the Holders of a majority in aggregate principal amount of the Series 2020 Notes then outstanding pursuant to the terms of the Trust Agreement at the time of the amendment.

In the event that the Authority makes such a modification, the annual financial information containing the modified operating data or financial information shall explain, in narrative form, the reasons for the modification and the impact of the change in the type of operating data or financial information being provided.

The provisions of this section shall terminate upon payment, or provision having been made for payment in a manner consistent with Rule 15c2-12, in full of the principal of and interest on all of the Series 2020 Notes.

## ARTICLE V

## SUPPLEMENTAL TRUST AGREEMENTS

Section 501. Supplemental Trust Agreements Without Consent of Holders. The Authority may, from time to time and at any time, execute and deliver such trust agreements supplemental hereto (which supplemental trust agreements shall thereafter form a part hereof) as shall be substantially consistent with the terms and



provisions of this Fifth Supplemental Trust Agreement and, in the opinion of the Trustee, who may rely upon a written opinion of legal counsel, shall not materially and adversely affect the interest of the Holders of the Series 2020 Notes:

(a) to cure any ambiguity or formal defect or omission, to correct or supplement any provision herein that may be inconsistent with any other provision herein, to make any other provisions with respect to matters or questions arising under this Fifth Supplemental Trust Agreement or to modify, alter, amend, add to or rescind any of the terms or provisions contained in this Fifth Supplemental Trust Agreement;

(b) to grant or to confer upon the Trustee for the benefit of the Holders of the Series 2020 Notes any additional rights, remedies, powers, authority or security that may lawfully be granted to or conferred upon the Holders of the Series 2020 Notes or the Trustee;

(c) to add to the covenants and agreements of the Authority in this Fifth Supplemental Trust Agreement other covenants and agreements thereafter to be observed by the Authority or to surrender any right or power herein reserved to or conferred upon the Authority;

(d) to permit the qualification of this Fifth Supplemental Trust Agreement under any federal statute now or hereafter in effect or under any state Blue Sky law, and, in connection therewith, if the Authority so determines, to add to this Fifth Supplemental Trust Agreement or any other supplemental trust agreement such other terms, conditions and provisions as may be permitted or required by such federal statute or Blue Sky law; or

(e) to provide for the issuance of Series 2020 Notes in bearer form.

At least thirty (30) days prior to the execution and delivery of any supplemental trust agreement for any of the purposes of this section, the Trustee shall cause at the Authority's expense to be paid from the Operations and Maintenance Expense Fund or from other available funds, a notice of the proposed supplemental trust agreement to be mailed first-class, postage prepaid, to the Local Government Commission and to all Holders of the Series 2020 Notes. Such notice shall briefly set forth the nature of the proposed supplemental trust agreement and shall state that copies thereof are on file at the designated corporate trust office of the Trustee for inspection by all Holders of the Series 2020 Notes. A failure on the part of the Trustee to mail the notice required by this section shall not affect the validity of such supplemental trust agreement.

Section 502. Modification of Supplemental Agreement with Consent of Holders. Subject to the terms and provisions contained in this section, and not otherwise, the Holders of not less than a majority in aggregate principal amount of the Series 2020 Notes then outstanding that will be affected, as defined in

Section 503, by a proposed supplemental trust agreement shall have the right, from time to time, anything contained in this Fifth Supplemental Trust Agreement to the contrary notwithstanding, to consent to and approve the execution and delivery by the Authority and the Trustee of such supplemental trust agreement as shall be deemed necessary or desirable by the Authority for the purpose of modifying, altering, amending, adding to or rescinding any of the terms or provisions contained in this Fifth Supplemental Trust Agreement or in any supplemental trust agreement; provided, however, that nothing herein contained shall permit, or be construed as permitting (a) an extension of the maturity of the principal of or the interest on any Series 2020 Note without the consent of the Holder of such Series 2020 Note, (b) a reduction in the principal amount of any Series 2020 Note or the rate of interest thereon without the consent of the Holder of such Series 2020 Note, (c) the creation of a pledge, charge and lien upon the Receipts other than the pledge, charge and lien created by the Trust Agreement without the consent of all Holders of the Series 2020 Notes then outstanding, (d) a preference or priority of any Series 2020 Note over any other Series 2020 Note without the consent of all Holders of the Series 2020 Notes then outstanding, or (e) a reduction in the aggregate principal amount of Series 2020 Notes required for consent to such supplemental trust agreement without the consent of all Holders of the Series 2020 Notes then outstanding. Nothing herein contained, however, shall be construed as making necessary the approval by the Holders of the Series 2020 Notes of the execution and delivery of any supplemental trust agreement as authorized in Section 501.

The Trustee shall cause such expense to be paid from the Operations and Maintenance Expense Fund or from any other available moneys and cause notice of the proposed supplemental trust agreement to be mailed, postage prepaid, to the Local Government Commission and all Holders of the Series 2020 Notes as of the date such notice is mailed. Such notice shall briefly set forth the nature of the proposed supplemental trust agreement and shall state that copies thereof are on file at the principal corporate trust office of the Trustee for inspection by all Holders of Series 2020 Notes. The Trustee shall not, however, be subject to any liability to any Holder by reason of its failure to mail the notice required by this section, and any such failure shall not affect the validity of such supplemental trust agreement when approved and consented to as provided in this section.

Whenever, at any time within three (3) years after the date of the mailing of such notice, the Authority shall deliver to the Trustee an instrument or instruments in writing purporting to be executed by the Holders of not less than a majority in aggregate principal amount of Series 2020 Notes then outstanding that are affected, as defined in Section 503, by a proposed supplemental trust agreement, which instrument or instruments shall refer to the proposed supplemental trust agreement described in such notice and shall specifically consent to and approve the execution and delivery thereof in substantially the form of the copy thereof referred to in such notice, thereupon, but not otherwise, the Authority and the Trustee may execute and deliver such supplemental trust agreement in substantially such form, without



liability or responsibility to any Holder of Series 2020 Notes, whether or not such Holder shall have consented thereto.

If the Holders of not less than a majority in aggregate principal amount of the Series 2020 Notes outstanding at the time of the execution and delivery of such supplemental trust agreement and that are affected, as defined in Section 503, by a proposed Trust Agreement have consented to and approved the execution and delivery thereof as herein provided, to the extent permitted by law, no Holder of Series 2020 Notes shall have any right to object to the execution and delivery of such supplemental trust agreement, to object to any of the terms and provisions contained therein or the operation thereof, to question the propriety of the execution and delivery thereof, or enjoin or restrain the Authority or the Trustee from executing and delivering the same or from taking any action pursuant to the provisions thereof.

Upon the execution and delivery of any supplemental trust agreement pursuant to the provisions of this section or Section 501, this Fifth Supplemental Trust Agreement shall be and be deemed to be modified and amended in accordance therewith, and the respective rights, duties and obligations under this Fifth Supplemental Trust Agreement of the Authority, the Trustee and all Holders of the Series 2020 Notes shall thereafter be determined, exercised and enforced in all respects pursuant to the provisions of this Fifth Supplemental Trust Agreement, as so modified and amended.

Section 503. Series 2020 Notes Affected. For purposes of this Fifth Supplemental Trust Agreement, Series 2020 Notes shall be deemed to be "affected" by a supplemental trust agreement if the same adversely affects or diminishes the rights of Holders against the Authority or the rights of the Holders in the security for such Series 2020 Notes. The Trustee may in its discretion determine whether any Series 2020 Notes would be affected by any supplemental trust agreement, and any such determination shall be conclusive upon the Holders of all Series 2020 Notes, whether theretofore or thereafter authenticated and delivered hereunder. The Trustee shall not be liable for any such determination made in good faith.

Section 504. Exclusion of Series 2020 Notes. Series 2020 Notes owned or held by or for the account of the Authority shall not be deemed outstanding Series 2020 Notes for the purpose of any consent or other action or any calculation of outstanding Series 2020 Notes provided for in this Article, and the Authority as Holder of such outstanding Series 2020 Notes shall not be entitled to consent or take any other action provided for in this Article. At the time of any consent or other action taken under this Article, the Authority shall furnish the Trustee an Officer's Certificate upon which the Trustee may rely, describing all Series 2020 Notes so to be excluded.

Section 505. Responsibilities of Trustee and Authority under this Article. The Trustee and the Authority shall be entitled to exercise their discretion in determining whether or not any proposed supplemental trust agreement or any term or provision

therein contained is desirable, after considering the purposes of such instrument, the needs of the Authority, the rights and interests of the Holders of the Series 2020 Notes, and the rights, obligations and interests of the Trustee. The Trustee shall be entitled to receive, and shall be fully protected in relying upon, the opinion of counsel approved by it, who may be bond counsel for the Authority, as conclusive evidence that any such proposed supplemental trust agreement does or does not comply with the provisions of this Fifth Supplemental Trust Agreement, and that it is or is not proper for it, under the provisions of this Article, to execute and deliver such supplemental trust agreement.

Section 506. Amendment to Section 503 of the Amended and Restated Trust Agreement. Pursuant to Sections 1101(a) and 1103 of the Amended and Restated Trust Agreement as an amendment not affecting the holders of other Indebtedness secured by the Trust Estate, the Authority and the Trustee hereby amends Section 503 by adding a new paragraph at the end thereof that reads as follows:

> Notwithstanding the foregoing, beginning upon issuance of the Series 2020 Notes, so long as there is no Event of Default and the Authority still expects to apply for and receive disbursements under the TIFIA 2019 Loan Agreement sufficient in amount to pay principal of the Series 2020 Notes at their maturity, the terms "Senior Lien Bonds" and "Senior Lien Parity Debt" in Section 503(b) of the Amended and Restated Trust Agreement shall not include the Series 2020 Notes. No such change in such defined terms applies to any other reference thereto. For the avoidance of doubt, the reason for such amendment is to avoid Revenue Fund amounts being deposited into the Principal Account for principal payments on the Series 2020 Notes so long as such payments are expected to be made from disbursements under the TIFIA 2019 Loan Agreement transferred thereto from the Series 2020 Subaccount of the Additional Projects Account.

## ARTICLE VI

## MISCELLANEOUS PROVISIONS

Section 601. Manner of Giving Notice. All notices, demands and requests to be given to or made hereunder by the Authority, the Local Government Commission, the Trustee or the Note Registrar shall be given or made in writing and shall be deemed to be properly given or made if sent by United States registered or certified mail, return receipt requested postage prepaid, addressed as follows:

| | | |
|---|---|---|
| (a) | As to the Authority – | North Carolina Turnpike Authority<br>1 South Wilmington Street<br>1578 Mail Service Center<br>Raleigh, NC 27699-1578 |
| | With a copy to – | NCDOT Secretary<br>1 South Wilmington Street<br>1501 Mail Service Center<br>Raleigh, NC 27699-1501 |
| | And to – | NCDOT CFO<br>1 South Wilmington Street<br>1514 Mail Service Center<br>Raleigh, NC 27699-1515 |
| (b) | As to the Trustee or Note Registrar – | Wells Fargo Bank, N.A.<br>123 S. Broad Street, Suite 1500<br>Philadelphia, PA 19109<br>Attention: Cody Fedorishen, Corporate Trust Services<br>Phone: (215) 670-6573<br>Fax: (877) 775-7570<br>Email: cody.fedorishen@wellsfargo.com |
| (c) | As to the Local Government Commission – | North Carolina Local Government Commission<br>3200 Atlantic Avenue<br>Raleigh, NC 27604<br>Attention: Secretary |

Any such notice, demand or request may also be transmitted to the appropriate above-mentioned party by e-mail or telephone and shall be deemed to be properly given or made at the time of such transmission if, and only if, such transmission of notice shall be confirmed by reasonable means.

Any of such addresses may be changed at any time upon written notice of such change sent by United States mail, postage prepaid, to the other parties by the party effecting the change.

Section 602. Substitute Mailing. If, because of the temporary or permanent suspension of postal service, the Authority, the Local Government Commission, the Trustee or the Note Registrar shall be unable to mail any notice required to be given by the provisions of this Fifth Supplemental Trust Agreement, such party shall give notice in such other manner as in the judgment of such party shall most effectively approximate mailing, and the giving of notice in such manner shall for all purposes of this Fifth Supplemental Trust Agreement be deemed to be in compliance with the requirement for the mailing thereof.

Section 603. Authority, Trustee, Note Registrar and Holders Alone Have Rights under Supplemental Agreement. Except as herein otherwise expressly

provided, nothing in this Fifth Supplemental Trust Agreement, express or implied, is intended or shall be construed to confer upon any person, firm or corporation, other than the Authority, the Trustee, the Note Registrar and the Holders of the Series 2020 Notes, any right, remedy or claim, legal or equitable, under or by reason of this Fifth Supplemental Trust Agreement or any provision being intended to be and being for the sole and exclusive benefit of the Authority, the Trustee, the Note Registrar and the Holders of the Series 2020 Notes.

Section 604. Effect of Partial Invalidity. In case any one or more of the provisions of this Fifth Supplemental Trust Agreement or the Series 2020 Notes shall for any reason be held to be illegal or invalid, such illegality or invalidity shall not affect any other provisions of this Fifth Supplemental Trust Agreement or the Series 2020 Notes, but this Fifth Supplemental Trust Agreement and the Series 2020 Notes shall be construed and enforced as if such illegal or invalid provisions had not been contained therein. In case any covenant, stipulation, obligation or agreement contained in this Fifth Supplemental Trust Agreement or the Series 2020 Notes shall for any reason be held to be in violation of law, then such covenant, stipulation, obligation or agreement shall be deemed to be the covenant, stipulation, obligation or agreement of the Authority to the full extent permitted by law.

Section 605. Effect of Covenants; Governing Law. All covenants, stipulations, obligations and agreements of the Authority contained in this Fifth Supplemental Trust Agreement shall be deemed to be covenants, stipulations, obligations and agreements of the Authority to the full extent permitted by the Constitution and laws of the State. This Fifth Supplemental Trust Agreement is executed and delivered with the intent that the laws of the State shall govern this construction.

Section 606. Headings. Any heading preceding the text of the several articles hereof, any table of contents or marginal notes appended to copies hereof, shall be solely for convenience of reference and shall not constitute a part of the Trust Agreement, nor shall they affect its meaning, construction or effect.

Section 607. Further Authority. The officers of the Authority, attorneys, engineers and other agents or employees of the Authority are hereby authorized to do all acts and things required of them by this Fifth Supplemental Trust Agreement for the full, punctual and complete performance of all of the terms, covenants and agreements contained in the Series 2020 Notes and this Fifth Supplemental Trust Agreement.

Section 608. Payment Due on Holidays. If the date for making any payment or the last day for performance of any act or the exercising of any right as provided in this Fifth Supplemental Trust Agreement is not a Business Day, such payment may be made or act performed or right exercised on the next Business Day with the same force and effect as if done on the date provided in this Fifth Supplemental Trust Agreement.



Section 609. Multiple Counterparts. This Fifth Supplemental Trust Agreement may be executed in multiple counterparts, each of which shall be regarded for all purposes as an original, and such counterparts shall constitute but one and the same instrument.

Section 610. E-Verify. The Trustee understands that "E-Verify" is a federal program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law in accordance with Section 64-25(5) of the NCGS. The Trustee uses E-Verify to verify the work authorization of its employees in accordance with Section 64-26(a) of the NCGS. The Trustee will require that any subcontractor that it uses in connection with the transactions contemplated by this Fifth Supplemental Trust Agreement certify to such subcontractor's compliance with E-Verify.

Section 611. Iran Divestment Act. As of the date of this Fifth Supplemental Trust Agreement, the Trustee is not included on a list of persons engaged in investment activities in Iran created and maintained by the North Carolina Department of State Treasurer pursuant to Section 147-86.58 of the Iran Divestment Act of 2015, Article 6E, as amended, of Chapter 147 of the NCGS. The Trustee will not knowingly utilize any subcontractor that is listed on any such list in connection with the transactions contemplated by this Fifth Supplemental Trust Agreement.

[Remainder of Page Left Intentionally Blank]

IN WITNESS WHEREOF, the Authority and the Trustee have caused this Fifth Supplemental Trust Agreement to be executed in their respective names by their respective duly authorized representatives all as of the date first written above.

NORTH CAROLINA TURNPIKE AUTHORITY

[redacted]

WELLS FARGO BANK, N.A., Trustee

By:_____

Title:_____

[Signature page to Fifth Supplemental Agreement of Trust]

IN WITNESS WHEREOF, the Authority and the Trustee have caused this Fifth Supplemental Trust Agreement to be executed in their respective names by their respective duly authorized representatives all as of the date first written above.

NORTH CAROLINA TURNPIKE AUTHORITY

By:_____

Chairman

WELLS FARGO BANK, N.A., Trustee

[redacted]

[Signature page to Fifth Supplemental Trust Agreement]

**EXHIBIT A**

**FORM OF SERIES 2020 NOTE**

R-___ $_____

United States of America
State of North Carolina

NORTH CAROLINA TURNPIKE AUTHORITY
TRIANGLE EXPRESSWAY SYSTEM SENIOR LIEN
TURNPIKE REVENUE BOND ANTICIPATION NOTE
SERIES 2020

| Interest Rate | Maturity Date | CUSIP |
|---|---|---|
| 5.000% | February 1, 2024 | 65830R CW7 |

The North Carolina Turnpike Authority (the "Authority"), a political subdivision within the Department of Transportation ("NCDOT") of the State of North Carolina, hereby promises to pay, but solely from the sources and in the manner hereinafter provided, to Cede & Co. or registered assigns or legal representative, on the maturity date set forth above, upon the presentation and surrender hereof at the designated office of Wells Fargo Bank, N.A., in Minneapolis, Minnesota (the "Note Registrar"), the principal sum of _____ DOLLARS ($_____).

The Authority also promises to pay, but solely from said sources, interest on this note (calculated on the basis of a 360-day year consisting of twelve 30-day months) from the interest payment date next preceding the date on which it is authenticated, unless it is authenticated on an interest payment date, in which event it shall bear interest from such interest payment date, or it is authenticated prior to January 1, 2021, in which event it shall bear interest from its date, payable on each January 1 or July 1 of each year beginning January 1, 2021, or the date on which principal is due at maturity, at the rate per annum set forth above until the principal sum hereof is paid. The interest so payable and punctually paid or duly provided for on any interest payment date will be paid to the person in whose name this note is registered at the close of business on the Regular Record Date for such interest, which shall be the 15th day (whether or not a business day) of the calendar month next preceding such interest payment date. Any such interest not so punctually paid or duly provided for shall forthwith cease to be payable to the registered owner on such Regular Record Date, and may be paid to the person in whose name this note is registered at the close of business on a Special Record Date for the payment of such defaulted interest to be fixed by the Trustee (hereinafter mentioned), notice whereof being given to the registered owners not less than 10 days prior to such Special Record Date, or may be paid at any time in any other lawful manner not inconsistent with



the requirements of any securities exchange on which the Series 2020 Notes (hereinafter mentioned) may be listed and upon such notice as may be required by such exchange, or as more fully provided in the Trust Agreement. All such payments shall be made in such coin or currency of the United States of America as at the time of payment is legal tender for payment of public and private debts.

This note is one of a duly authorized series of revenue bond anticipation notes of the Authority designated "Triangle Expressway System Senior Lien Turnpike Revenue Bond Anticipation Notes, Series 2020" (the "Series 2020 Notes"), issued under and pursuant to the Constitution and laws of the State of North Carolina, including the Act, a Bond Order of the Authority adopted on August 6, 2020, authorizing the issuance of the Series 2020 Notes, and an Amended and Restated Trust Agreement, dated as of December 1, 2019, between the Authority and Wells Fargo Bank, N.A., as trustee (in such capacity, the "Trustee"), as supplemented by a Fifth Supplemental Trust Agreement, dated as of October 1, 2020 (together, the "Trust Agreement"). The Series 2020 Notes are being issued (a) to provide interim financing to pay or reimburse the costs of land acquisition, design, construction and equipping of an extension of the existing Triangle Expressway System from its existing eastern termination point to intersect with I-40, (b) to pay capitalized interest on the Series 2020 Notes, and (c) to pay the costs incurred in connection with the issuance of the Series 2020 Notes. All terms not defined herein have the meanings therefor set forth in the Trust Agreement.

The Series 2020 Notes are being issued by means of a book-entry system with no physical distribution of note certificates to be made except as provided in the Fifth Supplemental Trust Agreement. One note certificate in the aggregate principal amount of the Series 2020 Notes and registered in the name of Cede & Co., a nominee of The Depository Trust Company, New York, New York ("DTC"), is being issued and required to be deposited with DTC and immobilized in its custody. The book-entry system will evidence ownership of the Series 2020 Notes in the principal amount of $5,000 or any whole multiple thereof, with transfers of ownership effected on the records of DTC and its participants pursuant to rules and procedures established by DTC and its participants. Transfer of principal and interest payments to beneficial owners of the Series 2020 Notes by participants of DTC will be the responsibility of such participants and other nominees of such beneficial owners. The Authority will not be responsible or liable for such transfers of payments or for maintaining, supervising or reviewing the records maintained by DTC, its participants or persons acting through such participants. While Cede & Co. is the registered owner of this note, notwithstanding the provisions hereinabove contained, payments of principal of and interest on this note shall be made in accordance with the existing arrangements between the Note Registrar and DTC.

The Series 2020 Notes are special obligations of the Authority secured by a senior pledge, charge and lien upon the Trust Estate (as defined in the Trust Agreement) in parity with the Authority's Triangle Expressway System Senior Lien

Turnpike Revenue Bonds, Series 2009B, the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2017, the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2018, and the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2019. The Authority expects to make all payments of principal of the Series 2020 Notes from disbursements under the TIFIA Series 2019 Loan Agreement (as defined in the Trust Agreement) and all payments of interest on the Series 2020 Notes from the Series 2020 Subaccount of the Capitalized Interest Account (as defined in the Trust Agreement). However, the Authority is not obligated to pay the principal of or the interest on the Series 2020 Notes except as provided in the Trust Agreement from the Trust Estate or certain other monies made available therefor under the Trust Agreement, and neither the faith and credit nor the taxing power of the State of North Carolina or any political subdivision thereof or the Authority is pledged to the payment of the principal of and the interest on the Series 2020 Notes. The Trust Agreement provides for the issuance or incurrence from time to time under the conditions, limitations and restrictions therein set forth of additional bonds and Senior Lien Parity Indebtedness secured *pari passu* as to the pledge of Receipts with the Series 2020 Notes. The Series 2020 Notes are not secured by any Senior Lien Parity Reserve Account under the Trust Agreement.

Reference is made to the Trust Agreement for a more complete statement of the provisions thereof and of the rights of the Authority, the Trustee and the registered owners of the Series 2020 Notes. Copies of the Trust Agreement will be available for inspection by any registered owner of the Series 2020 Notes at all reasonable times at the designated corporate trust office of the Trustee. By the purchase and acceptance of this note, the registered owner hereof signifies assent to all of the provisions of the Trust Agreement, including the amendments made by the Fifth Supplemental Trust Agreement.

At the principal office of the Note Registrar, in the manner and subject to the conditions provided in the Trust Agreement, Series 2020 Notes may be exchanged for an equal aggregate principal amount of Series 2020 Notes of the same maturity, of authorized denominations and bearing interest at the same rate.

The registered owner of this note shall have no right to enforce the provisions of the Trust Agreement or to institute action to enforce the covenants therein, or to take any action with respect to any event of default under the Trust Agreement, or to institute, appear in or defend any suit or other proceeding with respect thereto, except as provided in the Trust Agreement.

Modifications or alterations of the Trust Agreement or of any supplement to the Trust Agreement thereto may be made only to the extent and in the circumstances permitted by the Trust Agreement.



This note, notwithstanding the provisions for registration of transfer stated herein and contained in the Trust Agreement, at all times shall be, and shall be understood to be, an investment security within the meaning of and for all the purposes of Article 8 of the Uniform Commercial Code of North Carolina. This note is issued with the intent that the laws of the State of North Carolina shall govern its construction.

All acts, conditions and things required to happen, exist and be performed precedent to and in the issuance of this note and the execution and delivery of the Trust Agreement have happened, exist and have been performed as so required.

This note shall not be valid or become obligatory for any purpose or be entitled to any benefit or security under the Trust Agreement until it shall have been authenticated by the execution by the Note Registrar of the certificate of authentication endorsed hereon.

IN WITNESS WHEREOF, the North Carolina Turnpike Authority, by an order duly adopted by its Board, has caused this note to be manually signed by the Chairman of the Authority and the Secretary-Treasurer of the Authority to impress its corporate seal hereon and to attest the same, all as of the __th day of [_____], 2020.

NORTH CAROLINA TURNPIKE AUTHORITY

_____
Chairman

[SEAL]

_____
Secretary-Treasurer

**CERTIFICATE OF LOCAL GOVERNMENT COMMISSION**

The issuance of the within note has been approved under the provisions of The State and Local Government Revenue Bond Act.

_____
Secretary
Local Government Commission

## CERTIFICATE OF AUTHENTICATION

This note is a Revenue Bond Anticipation Note of the Series designated therein and issued under the provisions of the within mentioned Trust Agreement.

WELLS FARGO BANK, N.A.,
as Note Registrar

By:_____
Authorized Signatory

Date of authentication: _____, ___



## ASSIGNMENT

FOR VALUE RECEIVED the undersigned hereby sells, assigns and transfers unto _____
_____
_____

PLEASE INSERT SOCIAL SECURITY NUMBER
OR OTHER IDENTIFYING NUMBER OF ASSIGNEE
PLEASE PRINT OR TYPEWRITE NAME AND ADDRESS OF TRANSFEREE ____
_____ the within note and all right thereunder, and hereby irrevocably constitutes and appoints _____, attorney, to transfer the within note on the books kept for registration thereof, with full power of substitution in the premises.

Dated:_____

In the presence of:

| | |
|---|---|
| NOTICE: Signature must be guaranteed by an institution which is a participant in the Securities Transfer Agent Medallion Program (STAMP) or similar program. | The signature to this assignment must correspond with the name as it appears upon the face of the within note in every particular, without alteration or enlargement or any change whatever. |

**FIRST SUPPLEMENT TO**

**FIFTH SUPPLEMENTAL TRUST AGREEMENT**

Dated as of August 1, 2021

By and Between

**NORTH CAROLINA TURNPIKE AUTHORITY**

and

**WELLS FARGO BANK, N.A.,**
Trustee

Relating to:

$499,460,000
North Carolina Turnpike Authority
Triangle Expressway System Senior Lien Turnpike
Revenue Bond Anticipation Notes,
Series 2020

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This **FIRST SUPPLEMENT TO FIFTH SUPPLEMENTAL TRUST AGREEMENT**, dated as of August 1, 2021 (this "First Supplement"), between the **North Carolina Turnpike Authority**, a political subdivision within the Department of Transportation ("NCDOT") of the State of North Carolina (the "State"), duly existing under the laws of the State (the "Authority"), and **Wells Fargo Bank, N.A.,** a national banking association duly organized and existing under the laws of the United States of America and having a designated corporate trust office in Philadelphia, Pennsylvania, which is authorized under such laws to exercise trust powers, and from its office in Minneapolis, Minnesota acts in the capacity of bond and note registrar (the "Trustee"), amending the Fifth Supplemental Trust Agreement, dated as of October 1, 2020 (the "Fifth Supplemental Trust Agreement"), between the Authority and the Trustee:

W I T N E S S E T H:

**WHEREAS**, the Authority and the Trustee have heretofore entered into the Amended and Restated Trust Agreement, dated as of December 1, 2019 (the "Amended and Restated Trust Agreement"), providing for, among other things, providing for, among other things, the issuance or incurrence thereunder of Senior Lien Bonds, Subordinate Lien Bonds, Junior Indebtedness and Revenue Bond Anticipation Notes, all as defined in the Amended and Restated Trust Agreement, in order to provide funds to finance, together with other available funds, costs of acquisition, construction, installation and equipping of the Triangle Expressway System, and financing related reserves and other costs;

**WHEREAS**, pursuant to the Amended and Restated Trust Agreement, the Fourth Supplemental Trust Agreement, dated as of December 1, 2019 (the "Fourth Supplemental Trust Agreement"), and a Bond Order adopted by the Authority, the Authority has issued its Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2019 (the "Series 2019 Bonds"), to provide funds, together with other available funds, to (a) pay the costs of land acquisition, design, construction and equipping of an extension of the existing Triangle Expressway System from its existing eastern termination point to intersect with I-40 (the "2019 Additional Project"), (b) pay interest on certain Series 2019 Bonds, (c) pay the premium on a bond insurance policy for the Series 2019 Bonds, (d) pay the premium for a debt service reserve insurance policy with respect to the Series 2019 Bonds, and (e) pay the costs incurred in connection with the issuance of the Series 2019 Bonds;

**WHEREAS**, pursuant to the Amended and Restated Trust Agreement, the Fourth Supplemental Trust Agreement and the 2019 Bond Order, the Authority has issued its Triangle Expressway System Revenue Bond, TIFIA Series 2019 (the "TIFIA Series 2019 Bond"), to evidence its obligation to repay a loan from the United States Department of Transportation ("USDOT"), in an original principal amount not to exceed $499,461,980, under the TIFIA Loan Agreement dated as of December 17, 2019, between the Authority and USDOT (the "TIFIA 2019 Loan Agreement"), pursuant to the Transportation Infrastructure Finance and Innovation Act of 1998 ("TIFIA"), to provide funds for the costs of the 2019 Additional Project;

**WHEREAS,** to provide interim financing for the 2019 Additional Project, the Authority issued its Triangle Expressway System Senior Lien Turnpike Revenue Bond Anticipation Notes, Series 2020 (the "Series 2020 Notes" or "Phase I BANs"), pursuant to the Amended and Restated Trust Agreement and the Fifth Supplemental Trust Agreement, in anticipation of disbursements to be received under the TIFIA 2019 Loan Agreement;

**WHEREAS,** the Authority issued the Series 2020 Notes as Senior Lien Bonds secured on parity with the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2009B, its Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2017, its Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2018, and the Series 2019 Bonds;

**WHEREAS,** USDOT has agreed to reset the interest rate applicable to the TIFIA Indebtedness provided by USDOT to finance a portion of the cost of the 2019 Additional Project and the related TIFIA Series 2019 Bond from the rate set in 2019 to the rate currently applicable to TIFIA direct loans (which is the rate equal to or greater than the yield on the U.S. Treasury securities with a comparable term on the date the new loan agreement with USDOT is executed);

**WHEREAS,** in order to revise the interest rate on the TIFIA Indebtedness relating to the 2019 Additional Project, the Authority and USDOT will enter into a TIFIA Loan Agreement dated as of August 5, 2021, between the Authority and USDOT (the "TIFIA 2021 Loan Agreement"), and simultaneously terminate the TIFIA 2019 Loan Agreement;

**WHEREAS**, the terms, conditions, and covenants of the TIFIA 2021 Loan Agreement are substantially identical to the terms, conditions and covenants contained in the TIFIA 2019 Loan Agreement, except for the interest rate and related amortization schedule updated reporting requirements, revisions to the language resulting from the issuance of the Series 2020 Notes, and similar conforming changes;

**WHEREAS,** in accordance with Section 501 of the Fifth Supplemental Trust Agreement and Section 1101 of the Amended and Restated Trust Agreement, the Authority and the Trustee are entering into this First Supplement to amend certain terms of the Fifth Supplemental Trust Agreement; and

**WHEREAS,** all acts and things necessary to constitute this First Supplement a valid agreement according to its terms have been done and performed;

**NOW, THEREFORE**, in consideration of the mutual covenants and contained herein, the parties hereto agree as follows:

**AGREEMENTS**

Section 101 Definitions. Unless the context otherwise requires, capitalized terms used and not defined in this First Supplement shall have the meanings given such terms in the Amended and Restated Trust Agreement and the Fifth Supplement Trust Agreement, as amended hereby.

Section 102 Effective Date. The amendments set forth in Section 103 shall become effective on August 5, 2021 (the "Effective Date").

Section 103 Amendments to Fifth Supplemental Trust Agreement. On the Effective Date, pursuant to Section 501 thereof, the Fifth Supplemental Trust Agreement is amended as follows:

(a) All references in the Fifth Supplemental Trust Agreement to the "Fifth Supplemental Trust Agreement" shall mean the Fifth Supplemental Trust Agreement as supplemented and amended by this First Supplement.

(b) All references in the Fifth Supplemental Trust Agreement to the "TIFIA 2019 Loan Agreement" shall mean the TIFIA 2021 Loan Agreement.

(c) All references in the Fifth Supplemental Trust Agreement to the "TIFIA Series 2019 Bond" shall mean the North Carolina Turnpike Authority Triangle Expressway System Revenue Bond, TIFIA Series 2021 (the "TIFIA Series 2021 Bond"), issued by the Authority pursuant to the Fourth Supplemental Trust Agreement, as supplemented and amended by the First Supplement to Fourth Supplemental Trust Agreement dated as of August 1, 2021, between the Authority and the Trustee, to replace the North Carolina Turnpike Authority Triangle Expressway System Revenue Bond, TIFIA Series 2019, to evidence the obligation of the Authority to repay the loan under the TIFIA 2021 Loan Agreement.

Section 104 No Other Amendments. Except as expressly amended hereby, the terms of the Fifth Supplemental Trust Agreement shall remain in full force and effect in all respects, and the Authority hereby reaffirms its obligations under the Fifth Supplemental Trust Agreement, as amended by this First Supplement.

Section 105 Ratification of Fifth Supplemental Trust Agreement. As amended hereby, the Fifth Supplemental Trust Agreement is in all respects ratified and confirmed, and the Fifth Supplemental Trust Agreement as amended hereby shall be read, taken and construed as a single instrument.

Section 106 Effect of Partial Invalidity. In case any one or more of the provisions of this First Supplement shall for any reason be held to be illegal or invalid, such illegality or invalidity shall not affect any other provisions of this First Supplement, but this First Supplement shall be construed and enforced as if such illegal or invalid provisions had not been contained therein. In case any covenant, stipulation, obligation or agreement contained in this First Supplement shall for any reason be held to be in violation of law, then such covenant, stipulation, obligation or agreement shall be deemed to be the covenant, stipulation, obligation or agreement of the Authority to the full extent permitted by law.

Section 107 Effect of Covenants; Governing Law. All covenants, stipulations, obligations and agreements of the Authority contained in this First Supplement shall be deemed to be covenants, stipulations, obligations and agreements of the Authority to the full extent permitted by the Constitution and laws of the State. This First Supplement is executed and delivered with the intent that the laws of the State shall govern this construction.

Section 108 Headings. Any heading preceding the text of the several articles hereof, any table of contents or marginal notes appended to copies hereof, shall be solely for convenience of reference and shall not constitute a part of the Fifth Supplemental Trust Agreement or the Trust Agreement, nor shall they affect its meaning, construction or effect.

Section 109 Further Authority. The officers of the Authority, attorneys, engineers and other agents or employees of the Authority are hereby authorized to do all acts and things required of them by this First Supplement for the full, punctual and complete performance of all of the terms, covenants and agreements contained in this First Supplement.

Section 110 Multiple Counterparts. This First Supplement may be executed in multiple counterparts, each of which shall be regarded for all purposes as an original, and such counterparts shall constitute but one and the same instrument.



Section 111 E-Verify. The Trustee understands that "E-Verify" is a federal program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law in accordance with Section 64-25(5) of the NCGS. The Trustee uses E-Verify to verify the work authorization of its employees in accordance with Section 64-26(a) of the NCGS. The Trustee will require that any subcontractor that it uses in connection with the transactions contemplated by this First Supplement certify to such subcontractor's compliance with E-Verify.

Section 112 Iran Divestment Act. As of the date of this First Supplement, the Trustee is not included on a list of persons engaged in investment activities in Iran created and maintained by the North Carolina Department of State Treasurer pursuant to Section 147-86.58 of the Iran Divestment Act of 2015, Article 6E, as amended, of Chapter 147 of the NCGS. The Trustee will not knowingly utilize any subcontractor that is listed on any such list in connection with the transactions contemplated by this First Supplement.

[Remainder of Page Left Intentionally Blank]

IN WITNESS WHEREOF, the Authority and the Trustee have caused this First Supplement to be executed in their respective names by their respective duly authorized representatives all as of the date first written above.

NORTH CAROLINA TURNPIKE AUTHORITY

[redacted]

WELLS FARGO BANK, N.A., Trustee

By:_____
Vice President

IN WITNESS WHEREOF, the Authority and the Trustee have caused this First Supplement to be executed in their respective names by their respective duly authorized representatives all as of the date first written above.

NORTH CAROLINA TURNPIKE AUTHORITY

By:_____
Chairman

WELLS FARGO BANK, N.A., Trustee

[redacted]

**SIXTH SUPPLEMENTAL TRUST AGREEMENT**

Dated as of January 1, 2024

By and Between

**NORTH CAROLINA TURNPIKE AUTHORITY**

and

**COMPUTERSHARE TRUST COMPANY, N.A.,**
Trustee
**as successor Master Trustee**

Supplementing a Trust Agreement, dated as of June 1, 2009, as previously supplemented by a First Supplemental Trust Agreement, dated as of July 1, 2009, a Second Supplemental Trust Agreement, dated as of March 1, 2017, a Third Supplemental Trust Agreement, dated as of December 1, 2018, and a Fourth Supplemental Trust Agreement, dated as of December 1, 2019, now compiled as an Amended and Restated Trust Agreement, dated as of December 1, 2019, and as further supplemented by a Fifth Supplemental Trust Agreement dated as of October 1, 2020

Authorizing and Securing

$304,575,000
North Carolina Turnpike Authority
Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A

$35,785,304.70
North Carolina Turnpike Authority
Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds)

and

$417,193,471 (maximum principal amount)
North Carolina Turnpike Authority
Triangle Expressway System Revenue Bond, TIFIA Series 2024

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EXHIBIT A FORM OF SERIES 2024A BONDS

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This **SIXTH SUPPLEMENTAL TRUST AGREEMENT**, dated as of January 1, 2024 (the "Sixth Supplemental Trust Agreement"), between the **North Carolina Turnpike Authority** (the "Authority"), a political subdivision within the Department of Transportation ("NCDOT") of the State of North Carolina (the "State"), duly existing under the laws of the State, and **Computershare Trust Company, N.A.** (the "Trustee"), a national banking association duly organized and existing under the laws of the United States of America and having a designated corporate trust office in St. Paul, Minnesota, which is authorized under such laws to exercise trust powers, and from its office in St. Paul, Minnesota, acts in the capacity of bond registrar and as successor to Wells Fargo Bank, National Association, as master trustee (the "Master Trustee") under the Trust Agreement, dated as of June 1, 2009, as previously supplemented by a First Supplemental Trust Agreement, dated as of July 1, 2009, a Second Supplemental Trust Agreement, dated as of March 1, 2017, a Third Supplemental Trust Agreement, dated as of December 1, 2018, and a Fourth Supplemental Trust Agreement, dated as of December 1, 2019, now compiled as an Amended and Restated Trust Agreement, dated as of December 1, 2019, and as further supplemented by a Fifth Supplemental Trust Agreement dated as of October 1, 2020, each between the Master Trustee and the Authority:

W I T N E S S E T H:

**WHEREAS**, the Authority and Wells Fargo Bank, National Association, as predecessor to the Trustee have heretofore entered into the Amended and Restated Trust Agreement, dated as of December 1, 2019 (as previously amended, the "Amended and Restated Trust Agreement"), providing for, among other things, the issuance or incurrence thereunder of Senior Lien Bonds to finance, together with other available funds, the costs of acquisition, construction, installation and equipping of the Triangle Expressway System and to fund related reserves and pay other costs;

**WHEREAS**, pursuant to the Amended and Restated Trust Agreement, this Six Supplemental Trust Agreement (together with the Amended and Restated Trust Agreement, the "Trust Agreement") and Bond Orders adopted by the Authority on October 31, 2023 (collectively, the "2024 Bond Order"), the Authority desires to issue its Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A Bonds (the "Series 2024A Bonds"), and Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B Bonds (Capital Appreciation Bonds) (the "Series 2024B Bonds" and, together with the Series 2024A Bonds, the "Series 2024 Bonds"), to provide funds, together with other available funds, to (a) pay the costs of land acquisition for and design, construction and equipping of an extension of the Triangle Expressway System from I-40 to I-87/U.S. 64/U.S. 264 (the "2024 Additional Project"), (b) pay certain interest on the Series 2024A Bonds, (c) pay the premium on a bond insurance policy for the Insured Series 2024 Bonds, (d) pay the premium for a debt service reserve insurance policy with respect to the Series 2024 Bonds and (e) pay the costs incurred in connection with the issuance of the Series 2024 Bonds;

**WHEREAS**, pursuant to the Trust Agreement and the 2024 Bond Order, the Authority desires to obtain a new loan from the United States Department of Transportation ("USDOT") pursuant to the Transportation Infrastructure Finance Innovation and Finance Act of 1998 ("TIFIA") and in accordance with the terms of the TIFIA 2024 Loan Agreement (as hereinafter defined), with the Authority's obligation to repay such loan to be evidenced by a bond issued under the Trust Agreement and the 2024 Bond Order (as further described herein, the "TIFIA Series 2024 Bond"), to aid in financing such extension in a manner compatible with the terms of the outstanding indebtedness issued under the Trust Agreement and with the TIFIA Series 2024 Bond treated under the Trust Agreement as Junior Indebtedness but, upon certain conditions, may be treated as secured on parity with the Series 2024 Bonds and the other Senior Lien Bonds;

**WHEREAS,** the Authority will issue the Series 2024 Bonds as Senior Lien Bonds secured on parity with its Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2009B, Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2017, Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2018, and Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2019; and

**WHEREAS,** in order to facilitate the issuance of the TIFIA Series 2024 Bond and clarify any inconsistencies which might otherwise arise while still preserving the security for Senior Lien Bonds and other indebtedness issued under the Trust Agreement, certain amendments to the Amended and Restated Trust Agreement are required and are provided for in this Sixth Supplemental Trust Agreement;

**NOW, THEREFORE**, in consideration of the mutual covenants and contained herein, the parties hereto agree as follows:

## ARTICLE I

## DEFINITIONS

Section 101. Meaning of Words and Terms. Unless otherwise required by the context herein, in addition to the definitions in the introductory paragraphs hereto, words and terms used herein which are defined in the Amended and Restated Trust Agreement shall have the meanings assigned to them therein, and the following words and terms shall have the following meanings:

"2024 Bond Order" means, collectively, the Bond Orders of the Authority with respect to the Series 2024 Bonds and the TIFIA Series 2024 Bond adopted October 31, 2023.

"2024 Additional Project" has the meaning set forth in Section 207.

"Accreted Amount" means the amounts shown on the table attached as Schedule A to Exhibit B attached hereto for the Series 2024B Bonds for the dates shown on the table and, for any other date, the amount, as determined conclusively by the Trustee, calculated by interpolating, using a straightline method for the actual number of calendar days, between the amounts shown on such table for the two dates nearest to the date of determination.

"Amended and Restated Trust Agreement" means the Amended and Restated Trust Agreement, dated as of December 1, 2019, between the Authority and the Trustee, as supplemented and amended by the Fifth Supplemental Trust Agreement.

"Bond Registrar" means Computershare Trust Company, N.A., as designated by Section 201.

"Bond Year" means the period commencing on January 1 of any year and ending on December 31 of the same year, provided that the first Bond Year shall begin on the date of issuance of the Series 2024 Bonds.

"Closing" means the delivery of and payment for the Series 2024 Bonds.

"Closing Date" means the date of the Closing.

"Fifth Supplemental Trust Agreement" means the Fifth Supplemental Trust Agreement, dated as of October 1, 2020, between the Authority and the Trustee, as supplemented and amended by a First Supplement to Fifth Supplemental Trust Agreement, dated as of August 1, 2021, supplementing and amending the Amended and Restated Trust Agreement, dated as of December 1, 2019, between the Authority and the Trustee.

"Initial Offering Price" means the price at which the Series 2024 Bonds are offered for sale to the public or sold to the initial purchasers thereof at the time of sale thereof without reduction to reflect underwriter's discount.

"Insured Bondholder" means the Holder or Owner of an Insured Series 2024 Bond.

"Insured Series 2024 Bonds" means the Series 2024A Bonds maturing on January 1 in the years 2053, 2054 and 2058 and the Series 2024B Bonds maturing on January 1 in the years 2050, 2051, 2052 and 2053.

"Interest Payment Date" means any January 1 or July 1, commencing July 1, 2024.

"Prime Rate" has the meaning set forth in Section 501(f).



"Regular Record Date" means the 15th day of the month preceding any Interest Payment Date, whether or not a Business Day.

"Related Bonds" means the Series 2009B Bonds, the Series 2017 Bonds, the Series 2018 Bonds, the Series 2019 Bonds and the Series 2024 Bonds.

"Related Bond Documents" means the Trust Agreement, the Series 2024 Bond Insurance Policy and the Series 2024 Debt Service Reserve Policy.

"Related TIFIA Bonds" means the TIFIA Series 2021 Bond and the TIFIA Series 2024 Bond.

"Related TIFIA Documents" means the Trust Agreement and the TIFIA 2024 Debt Service Reserve Policy.

"Series 2024 Bond Insurance Policy" means the insurance policy issued by the Series 2024 Bond Insurer insuring the scheduled payment of the principal of and interest on the Insured Series 2024 Bonds when due.

"Series 2024 Bond Insurer" means Assured Guaranty Municipal Corp., or any successor thereto or assignee thereof.

"Series 2024 Bond Late Payment Rate" has the meaning set forth in Section 501(f).

"Series 2024 Bonds" means the Series 2024A Bonds and the Series 2024B Bonds.

"Series 2024 Cost of Issuance Fund" means the fund created and so designated by Section 401.

"Series 2024 Debt Service Reserve Policy" means Reserve Policy No. 219837-R, as amended by an Endorsement No. 1, issued by the Series 2024 Bond Insurer for the Senior Lien Parity Reserve Account upon issuance of the Series 2024 Bonds. The Series 2024 Debt Service Reserve Policy is a Reserve Alternative Instrument under the Trust Agreement and secures the Related Bonds. The Series 2024 Debt Service Reserve Policy supersedes the existing Series 2019 Debt Service Reserve Policy.

"Series 2024 Reserve Late Payment Rate" has the meaning set forth in Section 510(a).

"Series 2024 Subaccount of the Additional Projects Account" means the subaccount created and so designated by Section 401.

"Series 2024 Subaccount of the Capitalized Interest Account" means the subaccount created and so designated by Section 401.

"Series 2024 Subaccount of the Interest Account" means the subaccount created and so designated by Section 401.

"Series 2024 Subaccount of the Principal Account" means the subaccount created and so designated by Section 401.

"Series 2024 Subaccount of the Redemption Account" means the subaccount created and so designated by Section 401.

"Series 2024A Bonds" means Authority's Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A, issued pursuant to this Sixth Supplemental Trust Agreement.

"Series 2024B Bonds" means Authority's Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds), issued pursuant to this Sixth Supplemental Trust Agreement.

"Sinking Fund Requirement" means, with respect to the Term Bonds and for any Bond Year, the principal amount fixed or computed for retirement by purchase or redemption on or prior to January 1 of the following Bond Year.

The Sinking Fund Requirements for the Term Bonds shall be initially the respective principal amounts of such Term Bonds for retirement on each January 1 as fixed in Section 301(c).

If during any Bond Year, the total principal amount of Term Bonds retired by purchase or redemption under the provisions of this Sixth Supplemental Trust Agreement shall be greater than the amount of the Sinking Fund Requirement for such Term Bonds, the subsequent Sinking Fund Requirements for such Term Bonds shall be reduced in such amount aggregating the amount of such excess as shall be specified in an Officer's Certificate filed with the Trustee on or prior to January 15 of the next ensuing Bond Year.

"Sixth Supplemental Trust Agreement" means this Sixth Supplemental Trust Agreement, dated as of January 1, 2024, between the Authority and the Trustee, supplementing and amending the Amended and Restated Trust Agreement.

"Term Bonds" means the Series 2024A Bonds maturing on January 1 in the year 2058.

"TIFIA 2024 Loan Agreement" means the TIFIA Loan Agreement, dated as of [_____ __, 2024], between the Authority and USDOT, pursuant to which USDOT made a loan to the Authority the repayment of which is evidenced by the TIFIA Series 2024 Bond.



"TIFIA Series 2024 Bond" means the North Carolina Turnpike Authority Triangle Expressway System Revenue Bond, TIFIA Series 2024, issued by the Authority pursuant to this Sixth Supplemental Trust Agreement to evidence the obligation of the Authority to repay the loan under the TIFIA 2024 Loan Agreement. For the purposes of the TIFIA 2024 Debt Service Reserve Policy, the "TIFIA Series 2024 Bond" shall include any substitute bond issued to USDOT to effect an interest rate reset on the original TIFIA Series 2024 Bond issued on [_____ __, 2024], provided that the final maturity date of such substitute bond shall be no later than the final maturity date of the original TIFIA Series 2024 Bond.

"TIFIA 2024 Reserve Policy Provider" means Assured Guaranty Municipal Corp., or any successor thereto or assignee thereof.

"TIFIA 2024 Debt Service Reserve Policy" means the insurance policy issued by the TIFIA 2024 Reserve Policy Provider for the TIFIA Debt Service Reserve Account in connection with the issuance of the TIFIA Series 2024 Bond. The TIFIA Series 2024 Debt Service Reserve Policy is a Reserve Alternative Instrument under the Trust Agreement and secures the Related TIFIA Bonds.

"TIFIA 2024 Reserve Late Payment Rate" has the meaning set forth in Section 511 (a).

"Trust Agreement" means the Amended and Restated Trust Agreement as supplemented by this Sixth Supplemental Trust Agreement.

"USDOT" means the United States Department of Transportation.

Section 102. Rules of Construction. (a) Words of the masculine gender shall be deemed and construed to include correlative words of the feminine and neuter genders. Unless the context shall otherwise indicate, words used herein shall include the plural as well as the singular number.

(b) References herein to particular articles or sections are references to articles or sections of this Sixth Supplemental Trust Agreement unless some other reference is indicated.

## ARTICLE II

## AUTHORIZATION, FORM, ISSUANCE, DELIVERY AND REGISTRATION OF THE SERIES 2024 BONDS AND TIFIA SERIES 2024 BOND

Section 201. Authorization and Issuance of the Series 2024 Bonds. For the purpose of providing funds, together with any other available funds, to (a) pay or reimburse costs of the 2024 Additional Project, (b) pay costs incurred in connection with the issuance of the Series 2024 Bonds, (c) provide funds to pay certain interest

on certain Series 2024A Bonds, (d) pay the premium on a bond insurance policy for certain Series 2024 Bonds and (e) pay the premium for a debt service reserve insurance policy with respect to the Series 2024 Bonds, there shall be issued, under and pursuant to the Constitution and the laws of the State, including the Act, the Trust Agreement and the 2024 Bond Order, (1) a Series of Bonds designated "Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A" in the aggregate principal amount of $304,575,000 and (2) a Series of Bonds designated "Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds)" in the aggregate initial principal amount of $35,785,304.70, with an aggregate maturity amount of $135,315,000.

Computershare Trust Company, N.A., as trustee acting from its office in St. Paul, Minnesota, is hereby appointed Bond Registrar for the Series 2024 Bonds under this Sixth Supplemental Trust Agreement and will so act from its office in St. Paul, Minnesota.

Section 202. Forms of Series 2024 Bonds.

(a) The definitive Series 2024A Bonds shall be Current Interest Bonds, issuable in fully registered form in Authorized Denominations, shall be lettered "RA-" and shall be numbered from 1 consecutively upward. The definitive Series 2024A Bonds shall be substantially in the form set forth in Exhibit A attached hereto, with such appropriate variations, omissions and insertions as are permitted or required by the Trust Agreement.

(b) The definitive Series 2024B Bonds shall be Capital Appreciation Bonds, issuable in fully registered form in Authorized Denominations, shall be lettered "RB-" and shall be numbered from 1 consecutively upward. The definitive Series 2024B Bonds shall be substantially in the form set forth in Exhibit B attached hereto, with such appropriate variations, omissions and insertions as are permitted or required by the Trust Agreement.

Section 203. Details of Series 2024 Bonds.

(a) The Series 2024A Bonds shall be dated the date of their delivery, shall bear interest (computed on the basis of a 360-day year consisting of 12 months of 30 days each) until their payment, such interest to the maturity thereof being payable on each Interest Payment Date beginning July 1, 2024, at rates, and shall mature on January 1 in amounts, subject to the right of prior redemption, as follows:



| Year of Maturity | Principal Amount | Interest Rate | Yield |
|---|---|---|---|
| 2053 | $ 7,190,000 | 5.000% | 4.170%* |
| 2054 | 39,100,000 | 5.000 | 4.180* |
| 2058* | 258,285,000 | 5.000 | 4.230* |

* Yield reflects Series 2024A Bonds priced to first optional call date of January 1, 2034.
** Term Bonds.

(b) The Series 2024B Bonds shall be dated the date of their delivery. Interest on the Series 2024B Bonds shall not be paid currently, but shall accrue from the date of issuance thereof, compounded semiannually on each January 1 and July 1 over the life of such Series 2024B Bonds, and be paid at maturity or upon earlier redemption. The Series 2024B Bonds shall mature on January 1 of the years, subject to prior redemption, have the aggregate initial principal amounts, have the aggregate maturity amounts and have interest rates as follows:

| Year of Maturity | Initial Principal Amount | Maturity Amount | Interest Rate |
|---|---|---|---|
| 2050 | $9,669,546.60 | $33,740,000 | 4.880% |
| 2051 | 9,480,890.40 | 34,990,000 | 4.910 |
| 2052 | 9,264,083.70 | 36,185,000 | 4.940 |
| 2053 | 7,370,784.00 | 30,400,000 | 4.960 |

The Series 2024B Bonds shall have the Accreted Amounts determined from the table on Schedule A attached to Exhibit B attached hereto.

(c) The Series 2024 Bonds shall be issued by means of a book-entry system with no physical distribution of bond certificates to be made except as hereinafter provided. One bond certificate with respect to each date on which each of the Series 2024 Bonds is stated to mature, in the aggregate principal amount of the Series 2024 Bonds of the applicable Series stated to mature on such date and registered in the name of Cede & Co., as nominee of The Depository Trust Company, New York, New York ("DTC"), will be issued and required to be deposited with DTC and immobilized in its custody. The book-entry system will evidence ownership of the Series 2024 Bonds in the principal amount, in the case of the Series 2024A Bonds, or maturity amount, in the case of the Series 2024B Bonds, of $5,000 or any whole multiple thereof, with transfers of ownership effected on the records of DTC and its participants pursuant to rules and procedures established by DTC and its participants. The principal of each Series 2024 Bond and interest with respect thereto shall be payable to Cede & Co. or any other person appearing on the registration books of the Authority as the registered owner of such Series 2024 Bonds or its registered assigns or legal representatives. Transfer of principal and interest payments to participants of DTC will be the responsibility of DTC, and transfer of principal and interest payments to beneficial owners of the Series 2024 Bonds by

participants of DTC will be the responsibility of such participants and other nominees of such beneficial owners. The Authority, the Bond Registrar and the Trustee will not be responsible or liable for such transfers of payments or for maintaining, supervising or reviewing records maintained by DTC, its participants or persons acting through such participants.

In the event that (1) DTC determines not to continue to act as Securities Depository for the Series 2024 Bonds or (2) the Authority determines that continuation of the book-entry system of evidence and transfer of ownership of the Series 2024 Bonds would adversely affect the interests of the beneficial owners of the Series 2024 Bonds, the Authority will discontinue the book-entry system with DTC. If the Authority identifies another qualified Securities Depository to replace DTC, the Authority will make arrangements with DTC and such other Securities Depository to effect such replacement and deliver replacement bonds registered in the name of such other Securities Depository or its Securities Depository Nominee in exchange for the outstanding Series 2024 Bonds, and the references to DTC or Cede & Co. in this Sixth Supplemental Trust Agreement shall thereupon be deemed to mean such other Securities Depository or its Securities Depository Nominee. If the Authority fails to identify another qualified Securities Depository to replace DTC, the Authority will deliver replacement bonds in the form of fully registered certificates in the principal amount, in the case of the Series 2024A Bonds, or maturity amount, in the case of the Series 2024B Bonds, of $5,000 or any whole multiple thereof in exchange for the outstanding Series 2024 Bonds as required by DTC and others.

Section 204. Terms and Conditions for Issuance of the Series 2024 Bonds.

(a) The Series 2024 Bonds shall be executed substantially in the forms and in the manner herein set forth and shall be deposited with the Bond Registrar for authentication and delivery to the State Treasurer for redelivery to the purchasers thereof (or, in the alternative, may be delivered by the Bond Registrar to the purchasers thereof or held on their behalf if such Series 2024 Bonds have been executed by the State Treasurer in advance of their deliver to the Bond Registrar), but only upon the deposit with the Trustee of the purchase price of the Series 2024 Bonds and the accrued interest thereon.

(b) Simultaneously with the Closing and the deposit of the proceeds of the Series 2024 Bonds with the Trustee, the Trustee shall apply the proceeds in the amount of $358,343,593.96 (representing (1) $304,575,000.00, the principal amount of the Series 2024A Bonds, plus original issue premium of $19,027,895.40, less an underwriters' discount of $935,490.72, plus (2) $35,785,304.70, the principal amount of the Series 2024B Bonds, less an underwriters' discount of $109,115.42, less (3) the premiums for the Series 2024 Bond Insurance Policy ($4,696,504.46) and Series 2024 Debt Service Reserve Policy ($784,800.24)) to the Series 2024 Subaccount of the Additional Projects Account of the Project Fund, to the Series 2024 Subaccount of the Capitalized Interest Account and to the Series 2024 Cost of Issuance Fund, as



directed by the Authority in an Officer's Certificate filed with the Trustee simultaneously with the issuance of the Series 2024 Bonds.

Section 205. Series 2024 Bonds Secured by Senior Lien Parity Reserve Account. The Series 2024 Bonds shall be secured by the Senior Lien Parity Reserve Account in accordance with the terms and provisions of the Trust Agreement.

Section 206. Issuance of TIFIA Series 2024 Bond. In order to evidence the obligation of the Authority to pay the loan payments incurred pursuant to the TIFIA 2024 Loan Agreement, pursuant to Section 213 of the Trust Agreement and this Section 206, there shall be issued hereunder and under the Act and the 2024 Bond Order a bond of the Authority designated "North Carolina Turnpike Authority Triangle Expressway Revenue Bond, TIFIA Series 2024." Initially, the TIFIA Series 2024 Bond shall represent the obligation of the Authority to pay a maximum aggregate principal amount not to exceed $417,193,471 (excluding capitalized interest), such amount to be calculated from time to time in accordance with the terms of the TIFIA 2024 Loan Agreement, pursuant to which amounts are advanced to the Authority from time to time, with the principal amount owed to USDOT under the TIFIA Series 2024 Bond increasing in the amount of such advances. In addition, following the disbursement of the initial loan amount under the TIFIA 2024 Loan Agreement, the principal amount of the TIFIA Series 2024 Bond may increase further from time to time in the manner provided by the TIFIA 2024 Loan Agreement (if Receipts are not sufficient to pay TIFIA Scheduled Debt Service, as defined in the TIFIA 2024 Loan Agreement). If the TIFIA debt service schedule included as Exhibit G to the TIFIA 2024 Loan Agreement is revised, the Authority shall promptly provide a copy of such revised TIFIA debt service schedule to the Trustee. The TIFIA Series 2024 Bond shall constitute TIFIA Indebtedness for all purposes of the Trust Agreement.

The definitive TIFIA Series 2024 Bond shall be substantially in the form set forth in Exhibit C attached hereto, with such appropriate variations, omissions and insertions as are permitted or required by the Trust Agreement and the TIFIA 2024 Loan Agreement.

Computershare Trust Company, N.A., St. Paul, Minnesota, is hereby appointed Bond Registrar for the TIFIA Series 2024 Bond under this Sixth Supplemental Trust Agreement.

Section 207. Additional Project. The land acquisition for and design, construction and equipping of an extension of the Triangle Expressway System from I-40 to I-87/U.S. 64/U.S. 264 constitutes an Additional Project (the "2024 Additional Project") under the Trust Agreement and shall be, together with the Initial Project and the 2019 Additional Project, and subject to further Additional Projects being added pursuant to the Trust Agreement, the Triangle Expressway System.

## ARTICLE III

## REDEMPTION OF SERIES 2024 BONDS

Section 301. Redemption of Series 2024 Bonds.

(a) The Series 2024 Bonds shall not be subject to prior redemption except as provided in this Article III and pursuant to the Trust Agreement.

(b) The Series 2024A Bonds are subject to redemption prior to their respective maturities, at the option of the Authority, from any moneys that may be available for such purpose, either in whole or in part, on any date on or after January 1, 2034, at a Redemption Price equal to 100% of the principal amount of the Series 2024A Bonds to be redeemed, plus accrued interest to the date fixed for redemption.

(c) The Term Bonds maturing on January 1, 2058, are subject to mandatory redemption in part on each January 1 in the years and principal amounts set forth below, at a Redemption Price equal to 100% of the principal amount of such Series 2024A Bonds to be redeemed, plus accrued interest to the date fixed for redemption:

| Year | Amount |
|---|---|
| 2055 | $42,405,000 |
| 2056 | 66,690,000 |
| 2057 | 71,855,000 |
| 2058* | 77,335,000 |

* Final maturity.

(d) The Series 2024B Bonds are subject to redemption prior to their respective maturities, at the option of the Authority, from any moneys that may be available for such purpose, either in whole or in part on any date on or after January 1, 2034, at a Redemption Price equal to 100% of the Accreted Amount of such Series 2024B Bonds to be redeemed.

Section 302. Selection of Series 2024 Bonds for Redemption. The Series 2024 Bonds shall be redeemed only in principal amounts, in the case of the Series 2024A Bonds, or maturity amounts, in the case of the Series 2024B Bonds, of $5,000 or any whole multiple thereof. If less than all the Series 2024 Bonds of a Series are called for redemption, the Series 2024 Bonds of such Series to be so redeemed shall be called for redemption in the manner set forth in an Officer's Certificate filed with the Trustee.

If less than all of a maturity of the Series 2024 Bonds of a Series are to be called for redemption, the Bond Registrar shall select the Series 2024 Bonds to be redeemed by lot, each $5,000 portion of principal, in the case of the Series 2024A Bonds, or



maturity amount, in the case of the Series 2024B Bonds, being counted as one Series 2024 Bond for this purpose; provided, however, that so long as the only Owner of the Series 2024 Bonds is a Securities Depository Nominee, such selection shall be made by the Securities Depository.

Section 303. Redemption Notice. At least forty-five (45) days prior to the date fixed for redemption of any Series 2024 Bonds to be optionally redeemed, the Authority shall notify the Trustee and the Bond Registrar of its intention to redeem such Series 2024 Bonds. The Authority, the Bond Registrar and the Trustee may mutually agree to a shorter time period for such notice to the Trustee and the Bond Registrar. At least thirty (30) days but not more than sixty (60) days prior to the date fixed for redemption of any Series 2024 Bonds to be redeemed, whether such redemption be in whole or in part, the Bond Registrar shall cause a notice of any such redemption signed by the Bond Registrar to be mailed, first class, postage prepaid, to all Owners of Series 2024 Bonds to be redeemed in whole or in part, provided that notice to any Securities Depository shall be sent by registered or certified mail or by such other means as is agreed upon by the Bond Registrar and the Securities Depository and provided further that failure to mail any such notice to any Owner or any defect in such notice shall not affect the validity of the proceedings for such redemption as to the Series 2024 Bonds of any other Owner to whom notice was properly given. The Bond Registrar shall also deliver a copy of any such notice to the Local Government Commission.

Each such notice shall set forth the designation, date and CUSIP numbers of the Series 2024 Bonds to be redeemed, the date fixed for redemption, the Redemption Price to be paid, the address and phone number of the Trustee and Bond Registrar, the date of the Redemption Notice, the maturities of the Series 2024 Bonds to be redeemed and, if less than all of the Series 2024 Bonds of any one maturity then Outstanding shall be called for redemption, the distinctive numbers and letters, if any, of such Series 2024 Bonds to be redeemed and, in the case of Series 2024 Bonds to be redeemed in part only, the portion of the principal amount thereof to be redeemed. If any Series 2024 Bond is to be redeemed in part only, the notice of redemption shall state also that on or after the redemption date, upon surrender of such Series 2024 Bond, a new Series 2024 Bond in principal amount equal to the unredeemed portion of such Series 2024 Bond will be issued.

Any notice of redemption may state that the redemption to be effected is conditioned upon the receipt by the Trustee or Bond Registrar on or prior to the redemption date of moneys sufficient to pay the principal of and interest on the Series 2024 Bonds to be redeemed and that if such moneys are not so received such notice shall be of no force or effect and such Series 2024 Bond shall not be required to be redeemed. In the event that such notice contains such a condition and moneys sufficient to pay the principal of and interest on such Series 2024 Bonds are not received by the Trustee or Bond Registrar on or prior to the date fixed for redemption, the redemption shall not be made and the Bond Registrar shall within a reasonable

time thereafter give notice, in the manner in which the notice of redemption was given, that such moneys were not so received.

## ARTICLE IV

## ACCOUNTS, SUBACCOUNTS, REVENUES AND FUNDS

Section 401. Establishment of Subaccounts and Account; Application of Certain Amounts.

(a) The following Subaccounts of the accounts of the Senior Lien Debt Service Fund are hereby established:

(i) Series 2024 Subaccount of the Interest Account;

(ii) Series 2024 Subaccount of the Capitalized Interest Account;

(iii) Series 2024 Subaccount of the Principal Account;

(iv) Series 2024 Subaccount of the Redemption Account; and

(v) Series 2024 Subaccount of the Sinking Fund Account.

(b) The Series 2024 Cost of Issuance Fund is hereby established. There is also hereby established a Series 2024 Subaccount of the Additional Projects Account in the Project Fund.

(c) The fund and subaccounts mentioned above shall be established with and held by the Trustee pursuant to the Trust Agreement, provided that the Series 2024 Subaccount of the Capitalized Interest Account shall be held solely for the benefit of the Owners of the Series 2024A Bonds.

(d) On the date hereof, the Authority has caused to be deposited to the Series 2024 Subaccount of the Capitalized Interest Account, the amount of $64,112,953.52. On each Interest Payment Date, commencing July 1, 2024, the Trustee shall apply such funds in the Series 2024 Subaccount of the Capitalized Interest Account for payment of interest due on the Series 2024A Bonds on such Interest Payment Date. On July 1, 2028, the Trustee shall transfer the balance of any funds remaining in the Series 2024 Subaccount of the Capitalized Interest Account to the Series 2024 Subaccount of the Interest Account (to be applied to pay interest on the Series 2024A Bonds on January 1, 2029).

(e) Amounts deposited in the Series 2024 Subaccount of the Additional Projects Account on the Closing Date shall be used to pay or reimburse costs of the 2024 Additional Project.



(f) Upon delivery of an Officer's Certificate stating that all or a portion of the funds then on deposit in the Series 2024 Cost of Issuance Fund are not needed to pay the costs of issuance of the Series 2024 Bonds, such excess funds shall be transferred to the Series 2024 Subaccount of the Additional Projects Account and applied to pay costs of the 2024 Additional Project.

(g) The Trustee shall deposit to the Series 2024 Subaccount of the Redemption Account all amounts as shall be delivered to the Trustee by the Authority from time to time with instructions that such amounts be so deposited.

Section 402. Receipts Received by the Authority. The Trustee shall deposit or cause to be deposited, from Receipts held in the Revenue Fund, to the various accounts and subaccounts specified herein the amounts provided by Section 503 of the Trust Agreement.

Section 403. Application of Money in the Series 2024 Subaccount of the Sinking Fund Account.

(a) To the extent funds have been deposited to the Series 2024 Subaccount of the Sinking Fund Account and are available, the Trustee shall, at the request of the Authority, endeavor to purchase and cancel Term Bonds or portions thereof subject to redemption by operation of the Series 2024 Subaccount of the Sinking Fund Account or maturing on the next ensuing January 1 at the direction of an Authorized Officer. The purchase price of each such Term Bond shall not exceed par plus accrued interest to the date of purchase. The Trustee shall pay the interest accrued on such Term Bonds to the date of settlement therefor from the Series 2024 Subaccount of the Interest Account and the purchase price from the Series 2024 Subaccount of the Sinking Fund Account. No such purchase shall be made by the Trustee from money in the Series 2024 Subaccount of the Sinking Fund Account within the period of forty-five (45) days immediately preceding any January 1 on which such Term Bonds are subject to redemption. If in any Bond Year the sum of the amount on deposit in the Series 2024 Subaccount of the Sinking Fund Account for the payment of any Term Bonds and the principal amount of the Term Bonds that were purchased during such Bond Year pursuant to the provisions of this subsection (a) or delivered during such Bond Year to the Trustee by the Authority exceeds the Sinking Fund Requirement for the Outstanding Term Bonds for such Bond Year, the Trustee shall endeavor to purchase Outstanding Term Bonds with such excess money.

(b) The Trustee shall call for redemption on January 1 the Term Bonds then subject to redemption in a principal amount equal to the aggregate Sinking Fund Requirement for the Term Bonds for such Bond Year, less the principal amount of any such Term Bonds retired since the prior January 1 by purchase pursuant to subsection (a) of this Section 403 or delivered during such Bond Year to the Trustee by the Authority. If the amount available in the Series 2024 Subaccount of the Sinking Fund Account on a January 1 is not equal to the Sinking Fund Requirement

for the Term Bonds for the corresponding Bond Year less the principal amount of any such Term Bonds so delivered or purchased and retired, the Trustee shall apply the amount available in the Series 2024 Subaccount of the Sinking Fund Account to the redemption of Term Bonds then subject to redemption so as to exhaust, to the extent practicable, the amount available. On each redemption date the Trustee shall withdraw from the Series 2024 Subaccount of the Sinking Fund Account the amount required to pay the Redemption Price of the Term Bonds so called for redemption. The amount of interest on the Term Bonds so called for redemption shall be paid from the Series 2024 Subaccount of the Interest Account. If such date is the stated maturity date of any Term Bonds, the Trustee shall not call those Term Bonds for redemption but, on such maturity, shall withdraw the amount required for paying the principal of such Term Bonds when due and payable.

(c) If on any date there is money in the Series 2024 Subaccount of the Sinking Fund Account and no Term Bonds are then Outstanding or if on any payment date money remains therein after the mandatory redemption of Term Bonds in accordance with the Sinking Fund Requirement therefor, the Trustee shall withdraw such money therefrom and shall apply the same as follows and in the following order: (i) deposit in the Series 2024 Subaccount of the Interest Account, the Series 2024 Subaccount of the Principal Account and the Senior Lien Parity Reserve Account, the amounts, if any, required to be paid thereto in such month and (ii) deposit all remaining amounts to the Revenue Fund.

(d) If, in any Bond Year, by the application of money in the Series 2024 Subaccount of the Sinking Fund Account, the Trustee should purchase or receive from the Authority and cancel Term Bonds in excess of the aggregate Sinking Fund Requirement for such Bond Year, the Trustee shall file with the Authority not later than the twentieth (20th) day prior to the next January 1 on which Term Bonds are to be redeemed, a statement identifying the Term Bonds purchased or delivered during such Fiscal Year and the amount of such excess. The Authority shall thereafter cause an Officer's Certificate to be filed with the Trustee not later than January 15 of the following Bond Year setting forth with respect to the amount of such excess the Fiscal Years in which the Sinking Fund Requirements with respect to Term Bonds are to be reduced and the amount by which the Sinking Fund Requirements so determined are to be reduced.

(e) Upon the retirement of any Term Bonds by purchase and redemption pursuant to the provisions of this Section 403, the Trustee shall file with the Authority a statement identifying such Series 2024A Bonds and setting forth the date of purchase or redemption, the amount of the purchase price or the Redemption Price of such Term Bonds, and the amount paid as interest thereon. The expenses incurred in connection with the purchase or redemption of any such Term Bonds shall be paid by the Authority from the Revenue Fund or from any other available moneys.



Section 404. Application of Money in the Series 2024 Subaccount of the Redemption Account. The Trustee shall apply money in the Series 2024 Subaccount of the Redemption Account to the purchase or redemption of Series 2024 Bonds as follows:

(a) Subject to the provisions of subsections (c) and (d) of this Section 404, the Trustee shall endeavor to purchase and cancel Series 2024 Bonds or portions thereof, regardless of whether such Series 2024 Bonds or portions thereof are then subject to redemption, at the direction of an Authorized Officer, provided that the purchase price of each Series 2024 Bond shall not exceed the Redemption Price that would be payable on the next redemption date to the Owner of such Series 2024 Bond under the redemption provisions applicable to such Series 2024 Bond. The Trustee shall pay the interest accrued on such Series 2024 Bonds or portions thereof to the date of settlement from the Series 2024 Subaccount of the Interest Account and the purchase price from the Series 2024 Subaccount of the Redemption Account, but no such purchase shall be made by the Trustee from money in the Series 2024 Subaccount of the Redemption Account within the period of forty-five (45) days immediately preceding any date on which such Series 2024 Bonds or portions thereof are to be redeemed.

(b) Subject to the provisions of subsections (c) and (d) of this Section 404, the Trustee shall call for redemption on a date permitted by this Sixth Supplemental Trust Agreement such amount of Series 2024 Bonds or portions thereof as will exhaust the money then held in the Series 2024 Subaccount of the Redemption Account as nearly as may be practicable; provided, however, that not less than Fifty Thousand Dollars ($50,000) in principal amount of the Series 2024 Bonds shall be called for redemption at any one time unless the Trustee is so instructed by the Authority. The Trustee shall pay the accrued interest on the Series 2024 Bonds or portions thereof to be redeemed to the date of redemption from the Series 2024 Subaccount of the Interest Account and the Redemption Price of such Series 2024 Bonds or portions thereof from the Series 2024 Subaccount of the Redemption Account. The Trustee shall withdraw from the Series 2024 Subaccount of the Redemption Account and set aside the respective amounts required to pay the Redemption Price of the Series 2024 Bonds or portions thereof so called for redemption.

(c) Money in the Series 2024 Subaccount of the Redemption Account shall be applied by the Trustee in each Fiscal Year to the purchase or the redemption of Series 2024 Bonds then Outstanding in accordance with the latest Officer's Certificate filed with the Trustee designating the Series 2024 Bonds to be redeemed. In the event no such certificate is filed (i) the Trustee shall apply such money to the purchase of Series 2024A Bonds bearing the highest rate of interest and (ii) if Series 2024A Bonds of more than one maturity bear the same interest rate, the Trustee shall redeem such Series 2024A Bonds in the inverse order of maturities. For the avoidance of doubt, Series 2024B Bonds shall only be redeemed if the latest Officer's

Certificate filed with the Trustee has specifically designated the Series 2024B Bonds, or portions thereof, to be redeemed.

(d) Upon the retirement of any Series 2024 Bonds by purchase or redemption, pursuant to the provisions of this Section 404, the Trustee shall file with the Authority a statement identifying such Series 2024 Bonds and setting forth the date of purchase or redemption, the amount of the purchase price or the Redemption Price of such Series 2024 Bonds and the amount paid as interest thereon. The expenses incurred by the Trustee in connection with the purchase or redemption of any such Series 2024 Bonds shall be paid by the Authority from the Revenue Fund or from any other available moneys.

Section 405. Payment of Principal and Interest and Pledge of Receipts. The Authority covenants that it will promptly pay the principal of and the interest on every Series 2024 Bond issued under the provisions of this Sixth Supplemental Trust Agreement at the places, on the dates and in the manner provided herein and in said Series 2024 Bonds, according to the true intent and meaning thereof. The Authority further covenants that it will faithfully perform at all times all of its covenants, undertakings and agreements contained in the Trust Agreement, or in any Series 2024 Bond executed, authenticated and delivered hereunder or in any proceedings of the Authority pertaining thereto. The Authority represents and covenants that (a) it is duly authorized under the Constitution and laws of the State, particularly the Act, to issue the Series 2024 Bonds as Senior Lien Bonds authorized by the Trust Agreement and to pledge the Receipts in the manner and to the extent herein and in the Trust Agreement set forth, (b) all action on its part for the issuance of the Series 2024 Bonds has been duly and effectively taken and (c) such Series 2024 Bonds in the hands of the Owner thereof are and will be valid and binding special obligations of the Authority payable according to their terms.

Section 406. Tax Covenant. The Authority covenants to do and perform all acts and things permitted by law in order to assure that interest paid on the Series 2024 Bonds which was excludable from the gross income of their Owners for federal income taxes on the date of their issuance shall continue to be so excludable.

Section 407. Continuing Disclosure. The Authority hereby undertakes, for the benefit of the beneficial owners of the Series 2024 Bonds, to provide to the Municipal Securities Rulemaking Board:

(a) by not later than seven months from the end of each Fiscal Year, commencing with the Fiscal Year ended June 30, 2024, audited financial statements of the Authority for such Fiscal Year, if available, prepared in accordance with Section 159-34 of the General Statutes of North Carolina, as it may be amended from time to time, or any successor statute, or, if such audited financial statements of the Authority are not available by seven months from the end of such Fiscal Year, unaudited financial statements of the Authority for such Fiscal Year to be replaced



subsequently by audited financial statements of the Authority to be delivered within fifteen (15) days after such audited financial statements become available for distribution;

(b) by not later than seven months from the end of each Fiscal Year, commencing with the Fiscal Year ended June 30, 2024, (i) the financial and statistical data as of a date not earlier than the end of the preceding Fiscal Year evidencing compliance by the Authority with the Rate Covenant described under the heading "SECURITY AND SOURCES OF PAYMENT FOR THE SERIES 2024 BONDS – Rate Covenant" in the Official Statement, dated January 17, 2024, relating to the Series 2024 Bonds (the "Official Statement"), including the calculation of Revenues and Long-Term Debt Service Requirement, to the extent that such items are not included in the financial statements referred to in (a) above;

(c) within ten (10) Business Days following the occurrence of an event, notice of any of the following events with respect to the Series 2024 Bonds:

(i) principal and interest payment delinquencies;

(ii) unscheduled draws on debt service reserves reflecting financial difficulties;

(iii) unscheduled draws on credit enhancements reflecting financial difficulties;

(iv) substitution of credit or liquidity providers, or their failure to perform;

(v) issuance by the Internal Revenue Service of a proposed or final determination of taxability with respect to the Series 2024 Bonds; a Notice of Proposed Issues on IRS Form 5701-TEB with respect to the Series 2024 Bonds; adverse tax opinions, material notices or determinations with respect to the tax status of the Series 2024 Bonds; or other event affecting the tax status of the Series 2024 Bonds;

(vi) defeasances;

(vii) rating changes;

(viii) tender offers;

(ix) bankruptcy, insolvency, receivership or similar proceeding by the Authority; and

(x) default, event of acceleration, termination event, modification of terms, or other similar events under the terms of the financial obligation of the Authority, any of which reflect financial difficulties.

For purposes of the undertakings described in Section 406(c)(x) above and Section 406(d)(ix) below, "financial obligation" means (A) a debt obligation, (B) a derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation, or (C) a guarantee of either clause (A) or (B) above. The term "financial obligation" shall not include municipal securities as to which a final official statement has been provided to the Municipal Securities Rulemaking Board (the "MSRB") consistent with Rule 15c2-12, as hereinafter defined.

(d) within ten (10) Business Days following the occurrence of an event, notice of any of the following events with respect to the Series 2024 Bonds, if material:

(i) non-payment related defaults;

(ii) modification to the rights of the beneficial owners of the Series 2024 Bonds;

(iii) bond calls, other than bond calls relating to mandatory sinking fund redemption;

(iv) release, substitution or sale of any property securing repayment of the Series 2024 Bonds;

(v) mergers, consolidations, acquisition and sales of assets (other than in the ordinary course of business);

(vi) appointment of a successor or additional trustee or a change in the name of the trustee;

(vii) legislation shall be filed with the North Carolina General Assembly by the Governor of North Carolina or legislation is reported out of a committee in either body of the General Assembly which, if adopted in the form so filed or reported, would result in a reduction or delay in the receipt of $25 million for the Triangle Expressway System in State Appropriated Revenues in any Bond Year;

(viii) an administrative action is taken by the Governor of North Carolina, NCDOT or any other agency or authority of the State which will result in a reduction or delay in the receipt of $25 million for the Triangle Expressway System in State Appropriated Revenues in any Bond Year; and



(ix) incurrence of a financial obligation of the Authority, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a financial obligation of the Authority, any of which affect security holders, if material.

(e) within ten (10) Business Days following the occurrence of a failure, notice of a failure of the Authority to provide required annual financial information described in (a) or (b) above on or before the date specified.

The Authority may meet the continuing disclosure filing requirements described above by (1) providing the required information directly through the MSRB's Electronic Municipal Market Access (EMMA) System, or (2) complying with any other procedure the MSRB or the United States Securities and Exchange Commission implements.

If the Authority fails to comply with the undertaking described above, any beneficial owner of or the Series 2024 Bonds may take action to protect and enforce the rights of all beneficial owners with respect to such undertaking, including an action for specific performance; provided, however, that failure to comply with such undertaking shall not be an Event of Default under the Trust Agreement. All actions shall be instituted, had and maintained in the manner provided in this paragraph for the benefit of all beneficial owners of the Series 2024 Bonds.

The Authority reserves the right to modify from time to time the information to be provided to the extent necessary or appropriate in the judgment of the Authority, provided that:

(1) any such modification may only be made in connection with a change in circumstances that arises from a change in legal requirements, change in law, or change in the identity, nature or status of the Authority;

(2) the information to be provided, as modified, would have complied with the requirements of Rule 15c2-12 issued under the Securities Exchange Act of 1934 ("Rule 15c2-12") as of the date of the Official Statement, after taking into account any amendments or interpretations of Rule 15c2-12, as well as any changes in circumstances; and

(3) any such modification does not materially impair the interests of the Owners of the Series 2024 Bonds, as determined by the Trustee or bond counsel to the Authority, or by approving vote of the Owners of a majority in aggregate principal amount of the Series 2024 Bonds then outstanding pursuant to the terms of the Trust Agreement at the time of the amendment.

In the event that the Authority makes such a modification, the annual financial information containing the modified operating data or financial information

shall explain, in narrative form, the reasons for the modification and the impact of the change in the type of operating data or financial information being provided.

The provisions of this Section 407 shall terminate upon payment, or provision having been made for payment in a manner consistent with Rule 15c2-12, in full of the principal of and interest on all of the Series 2024 Bonds.

## ARTICLE V

## SERIES 2024 BOND INSURANCE POLICY AND SERIES 2024 BOND INSURER

Section 501. The Series 2024 Bond Insurance Policy. As long as the Series 2024 Bond Insurance Policy is in full force and effect and notwithstanding other provisions to the contrary in the Trust Agreement, except for Section 701 of the Trust Agreement, the Authority and the Trustee agree to comply with the following provisions:

(a) The prior written consent of the Series 2024 Bond Insurer shall be a condition precedent to the deposit of any Reserve Alternative Instrument other than the Series 2024 Debt Service Reserve Policy in lieu of a cash deposit into the Senior Lien Parity Reserve Account, if any. Amounts on deposit in the Senior Lien Parity Reserve Account Fund shall be applied solely to the payment of debt service due on Senior Lien Bonds secured thereby.

(b) The Series 2024 Bond Insurer shall be deemed to be the sole holder of the Insured Series 2024 Bonds for the purpose of exercising any voting right or privilege or giving any consent or direction or taking any other action that the holders of the Insured Series 2024 Bonds are entitled to take pursuant to the Trust Agreement pertaining to (i) defaults and remedies and (ii) the duties and obligations of the Trustee. In furtherance thereof and as a term of the Trust Agreement and each Insured Series 2024 Bond, the Trustee and each Insured Bondholder appoint the Series 2024 Bond Insurer as their agent and attorney-in-fact and agree that the Series 2024 Bond Insurer may at any time during the continuation of any proceeding by or against the Authority under the United States Bankruptcy Code or any other applicable bankruptcy, insolvency, receivership, rehabilitation or similar law (an "Insolvency Proceeding") direct all matters relating to such Insolvency Proceeding, including without limitation, (A) all matters relating to any claim or enforcement proceeding in connection with an Insolvency Proceeding (a "Claim"), (B) the direction of any appeal of any order relating to any Claim, (C) the posting of any surety, supersedes or performance bond pending any such appeal, and (D) the right to vote to accept or reject any plan of adjustment. In addition, the Trustee and each Insured Bondholder delegate and assign to the Series 2024 Bond Insurer, to the fullest extent permitted by law, the rights of the Trustee and each Insured Bondholder in the conduct of any Insolvency Proceeding, including, without limitation, all rights of any



party to an adversary proceeding or action with respect to any court order issued in connection with any such Insolvency Proceeding. Remedies granted to the Insured Bondholders shall expressly include mandamus.

(c) If, on the third Business Day prior to the related scheduled interest payment date or principal payment date ("Payment Date") there is not on deposit with the Trustee, after making all transfers and deposits required under the Trust Agreement, moneys sufficient to pay the principal of and interest on the Insured Series 2024 Bonds due on such Payment Date, the Trustee shall give notice to the Series 2024 Bond Insurer and to its designated agent (if any) (the "Series 2024 Bond Insurer's Fiscal Agent") by telephone or telecopy of the amount of such deficiency by 12:00 noon, New York City time, on such Business Day. If, on the second Business Day prior to the related Payment Date, there continues to be a deficiency in the amount available to pay the principal of and interest on the Insured Series 2024 Bonds due on such Payment Date, the Trustee shall make a claim under the Series 2024 Bond Insurance Policy and give notice to the Series 2024 Bond Insurer and the Series 2024 Bond Insurer's Fiscal Agent (if any) by telephone of the amount of such deficiency, and the allocation of such deficiency between the amount required to pay interest on the Insured Series 2024 Bonds and the amount required to pay principal of the Insured Series 2024 Bonds, confirmed in writing to the Series 2024 Bond Insurer and the Series 2024 Bond Insurer's Fiscal Agent by 12:00 noon, New York City time, on such second Business Day by filling in the form of Notice of Claim and Certificate delivered with the Series 2024 Bond Insurance Policy.

(d) The Trustee shall designate any portion of payment of principal of Insured Series 2024 Bonds paid by the Series 2024 Bond Insurer, whether by virtue of maturity or other advancement of maturity, on its books as a reduction in the principal amount of Insured Series 2024 Bonds registered to the then current Insured Bondholder, whether DTC or its nominee or otherwise, and shall issue a replacement Bond to the Series 2024 Bond Insurer, registered in the name of Assured Guaranty Municipal Corp., in a principal amount equal to the amount of principal so paid (without regard to authorized denominations); provided that the Trustee's failure to so designate any payment or issue any replacement Insured Series 2024 Bond shall have no effect on the amount of principal or interest payable by the Authority on any Insured Series 2024 Bond or the subrogation rights of the Series 2024 Bond Insurer.

(e) The Trustee shall keep a complete and accurate record of all funds deposited by the Series 2024 Bond Insurer into the Policy Payments Account (defined below) and the allocation of such funds to payment of interest on and principal of any Insured Series 2024 Bond. The Series 2024 Bond Insurer shall have the right to inspect such records at reasonable times upon reasonable notice to the Trustee.

(f) Upon payment of a claim under the Series 2024 Bond Insurance Policy, the Trustee shall establish a separate special purpose trust account for the benefit of Insured Bondholders referred to herein as the "Policy Payments Account" and over

which the Trustee shall have exclusive control and sole right of withdrawal. The Trustee shall receive any amount paid under the Series 2024 Bond Insurance Policy in trust on behalf of Insured Bondholders and shall deposit any such amount in the Policy Payments Account and distribute such amount only for purposes of making the payments for which a claim was made. Such amounts shall be disbursed by the Trustee to Insured Bondholders in the same manner as principal and interest payments are to be made with respect to the Insured Series 2024 Bonds under the sections hereof regarding payment of Insured Series 2024 Bonds. It shall not be necessary for such payments to be made by checks or wire transfers separate from the check or wire transfer used to pay debt service with other funds available to make such payments. Notwithstanding anything herein to the contrary, the Authority agrees to pay to the Series 2024 Bond Insurer (i) a sum equal to the total of all amounts paid by the Series 2024 Bond Insurer under the Series 2024 Bond Insurance Policy (the "Series 2024 Bond Insurer Advances"); and (ii) interest on such Series 2024 Bond Insurer Advances from the date paid by the Series 2024 Bond Insurer until payment thereof in full, payable to the Series 2024 Bond Insurer at the Series 2024 Bond Late Payment Rate per annum (collectively, the "Series 2024 Bond Insurer Reimbursement Amounts"). "Series 2024 Bond Late Payment Rate" means the lesser of (a) the greater of (i) the per annum rate of interest, publicly announced from time to time by JPMorgan Chase Bank at its principal office in the City of New York, as its prime or base lending rate ("Prime Rate") (any change in the Prime Rate to be effective on the date such change is announced by JPMorgan Chase Bank) plus 3%, and (ii) the then applicable highest rate of interest on the Insured Series 2024 Bonds and (b) the maximum rate permissible under applicable usury or similar laws limiting interest rates. The Series 2024 Bond Late Payment Rate shall be computed on the basis of the actual number of days elapsed over a year of 360 days. The Authority hereby covenants and agrees that the Series 2024 Bond Insurer Reimbursement Amounts, other than Excess Interest (defined below), are secured by a lien on and pledge of the Trust Estate and payable from such Trust Estate on a parity with debt service due on the Senior Lien Indebtedness. If the calculation of the interest due on the Series 2024 Insurer Advances pursuant to the provisions of this Section 501 results in an amount that exceeds the interest that is otherwise due and payable to Owners on the unpaid principal of and interest on the Series 2024 Insured Bonds pursuant to the Trust Agreement (the "Excess Interest"), then such Excess Interest shall be payable solely from the Revenue Fund pursuant first to Section 503(i) of the Trust Agreement or otherwise from amounts on deposit in (x) if any TIFIA Indebtedness is Outstanding, the Unrestricted Account of the General Reserve Fund or (y) if no TIFIA Indebtedness is Outstanding, the General Reserve Fund.

(g) Funds held in the Policy Payments Account shall not be invested by the Trustee and may not be applied to satisfy any costs, expenses or liabilities of the Trustee. Any funds remaining in the Policy Payments Account following an Insured Series 2024 Bond payment date shall promptly be remitted to the Series 2024 Bond Insurer.



(h) The Series 2024 Bond Insurer shall, to the extent it makes any payment of principal of or interest on the Insured Series 2024 Bonds, become subrogated to the rights of the recipients of such payments in accordance with the terms of the Series 2024 Bond Insurance Policy (which subrogation rights shall also include the rights of any such recipients in connection with any Insolvency Proceeding). Each obligation of the Authority to the Series 2024 Bond Insurer under the Related Bond Documents shall survive discharge or termination of such Related Bond Documents.

(i) Commencing on January 1, 2034, and on each January 1 thereafter (each, an "Annual Premium Payment Date") while the Series 2024A Bonds and the Series 2024B Bonds, respectively, are Outstanding, the Authority shall pay, or cause to be paid, to the Series 2024 Bond Insurer, a non-refundable premium payable annually in advance (collectively, the "Series 2024 Bond Insurer Installment Premium") in an aggregate amount equal to:

(i) with respect to the Series 2024A Bonds, the product of (x) 0.15% per annum and (y) the aggregate outstanding principal balance of the Series 2024A Bonds on the applicable Annual Premium Payment Date (after giving effect to principal payments made on such date); plus

(ii) with respect to the Series 2024B Bonds, the product of (x) 0.20% per annum and (y) the aggregate Accreted Amount Outstanding of the Series 2024B Bonds on the applicable Annual Premium Payment Date (after giving effect to any Accreted Amounts made on such date).

All periods will be based on a 30/360 day count. To the extent that any payment of the Series 2024 Bond Insurer Installment Premium is not paid when due, interest shall accrue on such unpaid amounts from the date such amount is due until the date the Series 2024 Bond Insurer is paid in full at a rate equal to the Series 2024 Bond Late Payment Rate (as defined in Section 501(f) hereof). The Series 2024 Bond Insurer Installment Premium, together with any unpaid amounts and any interest that may accrue thereon, due hereunder are secured by a lien on and pledge of the Trust Estate and shall be payable by the Trustee from the Revenue Fund pursuant to Section 503(i) of the Trust Agreement or otherwise from the General Reserve Fund, as applicable. The amounts payable pursuant hereto shall be non-refundable for any reason whatsoever, including the lack of any payment under the Series 2024 Bond Insurance Policy or any other circumstances relating to the Series 2024 Bonds, or provision being made by refunding or defeasance escrow for payment of the Series 2024 Bonds prior to maturity.

(j) The Authority shall pay or reimburse the Series 2024 Bond Insurer, from the Revenue Fund pursuant to Section 503(i) of the Trust Agreement or otherwise from the General Reserve Fund, as applicable, any and all charges, fees, costs and expenses that the Series 2024 Bond Insurer may reasonably pay or incur in connection with (i) the administration, enforcement, defense or preservation of any

rights or security in any Related Bond Document, (ii) the pursuit of any remedies under the Trust Agreement or any other Related Bond Document or otherwise afforded by law or equity, (iii) any amendment, waiver or other action with respect to, or related to, the Trust Agreement or any other Related Bond Document whether or not executed or completed, or (iv) any litigation or other dispute in connection with the Trust Agreement or any other Related Bond Document or the transactions contemplated thereby, other than costs resulting from the failure of the Series 2024 Bond Insurer to honor its obligations under the Series 2024 Bond Insurance Policy. The Series 2024 Bond Insurer reserves the right to charge a reasonable fee as a condition to executing any amendment, waiver or consent proposed in respect of the Trust Agreement or any other Related Bond Document.

(k) The Series 2024 Bond Insurer shall be entitled to pay principal of or interest on the Insured Series 2024 Bonds that shall become Due for Payment but shall be unpaid by reason of Nonpayment by the Authority (as such terms are defined in the Series 2024 Bond Insurance Policy) and any amounts due on the Insured Series 2024 Bonds as a result of acceleration of the maturity thereof in accordance with the Trust Agreement, whether or not the Series 2024 Bond Insurer has received a Notice of Nonpayment (as such terms are defined in the Series 2024 Bond Insurance Policy) or a claim upon the Series 2024 Bond Insurance Policy.

(l) The notice address of the Series 2024 Bond Insurer is: Assured Guaranty Municipal Corp., 1633 Broadway, New York, New York 10019, Attention: Managing Director- Surveillance, Re: Policy No. 219837-N, Telephone: (212) 974-0100; Telecopier: (212) 339-3556. In each case in which notice or other communication refers to an Event of Default, then a copy of such notice or other communication shall also be sent to the attention of the General Counsel and shall be marked to indicate "URGENT MATERIAL ENCLOSED."

(m) The Series 2024 Bond Insurer shall have the right to receive such additional information as it may reasonably request.

(n) The Authority will permit the Series 2024 Bond Insurer to discuss the affairs, finances and accounts of the Authority or any information the Series 2024 Bond Insurer may reasonably request regarding the security for the Insured Series 2024 Bonds with appropriate officers of the Authority and will use commercially reasonable efforts to enable the Series 2024 Bond Insurer to have access to the facilities, books and records of the Authority on any Business Day upon reasonable prior notice.

(o) In determining whether any amendment, consent, waiver or other action to be taken, or any failure to take action, under the Trust Agreement would adversely affect the security for the Insured Series 2024 Bonds or the rights of the Insured Bondholders, the Trustee shall consider the effect of any such amendment,



consent, waiver, action or inaction as if there were no Series 2024 Bond Insurance Policy.

(p) The Authority shall, upon the request of the Series 2024 Bond Insurer, provide evidence satisfactory to the Series 2024 Bond Insurer that all required permits, licenses, approvals or other authorizations or certifications necessary to proceed with and complete the Triangle Expressway System have been obtained.

Section 502. Additional Covenants with Respect to the Series 2024 Bond Insurer.

(a) The Authority shall provide the Series 2024 Bond Insurer with a copy of any notice, report, certification or other instrument to be delivered to the Trustee or USDOT pursuant to the Trust Agreement.

(b) Without the prior written consent of Series 2024 Bond Insurer, no Insured Series 2024 Bonds shall be purchased by the Authority in lieu of redemption, unless such Insured Series 2024 Bonds are redeemed, defeased or cancelled.

(c) The Authority will furnish or cause to be furnished to the Series 2024 Bond Insurer:

(i) prior to issuing additional Senior Lien Parity Indebtedness, any disclosure document or financing agreement pertaining to such Senior Lien Parity Indebtedness, which disclosure document or financing agreement shall include, without limitation, the applicable maturity schedule, interest rate or rates, redemption and security provisions pertaining to any such Senior Lien Parity Indebtedness;

(ii) within thirty (30) days following any litigation or investigation that may have a material adverse effect on the financial position of the Authority with respect to the Triangle Expressway System, notice of such litigation or investigation; and

(iii) copies of all continuing disclosure filings with national recognized municipal securities repositories with respect to the Authority.

The Trustee shall notify the Series 2024 Bond Insurer of any failure of the Authority to provide to the Trustee any notices, certificates and other information required by the Amended and Restated Trust Agreement or this Sixth Supplemental Trust Agreement.

(d) Any provision of the Trust Agreement or this Sixth Supplemental Trust Agreement expressly recognizing or granting rights in or to the Series 2024 Bond Insurer may not be amended in any manner which affects the rights of the Series 2024 Bond Insurer without the prior written consent of the Series 2024 Bond Insurer.

(e) The Authority shall obtain the prior written consent of the Series 2024 Bond Insurer to any self-insurance program implemented pursuant to Section 707 of the Trust Agreement.

(f) Except as otherwise agreed to by the Series 2024 Bond Insurer on or before closing, any interest rate exchange agreement ("Interest Rate Exchange Agreement") entered into by the Authority in connection with the Series 2024 Bonds or any Senior Lien Parity Debt subsequent to the date hereof (so long as any Insured Series 2024 Bonds remain Outstanding) shall meet the following conditions: (i) the Interest Rate Exchange Agreement must be entered into to manage interest costs related to or a hedge against (A) assets then held, or (B) debt then outstanding, or (C) debt reasonably expected to be issued within the next twelve (12) months, and (ii) the Interest Rate Exchange Agreement shall not contain any leverage element or multiplier component greater than 1.0x unless there is a matching hedge arrangement which effectively offsets the exposure from any such element or component. Unless otherwise consented to in writing by the Series 2024 Bond Insurer, any uninsured net settlement, breakage or other termination amount then in effect shall be subordinate to debt service on the Insured Series 2024 Bonds and on any debt on parity with the Insured Series 2024 Bonds. The Authority shall not terminate Interest Rate Exchange Agreement unless it demonstrates to the satisfaction of the Series 2024 Bond Insurer prior to the payment of any such termination amount that such payment will not cause the Authority to be in default under the Related Bond Documents, including but not limited to, any monetary obligations thereunder. All counterparties or guarantors to the Interest Rate Exchange Agreement must have a rating of at least "A-" and "A3" by S&P and Moody's. If the counterparty or guarantor's rating falls below "A-" and "A3" by either S&P or Moody's the counterparty or guarantor shall execute a credit support annex to the Interest Rate Exchange Agreement, which credit support annex shall be acceptable to the Series 2024 Bond Insurer. If the counterparty or the guarantor's long term unsecured rating falls below "Baal" or "BBB+" by either Moody's or S&P, a replacement counterparty or guarantor, acceptable to the Series 2024 Bond Insurer, shall be required.

(g) The Traffic Consultant is CDM Smith Inc. In the event that the Authority determines to consider engaging the services of another Traffic Consultant (or any successor thereto retained as provided in this subsection (g)), the Authority shall advise the Series 2024 Bond Insurer and shall provide the Series 2024 Bond Insurer with the names of at least three firms that the Authority may engage to provide the services of a Traffic Consultant. Thereafter, unless the Series 2024 Bond Insurer objects within thirty (30) days to the use of any of the firms proposed as the Traffic Consultant (in which event the Authority shall propose an alternative firm for approval), the Authority may engage any of the firms so proposed to be the Traffic Consultant.



(h) The Authority shall provide the Series 2024 Bond Insurer copies of any construction progress reports or other project oversight and monitoring reports delivered to USDOT under Sections 21 and 22 of the TIFIA 2024 Loan Agreement.

Section 503. Additional Restriction on the Issuance of Senior Lien Indebtedness. In addition to the provisions of Section 716 of the Trust Agreement, the Authority covenants for the benefit of the Series 2024 Bond Insurer (and not for the benefit of the Owners) that it will not, without the written consent of the Series 2024 Bond Insurer, incur Senior Lien Indebtedness subsequent to the issuance of the Insured Series 2024 Bonds unless prior to the incurrence thereof the Authority files with the Trustee and the Series 2024 Bond Insurer, in addition to the items to be filed with the Trustee pursuant to Section 716 of the Trust Agreement, (a) an Officer's Certificate demonstrating that the Revenues for the two most recent Fiscal Years for which audited financial statements are available were, in each Fiscal Year, at least 175% of the Long-Term Debt Service Requirement with respect to all Outstanding Long-Term Indebtedness constituting Senior Lien Indebtedness for such Fiscal Year, (b) the report of the Traffic Consultant required by Section 716(a)(ii) of the Trust Agreement showing that (i) the forecasted Revenues in each Fiscal Year are at least 175% of the Long-Term Debt Service Requirement with respect to all Outstanding Long-Term Indebtedness constituting Senior Lien Indebtedness (excluding any Long-Term Indebtedness constituting Senior Lien Indebtedness to be refunded by the Long-Term Indebtedness to be incurred) and the Long-Term Indebtedness proposed to be incurred, and (ii) the forecasted Revenues in each Fiscal Year are also at least 150% of the Long-Term Debt Service Requirement with respect to all Outstanding (and proposed to be incurred) (A) Long-Term Indebtedness constituting Senior Lien Indebtedness (excluding any Long-Term Indebtedness constituting Senior Lien Indebtedness to be refunded by the Long-Term Indebtedness to be incurred) and (B) TIFIA Indebtedness, and (c) evidence that the proposed Senior Lien Indebtedness has been rated at an investment grade rating by at least one nationally recognized municipal bond rating agency.

Section 504. Trustee/Paying Agent-Related Provisions.

(a) The Series 2024 Bond Insurer shall receive prior written notice of any name change of the Trustee or the Registrar or the resignation or removal of the Trustee or the Registrar.

(b) No removal, resignation or termination of the Trustee or the Registrar shall take effect until a successor, acceptable to the Series 2024 Bond Insurer, shall be appointed.

(c) The Trustee or the Registrar may be removed at any time at the request of the Series 2024 Bond Insurer for any breach of its obligations under the Amended and Restated Trust Agreement or this Sixth Supplemental Trust Agreement.

Section 505. Amendments to the Amended and Restated Trust Agreement or this Sixth Supplemental Trust Agreement; Amendments to Other Agreements. The Series 2024 Bond Insurer shall be given written notice by the Authority of any amendment of the Amended and Restated Trust Agreement or this Sixth Supplemental Trust Agreement that does not require the consent of the Owners. Any amendments to the Amended and Restated Trust Agreement or this Sixth Supplemental Trust Agreement that do require the consent of the Owners shall also require the consent of the Series 2024 Bond Insurer. The Authority shall provide a copy of any amendments to the Amended and Restated Trust Agreement or this Sixth Supplemental Trust Agreement to all nationally recognized securities rating agencies then rating the Insured Series 2024 Bonds.

Section 506. Third-Party Beneficiary. To the extent that this Sixth Supplemental Trust Agreement confers on or gives or grants to the Series 2024 Bond Insurer any right, remedy or claim under or by reason of this Sixth Supplemental Trust Agreement, the Series 2024 Bond Insurer is hereby explicitly recognized as being a third-party beneficiary hereunder and may enforce any such right, remedy or claim conferred, given or granted.

Section 507. Defeasance.

(a) If the principal or interest due with respect to the Insured Series 2024 Bonds shall be paid by the Series 2024 Bond Insurer pursuant to the Series 2024 Bond Insurance Policy, the Insured Series 2024 Bonds shall remain Outstanding for all purposes, not be defeased or otherwise satisfied and not be considered paid by the Authority, and the assignment and pledge of the trust estate and all covenants, agreements and other obligations of the Authority to the Owners shall continue to exist and shall run to the benefit of the Series 2024 Bond Insurer, and the Series 2024 Bond Insurer shall be subrogated to the rights of such Owners including, without limitation, any rights that such Owners may have in respect of securities law violations arising from the offer and sale of the Insured Series 2024 Bonds.

(b) In connection with any defeasance:

(i) The Authority shall receive an opinion of Bond Counsel to the effect (A) that the defeasance will not adversely impact the exclusion from gross income for federal income tax purposes of interest on the Insured Series 2024 Bonds and (B) that the refunded Insured Series 2024 Bonds are no longer "Outstanding" under the Trust Agreement.

(ii) The Authority shall enter into a refunding trust or escrow agreement (the "Escrow Agreement") and receive an opinion of counsel regarding the validity and enforceability of the Escrow Agreement; and

(iii) The Escrow Agreement shall provide that:



(A) Any substitution of securities shall require verification by an independent certified public accountant and the prior written consent of the Series 2024 Bond Insurer;

(B) The Authority will not exercise any optional redemption of the Insured Series 2024 Bonds secured by the Escrow Agreement or any other redemption unless (i) the right to make any such redemption has been expressly reserved in the Escrow Agreement and such reservation has been disclosed in detail in the official statement for the refunding bonds, and (ii) as a condition of any such redemption there shall be provided to the Series 2024 Bond Insurer a verification of an independent certified public accountant as to the sufficiency of escrow receipts without reinvestment to meet the escrow requirements remaining following such redemption; and

(C) The Authority shall not amend the Escrow Agreement or enter into a forward purchase agreement or other agreement with respect to rights in the escrow without prior written consent of the Series 2024 Bond Insurer.

Section 508. Rights of Series 2024 Bond Insurer. The additional covenants and rights of the Series 2024 Bond Insurer created pursuant to this Article V, including its rights to give consents, its rights to give approvals, its rights to receive notices and documents and all other rights, other than its rights to subrogation following any payment under the Series 2024 Bond Insurance Policy, shall not apply for so long as the Series 2024 Bond Insurer has failed to make a payment under the Series 2024 Bond Insurance Policy following a request by the Trustee in strict compliance with this Sixth Supplemental Trust Agreement and the Series 2024 Bond Insurance Policy.

Section 509. Non-Reliance on Series 2024 Bond Insurer. The Authority has made its own independent investigation and decision as to whether to insure the payment when due of the principal of and interest on the Insured Series 2024 Bonds and whether the Series 2024 Bond Insurance Policy is appropriate or proper for it based upon its own judgment and upon advice from such legal and financial advisers as it has deemed necessary. The Authority acknowledges that the Series 2024 Bond Insurer has not made, and therefore the Authority is not relying on, any recommendation from the Series 2024 Bond Insurer that the Authority insure the Insured Series 2024 Bonds or obtain the Series 2024 Bond Insurance Policy; it being understood and agreed that communications from the Series 2024 Bond Insurer (whether written or oral) referring to, containing information about or negotiating the terms and conditions of the Series 2024 Bond Insurance Policy, any related insurance document or the documentation governing the Insured Series 2024 Bonds do not constitute a recommendation to insure the Insured Series 2024 Bonds or obtain the Series 2024 Bond Insurance Policy.

The Authority further acknowledges that the Series 2024 Bond Insurer has not made any representation, warranty or undertaking, and has not given any assurance or guaranty, in each case, expressed or implied, concerning the rating of the Series 2024 Bond Insurer's financial strength by any rating agency. The Authority acknowledges that the ratings of the Series 2024 Bond Insurer reflect only the view of the respective rating agencies. The Authority understands that such ratings may not continue for any given time period and instead may change over time, including without limitation being placed under review for possible downgrade, revised downward, withdrawn entirely by the relevant rating agency if, in the judgment of such rating agency, circumstances so warrant, or withdrawn entirely by the Series 2024 Bond Insurer in its sole discretion. The Authority acknowledges and agrees that the Series 2024 Bond Insurer undertakes no responsibility to bring to its attention, and shall have no liability for, the placement of a rating under review for possible downgrade or the downward revision or withdrawal of any rating obtained, and that any such review for possible downgrade, downward revision or withdrawal may have an adverse effect on the Insured Series 2024 Bonds.

Section 510. Series 2024 Debt Service Reserve Policy. Notwithstanding other provisions in the Trust Agreement, except for Section 701 of the Trust Agreement:

(a) If a draw has been made on the Series 2024 Debt Service Reserve Policy, the Authority shall (1) from the deposits to the Senior Lien Parity Reserve Account made pursuant to Sections 503(c) and 507 of the Trust Agreement (or from amounts made available for Senior Lien Indebtedness pursuant to Section 805(a) of the Trust Agreement, as applicable), repay the Series 2024 Bond Insurer for such draw on a pro rata basis with any other provider of a Reserve Alternative Instrument credited to the Senior Lien Parity Reserve Account on which a draw has been made, and (2) pursuant first to Section 503(i) of the Trust Agreement or otherwise from amounts on deposit in the General Reserve Fund pursuant to Section 514 of the Trust Agreement, pay the Series 2024 Bond Insurer for all reasonable expenses related to such draw, and pay the Series 2024 Bond Insurer interest on such draw and such expenses from the date of payment by the Series 2024 Bond Insurer at the Series 2024 Reserve Late Payment Rate, each on a pro rata basis with any other provider of a Reserve Alternative Instrument credited to the Senior Lien Parity Reserve Account on which a draw has been made. "Series 2024 Reserve Late Payment Rate" means the lesser of (x) the greater of (i) the Prime Rate (any change in the Prime Rate to be effective on the date such change is announced by JPMorgan Chase Bank) plus 5%, and (ii) the then applicable highest rate of interest on the Bonds and (y) the maximum rate permissible under applicable usury or similar North Carolina laws limiting interest rates. The Series 2024 Reserve Late Payment Rate shall be computed on the basis of the actual number of days elapsed over a year of 360 days. In the event JPMorgan Chase Bank ceases to announce its Prime Rate publicly, Prime Rate shall be the publicly announced prime or base lending rate of such national bank as the Series 2024 Bond Insurer shall specify. If the calculation of the Series 2024 Reserve Late Payment Rate results in an effective rate of interest which, for any period,



exceeds the limit of the usury or any other laws applicable to the Senior Lien Indebtedness, then all sums in excess of those lawfully collectible as interest for the period in question shall, without further agreement or notice between or by any party hereto, be applied as additional interest for any later periods of time when amounts due pursuant to the provisions of this subsection (a) are outstanding to the extent that interest otherwise due pursuant to the provisions of this subsection (a) for such periods plus such additional interest would not exceed the limit of the usury or such other laws, and any excess shall be applied upon principal immediately upon receipt of such moneys by the Series 2024 Bond Insurer, with the same force and effect as if the Authority had specifically designated such extra sums to be so applied and the Series 2024 Bond Insurer had agreed to accept such extra payment(s) as additional interest for such later periods; provided such amounts are only payable from the Revenue Fund pursuant first to Section 503(i) of the Trust Agreement or otherwise from the General Reserve Fund. In no event shall any agreed-to or actual exaction as consideration for the amounts due pursuant to the provisions of this subsection (a) exceed the limits imposed or provided by the law applicable to this transaction for the use or detention of money or for forbearance in seeking its collection.

(b) Repayment of any amounts owing to the Series 2024 Bond Insurer under subsection (a)(1) of this Section 510 shall commence in the first month following each draw, and each such monthly payment shall be in an amount at least equal to 1/12$^{th}$ of the aggregate payments to be made to the Series 2024 Bond Insurer.

(c) As and to the extent that payments are made to the Series 2024 Bond Insurer in repayment of draws on the Series 2024 Debt Service Reserve Policy, the coverage under the Series 2024 Debt Service Reserve Policy will be increased by a like amount, subject to the terms of the Series 2024 Debt Service Reserve Policy. The obligation to pay amounts due under the Series 2024 Debt Service Reserve Policy shall be secured by a valid lien on the Trust Estate pledged as security for the Senior Lien Indebtedness (subject only to the priority of payment provisions set forth under this Section 510 and the Trust Agreement).

(d) All cash and investments in the Senior Lien Parity Reserve Account established for the Related Bonds shall be transferred to the Senior Lien Debt Service Fund for payment of debt service on Related Bonds before any drawing may be made on the Series 2024 Debt Service Reserve Policy or any other Reserve Alternative Instrument credited to the Senior Lien Parity Reserve Account in lieu of cash. Payment of any amounts due under the Series 2024 Debt Service Reserve Policy shall be made prior to replenishment of any such cash amounts. Draws on all Reserve Alternative Instruments (including the Series 2024 Debt Service Reserve Policy) on which there is available coverage shall be made on a pro-rata basis (calculated by reference to the coverage then available thereunder) after applying all available cash and investments in the Senior Lien Parity Reserve Account. Payment of any amounts due under the Series 2024 Debt Service Reserve Policy and reimbursement of amounts with respect to other Reserve Alternative Instruments shall be made on a

pro-rata basis prior to replenishment of any cash drawn from the Senior Lien Parity Reserve Account. For the avoidance of doubt, "available coverage" means the coverage then available for disbursement pursuant to the terms of the applicable Reserve Alternative Instrument without regard to the legal or financial ability or willingness of the provider of such instrument to honor a claim or draw thereon or the failure of such provider to honor any such claim or draw.

(e) If the Authority shall fail to pay when due any amounts owing to the Series 2024 Bond Insurer pursuant to subsection (a) hereof or shall breach any other covenant of this Section 510, the Series 2024 Bond Insurer shall be entitled to exercise any and all legal and equitable remedies available to it, including those provided under the Trust Agreement other than remedies which would adversely affect Owners of any Senior Lien Indebtedness.

(f) The Trust Agreement shall not be discharged until all amounts owing to the Series 2024 Bond Insurer pursuant to subsection (a) of this Section 510 have been paid in full. The Authority's obligation to pay such amounts shall expressly survive payment in full of the Related Bonds.

(g) The Authority shall include any amounts due under the Series 2024 Debt Service Reserve Policy then due and owing the Series 2024 Bond Insurer in the calculation of any additional bonds test and rate covenant in the Trust Agreement.

(h) The Trustee shall ascertain the necessity for a claim upon the Series 2024 Debt Service Reserve Policy in accordance with the provisions of subsection (a) hereof and provide notice to the Series 2024 Bond Insurer in accordance with the terms of the Series 2024 Debt Service Reserve Policy at least five Business Days prior to each date upon which interest or principal is due on the Related Bonds. Where deposits are required to be made by the Authority with the Trustee to the Senior Lien Parity Reserve Account more often than semi-annually, the Trustee shall give notice to the Series 2024 Bond Insurer of any failure of the Authority to make timely payment in full of such deposits within two Business Days of the date due.

Section 511. TIFIA 2024 Debt Service Reserve Policy. Notwithstanding other provisions in the Trust Agreement, except for Section 701 of the Trust Agreement:

(a) The prior written consent of the TIFIA 2024 Reserve Policy Provider shall be a condition precedent to the deposit of any Reserve Alternative Instrument other than the TIFIA 2024 Debt Service Reserve Policy in lieu of a cash deposit into the TIFIA Debt Service Reserve Account, if any. Amounts on deposit in the TIFIA Debt Service Reserve Account shall be applied solely to the payment of debt service due on TIFIA Indebtedness secured thereby.

(b) If a draw has been made on the TIFIA 2024 Debt Service Reserve Policy, the Authority shall (1) from the deposits to the TIFIA Debt Service Reserve Account made pursuant to Sections 503(c) and 509(c) of the Trust Agreement (or from amounts



made available for TIFIA Indebtedness pursuant to Section 805 of the Trust Agreement, as applicable), repay the TIFIA 2024 Reserve Policy Provider for such draw on a pro rata basis with any other provider of a Reserve Alternative Instrument credited to the TIFIA Debt Service Reserve Account on which a draw has been made, and (2) pursuant first to Section 503(i) of the Trust Agreement or otherwise from amounts on deposit in the General Reserve Fund pursuant to Section 514 of the Trust Agreement, pay the TIFIA 2024 Reserve Policy Provider for all reasonable expenses related to such draw, and pay the TIFIA 2024 Reserve Policy Provider interest on such draw and such expenses from the date of payment by the TIFIA 2024 Reserve Policy Provider at the TIFIA 2024 Reserve Late Payment Rate, each on a pro rata basis with any other provider of a Reserve Alternative Instrument credited to the TIFIA Debt Service Reserve Account on which a draw has been made. "TIFIA Reserve Late Payment Rate" means the lesser of (x) the greater of (i) the Prime Rate (any change in such Prime Rate to be effective on the date such change is announced by JPMorgan Chase Bank) plus 5%, and (ii) 12% and (y) the maximum rate permissible under applicable usury or similar North Carolina laws limiting interest rates. The TIFIA 2024 Reserve Late Payment Rate shall be computed on the basis of the actual number of days elapsed over a year of 360 days. In the event JPMorgan Chase Bank ceases to announce its Prime Rate publicly, Prime Rate shall be the publicly announced prime or base lending rate of such national bank as the TIFIA 2024 Reserve Policy Provider shall specify. If the calculation of the TIFIA 2024 Reserve Late Payment Rate results in an effective rate of interest which, for any period, exceeds the limit of the usury or any other laws applicable to the Related TIFIA Bonds, then all sums in excess of those lawfully collectible as interest for the period in question shall, without further agreement or notice between or by any party hereto, be applied as additional interest for any later periods of time when amounts due pursuant to the provisions of this subsection (a) are outstanding to the extent that interest otherwise due pursuant to the provisions of this subsection (a) for such periods plus such additional interest would not exceed the limit of the usury or such other laws, and any excess shall be applied upon principal immediately upon receipt of such moneys by the TIFIA 2024 Reserve Policy Provider, with the same force and effect as if the Authority had specifically designated such extra sums to be so applied and the TIFIA 2024 Reserve Policy Provider had agreed to accept such extra payment(s) as additional interest for such later periods; provided such amounts are only payable from the Revenue Fund pursuant first to Section 503(i) of the Trust Agreement or otherwise from the General Reserve Fund. In no event shall any agreed-to or actual exaction as consideration for the amounts due pursuant to the provisions of this subsection (a) exceed the limits imposed or provided by the law applicable to this transaction for the use or detention of money or for forbearance in seeking its collection.

(c) Repayment of any amounts owing to the TIFIA 2024 Reserve Policy Provider under subsection (a)(1) of this Section 511 shall commence in the first month following each draw, and each such monthly payment shall be in an amount at least

equal to 1/12th of the aggregate payments to be made to the TIFIA 2024 Reserve Policy Provider.

(d) As and to the extent that payments are made to the TIFIA 2024 Reserve Policy Provider in repayment of draws on the TIFIA 2024 Debt Service Reserve Policy, the coverage under the TIFIA 2024 Debt Service Reserve Policy will be increased by a like amount, subject to the terms of the TIFIA 2024 Debt Service Reserve Policy. The obligation to pay amounts due under the TIFIA 2024 Debt Service Reserve Policy shall be secured by a valid lien on the Trust Estate pledged as security for the Related TIFIA Bonds (subject only to the priority of payment provisions set forth under this Section 511 and the Trust Agreement).

(e) All cash and investments in the TIFIA Debt Service Reserve Account established for the Related TIFIA Bonds shall be transferred to (i) if a Bankruptcy Related Event has occurred, the Senior Lien Debt Service Fund or (ii) if no Bankruptcy Related Event has occurred, the Junior Indebtedness Debt Service Fund for payment of debt service on the Related TIFIA Bonds before any drawing may be made on the TIFIA 2024 Debt Service Reserve Policy or any other Reserve Alternative Instrument credited to the TIFIA Debt Service Reserve Account in lieu of cash. Payment of any amounts due under the TIFIA 2024 Debt Service Reserve Policy shall be made prior to replenishment of any such cash amounts. Draws on all Reserve Alternative Instruments (including the TIFIA 2024 Debt Service Reserve Policy) on which there is available coverage shall be made on a pro-rata basis (calculated by reference to the coverage then available thereunder) after applying all available cash and investments in the TIFIA Debt Service Reserve Account. Payment of any amounts due under the TIFIA 2024 Debt Service Reserve Policy and reimbursement of amounts with respect to other Reserve Alternative Instruments shall be made on a pro-rata basis prior to replenishment of any cash drawn from the TIFIA Debt Service Reserve Account. For the avoidance of doubt, "available coverage" means the coverage then available for disbursement pursuant to the terms of the applicable Reserve Alternative Instrument without regard to the legal or financial ability or willingness of the provider of such instrument to honor a claim or draw thereon or the failure of such provider to honor any such claim or draw.

(f) If the Authority shall fail to pay when due any amounts owing to the TIFIA 2024 Reserve Policy Provider pursuant to subsection (a) hereof or shall breach any other covenant of this Section 511, the TIFIA 2024 Reserve Policy Provider shall be entitled to exercise any and all legal and equitable remedies available to it, including those provided under the Trust Agreement other than remedies which would adversely affect Owners of any Senior Lien Indebtedness and, if no Bankruptcy Related Event has occurred, Holders of any TIFIA Indebtedness.

(g) The Trust Agreement shall not be discharged until all amounts owing to the TIFIA 2024 Reserve Policy Provider pursuant to subsection (a) of this Section 511 have been paid in full. The Authority's obligation to pay such amounts shall expressly survive payment in full of the Related TIFIA Bonds.

(h) The Authority shall include any amounts due under the TIFIA 2024 Debt Service Reserve Policy then due and owing the TIFIA 2024 Reserve Policy Provider in the calculation of any additional bonds test and rate covenant in the Trust Agreement.

(i) The Trustee shall ascertain the necessity for a claim upon the TIFIA 2024 Debt Service Reserve Policy in accordance with the provisions of subsection (a) hereof and provide notice to the TIFIA 2024 Reserve Policy Provider in accordance with the terms of the TIFIA 2024 Debt Service Reserve Policy at least five Business Days prior to each date upon which interest or principal is due on the Related TIFIA Bonds. Where deposits are required to be made by the Authority with the Trustee to the TIFIA Debt Service Reserve Account more often than semiannually, the Trustee shall give notice to the TIFIA 2024 Reserve Policy Provider of any failure of the Authority to make timely payment in full of such deposits within two Business Days of the date due.

(j) The TIFIA 2024 Debt Service Reserve Policy number is [_____].

(k) The Authority shall pay or reimburse the TIFIA 2024 Reserve Policy Provider, from the Revenue Fund pursuant to Section 503(i) of the Trust Agreement or otherwise from the General Reserve Fund, as applicable, any and all charges, fees, costs and expenses that the TIFIA 2024 Reserve Policy Provider may reasonably pay or incur in connection with (i) the administration, enforcement, defense or preservation of any rights or security in any Related TIFIA Document, (ii) the pursuit of any remedies under the Trust Agreement or any other Related TIFIA Document or otherwise afforded by law or equity, (iii) any amendment, waiver or other action with respect to, or related to, the Trust Agreement or any other Related TIFIA Document whether or not executed or completed, or (iv) any litigation or other dispute in connection with the Trust Agreement or any other Related TIFIA Document or the transactions contemplated thereby, other than costs resulting from the failure of the TIFIA 2024 Reserve Policy Provider to honor its obligations under the TIFIA 2024 Debt Service Reserve Policy. The TIFIA 2024 Reserve Policy Provider reserves the right to charge a reasonable fee as a condition to executing any amendment, waiver or consent proposed in respect of the Trust Agreement or any other Related TIFIA Document.

(l) The obligation of the Authority to pay amounts due under subsection (a) of this Section 511 to the TIFIA 2024 Reserve Policy Provider from available moneys under the Trust Estate shall be an absolute and unconditional obligation of the Authority and will be paid or performed strictly in accordance with the provisions of this Section 511, irrespective of (i) any lack of validity or enforceability of or any amendment or other modifications of, or waiver with respect to the Related TIFIA

Bonds, the Trust Agreement, this Sixth Supplemental Trust Agreement or any other Related TIFIA Document; (ii) any amendment or other modification of, or waiver with respect to the TIFIA 2024 Debt Service Reserve Policy; (iii) any exchange, release or non-perfection of any security interest in property securing the Related TIFIA Bonds, the Trust Agreement, this Sixth Supplemental Trust Agreement or any other Related TIFIA Documents; (iv) whether or not such Related TIFIA Bonds are contingent or matured, disputed or undisputed, liquidated or unliquidated; (v) any amendment, modification or waiver of or any consent to departure from the TIFIA 2024 Debt Service Reserve Policy, the Trust Agreement, this Sixth Supplemental Trust Agreement or all or any of the other Related TIFIA Documents; (vi) the existence of any claim, setoff, defense (other than the defense of payment in full), reduction, abatement or other right which the Authority may have at any time against the Trustee or any other person or entity other than the TIFIA 2024 Reserve Policy Provider, whether in connection with the transactions contemplated herein or in any other Related TIFIA Documents or any unrelated transactions; (vii) any statement or any other document presented under or in connection with the TIFIA 2024 Debt Service Reserve Policy proving in any and all respects invalid, inaccurate, insufficient, fraudulent or forged or any statement therein being untrue or inaccurate in any respect; or (viii) any payment by the TIFIA 2024 Reserve Policy Provider under the TIFIA 2024 Debt Service Reserve Policy against presentation of a certificate or other document which does not strictly comply with the terms of the TIFIA 2024 Debt Service Reserve Policy.

(m) The Authority shall fully observe, perform, and fulfill each of the provisions of the Trust Agreement and this Sixth Supplemental Trust Agreement applicable to the Related TIFIA Bonds (as each of those provisions may be amended, supplemented, modified or waived with the prior written consent of the TIFIA 2024 Reserve Policy Provider), each of the provisions thereof being expressly incorporated into this Section 511 by reference solely for the benefit of TIFIA 2024 Reserve Policy Provider as if set forth directly herein. Any provision of the Trust Agreement or this Sixth Supplemental Trust Agreement expressly recognizing or granting rights in or to the TIFIA 2024 Reserve Policy Provider may not be amended in any manner which affects the rights of the TIFIA 2024 Reserve Policy Provider without the prior written consent of the TIFIA 2024 Reserve Policy Provider. To the extent that this Sixth Supplemental Trust Agreement confers on or gives or grants to the TIFIA 2024 Reserve Policy Provider any right, remedy or claim under or by reason of this Sixth Supplemental Trust Agreement, the TIFIA 2024 Reserve Policy Provider is hereby explicitly recognized as being a third-party beneficiary hereunder and may enforce any such right, remedy or claim conferred, given or granted.

(n) The Authority covenants to provide to TIFIA 2024 Reserve Policy Provider, promptly upon request, any information regarding the Related TIFIA Bonds or the financial condition and operations of the Authority as reasonably requested by TIFIA 2024 Reserve Policy Provider. The Authority will permit TIFIA 2024 Reserve Policy Provider to discuss the affairs, finances and accounts of the



Authority or any information TIFIA 2024 Reserve Policy Provider may reasonably request regarding the security for the Related TIFIA Bonds with appropriate officers of the Authority and will use commercially reasonable efforts to enable TIFIA 2024 Reserve Policy Provider to have access to the facilities, books and records of the Authority on any business day upon reasonable prior notice.

(o) Notices and other information to TIFIA 2024 Reserve Policy Provider shall be sent to the following address (or such other address as TIFIA 2024 Reserve Policy Provider may designate in writing): Assured Guaranty Municipal Corp., 1633 Broadway, New York, New York 10019, Attention: Managing Director – Surveillance, Re: Policy No._____.

## ARTICLE VI

## SUPPLEMENTAL TRUST AGREEMENTS

Section 601. Supplemental Trust Agreements Without Consent of Owners. The Authority may, from time to time and at any time, execute and deliver such trust agreements supplemental hereto (which supplemental trust agreements shall thereafter form a part hereof) as shall be substantially consistent with the terms and provisions of this Sixth Supplemental Trust Agreement and, in the opinion of the Trustee, who may rely upon a written opinion of legal counsel, shall not materially and adversely affect the interest of the Owners of the Series 2024 Bonds:

(a) to cure any ambiguity or formal defect or omission, to correct or supplement any provision herein that may be inconsistent with any other provision herein, to make any other provisions with respect to matters or questions arising under this Sixth Supplemental Trust Agreement or to modify, alter, amend, add to or rescind any of the terms or provisions contained in this Sixth Supplemental Trust Agreement;

(b) to grant or to confer upon the Trustee for the benefit of the Owners of the Series 2024 Bonds any additional rights, remedies, powers, authority or security that may lawfully be granted to or conferred upon the Owners of the Series 2024 Bonds or the Trustee;

(c) to add to the covenants and agreements of the Authority in this Sixth Supplemental Trust Agreement other covenants and agreements thereafter to be observed by the Authority or to surrender any right or power herein reserved to or conferred upon the Authority;

(d) to permit the qualification of this Sixth Supplemental Trust Agreement under any federal statute now or hereafter in effect or under any state Blue Sky law, and, in connection therewith, if the Authority so determines, to add to this Sixth

Supplemental Trust Agreement or any other supplemental trust agreement such other terms, conditions and provisions as may be permitted or required by such federal statute or Blue Sky law; or

(e) to provide for the issuance of Series 2024 Bonds in bearer form.

At least thirty (30) days prior to the execution and delivery of any supplemental trust agreement for any of the purposes of this Section 601, the Trustee shall cause at the Authority's expense to be paid from the Operations and Maintenance Expense Fund or from other available funds, a notice of the proposed supplemental trust agreement to be mailed first-class, postage prepaid, to the Local Government Commission and to all Owners of the Series 2024 Bonds. Such notice shall briefly set forth the nature of the proposed supplemental trust agreement and shall state that copies thereof are on file at the designated corporate trust office of the Trustee for inspection by all Owners of the Series 2024 Bonds. A failure on the part of the Trustee to mail the notice required by this Section 601 shall not affect the validity of such supplemental trust agreement.

Section 602. Modification of Supplemental Agreement with Consent of Owners. Subject to the terms and provisions contained in this Section 602, and not otherwise, the Owners of not less than a majority in aggregate principal amount of the Series 2024 Bonds then Outstanding that will be affected, as defined in Section 603, by a proposed supplemental trust agreement shall have the right, from time to time, anything contained in this Sixth Supplemental Trust Agreement to the contrary notwithstanding, to consent to and approve the execution and delivery by the Authority and the Trustee of such supplemental trust agreement as shall be deemed necessary or desirable by the Authority for the purpose of modifying, altering, amending, adding to or rescinding any of the terms or provisions contained in this Sixth Supplemental Trust Agreement or in any supplemental trust agreement; provided, however, that nothing herein contained shall permit, or be construed as permitting (a) an extension of the maturity of the principal of or the interest on any Series 2024 Bond without the consent of the Owner of such Series 2024 Bond, (b) a reduction in the principal amount of any Series 2024 Bond or the rate of interest thereon without the consent of the Owner of such Series 2024 Bond, (c) the creation of a pledge, charge and lien upon the Receipts other than the pledge, charge and lien created by the Trust Agreement without the consent of all Owners of the Series 2024 Bonds then Outstanding, (d) a preference or priority of any Series 2024 Bond over any other Series 2024 Bond without the consent of all Owners of the Series 2024 Bonds then Outstanding, or (e) a reduction in the aggregate principal amount of Series 2024 Bonds required for consent to such supplemental trust agreement without the consent of all Owners of the Series 2024 Bonds then Outstanding. Nothing herein contained, however, shall be construed as making necessary the approval by the Owners of the Series 2024 Bonds of the execution and delivery of any supplemental trust agreement as authorized in Section 601.



The Trustee shall cause such expense to be paid from the Operations and Maintenance Expense Fund or from any other available moneys and cause notice of the proposed supplemental trust agreement to be mailed, postage prepaid, to the Local Government Commission and all Owners of the Series 2024 Bonds as of the date such notice is mailed. Such notice shall briefly set forth the nature of the proposed supplemental trust agreement and shall state that copies thereof are on file at the principal corporate trust office of the Trustee for inspection by all Owners of Series 2024 Bonds. The Trustee shall not, however, be subject to any liability to any Owner by reason of its failure to mail the notice required by this section, and any such failure shall not affect the validity of such supplemental trust agreement when approved and consented to as provided in this section.

Whenever, at any time within three (3) years after the date of the mailing of such notice, the Authority shall deliver to the Trustee an instrument or instruments in writing purporting to be executed by the Owners of not less than a majority in aggregate principal amount of Series 2024 Bonds then outstanding that are affected, as defined in Section 603, by a proposed supplemental trust agreement, which instrument or instruments shall refer to the proposed supplemental trust agreement described in such notice and shall specifically consent to and approve the execution and delivery thereof in substantially the form of the copy thereof referred to in such notice, thereupon, but not otherwise, the Authority and the Trustee may execute and deliver such supplemental trust agreement in substantially such form, without liability or responsibility to any Owner of Series 2024 Bonds, whether or not such Owner shall have consented thereto.

If the Owners of not less than a majority in aggregate principal amount of the Series 2024 Bonds outstanding at the time of the execution and delivery of such supplemental trust agreement and that are affected, as defined in Section 603, by a proposed Trust Agreement have consented to and approved the execution and delivery thereof as herein provided, to the extent permitted by law, no Owner of Series 2024 Bonds shall have any right to object to the execution and delivery of such supplemental trust agreement, to object to any of the terms and provisions contained therein or the operation thereof, to question the propriety of the execution and delivery thereof, or enjoin or restrain the Authority or the Trustee from executing and delivering the same or from taking any action pursuant to the provisions thereof.

Upon the execution and delivery of any supplemental trust agreement pursuant to the provisions of this Section 602 or Section 601, this Sixth Supplemental Trust Agreement shall be and be deemed to be modified and amended in accordance therewith, and the respective rights, duties and obligations under this Sixth Supplemental Trust Agreement of the Authority, the Trustee, all Owners of the Series 2024 Bonds and the Series 2024 Bond Insurer shall thereafter be determined, exercised and enforced in all respects pursuant to the provisions of this Sixth Supplemental Trust Agreement, as so modified and amended.

Section 603. Series 2024 Bonds Affected. For purposes of this Sixth Supplemental Trust Agreement, Series 2024 Bonds shall be deemed to be "affected" by a supplemental trust agreement if the same adversely affects or diminishes the rights of Owners against the Authority or the rights of the Owners in the security for such Series 2024 Bonds. The Trustee may in its discretion determine whether any Series 2024 Bonds would be affected by any supplemental trust agreement, and any such determination shall be conclusive upon the Owners of all Series 2024 Bonds, whether theretofore or thereafter authenticated and delivered hereunder. The Trustee shall not be liable for any such determination made in good faith.

Section 604. Exclusion of Series 2024 Bonds. Series 2024 Bonds owned or held by or for the account of the Authority shall not be deemed Outstanding Series 2024 Bonds for the purpose of any consent or other action or any calculation of Outstanding Series 2024 Bonds provided for in this Article VI, and the Authority as Owner of such Outstanding Series 2024 Bonds shall not be entitled to consent or take any other action provided for in this Article VI. At the time of any consent or other action taken under this Article VI, the Authority shall furnish the Trustee an Officer's Certificate upon which the Trustee may rely, describing all Series 2024 Bonds so to be excluded.

Section 605. Responsibilities of Trustee and Authority under this Article. The Trustee and the Authority shall be entitled to exercise their discretion in determining whether or not any proposed supplemental trust agreement or any term or provision therein contained is desirable, after considering the purposes of such instrument, the needs of the Authority, the rights and interests of the Owners of the Series 2024 Bonds, and the rights, obligations and interests of the Trustee. The Trustee shall be entitled to receive, and shall be fully protected in relying upon, the opinion of counsel approved by it, who may be bond counsel for the Authority, as conclusive evidence that any such proposed supplemental trust agreement does or does not comply with the provisions of this Sixth Supplemental Trust Agreement, and that it is or is not proper for it, under the provisions of this Article VI, to execute and deliver such supplemental trust agreement.

## ARTICLE VII

### AMENDMENTS TO AMENDED AND RESTATED TRUST AGREEMENT

Section 701. Amendments Without Consent of Owners or Holders. Based in part on an opinion of legal counsel, pursuant to Section 1101 of the Amended and Restated Trust Agreement, the following amendments to the Amended and Restated Trust Agreement are determined by the Trustee to not materially and adversely affect the interests of the Owners and the Holders, to either cure ambiguities or defects, grant additional rights for the benefit of the Owners and the Holders, add limitations and restrictions to be observed by the Authority under the Amended and Restated Trust Agreement, or do not "affect" Holders:



(a) The following definitions are hereby added, or revised or deleted as noted, to Section 101 of the Amended and Restated Trust Agreement:

(i) ""2024 Additional Project" is defined in Section 207 of the Sixth Supplemental Trust Agreement."

(ii) ""Fifth Supplemental Trust Agreement" means the Fifth Supplemental Trust Agreement, dated as of October 1, 2020, between the Authority and the Trustee, as supplemented and amended by a First Supplement to Fifth Supplemental Trust Agreement, dated as of August 1, 2021, supplementing and amending the Amended and Restated Trust Agreement."

(iii) The definition of "Loan Life Coverage Ratio" is revised to read as follows:

> ""Loan Life Coverage Ratio" shall have the meaning set forth in each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect."

(iv) Subsection (a) of the definition of "Long-Term Debt Service Requirement" is hereby revised to read as follows:

> "(a) with respect to Balloon Long-Term Indebtedness, the amount of principal which would be payable in such period if such principal were amortized from the date of incurrence thereof over a period of twenty (20) years (or the actual number of years over which such Balloon Long-Term Indebtedness is being amortized, if greater than twenty (20) years, but in no event greater than forty (40) years) on a level debt service basis at an interest rate equal to the current market rate for an obligation with such assumed amortization as set forth in an opinion of a banking institution, a registered municipal advisor or an investment banking institution knowledgeable in financing of Triangle Expressway System delivered to the Trustee as the interest rate at which the Authority could reasonably expect to borrow the same by incurring Indebtedness with the same term as assumed above; provided, however, in the case of any Phase 2 BANs intended to be paid with proceeds of a draw on the TIFIA 2024 Loan Agreement, the payment terms contained in the TIFIA 2024 Loan Agreement shall be utilized for purposes of calculating the Long-Term Debt Service Requirement with respect to the Phase 2 BANs;"

(v) ""Phase 2 BANs" means Revenue Bond Anticipation Notes issued to pay costs of the 2024 Additional Project, which are intended to be paid by a draw on the TIFIA Series 2024 Bond."

(vi) The definition of "Principal" is revised to read as follows:

""Principal" has the ordinary meaning for such term, except in the following contexts: (a) with respect to any Capital Appreciation Bond, "Principal" refers to the Accreted Amount thereof (the difference between the stated amount to be paid at maturity and the Accreted Amount being deemed unearned interest) except as used in connection with the authorization and issuance of Bonds and with the order of priority of payments of Bonds after an Event of Default, in which case "Principal" means the initial public offering price of a Capital Appreciation Bond and the difference between the Accreted Amount and the initial public offering price shall be deemed to be interest, (b) with respect to any Current Interest Bond, "Principal" refers to the principal amount of such Bond or Indebtedness payable at maturity or in satisfaction of a Sinking Fund Requirement, if applicable, (c) with respect to any Convertible CAB Bond, "Principal" refers to the Accreted Amount thereof through and after the respective Convertible CAB Bond Conversion Date except as used in connection with the authorization and issuance of Bonds and with the order of priority of payments of Bonds after an Event of Default, in which cases "Principal" or "principal" means, if on or before the Convertible CAB Bond Conversion Date, the initial principal amount of a Convertible CAB Bond and the difference between the Accreted Amount and the initial principal amount shall be deemed to be interest, or, if after the Convertible CAB Bond Conversion Date, the Accreted Amount as of such Convertible CAB Bond Conversion Date, and (d) with respect to the TIFIA Series 2021 Bond and the TIFIA Series 2024 Bond, "Principal" refers to the principal portions of the applicable TIFIA Mandatory Debt Service and the applicable TIFIA Scheduled Debt Service."

(vii) Subsection (e) of the definition of "Receipts" is hereby revised to read as follows:

"(e) the investment income realized on, and the income and gains realized upon the maturity or sale of, securities held by or on behalf of the Authority in the Revenue Fund, provided, however, there shall not be included in the calculation of Receipts for purposes of the Rate Covenant (as defined in each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect) or the test with respect to the issuance of additional Indebtedness such amounts;"

(viii) The definition of "Renewal and Replacement Fund Requirement" is hereby revised to read as follows:



""Renewal and Replacement Fund Requirement" means for each Fiscal Year commencing in the first full Fiscal Year after the Substantial Completion Date, an amount equal to (a) one hundred percent (100%) of the total Renewal and Replacement Expenses for the Triangle Expressway System set forth in the Annual Budget for the current Fiscal Year plus (b) one-tenth (1/10) of the total budgeted Renewal and Replacement Expenses for the Triangle Expressway System for each of the next succeeding nine Fiscal Years as set forth in (i) if either or both of the TIFIA Series 2021 Bond and the TIFIA Series 2024 Bond remains Outstanding, the Financial Plan (as defined in each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect) and (ii) if neither the TIFIA Series 2021 Bond nor the TIFIA Series 2024 Bond remains Outstanding, the Annual Budget and Capital Improvement Plan adopted by the Authority."

(ix) The definition of "Senior Lien Bonds" is hereby revised to read as follows:

""Senior Lien Bonds" means any Bonds secured on a parity with each other and any Senior Lien Parity Debt and Senior Lien Derivative Agreement Regularly Scheduled Payment by this Trust Agreement, including, upon the occurrence of a Bankruptcy Related Event, each of the TIFIA Series 2021 Bond and the TIFIA Series 2024 Bond."

(x) ""Series 2019 Bond Insurer" shall have the meaning set forth in the Fourth Supplemental Trust Agreement."

(xi) ""Series 2019 Debt Service Reserve Policy" shall have the meaning set forth in the Fourth Supplemental Trust Agreement."

(xii) ""Series 2024 Bond Insurer" shall have the meaning set forth in the Sixth Supplemental Trust Agreement."

(xiii) ""Series 2024 Bond Insurer" shall have the meaning set forth in Section 501(i) of the Sixth Supplemental Trust Agreement."

(xiv) ""Series 2024 Debt Service Reserve Policy" shall have the meaning set forth in the Sixth Supplemental Trust Agreement."

(xv) ""Sixth Supplemental Trust Agreement" means the Sixth Supplemental Trust Agreement, dated as of January 1, 2024, between the Authority and the Trustee, supplementing and amending the Amended and Restated Trust Agreement."

(xvi) The definition of "TIFIA Indebtedness" is hereby revised to read as follows:

> ""TIFIA Indebtedness" means, if Outstanding, the TIFIA Series 2009 Bond, the TIFIA Series 2021 Bond, the TIFIA Series 2024 Bond and any additional bonds or other secured loan from USDOT, as lender, to the Authority, as borrower, pursuant the TIFIA Loan Agreement and to the Transportation Infrastructure Finance and Innovation Act of 1998, as codified as 23 U.S.C. §60l *et seq.,* as the same may be amended from time to time, with respect to the Triangle Expressway System, and secured by the pledge, charge and lien on the Trust Estate in the manner provided in Section 503."

(xvii) The definition of "TIFIA Loan Agreement" is hereby revised to read as follows:

> ""TIFIA Loan Agreement" means the TIFIA 2009 Loan Agreement, the TIFIA 2021 Loan Agreement, the TIFIA 2024 Loan Agreement and any other comparable agreement between the Authority and USDOT, so long as the TIFIA Indebtedness related thereto is Outstanding. The TIFIA Series 2009 Bond is not Outstanding as of the date of this Amended and Restated Trust Agreement, and the TIFIA 2009 Loan Agreement has been terminated."

(xviii) The definition of "TIFIA Mandatory Debt Service" is hereby revised to read as follows:

> ""TIFIA Mandatory Debt Service" shall have the meaning set forth in each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect."

(xix) The definition of "TIFIA Scheduled Debt Service" is hereby revised to read as follows:

> ""TIFIA Scheduled Debt Service" shall have the meaning set forth in each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect."

(xx) ""TIFIA 2024 Loan Agreement" means the loan agreement entered into between USDOT and the Authority, including any supplements or amendments thereto, with respect to the TIFIA Series 2024 Bond."

(xxi) ""TIFIA Series 2024 Bond" means the North Carolina Turnpike Authority Triangle Expressway Revenue Bond, TIFIA Series 2024, to evidence the obligation of the Authority to repay the loan under the TIFIA 2024 Loan Agreement."

(xxii) ""TIFIA Series 2024 Debt Service Reserve Policy" shall have the meaning set forth in the Sixth Supplemental Trust Agreement."

(b) Clause (iv) of the fifth paragraph of Section 208 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

> "(iv) (A) if the TIFIA Series 2021 Bond remains Outstanding, evidence of compliance with Section 17(a) of the TIFIA 2021 Loan Agreement, and (B) if the TIFIA Series 2024 Bond remains Outstanding, evidence of compliance with Section 16(a) of the TIFIA 2024 Loan Agreement;"

(c) The final paragraph of Section 211 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

> "Notwithstanding anything else herein to the contrary, Phase 2 BANs may be issued without meeting the requirements of subsection (d) other than to file evidence that such Revenue Bond Anticipation Notes will be Senior Lien Indebtedness or Subordinate Lien Indebtedness, provided that the Phase 2 BANs shall be assumed to amortize over the same period and in the same amounts as the TIFIA Series 2024 Bond."

(d) Subsection (a) of Section 213 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

> "(a) Senior Lien Parity Debt, Subordinate Lien Parity Debt and Junior Indebtedness may be incurred by the Authority from time to time for any purpose for which Bonds may be issued under Section 208; provided if TIFIA Indebtedness is Outstanding, written consent of USDOT is required for the issuance of (i) any Subordinate Lien Parity Debt (other than Phase 2 BANs) and (ii) any other Junior Indebtedness."

(e) The final paragraph of Section 407 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

> "Upon the later of (a) the receipt of such certificate or (b) the date of final disbursement of the TIFIA Loan (as defined in the TIFIA 2024 Loan Agreement), the Trustee shall withdraw all money then remaining in the relevant account or subaccount in the Project Fund in excess of the amount then needed for completion of the remainder of the Initial Project or the Additional Project and apply the same, subject to Section 604, upon direction of the Authority, to the Restricted Account of the General Reserve Fund or to the Senior Lien Debt Service Fund."

(f) Subsection (i) of Section 503 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"(i) to a Bond Insurer for Insured Bonds, including the Series 2009B Bond Insurer, the Series 2017 Bond Insurer, the Series 2018 Bond Insurer, the Series 2019 Bond Insurer and the Series 2024 Bond Insurer, any Series 2024 Bond Insurer Installment Premium and any fees and interest, including Excess Interest, due to such Bond Insurer in excess of the amount of principal and interest paid by it with respect to such Insured Bonds, to any provider of a Reserve Alternative Instrument, including the Series 2024 Debt Service Reserve Policy and the TIFIA 2024 Debt Service Reserve Policy, any fees and interest payable to such provider in excess of the amount paid to it from the applicable Senior Lien Parity Reserve Account, Senior Lien Special Reserve Account, Subordinate Lien Parity Reserve Account or Subordinate Lien Special Reserve Account, and to any Credit Provider of a Credit Facility other than a Bond Insurance Policy or a Reserve Alternative Instrument, any fees and interest payable to such Credit Provider in excess of the amount paid to it directly or indirectly from subsection (a) through (h) above, provided that, to the extent there are insufficient amounts available pursuant to this subsection for all amounts due hereunder, amounts due relating to Senior Lien Bonds shall be paid first;"

(g) Subsection (o) of Section 503 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"(o) (i) for so long as the TIFIA Series 2021 Bond remains Outstanding, in the event that the Authority has failed to comply with the Rate Coverage Test set forth in Section 16(m)(i) of the TIFIA 2021 Loan Agreement for thirty (30) consecutive months and (ii) for so long as the TIFIA Series 2024 Bond remains Outstanding, in the event that the Authority has failed to comply with the Rate Coverage Test set forth in Section 15(m)(i) of the TIFIA 2024 Loan Agreement for thirty (30) consecutive months, to the mandatory prepayment of the TIFIA Series 2021 Bond, the TIFIA Series 2024 Bond and any Senior Lien Indebtedness in accordance with the Special Redemption Arrangement; and"

(h) Subsection (p) of Section 503 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"(p) after all deposits are made in accordance with subsections (a) through (o) above, any remaining moneys shall be deposited in the General Reserve Fund, provided, however, that for so long as either or both of the TIFIA Series 2021 Bond and the TIFIA Series 2024 Bond are Outstanding, all remaining moneys shall be deposited in accordance with the requirements of Section 514(b)."



(i) The third paragraph following Subsection (p) of Section 503 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"With respect to the Guarantee Repayments and the mandatory prepayments required by paragraphs (n) and (o) above, respectively, the Authority shall provide to USDOT a certificate demonstrating satisfaction of the requirements for such prepayment set forth in Section 8(d) of the TIFIA 2021 Loan Agreement and Section 8(d) of the TIFIA 2024 Loan Agreement, as applicable."

(j) The final paragraph of Section 503 of the Amended and Restated Trust Agreement, as added pursuant to Section 506 of the Fifth Supplemental Trust Agreement, is hereby revised to read as follows:

"Notwithstanding the foregoing, beginning upon issuance of the Phase 2 BANs, if any, so long as there is no Event of Default and the Authority still expects to apply for and receive disbursements under the TIFIA 2024 Loan Agreement sufficient in amount to pay principal of the Phase 2 BANs at their maturity, the terms "Senior Lien Bonds" and "Senior Lien Parity Debt" in Section 503(b) of this Trust Agreement shall not include the Phase 2 BANs. No such change in such defined terms applies to any other reference thereto. For the avoidance of doubt, the reason for such amendment is to avoid Revenue Fund amounts being deposited into the Principal Account for principal payments on the Phase 2 BANs so long as such payments are expected to be made from disbursements under the TIFIA 2024 Loan Agreement transferred thereto from the applicable subaccount of the Additional Projects Account."

(k) Subsection (b) of Section 514 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"(b) For so long as either or both of the TIFIA Series 2021 Bond and the TIFIA Series 2024 Bond remain Outstanding and in accordance with Section 503(p), moneys shall be deposited to the General Reserve Fund in accordance with the following provisions:"

(l) The fourth paragraph of Section 518 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"The aforementioned pledge, charge and lien upon the Trust Estate shall not inhibit the sale or disposition of any portion of the Triangle Expressway System in accordance with this Trust Agreement and the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement, to the extent each such TIFIA Loan Agreement remains in effect, and shall not impair or restrict the ability of the Authority to invest in securities and other forms of investment, subject to the provisions of this Trust Agreement."

(m) The second paragraph of Section 602 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"Except otherwise provided in (a) this Section with respect to the Senior Lien Parity Reserve Account, Subordinate Lien Parity Reserve Account, Junior Indebtedness Debt Service Reserve Account and TIFIA Debt Service Reserve Account, (b) if the TIFIA Series 2021 Bond is Outstanding, Section 16(k)(iv) of the TIFIA 2021 Loan Agreement and (c) if the TIFIA Series 2024 Bond is Outstanding, Section 15(k)(iv) of the TIFIA 2024 Loan Agreement, Investment Obligations shall mature or be redeemable at the option of the holder thereof not later than the respective dates when the money held for the credit of such funds, accounts and subaccounts will be required for the purposes intended."

(n) The final paragraph of Section 603 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"Whenever the value of the cash and Investment Obligations in the TIFIA Debt Service Reserve Account held by the Trustee, plus accrued interest to the date of valuation, is greater than the TIFIA Debt Service Reserve Account Requirement, the Authority shall be entitled to transfer such excess to the subaccount for the TIFIA Series 2021 Bond and the TIFIA Series 2024 Bond within the Interest Account of the Senior Lien Debt Service Fund (if a Bankruptcy Related Event has occurred) or the subaccount for the TIFIA Series 2021 Bond and the TIFIA Series 2024 Bond within the TIFIA Interest Account of the Junior Indebtedness Debt Service Fund (if no Bankruptcy Related Event has occurred); provided, however, that nothing herein shall require the Authority to liquidate or sell any Investment Obligation held in the TIFIA Debt Service Reserve Account for purposes of making such transfer."

(o) Subsection (i) of Section 704 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"(i) Pursuant to Section 723, the Authority also agrees to comply with (i) the rate covenant set forth in the TIFIA 2021 Loan Agreement for so long as the TIFIA Series 2021 Bond is Outstanding and (ii) the rate covenant set forth in the TIFIA 2024 Loan Agreement for so long as the TIFIA Series 2024 Bond is Outstanding."

(p) Subsection (a)(ii) of Section 709 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"(ii) first, to the redemption or prepayment of Senior Lien Indebtedness, if any, pro rata to the extent practicable in the manner provided in the Senior Lien Resolutions; second, to the redemption or prepayment of Subordinate Lien Indebtedness, if any, pro rata to the extent practicable in the manner provided in the Subordinate Lien Resolutions; and third, to the



redemption or prepayment of Junior Indebtedness, if any, pro rata to the extent practicable in the manner provided in the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement; provided, however, that Senior Lien Indebtedness, Subordinate Lien Indebtedness and Junior Indebtedness may be redeemed or prepaid only if (A) the Triangle Expressway System has not been restored to substantially the same condition as prior to such damage, destruction or taking or (B) the licensed architect or engineer employed by the Authority has been unable to make the statement required by subsection (a)(i)(C) of this Section; or"

(q) The final paragraph of Section 716 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"Notwithstanding the remainder of this Section, (x) so long as the TIFIA Series 2021 Bond is Outstanding, the issuance of additional Senior Lien Indebtedness is also subject to the requirements of the definition of "Additional Secured Indebtedness" in clauses (b), (c) and (e) thereof in the TIFIA 2021 Loan Agreement; and (y) so long as the TIFIA Series 2024 Bond is Outstanding, the issuance of additional Senior Lien Indebtedness is also subject to the requirements of the definition of "Additional Secured Indebtedness" in clauses (b), (c) and (e) thereof in the TIFIA 2024 Loan Agreement."

(r) Section 722 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"Section 722. Calculations with respect to Capital Appreciation Bonds, Convertible CAB Bonds, TIFIA Series 2021 Bond and TIFIA Series 2024 Bond. Whenever in this Trust Agreement a vote or percentage test is applied to the principal amount of Outstanding Bonds, the Accreted Amount of each Outstanding Capital Appreciation Bond and Convertible CAB Bond shall be used as its principal amount. The Outstanding TIFIA Loan Balance (as defined in each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect) shall be used as the principal amount of the TIFIA Series 2021 Bond and the TIFIA Series 2024 Bond."

(s) Section 723 of the Amended and Restated Trust Agreement is hereby revised to read as follows:

"Section 723 Special TIFIA Provisions. Terms not defined in this Section or in Section 101 shall have the meanings therefor set forth in each of (x) the TIFIA 2021 Loan Agreement so long as the TIFIA Series 2021 Bond remains Outstanding and (y) the TIFIA 2024 Loan Agreement so long as the TIFIA Series 2024 Bond remains Outstanding, provided that, for the avoidance of doubt, defined terms that refer to a

distinct series of TIFIA Indebtedness in each TIFIA Loan Agreement shall include each such series of TIFIA Indebtedness when used in this Trust Agreement to the extent such TIFIA Indebtedness remains Outstanding. In addition, (1) for so long as the TIFIA Series 2021 Bond remains Outstanding, the Authority shall comply with the provisions of the TIFIA 2021 Loan Agreement, and (2) for so long as the TIFIA Series 2024 Bond remains Outstanding, the Authority shall comply with the provisions of the TIFIA 2024 Loan Agreement, including, but not limited to, the following:

(a) Required Notifications Prior to Changes. The Authority shall provide USDOT with the following notifications:

(i) The retention by the Authority of any General Engineering Consultant other than HNTB North Carolina, P.C., will not be effective if objected to by USDOT within fifteen (15) Business Days after receiving notice from the Authority of the name of the proposed General Engineering Consultant, together with supporting information regarding the qualifications of the proposed firm; and

(ii) The retention by the Authority of any firm as Traffic Consultant other than CDM Smith will not be effective if objected to by USDOT within fifteen (15) Business Days after receiving notice from the Authority of the name of the proposed Traffic Consultant, together with supporting information regarding the qualifications of the proposed firm.

(b) Required Approvals. The prior written approval of USDOT shall be required as follows:

(i) For the issuance or incurrence of any Senior Lien Indebtedness, Subordinate Lien Indebtedness or Junior Lien Indebtedness, as described in or otherwise permitted in the definition of "Additional Secured Indebtedness" in each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect;

(ii) For the use of any Reserve Alternative Instrument, provided that such approval shall not be required in connection with any Reserve Alternative Instrument relating to Existing Senior Bonds (as defined in each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect), the TIFIA



Series 2021 Bond or the TIFIA Series 2024 Bond, including any endorsement thereto or policy in replacement thereof which increases the stated policy limit or extends the termination date;

(iii) For any Credit Facility, other than any Bond Insurance Policy or Reserve Alternative Instrument provided in connection with the Series 2019 Bonds, the TIFIA Series 2021 Bond, the Series 2024 Bonds, the TIFIA Series 2024 Bond or any Senior Lien Bonds issued by the Authority and otherwise meeting the requirements of this Trust Agreement and the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect;

(iv) For any Derivative Agreement;

(v) The method of calculation of debt service on any Additional Bonds, Parity Debt or other Indebtedness including but not limited to Derivative Indebtedness, Grant Anticipation Notes, Long-Term Indebtedness, Put Indebtedness, Revenue Bond Anticipation Notes, Short-Term Indebtedness, and Variable Rate Indebtedness to be used when calculating debt service or determining reserve requirements or compliance with the covenants contained herein and in the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect;

(vi) The method of calculating payment obligations with respect to Derivative Agreement Additional Payments, Derivative Agreement Regularly Scheduled Payments, Reserve Alternative Instruments and Credit Facilities to be used when calculating debt service or determining reserve requirements or compliance with the covenants contained herein and in the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect;

(vii) The redesignation of a Non-System Project as an Additional Project under Section 715 unless the Authority demonstrates compliance with Section 17(f) of the TIFIA 2021 Loan Agreement and Section 16(f) of the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect; and

(viii) The amendment or modification of this Trust Agreement Documents or the Authority's organizational

documents (other than any amendment or modification that is of a ministerial nature).

(c) Controlling Provisions.

(i) In addition to the covenants set forth in Article VII of this Trust Agreement, including but not limited to Section 704, the Authority must comply also with the covenants set forth in the TIFIA 2021 Loan Agreement, including in Section 16 and 17 of the TIFIA 2021 Loan Agreement, and the TIFIA 2024 Loan Agreement, including Sections 15 and 16 of the TIFIA 2024 Loan Agreement, for so long as each such TIFIA Loan Agreement remains in effect.

(ii) Investment Obligations only meet the definition of Investment Obligations if they are permitted by each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect and authorized by Section 159-30 of the NCGS.

(iii) Permitted Encumbrances means "Permitted Liens" as defined in each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect.

(iv) Neither the TIFIA Series 2021 Bond nor the TIFIA Series 2024 Bond may be defeased without the prior written consent of USDOT.

(v) To the extent any term or provision in this Trust Agreement relating to the TIFIA Series 2021 Bond or the TIFIA Series 2024 Bond is in conflict with terms or provisions in the TIFIA 2021 Loan Agreement or the TIFIA 2024 Loan Agreement, respectively, then the terms and provisions in the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement, as applicable, shall control unless such action would have a material adverse effect upon the security for, or the timing or amount of payments to be made to, holders of any Secured Indebtedness (as defined in each of the TIFIA 2021 Loan Agreement and the TIFIA 2024 Loan Agreement for so long as each such TIFIA Loan Agreement remains in effect) or the methodology for remedies and payments resulting therefrom set forth in this Trust Agreement."



## ARTICLE VIII

## MISCELLANEOUS PROVISIONS

Section 801. Manner of Giving Notice. All notices, demands and requests to be given to or made hereunder by the Authority, the Local Government Commission, the Trustee, the Bond Registrar or the Series 2024 Bond Insurer shall be given or made in writing and shall be deemed to be properly given or made if sent by United States registered or certified mail, return receipt requested postage prepaid, addressed as follows:

| | | |
|---|---|---|
| (a) | As to the Authority – | North Carolina Turnpike Authority<br>1 South Wilmington Street<br>1578 Mail Service Center<br>Raleigh, NC 27699-1578 |
| | With a copy to – | NCDOT Secretary<br>1 South Wilmington Street<br>1501 Mail Service Center<br>Raleigh, NC 27699-1501 |
| | And to – | NCDOT CFO<br>1 South Wilmington Street<br>1514 Mail Service Center<br>Raleigh, NC 27699-1515 |
| (b) | As to the Trustee or Bond Registrar – | Computershare Trust Company, N.A.<br>1505 Energy Park Drive<br>St. Paul, Minnesota 55108<br>Attention: Cody Fedorishen, Corporate Trust Services<br>Phone: (215) 285-8737<br>Fax: (7817) 364-3306<br>Email: Cody.Fedorishen@computershare.com |
| (c) | As to the Local Government Commission – | North Carolina Local Government Commission<br>3200 Atlantic Avenue<br>Raleigh, NC 27604<br>Attention: Secretary |

(d) As to the Series 2024 Bond Insurer

Assured Guaranty Municipal Corp.
1633 Broadway
New York, NY 10019
Attention: Managing Director
Surveillance, Re: Policy No. [_____]
Phone: (212) 974-0100
Fax: (212) 339-3556

Any such notice, demand or request may also be transmitted to the appropriate above-mentioned party by e-mail or telephone and shall be deemed to be properly given or made at the time of such transmission if, and only if, such transmission of notice shall be confirmed by reasonable means.

Any of such addresses may be changed at any time upon written notice of such change sent by United States mail, postage prepaid, to the other parties by the party effecting the change.

Section 802. Substitute Mailing. If, because of the temporary or permanent suspension of postal service, the Authority, the Local Government Commission, the Trustee or the Bond Registrar shall be unable to mail any notice required to be given by the provisions of this Sixth Supplemental Trust Agreement, such party shall give notice in such other manner as in the judgment of such party shall most effectively approximate mailing, and the giving of notice in such manner shall for all purposes of this Sixth Supplemental Trust Agreement be deemed to be in compliance with the requirement for the mailing thereof.

Section 803. Authority, Trustee, Bond Registrar, Owners, TIFIA and Series 2024 Bond Insurer Alone Have Rights under Supplemental Agreement. Except as herein otherwise expressly provided, nothing in this Sixth Supplemental Trust Agreement, express or implied, is intended or shall be construed to confer upon any person, firm or corporation, other than the Authority, the Trustee, the Bond Registrar, the Owners of the Series 2024 Bonds, TIFIA and the Series 2024 Bond Insurer, any right, remedy or claim, legal or equitable, under or by reason of this Sixth Supplemental Trust Agreement or any provision being intended to be and being for the sole and exclusive benefit of the Authority, the Trustee, the Bond Registrar, the Owners of the Series 2024 Bonds, TIFIA and the Series 2024 Bond Insurer.

Section 804. Effect of Partial Invalidity. In case any one or more of the provisions of this Sixth Supplemental Trust Agreement or the Series 2024 Bonds shall for any reason be held to be illegal or invalid, such illegality or invalidity shall not affect any other provisions of this Sixth Supplemental Trust Agreement or the Series 2024 Bonds, but this Sixth Supplemental Trust Agreement and the Series 2024 Bonds shall be construed and enforced as if such illegal or invalid provisions had not been contained therein. In case any covenant, stipulation, obligation or agreement contained in this Sixth Supplemental Trust Agreement or the Series 2024 Bonds shall



for any reason be held to be in violation of law, then such covenant, stipulation, obligation or agreement shall be deemed to be the covenant, stipulation, obligation or agreement of the Authority to the full extent permitted by law.

Section 805. Effect of Covenants; Governing Law. All covenants, stipulations, obligations and agreements of the Authority contained in this Sixth Supplemental Trust Agreement shall be deemed to be covenants, stipulations, obligations and agreements of the Authority to the full extent permitted by the Constitution and laws of the State. This Sixth Supplemental Trust Agreement is executed and delivered with the intent that the laws of the State shall govern this construction.

Section 806. Headings. Any heading preceding the text of the several articles hereof, any table of contents or marginal notes appended to copies hereof, shall be solely for convenience of reference and shall not constitute a part of this Sixth Supplemental Trust Agreement, nor shall they affect its meaning, construction or effect.

Section 807. Further Authority. The officers of the Authority, attorneys, engineers and other agents or employees of the Authority are hereby authorized to do all acts and things required of them by this Sixth Supplemental Trust Agreement for the full, punctual and complete performance of all of the terms, covenants and agreements contained in the Series 2024 Bonds and this Sixth Supplemental Trust Agreement.

Section 808. Payment or Performance Due on Holidays. If the date for making any payment or the last day for performance of any act or the exercising of any right as provided in this Sixth Supplemental Trust Agreement is not a Business Day, such payment may be made or act performed or right exercised on the next Business Day with the same force and effect as if done on the date provided in this Sixth Supplemental Trust Agreement.

Section 809. Multiple Counterparts. This Sixth Supplemental Trust Agreement may be executed in multiple counterparts, each of which shall be regarded for all purposes as an original, and such counterparts shall constitute but one and the same instrument.

Section 810. E-Verify. The Trustee understands that "E-Verify" is a federal program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law in accordance with Section 64-25(5) of the NCGS. The Trustee uses E-Verify to verify the work authorization of its employees in accordance with Section 64-26(a) of the NCGS. The Trustee will require that any subcontractor that it uses in connection with the transactions contemplated by this Sixth Supplemental Trust Agreement certify to such subcontractor's compliance with E-Verify.

Section 811. Iran Divestment Act. As of the date of this Sixth Supplemental Trust Agreement, the Trustee is not included on a list of persons engaged in investment activities in Iran created and maintained by the North Carolina Department of State Treasurer pursuant to Section 147-86.58 of the Iran Divestment Act of 2015, Article 6E, as amended, of Chapter 147 of the NCGS. The Trustee will not knowingly utilize any subcontractor that is listed on any such list in connection with the transactions contemplated by this Sixth Supplemental Trust Agreement.

[Remainder of Page Left Intentionally Blank]



IN WITNESS WHEREOF, the Authority and the Trustee have caused this Sixth Supplemental Trust Agreement to be executed in their respective names by their respective duly authorized representatives all as of the date first written above.

NORTH CAROLINA TURNPIKE AUTHORITY

By:_____
Name: Joseph R. Hopkins, P.E.
Title: Chairman

COMPUTERSHARE TRUST COMPANY, N.A.,
Trustee, as successor to Wells Fargo Bank,
National Association, as Master Trustee

By:_____
Name:_____
Title:_____

**EXHIBIT A**

**FORM OF SERIES 2024A BOND**

RA-___ $_____

United States of America
State of North Carolina

NORTH CAROLINA TURNPIKE AUTHORITY
TRIANGLE EXPRESSWAY SYSTEM SENIOR LIEN
TURNPIKE REVENUE BOND
SERIES 2024A

| Interest Rate | Maturity Date | CUSIP |
|---|---|---|
| ___% | January 1, 20__ | |

The North Carolina Turnpike Authority (the "Authority"), a political subdivision within the Department of Transportation ("NCDOT") of the State of North Carolina, hereby promises to pay, but solely from the sources and in the manner hereinafter provided, to CEDE & CO. or registered assigns or legal representative, on the maturity date set forth above (or earlier as hereinafter referred to), upon the presentation and surrender hereof at the designated corporate trust office of Computershare Trust Company, N.A., in St. Paul, Minnesota (the "Bond Registrar"), as successor to Wells Fargo, National Association, the principal sum of _____ DOLLARS ($_____).

The Authority also promises to pay, but solely from said sources, interest on this bond (calculated on the basis of a 360-day year consisting of twelve 30-day months) from the interest payment date next preceding the date on which it is authenticated, unless it is authenticated on an interest payment date, in which event it shall bear interest from such interest payment date, or it is authenticated prior to July 1, 2024, in which event it shall bear interest from its date, payable on January 1 and July 1 of each year, beginning July 1, 2024, at the rate per annum set forth above until the principal sum hereof is paid. The interest so payable and punctually paid or duly provided for on any interest payment date will be paid to the person in whose name this bond is registered at the close of business on the Regular Record Date for such interest, which shall be the 15th day (whether or not a Business Day) of the calendar month next preceding such interest payment date. Any such interest not so punctually paid or duly provided for shall forthwith cease to be payable to the registered owner on such Regular Record Date, and may be paid to the person in whose name this bond is registered at the close of business on a Special Record Date for the payment of such defaulted interest to be fixed by the Trustee (hereinafter defined), notice whereof being given to the registered owners not less than 10 days



prior to such Special Record Date, or may be paid at any time in any other lawful manner not inconsistent with the requirements of any securities exchange on which the Series 2024A Bonds (hereinafter defined) may be listed and upon such notice as may be required by such exchange, or as more fully provided in the Trust Agreement. All such payments shall be made in such coin or currency of the United States of America as at the time of payment is legal tender for payment of public and private debts.

This bond is one of a duly authorized series of revenue bonds of the Authority designated "Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A" (the "Series 2024A Bonds"), issued under and pursuant to the Constitution and laws of the State of North Carolina, including the Act, a Bond Order of the Authority adopted on October 31, 2023, authorizing the issuance of the Series 2024A Bonds, and an Amended and Restated Trust Agreement, dated as of December 1, 2019, between the Authority and Computershare Trust Company, N.A., as successor trustee (in such capacity, the "Trustee"), as supplemented and amended by a Fifth Supplemental Trust Agreement, dated as of October 1, 2020, as amended by a First Supplement to Fifth Supplemental Trust Agreement, dated as of August 1, 2021, and a Sixth Supplemental Trust Agreement, dated as of January 1, 2024 (the "Sixth Supplemental Trust Agreement" and, collectively, the "Trust Agreement"). The Series 2024A Bonds, together with the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds) (the "Series 2024B Bonds" and, together with the Series 2024A Bonds, the "Series 2024 Bonds"), are being issued to provide funds, together with other available funds, to (a) pay the costs of land acquisition for and design, construction and equipping of an extension of the Triangle Expressway System from I-40 to I-87/U.S. 64/U.S. 264, (b) pay certain interest on certain Series 2024A Bonds, (c) pay the premium on a bond insurance policy for the Series 2024 Bonds, (d) pay the premium for a debt service reserve insurance policy with respect to the Series 2024 Bonds and (e) pay the costs incurred in connection with the issuance of the Series 2024 Bonds. All terms not defined herein have the meanings therefor set forth in the Trust Agreement.

The Series 2024A Bonds are being issued by means of a book-entry system with no physical distribution of bond certificates to be made except as provided in the Sixth Supplemental Trust Agreement. One bond certificate with respect to each date on which the Series 2024A Bonds are stated to mature, in the aggregate principal amount of the Series 2024A Bonds stated to mature on such date and registered in the name of Cede & Co., a nominee of The Depository Trust Company, New York, New York ("DTC"), is being issued and required to be deposited with DTC and immobilized in its custody. The book-entry system will evidence ownership of the Series 2024A Bonds in the principal amount of $5,000 or any whole multiple thereof, with transfers of ownership effected on the records of DTC and its participants pursuant to rules and procedures established by DTC and its participants. Transfer of principal and interest payments to beneficial owners of the Series 2024A Bonds by participants of DTC will be the responsibility of such participants and other nominees

of such beneficial owners. The Authority will not be responsible or liable for such transfers of payments or for maintaining, supervising or reviewing the records maintained by DTC, its participants or persons acting through such participants. While Cede & Co. is the registered owner of this bond, notwithstanding the provisions hereinabove contained, payments of principal of and interest on this bond shall be made in accordance with the existing arrangements between the Bond Registrar and DTC.

The Series 2024A Bonds are special obligations of the Authority secured by a pledge, charge and lien upon Receipts. The Authority is not obligated to pay the principal of or the interest on the Series 2024A Bonds except as provided in the Trust Agreement from Receipts or certain other monies made available therefor under the Trust Agreement, and neither the faith and credit nor the taxing power of the State of North Carolina or any political subdivision thereof or the Authority is pledged to the payment of the principal of and the interest on the Series 2024A Bonds. The Trust Agreement provides for the issuance or incurrence from time to time under the conditions, limitations and restrictions therein set forth of additional bonds and Senior Lien Parity Debt secured pari passu as to the pledge of Receipts with the Series 2024A Bonds.

Reference is made to the Trust Agreement for a more complete statement of the provisions thereof and of the rights of the Authority, the Trustee and the registered owners of the Series 2024A Bonds. Copies of the Trust Agreement will be available for inspection by any registered owner of the Series 2024A Bonds at all reasonable times at the designated corporate trust office of the Trustee. By the purchase and acceptance of this bond, the registered owner hereof signifies assent to all of the provisions of the Trust Agreement, including the amendments made by the Sixth Supplemental Trust Agreement.

At the designated corporate trust office of the Bond Registrar, in the manner and subject to the conditions provided in the Trust Agreement, Series 2024A Bonds may be exchanged for an equal aggregate principal amount of Series 2024A Bonds of the same maturity, of authorized denominations and bearing interest at the same rate.

The Series 2024A Bonds are subject to redemption, at the option of the Authority, in whole or in part on any date on or after January 1, 2034, from any moneys that may be available for such purpose, at a Redemption Price equal to 100% of the principal amount of the Series 2024A Bonds to be redeemed, plus accrued interest to the date fixed for redemption, all in the manner provided in the Trust Agreement.

The Series 2024A Bonds maturing on January 1, 2058, are subject to mandatory redemption in part on each January 1 in the years and principal amounts set forth below from moneys deposited to the credit of the Sinking Fund Account, at



a Redemption Price equal to 100% of the principal amount of such Series 2024A Bonds to be redeemed, plus accrued interest to the date fixed for redemption:

| Year | Amount |
|---|---|
| 2055 | $42,405,000 |
| 2056 | 66,690,000 |
| 2057 | 71,855,000 |
| 2058* | 77,335,000 |

* Final maturity.

At least thirty (30) days but not more than sixty (60) days prior to the date fixed for redemption of any Series 2024A Bonds to be redeemed, whether such redemption is in whole or in part, the Bond Registrar shall cause a notice of any such redemption signed by the Bond Registrar to be mailed, first class, postage prepaid, to all registered owners of Series 2024A Bonds to be redeemed in whole or in part, provided that failure to mail any such notice to any registered owner or any defect in such notice shall not affect the validity of the proceedings for such redemption as to the Series 2024A Bonds of any other registered owner to whom such notice is properly given.

On the date designated for redemption, notice having been given as aforesaid, the Series 2024A Bonds or portions thereof so called for redemption shall become due and payable at the Redemption Price provided for the redemption of such Series 2024A Bonds or such portions thereof on such date plus accrued interest to such date.

If less than all of the Series 2024A Bonds are to be called for redemption, the Series 2024A Bonds to be so redeemed shall be called for redemption in the manner that the Authority shall determine as set forth in an Officer's Certificate filed with the Trustee. If less than all the Series 2024A Bonds of any one maturity are called for redemption, the Bond Registrar shall select the Series 2024A Bonds to be redeemed by lot, each $5,000 portion of principal being counted as one Series 2024A Bond for this purpose; provided, however, that so long as the only registered owner of the Series 2024A Bonds is Cede & Co., such selection shall be made by DTC.

Any notice of redemption may state that the redemption to be effected is conditioned upon the receipt by the Trustee or Bond Registrar on or prior to the redemption date of moneys sufficient to pay the principal of and premium, if any, and interest on the Series 2024A Bonds to be redeemed and that if such moneys are not so received such notice shall be of no force or effect and such Series 2024A Bonds shall not be required to be redeemed. In the event that such notice contains such a condition and moneys sufficient to pay the principal of and premium, if any, and interest on such Series 2024A Bonds are not received by the Trustee or Bond Registrar on or prior to the date fixed for redemption, the redemption shall not be made and the Bond Registrar shall within a reasonable time thereafter give notice,

in the manner in which the notice of redemption was given, that such moneys were not so received.

The registered owner of this bond shall have no right to enforce the provisions of the Trust Agreement or to institute action to enforce the covenants therein, or to take any action with respect to any event of default under the Trust Agreement, or to institute, appear in or defend any suit or other proceeding with respect thereto, except as provided in the Trust Agreement.

Modifications or alterations of the Trust Agreement or of any supplement to the Trust Agreement thereto may be made only to the extent and in the circumstances permitted by the Trust Agreement.

This bond, notwithstanding the provisions for registration of transfer stated herein and contained in the Trust Agreement, at all times shall be, and shall be understood to be, an investment security within the meaning of and for all the purposes of Article 8 of the Uniform Commercial Code of North Carolina. This bond is issued with the intent that the laws of the State of North Carolina shall govern its construction.

All acts, conditions and things required to happen, exist and be performed precedent to and in connection with the issuance of this bond and the execution and delivery of the Trust Agreement have happened, exist and have been performed as so required.

This bond shall not be valid or become obligatory for any purpose or be entitled to any benefit or security under the Trust Agreement until it shall have been authenticated by the execution by the Bond Registrar of the certificate of authentication endorsed hereon.



IN WITNESS WHEREOF, the North Carolina Turnpike Authority, by an order duly adopted by its Board, has caused this bond to be manually signed by the Chairman of the Authority and the Secretary-Treasurer of the Authority to impress its corporate seal hereon and to attest the same, all as of the __ th day of _____, 2024.

NORTH CAROLINA TURNPIKE AUTHORITY

_____
Chairman

[SEAL]

_____
Secretary-Treasurer

**CERTIFICATE OF LOCAL GOVERNMENT COMMISSION**

The issuance of the within bond has been approved under the provisions of The State and Local Government Revenue Bond Act.

_____
Secretary
Local Government Commission

**CERTIFICATE OF AUTHENTICATION**

This bond is a Bond of the Series designated therein and issued under the provisions of the within mentioned Trust Agreement.

COMPUTERSHARE TRUST COMPANY, N.A., as Bond Registrar, as successor to Wells Fargo Bank, National Association

By:_____
Authorized Signatory

Date of authentication: _____, ____

**STATEMENT OF INSURANCE**

Assured Guaranty Municipal Corp. ("AGM"), New York, New York, has delivered its municipal bond insurance policy (the "Policy") with respect to the scheduled payments due of principal of and interest on this Series 2024A Bond to Computershare Trust Company, N.A., as Trustee and Registrar on behalf of the holders of the Series 2024A Bonds (the "Paying Agent"). Said Policy is on file and available for inspection at the principal office of the Paying Agent and a copy thereof may be obtained from AGM or the Paying Agent. All payments required to be made under the Policy shall be made in accordance with the provisions thereof. The owner of this Series 2024A Bond acknowledges and consents to the subrogation rights of AGM as more fully set forth in the Policy.



**ASSIGNMENT**

FOR VALUE RECEIVED the undersigned hereby sells, assigns and transfers unto

_____

_____.

PLEASE INSERT SOCIAL SECURITY NUMBER
OR OTHER IDENTIFYING NUMBER OF ASSIGNEE

_____

_____

_____

PLEASE PRINT OR TYPEWRITE NAME AND ADDRESS OF TRANSFEREE _____

_____

the within bond and all right thereunder, and hereby irrevocably constitutes and appoints _____, attorney, to transfer the within bond on the books kept for registration thereof, with full power of substitution in the premises.

Dated: _____

In the presence of:

_____ _____

NOTICE: Signature must be guaranteed by an institution which is a participant in the Securities Transfer Agent Medallion Program (STAMP) or similar program.

The signature to this assignment must correspond with the name as it appears upon the face of the within bond in every particular, without alteration or enlargement or any change whatever.

**EXHIBIT B**

**FORM OF SERIES 2024B BOND**

RB-___ $_____

United States of America
State of North Carolina

NORTH CAROLINA TURNPIKE AUTHORITY
TRIANGLE EXPRESSWAY SYSTEM SENIOR LIEN
TURNPIKE REVENUE BOND, SERIES 2024B
(CAPITAL APPRECIATION BONDS)

| Initial Principal | Maturity Amount | Interest Rate | Maturity Date | CUSIP |
|---|---|---|---|---|
| | | % | _____ 1, 20___ | |

The North Carolina Turnpike Authority (the "Authority"), a political subdivision within the Department of Transportation ("NCDOT") of the State of North Carolina, hereby promises to pay, but solely from the sources and in the manner hereinafter provided, to CEDE & CO. or registered assigns or legal representative, on the maturity date set forth above (or earlier as hereinafter referred to), upon the presentation and surrender hereof at the designated corporate trust office of Computershare Trust Company, N.A., in Minneapolis, Minnesota (the "Bond Registrar"), the principal sum of _____ DOLLARS ($_____).

The Authority also promises to pay, but solely from said sources, interest on this bond that shall accrete and compound at the rate per annum set forth above but is payable only at maturity or upon earlier redemption. If paid at maturity, the aggregate amount of principal and interest will be the maturity amount stated above. The amount so payable and punctually paid or duly provided for will be paid to the person in whose name this bond is registered at the close of business on the Regular Record Date for such payment, which shall be the 15th day (whether or not a Business Day) of the calendar month next preceding such payment date. Any such payment not so punctually paid or duly provided for shall forthwith cease to be payable to the registered owner on such Regular Record Date, and may be paid to the person in whose name this bond is registered at the close of business on a Special Record Date for the payment of such defaulted payment to be fixed by the Trustee (hereinafter defined), notice whereof being given to the registered owners not less than 10 days prior to such Special Record Date, or may be paid at any time in any other lawful manner not inconsistent with the requirements of any securities exchange on which the Series 2024B Bonds (hereinafter defined) may be listed and upon such notice as may be required by such exchange, or as more fully provided in the Trust Agreement (hereinafter defined). All such payments shall be made in such coin or currency of



the United States of America as at the time of payment is legal tender for payment of public and private debts. The Accreted Amount of this bond is determinable on Schedule A attached hereto and as described in the Trust Agreement.

This bond is one of a duly authorized series of revenue bonds of the Authority designated "Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds)" (the "Series 2024B Bonds"), issued under and pursuant to the Constitution and laws of the State of North Carolina, including the Act, a Bond Order of the Authority adopted on October 31, 2023, authorizing the issuance of the Series 2024B Bonds, and an Amended and Restated Trust Agreement, dated as of December 1, 2019, between the Authority and Computershare Trust Company, N.A., as successor trustee (in such capacity, the "Trustee"), as supplemented and amended by a Fifth Supplemental Trust Agreement, dated as of October 1, 2020, as amended by a First Supplement to Fifth Supplemental Trust Agreement, dated as of August 1, 2021, and a Sixth Supplemental Trust Agreement, dated as of January 1, 2024 (the "Sixth Supplemental Trust Agreement" and, collectively, the "Trust Agreement"). The Series 2024B Bonds, together with the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A (the "Series 2024A Bonds" and, together with the Series 2024B Bonds, the "Series 2024 Bonds") are being issued to provide funds, together with other available funds, to (a) pay the costs of land acquisition for and design, construction and equipping of an extension of the Triangle Expressway System from I-40 to I-87/U.S. 64/U.S. 264, (b) pay the premium on a bond insurance policy for the Series 2024 Bonds, (c) pay the premium for a debt service reserve insurance policy with respect to the Series 2024 Bonds and (d) pay the costs incurred in connection with the issuance of the Series 2024 Bonds. All terms not defined herein have the meanings therefor set forth in the Trust Agreement.

The Series 2024B Bonds are being issued by means of a book-entry system with no physical distribution of bond certificates to be made except as provided in the Sixth Supplemental Trust Agreement. One bond certificate with respect to each date on which the Series 2024B Bonds are stated to mature, in the aggregate maturity amount of the Series 2024B Bonds stated to mature on such date and registered in the name of Cede & Co., a nominee of The Depository Trust Company, New York, New York ("DTC"), is being issued and required to be deposited with DTC and immobilized in its custody. The book-entry system will evidence ownership of the Series 2024B Bonds in the maturity amount of $5,000 or any whole multiple thereof, with transfers of ownership effected on the records of DTC and its participants pursuant to rules and procedures established by DTC and its participants. Transfer of principal and interest payments to beneficial owners of the Series 2024B Bonds by participants of DTC will be the responsibility of such participants and other nominees of such beneficial owners. The Authority will not be responsible or liable for such transfers of payments or for maintaining, supervising or reviewing the records maintained by DTC, its participants or persons acting through such participants. While Cede & Co. is the registered owner of this bond, notwithstanding the provisions

hereinabove contained, payments of principal of and interest on this bond shall be made in accordance with the existing arrangements between the Bond Registrar and DTC.

The Series 2024B Bonds are special obligations of the Authority secured by a pledge, charge and lien upon Receipts. The Authority is not obligated to pay the principal of or the interest on the Series 2024B Bonds except as provided in the Trust Agreement from Receipts or certain other monies made available therefor under the Trust Agreement, and neither the faith and credit nor the taxing power of the State of North Carolina or any political subdivision thereof or the Authority is pledged to the payment of the principal of and the interest on the Series 2024B Bonds. The Trust Agreement provides for the issuance or incurrence from time to time under the conditions, limitations and restrictions therein set forth of additional bonds and Senior Lien Parity Debt secured pari passu as to the pledge of Receipts with the Series 2024B Bonds.

Reference is made to the Trust Agreement for a more complete statement of the provisions thereof and of the rights of the Authority, the Trustee and the registered owners of the Series 2024B Bonds. Copies of the Trust Agreement will be available for inspection by any registered owner of the Series 2024B Bonds at all reasonable times at the designated corporate trust office of the Trustee. By the purchase and acceptance of this bond, the registered owner hereof signifies assent to all of the provisions of the Trust Agreement, including the amendments made by the Sixth Supplemental Trust Agreement.

At the designated corporate trust office of the Bond Registrar, in the manner and subject to the conditions provided in the Trust Agreement, Series 2024B Bonds may be exchanged for an equal aggregate maturity amount of Series 2024B Bonds of the same maturity, of authorized denominations and bearing interest at the same rate.

The Series 2024B Bonds are subject to redemption prior to their respective maturities, at the option of the Authority, from any moneys that may be available for such purpose, either in whole or in part on any date on or after January 1, 2034, at a Redemption Price equal to 100% of the Accreted Amount of such Series 2024B Bonds to be redeemed, all in the manner provided in the Trust Agreement.

At least thirty (30) days but not more than sixty (60) days prior to the date fixed for redemption of any Series 2024B Bonds to be redeemed, whether such redemption is in whole or in part, the Bond Registrar shall cause a notice of any such redemption signed by the Bond Registrar to be mailed, first class, postage prepaid, to all registered owners of Series 2024B Bonds to be redeemed in whole or in part, provided that failure to mail any such notice to any registered owner or any defect in such notice shall not affect the validity of the proceedings for such redemption as to



the Series 2024B Bonds of any other registered owner to whom such notice is properly given.

On the date designated for redemption, notice having been given as aforesaid, the Series 2024B Bonds or portions thereof so called for redemption shall become due and payable at the Redemption Price provided for the redemption of such Series 2024B Bonds or such portions thereof on such date plus accrued interest to such date.

If less than all of the Series 2024B Bonds are to be called for redemption, the Series 2024B Bonds to be so redeemed shall be called for redemption in the manner that the Authority shall determine as set forth in an Officer's Certificate filed with the Trustee. If less than all the Series 2024B Bonds of any one maturity are called for redemption, the Bond Registrar shall select the Series 2024B Bonds to be redeemed by lot, each $5,000 portion of maturity amount being counted as one Series 2024B Bond for this purpose; provided, however, that so long as the only registered owner of the Series 2024B Bonds is Cede & Co., such selection shall be made by DTC.

Any notice of redemption may state that the redemption to be effected is conditioned upon the receipt by the Trustee or Bond Registrar on or prior to the redemption date of moneys sufficient to pay the principal of and interest on the Series 2024B Bonds to be redeemed and that if such moneys are not so received such notice shall be of no force or effect and such Series 2024B Bond shall not be required to be redeemed. In the event that such notice contains such a condition and moneys sufficient to pay the principal of and interest on such Series 2024B Bonds are not received by the Trustee or Bond Registrar on or prior to the date fixed for redemption, the redemption shall not be made and the Bond Registrar shall within a reasonable time thereafter give notice, in the manner in which the notice of redemption was given, that such moneys were not so received.

The registered owner of this bond shall have no right to enforce the provisions of the Trust Agreement or to institute action to enforce the covenants therein, or to take any action with respect to any event of default under the Trust Agreement, or to institute, appear in or defend any suit or other proceeding with respect thereto, except as provided in the Trust Agreement.

Modifications or alterations of the Trust Agreement or of any supplement to the Trust Agreement thereto may be made only to the extent and in the circumstances permitted by the Trust Agreement.

This bond, notwithstanding the provisions for registration of transfer stated herein and contained in the Trust Agreement, at all times shall be, and shall be understood to be, an investment security within the meaning of and for all the purposes of Article 8 of the Uniform Commercial Code of North Carolina. This bond is issued with the intent that the laws of the State of North Carolina shall govern its construction.

All acts, conditions and things required to happen, exist and be performed precedent to and in connection with the issuance of this bond and the execution and delivery of the Trust Agreement have happened, exist and have been performed as so required.

This bond shall not be valid or become obligatory for any purpose or be entitled to any benefit or security under the Trust Agreement until it shall have been authenticated by the execution by the Bond Registrar of the certificate of authentication endorsed hereon.

IN WITNESS WHEREOF, the North Carolina Turnpike Authority, by an order duly adopted by its Board, has caused this bond to be manually signed by the Chairman of the Authority and the Secretary-Treasurer of the Authority to impress its corporate seal hereon and to attest the same, all as of the __th day of _____, [20__].

NORTH CAROLINA TURNPIKE AUTHORITY

_____
Chairman

[SEAL]

_____
Secretary-Treasurer

**CERTIFICATE OF LOCAL GOVERNMENT COMMISSION**

The issuance of the within bond has been approved under the provisions of The State and Local Government Revenue Bond Act.

_____
Secretary
Local Government Commission



**CERTIFICATE OF AUTHENTICATION**

This bond is a Bond of the Series designated therein and issued under the provisions of the within mentioned Trust Agreement.

COMPUTERSHARE TRUST COMPANY, N.A., as Bond Registrar, as successor to Wells Fargo Bank, National Association

By:_____
Authorized Signatory

Date of authentication: _____, ____

**STATEMENT OF INSURANCE**

Assured Guaranty Municipal Corp. ("AGM"), New York, New York, has delivered its municipal bond insurance policy (the "Policy") with respect to the scheduled payments due of principal of and interest on this Series 2024B Bond to Computershare Trust Company, N.A., as Trustee and Registrar on behalf of the holders of the Series 2024B Bonds (the "Paying Agent"). Said Policy is on file and available for inspection at the principal office of the Paying Agent and a copy thereof may be obtained from AGM or the Paying Agent. All payments required to be made under the Policy shall be made in accordance with the provisions thereof. The owner of this Series 2024B Bond acknowledges and consents to the subrogation rights of AGM as more fully set forth in the Policy.



**ASSIGNMENT**

FOR VALUE RECEIVED the undersigned hereby sells, assigns and transfers unto

_____

_____.

PLEASE INSERT SOCIAL SECURITY NUMBER
OR OTHER IDENTIFYING NUMBER OF ASSIGNEE

_____

_____

_____

PLEASE PRINT OR TYPEWRITE NAME AND ADDRESS OF TRANSFEREE _____

_____

the within bond and all right thereunder, and hereby irrevocably constitutes and appoints _____, attorney, to transfer the within bond on the books kept for registration thereof, with full power of substitution in the premises.

Dated: _____

In the presence of:

_____ _____

NOTICE: Signature must be guaranteed by an institution which is a participant in the Securities Transfer Agent Medallion Program (STAMP) or similar program.

The signature to this assignment must correspond with the name as it appears upon the face of the within bond in every particular, without alteration or enlargement or any change whatever.

**SCHEDULE A**

**To Series 2024B Bond**

**ACCRETED AMOUNTS FOR EACH $5,000 MATURITY AMOUNT**

| Date | 2024B Bond 01/01/2050 4.880% | 2024B Bond 01/01/2051 4.910% | 2024B Bond 01/01/2052 4.940% | 2024B Bond 01/01/2053 4.960% |
|---|---|---|---|---|
| 01/30/2024 | $1,432.95 | $1,354.80 | $1,280.10 | $1,212.30 |
| 07/01/2024 | 1,462.25 | 1,382.65 | 1,306.60 | 1,237.45 |
| 01/01/2025 | 1,497.90 | 1,416.55 | 1,338.85 | 1,268.15 |
| 07/01/2025 | 1,534.45 | 1,451.35 | 1,371.95 | 1,299.60 |
| 01/01/2026 | 1,571.90 | 1,487.00 | 1,405.85 | 1,331.85 |
| 07/01/2026 | 1,610.25 | 1,523.50 | 1,440.55 | 1,364.85 |
| 01/01/2027 | 1,649.55 | 1,560.90 | 1,476.15 | 1,398.70 |
| 07/01/2027 | 1,689.80 | 1,599.20 | 1,512.60 | 1,433.40 |
| 01/01/2028 | 1,731.00 | 1,638.45 | 1,549.95 | 1,468.95 |
| 07/01/2028 | 1,773.25 | 1,678.70 | 1,588.25 | 1,505.40 |
| 01/01/2029 | 1,816.55 | 1,719.90 | 1,627.45 | 1,542.70 |
| 07/01/2029 | 1,860.85 | 1,762.15 | 1,667.65 | 1,580.95 |
| 01/01/2030 | 1,906.25 | 1,805.40 | 1,708.85 | 1,620.20 |
| 07/01/2030 | 1,952.75 | 1,849.70 | 1,751.05 | 1,660.35 |
| 01/01/2031 | 2,000.40 | 1,895.15 | 1,794.30 | 1,701.55 |
| 07/01/2031 | 2,049.25 | 1,941.65 | 1,838.65 | 1,743.75 |
| 01/01/2032 | 2,099.25 | 1,989.30 | 1,884.05 | 1,787.00 |
| 07/01/2032 | 2,150.45 | 2,038.15 | 1,930.60 | 1,831.30 |
| 01/01/2033 | 2,202.90 | 2,088.20 | 1,978.30 | 1,876.70 |
| 07/01/2033 | 2,256.70 | 2,139.45 | 2,027.15 | 1,923.25 |
| 01/01/2034 | 2,311.75 | 2,192.00 | 2,077.20 | 1,970.95 |
| 07/01/2034 | 2,368.15 | 2,245.80 | 2,128.55 | 2,019.85 |
| 01/01/2035 | 2,425.95 | 2,300.95 | 2,181.10 | 2,069.95 |
| 07/01/2035 | 2,485.10 | 2,357.40 | 2,235.00 | 2,121.25 |
| 01/01/2036 | 2,545.75 | 2,415.30 | 2,290.20 | 2,173.90 |
| 07/01/2036 | 2,607.90 | 2,474.60 | 2,346.75 | 2,227.80 |
| 01/01/2037 | 2,671.50 | 2,535.35 | 2,404.70 | 2,283.05 |
| 07/01/2037 | 2,736.70 | 2,597.60 | 2,464.10 | 2,339.65 |
| 01/01/2038 | 2,803.45 | 2,661.35 | 2,525.00 | 2,397.70 |
| 07/01/2038 | 2,871.90 | 2,726.70 | 2,587.35 | 2,457.15 |
| 01/01/2039 | 2,941.95 | 2,793.65 | 2,651.25 | 2,518.10 |
| 07/01/2039 | 3,013.75 | 2,862.20 | 2,716.75 | 2,580.55 |
| 01/01/2040 | 3,087.25 | 2,932.50 | 2,783.85 | 2,644.55 |
| 07/01/2040 | 3,162.60 | 3,004.50 | 2,852.60 | 2,710.10 |
| 01/01/2041 | 3,239.75 | 3,078.25 | 2,923.05 | 2,777.35 |
| 07/01/2041 | 3,318.80 | 3,153.80 | 2,995.25 | 2,846.20 |
| 01/01/2042 | 3,399.80 | 3,231.25 | 3,069.25 | 2,916.80 |
| 07/01/2042 | 3,482.75 | 3,310.55 | 3,145.05 | 2,989.15 |
| 01/01/2043 | 3,567.75 | 3,391.85 | 3,222.75 | 3,063.25 |
| 07/01/2043 | 3,654.80 | 3,475.10 | 3,302.35 | 3,139.25 |
| 01/01/2044 | 3,743.95 | 3,560.45 | 3,383.90 | 3,217.10 |
| 07/01/2044 | 3,835.30 | 3,647.85 | 3,467.50 | 3,296.85 |
| 01/01/2045 | 3,928.90 | 3,737.40 | 3,553.15 | 3,378.65 |
| 07/01/2045 | 4,024.75 | 3,829.15 | 3,640.90 | 3,462.40 |
| 01/01/2046 | 4,123.00 | 3,923.15 | 3,730.85 | 3,548.30 |
| 07/01/2046 | 4,223.60 | 4,019.45 | 3,823.00 | 3,636.30 |
| 01/01/2047 | 4,326.65 | 4,118.15 | 3,917.40 | 3,726.45 |
| 07/01/2047 | 4,432.20 | 4,219.25 | 4,014.20 | 3,818.90 |
| 01/01/2048 | 4,540.35 | 4,322.85 | 4,113.35 | 3,913.60 |
| 07/01/2048 | 4,651.15 | 4,428.95 | 4,214.95 | 4,010.65 |
| 01/01/2049 | 4,764.60 | 4,537.70 | 4,319.05 | 4,110.10 |
| 07/01/2049 | 4,880.90 | 4,649.10 | 4,425.70 | 4,212.05 |
| 01/01/2050 | 5,000.00 | 4,763.25 | 4,535.05 | 4,316.50 |
| 07/01/2050 | | 4,880.15 | 4,647.05 | 4,423.55 |
| 01/01/2051 | | 5,000.00 | 4,761.85 | 4,533.25 |
| 07/01/2051 | | | 4,879.45 | 4,645.70 |
| 01/01/2052 | | | 5,000.00 | 4,760.90 |
| 07/01/2052 | | | | 4,879.00 |
| 01/01/2053 | | | | 5,000.00 |



**EXHIBIT C**

**FORM OF TIFIA SERIES 2024 BOND**

**UNITED STATES OF AMERICA**

**STATE OF NORTH CAROLINA**
**NORTH CAROLINA TURNPIKE AUTHORITY**

**COMPLETE 540 PHASE 2 PROJECT**

**[(TIFIA _____-_____)]**
**TIFIA Series 2024 Bond**

**Maximum Principal Amount: $417,193,471 (excluding capitalized interest)**

**Effective Date: [_____ __, 20__]**

**Final Maturity Date: [The earlier of (i) [_____ __, 20__] and (ii) the Semi-Annual Payment Date on or prior to the date that is thirty-five (35) years following the Substantial Completion Date]**

The **NORTH CAROLINA TURNPIKE AUTHORITY**, a political subdivision within the Department of Transportation of the State of North Carolina (the *"Authority"*), for value received, hereby promises to pay, but solely from the sources and in the manner hereinafter provided, to the order of the **UNITED STATES DEPARTMENT OF TRANSPORTATION**, acting by and through the Executive Director of the Build America Bureau, or its assigns (the *"TIFIA Lender"*), the lesser of (x) the Maximum Principal Amount set forth above and (y) the aggregate unpaid principal amount of all disbursements (the "*Disbursements*") made by the TIFIA Lender (such lesser amount, together with any interest that is capitalized and added to principal in accordance with the provisions of the TIFIA Loan Agreement (as defined below), being hereinafter referred to as the *"Outstanding Principal Sum"*), together with accrued and unpaid interest (including, if applicable, interest at the Default Rate, as defined in the TIFIA Loan Agreement) on the Outstanding Principal Sum and all fees, costs and other amounts payable in connection therewith, all as more fully described in the TIFIA Loan Agreement. The principal hereof shall be payable in the manner and at the place provided in the TIFIA Loan Agreement in accordance with **Exhibit G** to the TIFIA Loan Agreement, as revised from time to time in accordance with the TIFIA Loan Agreement, until paid in full. The TIFIA Lender is hereby authorized to modify the Loan Amortization Schedule included in **Exhibit G** to the TIFIA Loan Agreement from time to time in accordance with the terms of the TIFIA Loan Agreement to reflect the amount of each disbursement made thereunder and the date and amount of principal or interest paid by the Authority

thereunder. Absent manifest error, the TIFIA Lender's determination of such matters as set forth on **Exhibit G** to the TIFIA Loan Agreement shall be conclusive evidence thereof; provided, however, that neither the failure to make any such recordation nor any error in such recordation shall affect in any manner the Authority's obligations hereunder or under any other TIFIA Loan Document.

Payments hereon are to be made in accordance with Section 9(f) (*Manner of Payment*) and Section 36 (*Notices; Payment Instructions*) of the TIFIA Loan Agreement as the same become due. Principal of and interest on this TIFIA Bond shall be paid in funds available on or before the due date and in any lawful coin or currency of the United States of America that at the date of payment is legal tender for the payment of public and private debts. If the Final Maturity Date is amended in connection with an update to the Financial Plan provided to the TIFIA Lender pursuant to Section 21(a)(iii)(B) (*Financial Plan; Financial Statements*) of the TIFIA Loan Agreement, the due date of this TIFIA Bond shall be deemed to be amended to change the due date to such revised Final Maturity Date without any further action required on the part of the Authority or the TIFIA Lender, and such amendment shall in no way amend, modify or affect the other provisions of this TIFIA Bond without the prior written agreement of the TIFIA Lender.

This TIFIA Bond is issued under and pursuant to (i) the Constitution and laws of the State of North Carolina, including the Act (as defined in the Trust Agreement), (ii) a Bond Order of the Authority adopted on October 31, 2023, authorizing, among other things, the issuance of this TIFIA Bond, (iii) an Amended and Restated Trust Agreement, dated as of December 1, 2019, as previously supplemented and amended and as further supplemented and amended by a Sixth Supplemental Trust Agreement dated as of January 1, 2024 (collectively, the "*Trust Agreement*"), all between the Authority and Computershare Trust Company, N.A., as successor trustee (the "*Trustee*"), (iv) Article 6H of Chapter 136, as amended, of the General Statutes of North Carolina (the "*Authority Act*"), and The State and Local Government Revenue Bond Act, Article 5 of Chapter 159 of the North Carolina General Statutes, as amended (the "Revenue Bond Act" and, together with the Authority Act, the "*Act*"), and (v) a Loan Agreement dated as of the date hereof, between the Authority and the TIFIA Lender, under the Transportation Infrastructure Finance and Innovation Act of 1998, as amended, (the "*TIFIA Loan Agreement*"), and is issued to evidence the obligation of the Authority under the TIFIA Loan Agreement to repay the loan made by the TIFIA Lender and any other payments of any kind required to be paid by the Authority under the TIFIA Loan Agreement or the other TIFIA Loan Documents referred to therein. Reference is made to the TIFIA Loan Agreement for all details relating to the Authority's obligations thereunder. The proceeds of this TIFIA Bond will be used to finance, in part, the design and construction, capital improvements and equipment constituting a turnpike project of the Authority known as the "Complete 540 Phase 2" project, which will extend the Triangle Expressway System approximately 10 miles from I-40 to I-87/U.S 64/U.S. 264 in Knightdale, North Carolina (the "*Project*"). All



capitalized terms used in this TIFIA Bond and not defined herein shall have the meanings set forth in the TIFIA Loan Agreement.

Pursuant to the Act, other Bond Orders and the Trust Agreement, the Authority has also issued its Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2009B (Capital Appreciation Bonds), in the aggregate principal amount of $35,173,108.85 (the "*Series 2009B Bonds*"), Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2017, in the aggregate principal amount of $200,515,000 (the "*Series 2017 Bonds*"), Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2018, in the aggregate principal amount of $401,155,000 (the "*Series 2018 Bonds*"), Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2019, in the aggregate principal amount of $370,975,000 (the "*Series 2019 Bonds*"), Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A, in the aggregate principal amount of $304,575,000 (the "*Series 2024A Bonds*"), and Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds), in the aggregate principal amount of $35,785,304.70 (the "*Series 2024B Bonds*" and, collectively with the Series 2009B Bonds, the Series 2017 Bonds, the Series 2018 Bonds, the Series 2019 Bonds and the Series 2024A Bonds, the "*Prior Bonds*"). This TIFIA Bond, together with the Authority's North Carolina Turnpike Authority Triangle Expressway System Revenue Bond, TIFIA Series 2021 (the "TIFIA Series 2021 Bond"), initially are secured by and payable from the Trust Estate on a basis subordinate to the Prior Bonds but upon the occurrence of a Bankruptcy Related Event with respect to the Authority will be secured in parity therewith. Additional indebtedness secured as to the lien on the Trust Estate on a parity with or subordinate to this TIFIA Bond, the TIFIA Series 2021 Bond and/or the Prior Bonds may be issued or secured thereunder pursuant to the terms of the Trust Agreement, the TIFIA Loan Agreement and the TIFIA 2021 Loan Agreement.

**The Authority is not obligated to pay the principal of or the interest on this TIFIA Bond or other amounts which may be due under the TIFIA Loan Agreement or any other TIFIA Loan Documents except as provided in the Trust Agreement from the Trust Estate, and neither the faith and credit nor the taxing power of the State of North Carolina or any political subdivision thereof or the Authority is pledged to the payment of the principal of and the interest on this TIFIA Bond or other amounts due under the TIFIA Loan Agreement or any other TIFIA Loan Documents.**

This TIFIA Bond is subject to optional and mandatory prepayment in accordance with the TIFIA Loan Agreement.

This TIFIA Bond may be prepaid at the option of the Authority in whole or in part (and, if in part, the principal installments and amounts thereof to be prepaid are to be determined in accordance with the TIFIA Loan Agreement; provided, however, such prepayments shall be in principal amounts of at least $1,000,000 or any integral

multiple of $1.00 in excess thereof), at any time or from time to time, without penalty or premium, by paying to the TIFIA Lender all or part of the principal amount of the TIFIA Bond in accordance with the TIFIA Loan Agreement.

Reference is made to the Trust Agreement and the TIFIA Loan Agreement for a more complete statement of the provisions thereof. Any delay on the part of the TIFIA Lender in exercising any right hereunder shall not operate as a waiver of any such right, and any waiver granted with respect to one default shall not operate as a waiver in the event of any subsequent default.

All acts, conditions and things required by the Constitution and laws of the State to happen, exist and be performed precedent to and in connection with the issuance of this TIFIA Bond have happened, exist and have been performed as so required.

This TIFIA Bond is issued with the intent that the federal laws of the United States of America shall govern its construction to the extent such federal laws are applicable and the internal laws of the State of North Carolina shall govern its construction to the extent such federal laws are not applicable.

This TIFIA Bond shall not be valid or become obligatory for any purpose or be entitled to any benefit or security under the Trust Agreement until it shall have been authenticated by the execution by the Bond Registrar of the certificate of authentication endorsed hereon.

**IN WITNESS WHEREOF**, the North Carolina Turnpike Authority, by an order duly adopted by its Board, has caused this TIFIA Bond to be manually signed by the Chairman of the Authority and the Secretary-Treasurer of the Authority to impress its corporate seal hereon and to attest the same, all as of the _____ day of [_____], [20__].

**NORTH CAROLINA TURNPIKE AUTHORITY**

[SEAL]

By:_____
Chairman

By:_____
Secretary-Treasurer



**CERTIFICATE OF LOCAL GOVERNMENT COMMISSION**

The issuance of the within bond has been approved under the provisions of The State and Local Government Revenue Bond Act.

By: _____
Secretary
Local Government Commission

**CERTIFICATE OF AUTHENTICATION**

This TIFIA Bond is issued under the provisions of the within mentioned Trust Agreement.

**COMPUTERSHARE TRUST COMPANY, N.A.**, as Bond Registrar, as successor to Wells Fargo Bank, National Association

By: _____
Authorized Signatory

Date of authentication: _____ ___, 20__

**ASSIGNMENT**

**FOR VALUE RECEIVED** the undersigned hereby unconditionally sells, assigns and transfers unto _____
_____

.

[PLEASE INSERT SOCIAL SECURITY NUMBER OR OTHER IDENTIFYING NUMBER OF ASSIGNEE]

[PLEASE PRINT OR TYPEWRITE NAME AND ADDRESS OF TRANSFEREE]

the within bond and all right thereunder, and hereby irrevocably constitutes and appoints _____, attorney, to transfer the within bond on the books kept for registration thereof, with full power of substitution in the premises.

Dated: _____

In the presence of:

_____

NOTICE: Signature must be guaranteed by an institution which is a participant in the Securities Transfer Agent Medallion Program (STAMP) or similar program.

The signature to this assignment must correspond with the name as it appears upon the face of the within bond in every particular, without alteration or enlargement or any change whatever.



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# APPENDIX C

# 2023 TRAFFIC AND REVENUE UPDATE STUDY

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101 E. River Drive, Suite 1A
East Hartford, CT 06108
tel. : 860-529-7615

September 29, 2023

Mr. David Roy
Chief Financial Officer
North Carolina Turnpike Authority
1 South Wilmington Street
1578 Mail Service Center
Raleigh, NC 27601

Subject: Triangle Expressway and Complete 540 Phases 1 & 2 T&R Forecast Bringdown Letter

Dear Mr. Roy:

This letter summarizes the work efforts and updated inputs and assumptions used to develop updated traffic and toll revenue (T&R) estimates for the Triangle Expressway System including Complete 540 Phases 1 & 2. To produce this updated forecast, CDM Smith relied primarily on actual traffic and revenue data on the facility, and updated the models originally developed for the ***North Carolina Triangle Expressway and Complete 540 Phases 1 & 2 Traffic and Revenue Study***, dated January 2021 (2021 T&R Study). The following key inputs and assumptions were updated:

- Updates to current and projected socioeconomic data in Wake, Durham, and Johnston Counties, were provided by Dr. Stephen Appold, independent economist.
- Updates to future travel demand model roadway networks were made based on:
  - ***2024-2033 NC State Transportation Improvement Program (STIP)*** as of July 2023,
  - NC Capital Area Metropolitan Planning Organization (CAMPO) and Durham - Chapel Hill – Carrboro Metropolitan Planning Organization (DCHC MPO) ***2050 Metropolitan Transportation Plan (MTP)*** and interactive maps as of July 2023.
- Updates were made to inflation forecasts and other corresponding variables such as travelers' values of time (VOT) and vehicle operating costs (VOC).
- Near-term assumptions for T&R growth by vehicle class and method of payment were updated based on an additional 32 months of historical monthly traffic and revenue data on Triangle Expressway.
- Future-year travel demand model trip table adjustments were made to account for observed changes in the hourly distribution of transactions on Triangle Expressway related to increased rates of work from home.

The intent of this letter is to review and revise, as warranted, the forecasts developed for the 2021 T&R Study. Updated fiscal year forecasts are provided for the base case which includes the existing Triangle Expressway, Complete 540 Phase 1 (under construction), and Complete 540 Phase 2 (planned).

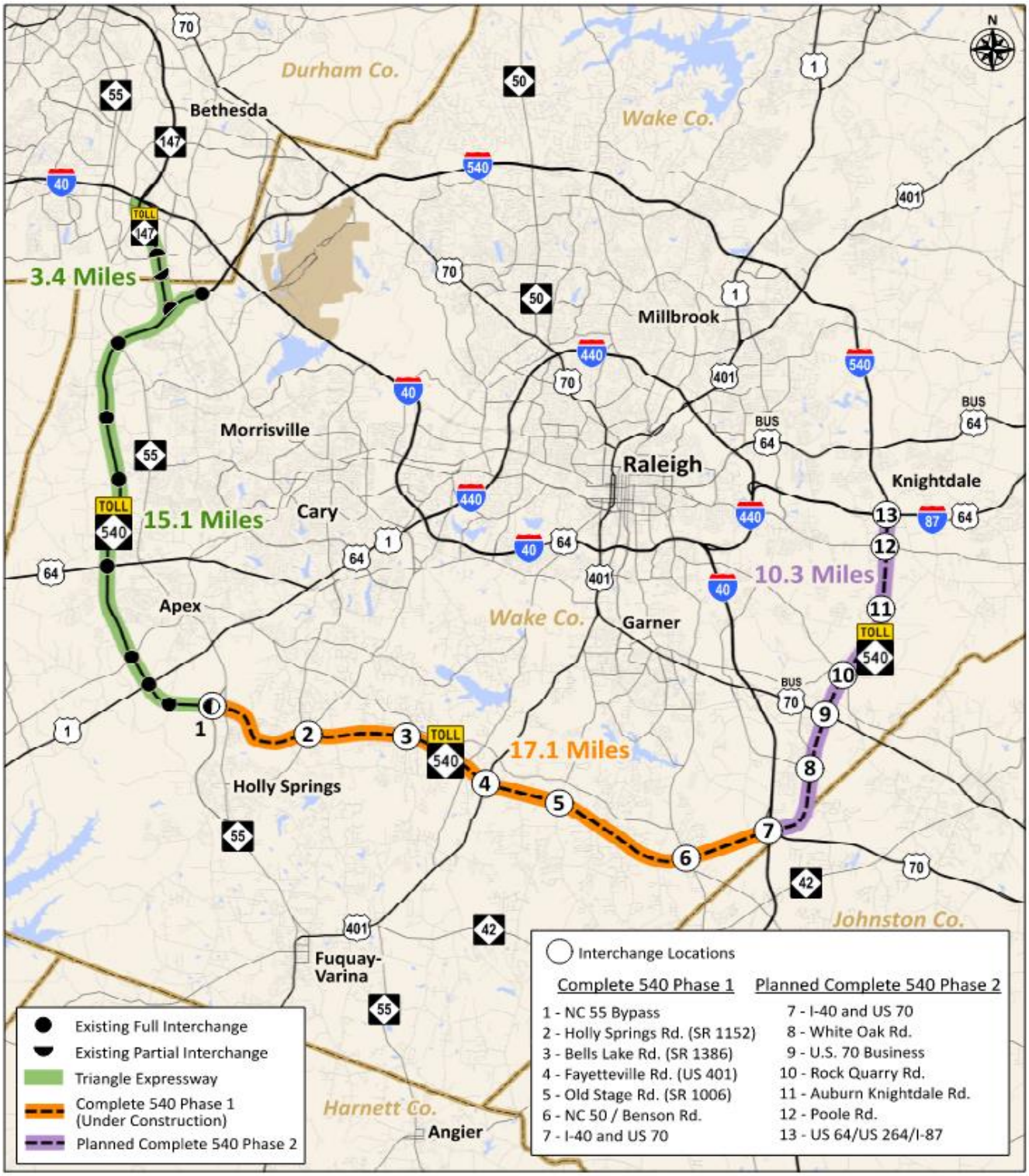
## 1. Project Description

**Figure 1.1** shows the location of the existing Triangle Expressway, Complete 540 Phase 1 (currently under construction), and the planned Complete 540 Phase 2 within North Carolina and the connecting roadway system. The completion of Complete 540 Phases 1 and 2 would complete the 540 Outer Loop, which would consist of Interstate 540, the Triangle Expressway and Complete 540 Phases 1 and 2, also known as the Southern and Eastern Wake Expressway, respectively. Interstate 540, on the northern side of Raleigh is a toll-free roadway, while the Triangle Expressway is a toll road that opened in its entirety in early 2013. Complete 540 Phases 1 and 2 are being implemented as tolled extensions of the Triangle Expressway.

Complete 540 Phase 1, which is currently expected to open July 1, 2024, will extend the Triangle Expressway by about 17.1 miles from its current southern terminus at the NC 55 Bypass in Apex, NC to I-40 and US 70, south of Raleigh. In central and eastern North Carolina, I-40 is an important road that connects inland communities such Winston-Salem, Greensboro, Durham, and Raleigh, to shore points, including Wilmington and numerous recreational areas in southwestern NC. Upon completion, the Triangle Expressway and Complete 540 Phase 1 will provide an alternative route for longer-distance trips, avoiding the more congested sections of I-40 serving local movements in the Raleigh area.

The planned Complete 540 Phase 2 would complete the I-540/Toll NC 540 outer beltway around the greater Raleigh area by extending Toll NC 540 from the eastern terminus of Phase 1 at I-40/US 70 in Clayton to Interstate 540 at the interchange with I-87/U.S. 64/U.S. 264 near Knightdale. Complete 540 Phases 1 and 2 will provide improved connectivity for residents, including those in Apex, Cary, Holly Springs, Fuquay- Varina, Garner, Clayton, and Knightdale.

**Figure 1.1: Project Location Map**



# 2. Recent Historical Transactions and Revenue

An additional 32 months of historical monthly traffic and revenue data on Triangle Expressway have become available since the completion of the 2021 T&R Study. This section presents an overview of transaction and revenue growth during that timeframe by vehicle class and method of payment, as well as a comparison of systemwide T&R versus the 2021 T&R Study forecast on a semi-annual basis.

## 2.1 Historical Transaction and Toll Revenue Growth

Monthly transactions and collected toll revenue are shown in **Table 2.1** from January 2019 through July 2023. The data is presented separately for passenger cars and commercial vehicles. The table highlights the impacts of the COVID-19 pandemic with transactions declining in 2020 by 31.0 percent for passenger cars and 5.8 percent for commercial vehicles, year-over-year. The peak impact occurred in April 2020 for passenger cars and May 2020 for commercial vehicles. While commercial vehicles recovered quickly to record-high growth by the end of 2020, passenger cars continued to have negative impacts through February 2021, coinciding with the "second wave" of COVID cases in the winter. Through the remainder of 2021, there was a steady recovery over 2020 levels, with year-over-year growth averaging 35 percent in the second half of the year. In January 2022, the Omicron variant became widespread and caused slight declines in growth. For the period from January to June 2022 the year-over-year growth was 18.6 percent, slightly above the 17.1 percent growth for the same period in 2023 over the year prior.

The impact of the COVID-19 pandemic on passenger car and commercial vehicle transactions on the Triangle Expressway, sorted by ETC vs. BBM, are shown in **Figure 2.1**. The impacts shown in the chart represent a 30-day rolling average impact for both passenger cars and commercial vehicles. Due to the small percentage and variable nature of truck traffic in the corridor, the impacts were less consistent on a day-to-day basis. The percent impacts shown in Figure 2.1 is the difference between actual transactions through June 2023 compared to estimated transactions over the same timeframe had COVID-19 not occurred, including expected normal growth. For continuity, the transaction impacts shown in Figure 2.1 exclude transactions at the new mainline toll zone north of the Morrisville Parkway interchange which began recording toll transactions on August 9, 2020.

The trends shown in Figure 2.1 align with the impacts shown in Table 2.1. Since the peak impacts in April 2020, passenger cars have been on a steady recovery to expected pre-COVID trends. BBM transactions are nearly at pre-COVID trends for the last 6 months, while ETC is within 10%. This variance accounts for the reduction in commuting trips from increases in teleworking. Commercial vehicles continue to meet or exceed pre-COVID trends since the beginning of 2021. The variance in ETC vs. BBM trends for commercial vehicles aren't as pronounced due to the higher ETC market share and increase in e-commerce spurring substantial year-over-year growth.

## Table 2.1: Triangle Expressway - Monthly Transaction and Collected Toll Revenue Trends

**Passenger Cars (Class 1: 2-Axle Vehicles)**

| | Toll Transactions (000s) | | | | | | | | Toll Revenue (000s) (1) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Month | 2019 | % Chg | 2020 (2,3) | % Chg | 2021 | % Chg | 2022 | % Chg | 2023 (4) | 2019 | % Chg | 2020 (2,3) | % Chg | 2021 | % Chg | 2022 | % Chg | 2023 (4) |
| January | 4,437 | 5.1 | 4,662 | (26.0) | 3,451 | 13.4 | 3,914 | 35.9 | 5,320 | $ 3,566 | 19.9 | $ 4,275 | (36.2) | $ 2,727 | 21.2 | $ 3,304 | 33.8 | $ 4,421 |
| February | 4,132 | 5.4 | 4,354 | (22.2) | 3,388 | 29.3 | 4,380 | 16.9 | 5,121 | 3,629 | 11.7 | 4,053 | (41.1) | 2,386 | 32.0 | 3,149 | 11.1 | 3,500 |
| March | 4,723 | (30.3) | 3,290 | 26.7 | 4,169 | 24.3 | 5,181 | 15.7 | 5,996 | 4,196 | (20.1) | 3,352 | (19.1) | 2,712 | 51.7 | 4,115 | (0.6) | 4,089 |
| April | 4,631 | (63.2) | 1,706 | 156.6 | 4,377 | 15.6 | 5,060 | 10.1 | 5,572 | 3,973 | (37.1) | 2,498 | 17.4 | 2,933 | 26.4 | 3,707 | 14.9 | 4,258 |
| May | 4,987 | (55.6) | 2,215 | 101.8 | 4,471 | 18.2 | 5,287 | 15.1 | 6,084 | 4,031 | (47.6) | 2,112 | 36.8 | 2,889 | 31.9 | 3,810 | 20.6 | 4,594 |
| June | 4,608 | (40.3) | 2,752 | 68.2 | 4,628 | 12.6 | 5,213 | 13.1 | 5,894 | 3,796 | (48.4) | 1,959 | 63.0 | 3,194 | 12.1 | 3,581 | 40.7 | 5,040 |
| July | 4,673 | (37.4) | 2,926 | 61.5 | 4,726 | 4.1 | 4,920 | 14.5 | 5,632 | 4,026 | (40.6) | 2,390 | 41.9 | 3,391 | 13.9 | 3,861 | 12.6 | 4,348 |
| August | 4,920 | (28.4) | 3,522 | 38.4 | 4,875 | 12.5 | 5,484 | | | 4,236 | (40.7) | 2,514 | 30.5 | 3,281 | 23.0 | 4,035 | | |
| September | 4,607 | (19.1) | 3,726 | 27.8 | 4,762 | 9.5 | 5,215 | | | 3,972 | (39.8) | 2,391 | 51.3 | 3,618 | 1.1 | 3,660 | | |
| October | 5,162 | (21.5) | 4,053 | 24.3 | 5,038 | 14.1 | 5,749 | | | 4,241 | (38.0) | 2,630 | 53.7 | 4,042 | 10.5 | 4,465 | | |
| November | 4,564 | (18.2) | 3,733 | 30.3 | 4,866 | 11.0 | 5,400 | | | 3,832 | (34.5) | 2,511 | 47.6 | 3,706 | (3.7) | 3,571 | | |
| December | 4,471 | (14.6) | 3,820 | 26.2 | 4,819 | 9.8 | 5,293 | | | 3,918 | (33.8) | 2,592 | 36.1 | 3,529 | 21.8 | 4,298 | | |
| **Total Year** | 55,915 | (27.1) | 40,758 | 31.4 | 53,569 | 14.1 | 61,095 | | 39,619 | $47,416 | (29.8) | $33,277 | 15.4 | $38,408 | 18.6 | $45,555 | | $30,249 |
| **Jan-June** | 27,517 | (31.0) | 18,979 | 29.0 | 24,482 | 18.6 | 29,034 | 17.1 | 33,987 | 23,191 | (21.3) | 18,249 | (7.7) | 16,841 | 28.7 | 21,666 | 19.6 | 25,902 |

**Commercial Vehicles (Classes 2 and 3: 3-or-more Axle Vehicles)**

| | Toll Transactions (000s) | | | | | | | | Toll Revenue (000s) (1) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | 2019 | % Chg | 2020 (2,3) | % Chg | 2021 | % Chg | 2022 | % Chg | 2023 (4) | 2019 | % Chg | 2020 (2,3) | % Chg | 2021 | % Chg | 2022 | % Chg | 2023 (4) |
| January | 164 | 3.7 | 170 | 16.9 | 199 | (0.2) | 199 | 16.9 | 233 | $ 305 | 13.4 | $ 346 | (8.4) | $ 317 | (0.4) | $ 316 | 13.3 | $ 358 |
| February | 146 | 3.5 | 151 | 23.8 | 187 | 22.3 | 228 | (0.4) | 228 | 281 | 14.4 | 322 | (41.0) | 190 | 91.4 | 363 | (23.8) | 277 |
| March | 187 | 3.8 | 194 | 35.9 | 263 | 2.9 | 271 | 6.8 | 289 | 376 | 1.3 | 381 | (3.7) | 367 | 14.5 | 420 | 42.3 | 598 |
| April | 184 | (11.4) | 163 | 66.6 | 271 | (4.2) | 259 | 0.9 | 262 | 345 | 1.9 | 352 | 31.2 | 462 | (9.2) | 419 | (2.1) | 411 |
| May | 213 | (25.0) | 160 | 59.5 | 255 | 3.3 | 263 | 13.2 | 298 | 410 | (22.2) | 319 | 34.9 | 430 | (17.1) | 357 | 29.9 | 463 |
| June | 194 | (3.7) | 187 | 40.1 | 261 | 7.7 | 281 | 3.0 | 290 | 374 | (36.4) | 238 | 62.5 | 387 | 23.9 | 479 | (8.9) | 436 |
| July | 198 | 2.6 | 203 | 31.1 | 266 | (6.0) | 250 | 7.8 | 270 | 416 | (2.1) | 407 | (2.1) | 399 | 2.7 | 410 | 2.7 | 421 |
| August | 207 | 10.7 | 229 | 16.3 | 266 | 5.3 | 280 | | 0 | 411 | (5.2) | 390 | 20.1 | 468 | (1.8) | 459 | | |
| September | 193 | 21.2 | 234 | 8.6 | 254 | 2.5 | 261 | | 0 | 381 | (2.5) | 371 | 18.3 | 439 | (2.1) | 430 | | |
| October | 209 | 25.4 | 262 | (2.6) | 256 | 7.3 | 274 | | 0 | 408 | (2.1) | 399 | 2.7 | 410 | 6.1 | 435 | | |
| November | 167 | 33.1 | 222 | 10.3 | 245 | (2.4) | 239 | | 0 | 348 | (8.1) | 320 | 23.7 | 395 | (9.2) | 359 | | |
| December | 154 | 43.0 | 220 | 3.6 | 228 | (4.4) | 218 | | 0 | 321 | (3.5) | 309 | 15.7 | 358 | (9.0) | 326 | | |
| **Total Year** | 2,215 | 8.1 | 2,395 | 23.3 | 2,952 | 2.5 | 3,025 | | 1,869 | $ 4,375 | (5.1) | $ 4,154 | 11.3 | $ 4,622 | 3.3 | $ 4,774 | | $ 2,964 |
| **Jan-June** | 1,087 | (5.8) | 1,024 | 40.2 | 1,436 | 4.6 | 1,502 | 6.4 | 1,599 | 2,091 | (6.4) | 1,958 | 10.0 | 2,153 | 28.4 | 2,764 | 7.2 | 2,964 |

**Total Vehicles (Classes 1 through 3)**

| | Toll Transactions (000s) | | | | | | | | Toll Revenue (000s) (1) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | 2019 | % Chg | 2020 (2,3) | % Chg | 2021 | % Chg | 2022 | % Chg | 2023 (4) | 2019 | % Chg | 2020 (2,3) | % Chg | 2021 | % Chg | 2022 | % Chg | 2023 (4) |
| January | 4,601 | 5.0 | 4,833 | (24.5) | 3,650 | 12.7 | 4,113 | 35.0 | 5,553 | $ 3,871 | 19.4 | $ 4,621 | (34.1) | $ 3,044 | 18.9 | $ 3,619 | 32.0 | $ 4,778 |
| February | 4,278 | 5.3 | 4,505 | (20.7) | 3,574 | 28.9 | 4,608 | 16.1 | 5,349 | 3,910 | 11.9 | 4,375 | (41.1) | 2,576 | 36.4 | 3,513 | 7.5 | 3,777 |
| March | 4,909 | (29.0) | 3,484 | 27.2 | 4,432 | 23.0 | 5,452 | 15.3 | 6,285 | 4,571 | (18.4) | 3,732 | (17.5) | 3,079 | 47.3 | 4,535 | 3.3 | 4,687 |
| April | 4,814 | (61.2) | 1,868 | 148.7 | 4,647 | 14.5 | 5,319 | 9.7 | 5,833 | 4,319 | (34.0) | 2,850 | 19.1 | 3,395 | 21.5 | 4,126 | 13.2 | 4,669 |
| May | 5,200 | (54.3) | 2,375 | 99.0 | 4,726 | 17.4 | 5,550 | 15.0 | 6,382 | 4,440 | (45.2) | 2,431 | 36.5 | 3,319 | 25.5 | 4,166 | 21.4 | 5,058 |
| June | 4,802 | (38.8) | 2,938 | 66.4 | 4,889 | 12.4 | 5,494 | 12.6 | 6,184 | 4,170 | (47.3) | 2,197 | 63.0 | 3,580 | 13.4 | 4,061 | 34.9 | 5,476 |
| July | 4,871 | (35.8) | 3,129 | 59.5 | 4,992 | 3.6 | 5,171 | 14.1 | 5,901 | 4,442 | (37.0) | 2,797 | 35.5 | 3,790 | 12.7 | 4,271 | 11.7 | 4,769 |
| August | 5,127 | (26.8) | 3,750 | 37.1 | 5,141 | 12.1 | 5,764 | | | 4,647 | (37.5) | 2,904 | 29.1 | 3,749 | 19.9 | 4,494 | | |
| September | 4,800 | (17.5) | 3,960 | 26.7 | 5,016 | 9.2 | 5,476 | | | 4,353 | (36.5) | 2,762 | 46.9 | 4,057 | 0.8 | 4,090 | | |
| October | 5,371 | (19.6) | 4,316 | 22.7 | 5,294 | 13.8 | 6,023 | | | 4,649 | (34.8) | 3,029 | 47.0 | 4,452 | 10.1 | 4,900 | | |
| November | 4,731 | (16.4) | 3,955 | 29.2 | 5,111 | 10.3 | 5,639 | | | 4,180 | (32.3) | 2,831 | 44.9 | 4,102 | (4.2) | 3,930 | | |
| December | 4,625 | (12.7) | 4,040 | 24.9 | 5,047 | 9.2 | 5,512 | | | 4,239 | (31.5) | 2,902 | 34.0 | 3,887 | 18.9 | 4,624 | | |
| **Total Year** | 58,130 | (25.8) | 43,153 | 31.0 | 56,520 | 13.4 | 64,120 | | 41,488 | $51,791 | (27.7) | $37,431 | 15.0 | $43,030 | 17.0 | $50,329 | | $33,213 |
| **Jan-June** | 28,604 | (30.1) | 20,003 | 29.6 | 25,919 | 17.8 | 30,536 | 16.5 | 35,586 | 25,282 | (20.1) | 20,206 | (6.0) | 18,993 | 26.5 | 24,020 | 18.4 | 28,444 |

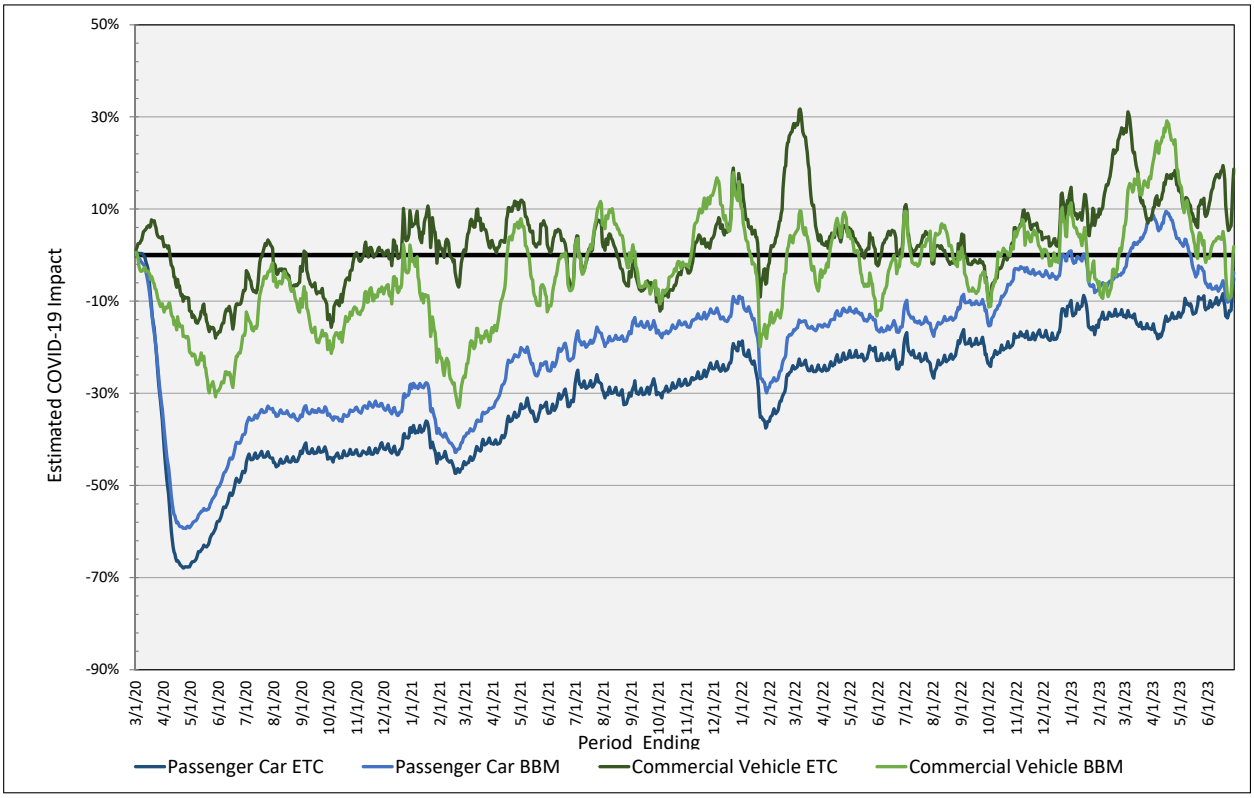
(1) Programmed toll increases occurred every year on January 1st.

(2) COVID-19 related transaction and toll revenue impacts began in March 2020.

(3) Morrisville Parkway Interchange ramps open to traffic February 4, 2020. The corresponding mainline toll zone north of the interchange began recording tolled transactions August 9, 2020.

(4) Represents transactions and revenue through July 2023.

**Figure 2.1: Triangle Expressway Estimated 30-Day Rolling Average COVID-19 Transaction Impacts**




## 2.2 ETC Market Share of Transactions

**Table 2.2** provides the ETC market share of transactions for the Triangle Expressway from 2013 through 2023 year-to-date. From 2013 through 2019 before the pandemic, ETC market share was increasing, reaching 68.7 percent by 2019 for Class 1 and 28.8 percent for Class 2&3. The COVID-19 pandemic had a negative impact for Class 1 transactions in 2020 and 2021, but since 2021 it has been recovering. For Class 2&3, ETC market share peaked in 2020 before declining in 2021. However, in 2023 YTD it has reached an all-time high of 59.8 percent. The total current market share in 2023 YTD is back to 2020 levels, which is around 4 percent lower than previously forecasted.

**Table 2.2: ETC Market Share of Transactions**

| Calendar Year | Classes Class 1 | Classes 2 & 3 | Total |
|---|---|---|---|
| 2013 | 61.6% | 52.3% | 61.3% |
| 2014 | 62.7% | 54.5% | 62.4% |
| 2015 | 62.5% | 54.6% | 62.2% |
| 2016 | 64.7% | 57.4% | 64.4% |
| 2017 | 66.0% | 56.7% | 65.7% |
| 2018 | 67.2% | 56.7% | 66.8% |
| 2019 | 68.7% | 58.8% | 68.3% |
| 2020 | 66.7% | 59.7% | 66.3% |
| 2021 | 64.1% | 56.8% | 63.8% |
| 2022 | 65.9% | 59.3% | 65.5% |
| 2023 | 66.6% | 59.8% | 66.3% |

## 3. Forecast versus Actual Transactions and Revenue

The following section compares the 2021 T&R Study forecast to actual transactions and revenue collected through June 2023. **Table 3.1** provides the comparison for transactions and **Table 3.2** provides the toll and fee revenue.

In the first twelve months after forecast delivery in January 2021, the Triangle Expressway performed well compared to forecast. Transactions surpassed forecast in the range of 6.3 to 7.9 percent. However, short-term recovery assumptions in the 2021 T&R Study forecast combined with negative T&R impacts from the Omicron variant lead to a shortfall in transactions starting in January 2022. Since that time, the variance between forecast and actual transactions has steadily diminished. Transaction totals during the most recent six-month period from January to June 2023 were 3.8 percent below forecast.

**Table 3.1: Forecast versus Actual Transactions (000s)**

| Semi-Annual Period (1) | Forecast Classes Class 1 | Forecast Classes 2 & 3 | Forecast Total | Actual Classes Class 1 | Actual Classes 2 & 3 | Actual Total | % Difference Classes Class 1 | % Difference Classes 2 & 3 | % Difference Total |
|---|---|---|---|---|---|---|---|---|---|
| Jul.-Dec. 2020 | 22,343 | 889 | 23,233 | 21,779 | 1,371 | 23,150 | -2.5% | 54.1% | -0.4% |
| Jan.-Jun. 2021 | 23,105 | 922 | 24,027 | 24,482 | 1,436 | 25,919 | 6.0% | 55.8% | 7.9% |
| Jul.-Dec. 2021 | 27,671 | 1,107 | 28,779 | 29,086 | 1,515 | 30,602 | 5.1% | 36.8% | 6.3% |
| Jan.-Jun. 2022 | 31,850 | 1,278 | 33,128 | 29,034 | 1,502 | 30,536 | -8.8% | 17.6% | -7.8% |
| Jul.-Dec. 2022 | 34,283 | 1,379 | 35,662 | 32,062 | 1,523 | 33,584 | -6.5% | 10.4% | -5.8% |
| Jan.-Jun. 2023 | 35,550 | 1,433 | 36,983 | 33,987 | 1,599 | 35,586 | -4.4% | 11.5% | -3.8% |

Similar trends can be seen in forecast vs actual collected toll revenue in Table 3.2. For the first two semi-annual periods of the forecast, collected toll revenue surpassed forecast by 4.4 to 8.7 percent. Collected toll revenue fell short of forecast beginning in the first half of 2022 following the onset of the Omicron variant. Since then, the variance between forecast and actual collected toll revenue has

diminished. Processing fee revenue has consistently exceeded forecast since the 2021 T&R study. Total collected revenue was within three percent of forecast for the most recent six-month period.

**Table 3.2: Forecast versus Actual Collected Revenue (000s)**

| | Forecast | | | | |
|---|---|---|---|---|---|
| **Semi-Annual** | Collected Toll Revenue | | | Processing | Total |
| **Period** | ETC | BBM | Total | Fees | Collected |
| Jul. - Dec. 2020 | $11,038 | $6,292 | $17,330 | $453 | $17,783 |
| Jan. - Jun. 2021 | 11,640 | 6,552 | 18,192 | 1,719 | 19,911 |
| Jul. - Dec. 2021 | 14,216 | 7,901 | 22,117 | 2,039 | 24,156 |
| Jan. - Jun. 2022 | 16,685 | 9,157 | 25,843 | 2,324 | 28,166 |
| Jul. - Dec. 2022 | 18,313 | 9,925 | 28,238 | 2,476 | 30,714 |
| Jan. - Jun. 2023 | 19,362 | 10,362 | 29,724 | 2,542 | 32,266 |
| | **Actual** | | | | |
| **Semi-Annual** | Collected Toll Revenue | | | Processing | Total |
| **Period** | ETC | BBM | Total | Fees | Collected |
| Jul. - Dec. 2020 | $10,923 | $6,302 | $17,225 | $528 | $17,753 |
| Jan. - Jun. 2021 | 11,554 | 7,440 | 18,993 | 1,813 | 20,806 |
| Jul. - Dec. 2021 | 14,555 | 9,482 | 24,037 | 2,386 | 26,423 |
| Jan. - Jun. 2022 | 14,708 | 9,312 | 24,020 | 3,067 | 27,087 |
| Jul. - Dec. 2022 | 16,261 | 10,047 | 26,309 | 2,741 | 29,050 |
| Jan. - Jun. 2023 | 17,554 | 10,890 | 28,444 | 2,871 | 31,316 |
| | **Percent Difference** | | | | |
| **Semi-Annual** | Collected Toll Revenue | | | Processing | Total |
| **Period** | ETC | BBM | Total | Fees | Collected |
| Jul. - Dec. 2020 | -1.0% | 0.2% | -0.6% | 16.4% | -0.2% |
| Jan. - Jun. 2021 | -0.7% | 13.6% | 4.4% | 5.4% | 4.5% |
| Jul. - Dec. 2021 | 2.4% | 20.0% | 8.7% | 17.0% | 9.4% |
| Jan. - Jun. 2022 | -11.9% | 1.7% | -7.1% | 32.0% | -3.8% |
| Jul. - Dec. 2022 | -11.2% | 1.2% | -6.8% | 10.7% | -5.4% |
| Jan. - Jun. 2023 | -9.3% | 5.1% | -4.3% | 12.9% | -2.9% |

## 4. Model Input Updates

For this update, CDM Smith focused on collecting data and updating model inputs which were most likely to significantly influence the traffic and revenue estimates on the Triangle Expressway system. CDM Smith used the Triangle Regional Model version 6 (TRMv6) for the 2021 T&R Study and again as the basis for this update. Various elements of the model were updated or adjusted for the 2021 T&R Study based on information available to the project team at the time the work was performed. The following key inputs and assumptions were further reviewed and updated for this study:

- Socioeconomic forecasts including population, households, and employment
- Long-range highway improvement program

- Inflation forecasts, estimates of values of time and vehicle operating cost
- Trip table revisions related to telecommuting
- ETC market share estimates

## 4.1 Socioeconomic Forecasts

CDM Smith engaged an independent economist, Dr. Stephen J. Appold, to provide a review and update of the land use and socioeconomic growth forecasts used in the 2021 T&R Study. Such socio-economic estimates and projections are important inputs into the assessment of the future growth in demand for the region and study corridors.

### *4.1.1 Adjustments to Population Forecast*

**Table 4.1** presents the updated population forecasts on a county basis. As noted, only Durham, Orange, and Wake counties are entirely within the TRMv6 model area. While there are some changes both in value and in growth rate from year to year, in general the changes are very minimal. On a total basis, growth between 2019 and 2025 in the 2021 T&R Study was 1.8% per year, while growth between 2020 and 2025 is now 1.9% per year. Overall, the 2021 T&R Study growth between 2019 and 2045 and the new study growth between 2020 and 2045 are both 1.7% per year. On a total area basis, the current study population forecast is higher than estimates from the 2021 T&R Study by 28.7 thousand in 2025, 68.9 thousand in 2035, and 77.5 thousand in 2045.

**Table 4.1 – Model Area Population Forecasts by County – 2021 T&R Study and Current Study Values (000)**

**2021 Study**

| County (1) | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| Durham (1) | 305.1 | 1.3 % | 328.8 | 1.3 % | 372.6 | 1.2 % | 419.3 | 1.2 % |
| Johnston | 177.0 | 3.5 | 217.8 | 2.5 | 279.0 | 2.3 | 349.6 | 2.7 |
| Orange (1) | 136.1 | 1.2 | 146.3 | 0.9 | 160.4 | 0.9 | 175.0 | 1.0 |
| Wake (1) | 1,089.3 | 1.5 | 1,193.4 | 1.7 | 1,410.8 | 1.6 | 1,647.4 | 1.6 |
| Other (2) | 213.1 | 2.9 | 252.4 | 1.7 | 298.1 | 1.6 | 349.5 | 1.9 |
| Total | 1,920.6 | 1.8 | 2,138.7 | 1.7 | 2,520.8 | 1.6 | 2,940.8 | 1.7 |

**Current Study**

| County (1) | 2020 | AAPC 2020-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2020-45 |
|---|---|---|---|---|---|---|---|---|
| Durham (1) | 311.1 | 1.3 % | 331.0 | 1.3 % | 375.2 | 1.1 % | 419.3 | 1.2 % |
| Johnston | 191.6 | 3.8 | 231.3 | 2.2 | 288.5 | 1.9 | 348.2 | 2.4 |
| Orange (1) | 137.8 | 0.7 | 142.6 | 0.9 | 155.9 | 0.8 | 168.9 | 0.8 |
| Wake (1) | 1,111.7 | 1.8 | 1,215.0 | 1.9 | 1,468.7 | 1.6 | 1,723.3 | 1.8 |
| Other (2) | 221.1 | 2.3 | 247.5 | 2.0 | 301.4 | 1.8 | 358.6 | 2.0 |
| Total | 1,973.3 | 1.9 | 2,167.4 | 1.8 | 2,589.7 | 1.5 | 3,018.2 | 1.7 |

(1) Only Durham, Orange and Wake counties are entirely contained in the TRMv6 model area. The population in the remaining counties represents only the portion within the TRM model boundaries.
(2) Other includes Chatham, Franklin, Granville, Harnett, Nash, and Person Counties

Note: AAPC is an abbreviation for Average Annual Percent Change

The socioeconomic data was aggregated into 6 regions around the model area (see **Figure 4.1**). **Table 4.2** shows the forecast by year for the 2021 T&R Study and the current study. The total forecast for population within the 6 regions has increased from 686.1 thousand in 2019 to 701.9 thousand in 2020. The growth rates by region are very similar over time. On a total basis of all regions, from 2019 to 2045 the older study forecasted growth at 1.7% per year while the current study forecasted growth at 1.8% per year.

**Table 4.3** shows the differences between the 2021 T&R Study and the current study by forecast year. In 2025, the current study is 14.0 thousand higher, 32.5 thousand higher in 2035, and 38.5 thousand higher in 2045.

**Table 4.2 – Detailed Study Area Total Population Forecasts by Region (000)**

**2021 Study**

| Region Number and Name | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 128.0 | 1.0 % | 135.5 | 1.0 % | 149.6 | 1.0 % | 164.8 | 1.0 % |
| 2 North of US 1 | 118.2 | 0.9 | 124.6 | 1.0 | 137.8 | 1.0 | 152.3 | 1.0 |
| 3 South Wake | 153.4 | 2.6 | 178.7 | 2.6 | 231.5 | 2.2 | 289.0 | 2.5 |
| 4 Johnston | 57.8 | 3.4 | 70.5 | 2.5 | 90.5 | 2.3 | 113.3 | 2.6 |
| 5 East Wake | 54.8 | 3.0 | 65.6 | 3.0 | 87.9 | 2.5 | 112.3 | 2.8 |
| 6 Inner Ring | 173.9 | 1.0 | 184.3 | 1.1 | 206.0 | 1.1 | 229.6 | 1.1 |
| Total | 686.1 | 1.7 | 759.1 | 1.8 | 903.4 | 1.6 | 1,061.3 | 1.7 |

**Current Study**

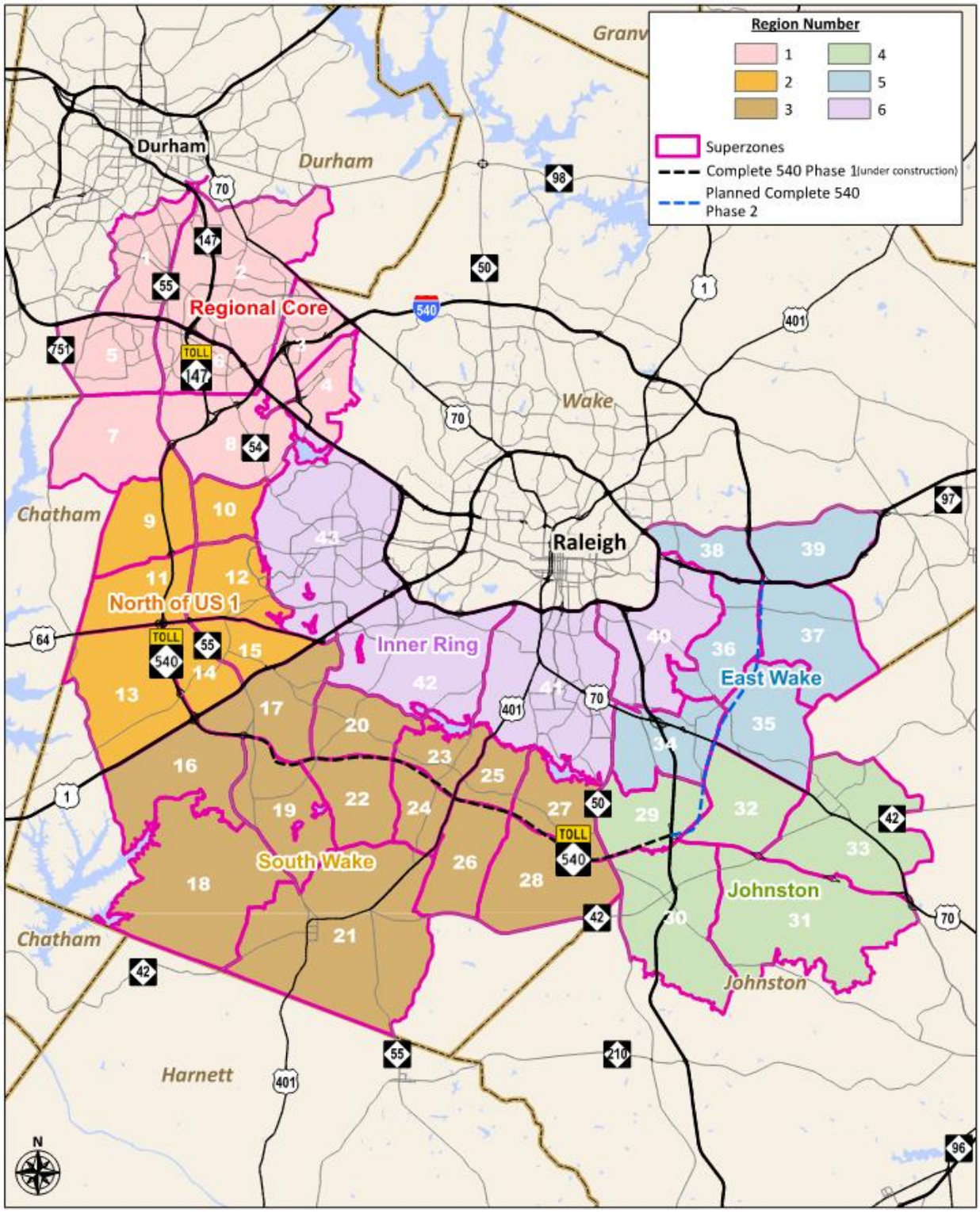
| Region Number and Name | 2020 | AAPC 2020-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2020-45 |
|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 134.5 | 0.9 % | 141.0 | 1.0 % | 155.8 | 0.9 % | 170.7 | 1.0 % |
| 2 North of US 1 | 122.7 | 1.0 | 129.0 | 1.1 | 144.5 | 1.0 | 160.0 | 1.1 |
| 3 South Wake | 158.2 | 3.0 | 183.3 | 2.9 | 244.9 | 2.3 | 306.8 | 2.7 |
| 4 Johnston | 63.3 | 3.6 | 75.7 | 2.3 | 95.2 | 1.9 | 115.4 | 2.4 |
| 5 East Wake | 54.5 | 3.6 | 65.2 | 3.4 | 91.2 | 2.5 | 117.3 | 3.1 |
| 6 Inner Ring | 168.6 | 1.2 | 178.9 | 1.3 | 204.3 | 1.2 | 229.7 | 1.2 |
| Total | 701.9 | 2.0 | 773.2 | 1.9 | 935.9 | 1.6 | 1,099.8 | 1.8 |

Note: TRMv6 is the Triangle Regional Model version 6
AAPC is an abbreviation for Average Annual Percent Change

**Table 4.3 – Detailed Study Area Total Population Differences by Region (000)**

| Region Number and Name | 2025 2021 Study | 2025 Current Study | 2025 Difference | 2035 2021 Study | 2035 Current Study | 2035 Difference | 2045 2021 Study | 2045 Current Study | 2045 Difference |
|---|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 135.5 | 141.0 | 5.5 | 149.6 | 155.8 | 6.2 | 164.8 | 170.7 | 5.9 |
| 2 North of US 1 | 124.6 | 129.0 | 4.4 | 137.8 | 144.5 | 6.7 | 152.3 | 160.0 | 7.7 |
| 3 South Wake | 178.7 | 183.3 | 4.6 | 231.5 | 244.9 | 13.4 | 289.0 | 306.8 | 17.7 |
| 4 Johnston | 70.5 | 75.7 | 5.2 | 90.5 | 95.2 | 4.7 | 113.3 | 115.4 | 2.0 |
| 5 East Wake | 65.6 | 65.2 | (0.4) | 87.9 | 91.2 | 3.3 | 112.3 | 117.3 | 5.0 |
| 6 Inner Ring | 184.3 | 178.9 | (5.3) | 206.0 | 204.3 | (1.7) | 229.6 | 229.7 | 0.1 |
| Total | 759.1 | 773.2 | 14.0 | 903.4 | 935.9 | 32.5 | 1,061.3 | 1,099.8 | 38.5 |

**Figure 4.1 - Region Boundaries**



### *4.1.2 Adjustments to Household Forecasts*

**Table 4.4** presents the updated household forecasts on a county basis. Like the population forecasts, the current study household forecasts are slightly higher in both total households and growth rate over time. The 2021 T&R Study had a total of 757.2 thousand households in 2019, while the current study has a total of 787.8 thousand. On a growth rate basis, the 2021 study grew at a rate of 1.9 percent per year between 2019 and 2045, while the current study forecast grows at a rate of 2.0 percent per year from 2020 to 2045.

Comparing the two parts of the table you can calculate differences in households forecasted between the 2021 T&R Study and the current study by year. In 2025, the current study is 29.8 thousand higher, 61.3 thousand higher in 2035, and 57.7 thousand higher in 2045.

**Table 4.4 – Model Area Household Forecasts by County (000)**

| | 2021 Study | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **County (1)** | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
| Durham (1) | 128.1 | 0.7 % | 133.5 | 0.8 % | 145.3 | 1.2 % | 164.3 | 1.0 % |
| Johnston | 64.0 | 4.1 | 81.4 | 2.6 | 105.3 | 2.4 | 134.1 | 2.9 |
| Orange (1) | 55.5 | 1.3 | 59.9 | 1.1 | 67.0 | 1.2 | 75.6 | 1.2 |
| Wake (1) | 425.5 | 2.2 | 483.7 | 2.0 | 591.1 | 1.9 | 712.2 | 2.0 |
| Other (2) | 84.2 | 3.2 | 101.6 | 1.8 | 121.1 | 1.8 | 144.6 | 2.1 |
| Total | 757.2 | 2.1 | 860.1 | 1.8 | 1,029.8 | 1.8 | 1,230.8 | 1.9 |

| | Current Study | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **County (1)** | 2020 | AAPC 2020-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2020-45 |
| Durham (1) | 135.2 | 1.4 % | 144.7 | 1.5 % | 167.8 | 1.2 % | 189.6 | 1.4 % |
| Johnston | 67.8 | 5.2 | 87.5 | 2.4 | 111.2 | 1.9 | 134.2 | 2.8 |
| Orange (1) | 57.1 | 1.3 | 60.9 | 1.2 | 68.4 | 0.9 | 74.8 | 1.1 |
| Wake (1) | 440.0 | 2.4 | 494.9 | 2.3 | 619.1 | 1.8 | 741.3 | 2.1 |
| Other (2) | 87.7 | 3.0 | 101.9 | 2.0 | 124.8 | 1.8 | 148.6 | 2.1 |
| Total | 787.8 | 2.5 | 889.9 | 2.1 | 1,091.1 | 1.7 | 1,288.5 | 2.0 |

(1) Only Durham, Orange and Wake counties are entirely contained in the TRMv6 model area. The population in the remaining counties represents only the portion within the TRM model boundaries.

(2) Other includes Chatham, Franklin, Granville, Harnett, Nash, and Person Counties

Note: AAPC is an abbreviation for Average Annual Percent Change

Like population, the household forecasts were also summarized on a region basis. **Table 4.5** shows the 2021 T&R Study and the current study forecasts grouped by the 6 regions. Growth rates for the current study showed higher growth in the early years between 2020 and 2035 at 2.6 percent per year (2020 to 2025) and 2.3 percent per year (2025 to 2035), compared to 2.2 percent per year (2019 to 2025) and 2.0 percent per year (2025 to 2035). Beyond 2035, the growth rates were more similar. On an overall forecast basis, the 2021 T&R Study had a growth rate of 2.0 percent per year

from 2019 to 2045, while the current study had a growth rate of 2.1 percent per year from 2020 to 2045.

**Table 4.6** shows the 2021 T&R Study and the current study forecasts differences by year. On a total basis, the difference between forecasts is 10.6 thousand households in 2025, 21.4 thousand in 2035, and 20.8 thousand in 2045.

**Table 4.5 – Detailed Study Area Household Forecasts by Region (000)**

**2021 Study**

| Region Number and Name | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 53.1 | 0.8 % | 55.7 | 0.9 % | 60.6 | 1.1 % | 67.4 | 0.9 % |
| 2 North of US 1 | 41.5 | 1.3 | 44.9 | 1.3 | 51.3 | 1.3 | 58.6 | 1.3 |
| 3 South Wake | 53.5 | 3.7 | 66.6 | 3.1 | 90.8 | 2.7 | 118.1 | 3.1 |
| 4 Johnston | 20.9 | 4.1 | 26.5 | 2.7 | 34.7 | 2.5 | 44.3 | 2.9 |
| 5 East Wake | 19.4 | 4.3 | 25.0 | 3.5 | 35.3 | 2.9 | 46.9 | 3.4 |
| 6 Inner Ring | 67.4 | 1.4 | 73.4 | 1.4 | 84.4 | 1.4 | 96.9 | 1.4 |
| Total | 255.7 | 2.2 | 292.1 | 2.0 | 357.1 | 1.9 | 432.1 | 2.0 |

**Current Study**

| Region Number and Name | 2020 | AAPC 2020-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2020-45 |
|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 56.9 | 1.1 % | 60.0 | 1.2 % | 67.5 | 1.0 % | 74.8 | 1.1 % |
| 2 North of US 1 | 43.1 | 1.5 | 46.3 | 1.5 | 53.7 | 1.3 | 61.0 | 1.4 |
| 3 South Wake | 55.8 | 4.1 | 68.2 | 3.5 | 96.2 | 2.5 | 123.7 | 3.2 |
| 4 Johnston | 22.5 | 5.0 | 28.7 | 2.6 | 37.0 | 2.0 | 45.1 | 2.8 |
| 5 East Wake | 19.9 | 4.8 | 25.2 | 3.9 | 37.0 | 2.8 | 48.7 | 3.7 |
| 6 Inner Ring | 68.6 | 1.6 | 74.3 | 1.6 | 87.0 | 1.4 | 99.6 | 1.5 |
| Total | 266.7 | 2.6 | 302.7 | 2.3 | 378.5 | 1.8 | 452.9 | 2.1 |

Note: AAPC is an abbreviation for Average Annual Percent Change

**Table 4.6 – Detailed Study Area Household Differences by Region (000)**

| Region Number and Name | 2025 2021 Study | 2025 Current Study | 2025 Difference | 2035 2021 Study | 2035 Current Study | 2035 Difference | 2045 2021 Study | 2045 Current Study | 2045 Difference |
|---|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 55.7 | 60.0 | 4.4 | 60.6 | 67.5 | 6.9 | 67.4 | 74.8 | 7.4 |
| 2 North of US 1 | 44.9 | 46.3 | 1.4 | 51.3 | 53.7 | 2.4 | 58.6 | 61.0 | 2.5 |
| 3 South Wake | 66.6 | 68.2 | 1.6 | 90.8 | 96.2 | 5.4 | 118.1 | 123.7 | 5.6 |
| 4 Johnston | 26.5 | 28.7 | 2.2 | 34.7 | 37.0 | 2.4 | 44.3 | 45.1 | 0.8 |
| 5 East Wake | 25.0 | 25.2 | 0.1 | 35.3 | 37.0 | 1.7 | 46.9 | 48.7 | 1.8 |
| 6 Inner Ring | 73.4 | 74.3 | 0.9 | 84.4 | 87.0 | 2.6 | 96.9 | 99.6 | 2.7 |
| Total | 292.1 | 302.7 | 10.6 | 357.1 | 378.5 | 21.4 | 432.1 | 452.9 | 20.8 |

The last set of updated forecasts were the employment forecasts. **Table 4.7** shows the employment forecast by county for the model area for the 2021 T&R Study and the current study. The 2020 employment numbers as a base were lower than the 2019 numbers from the older study. However, a higher growth rate in the early years has the current study being higher by the year 2025 with 1,163.4 thousand jobs compared to the older study with 1,122.3 thousand jobs. Beyond 2035, the growth rates matched at 0.9 percent per year until 2045. Overall, the growth rate for the current study is slightly higher at 1.4 percent per year from 2020 to 2045 compared to the older study at 1.1 percent per year from 2019 to 2045.

**Table 4.7 – Model Area Employment Forecasts by County (000)**

| | 2021 Study | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **County (1)** | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
| Durham (1) | 230.0 | 0.7 % | 239.7 | 1.0 % | 264.8 | 0.7 % | 285.3 | 0.8 % |
| Johnston | 50.0 | 2.4 | 57.6 | 1.7 | 67.9 | 1.3 | 77.5 | 1.7 |
| Orange (1) | 79.7 | 0.9 | 84.0 | 0.8 | 90.9 | 0.9 | 99.3 | 0.8 |
| Wake (1) | 624.7 | 1.5 | 682.9 | 1.1 | 763.8 | 1.0 | 841.2 | 1.2 |
| Other (2) | 54.2 | 1.2 | 58.2 | 1.0 | 64.1 | 0.7 | 68.8 | 0.9 |
| Total | 1,038.6 | 1.3 | 1,122.3 | 1.1 | 1,251.5 | 0.9 | 1,372.1 | 1.1 |

| | Current Study | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **County (1)** | 2020 | AAPC 2020-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2020-45 |
| Durham (1) | 231.4 | 1.9 % | 254.8 | 1.2 % | 287.4 | 0.7 % | 309.3 | 1.2 % |
| Johnston | 51.1 | 3.3 | 60.1 | 1.1 | 67.4 | 0.7 | 72.3 | 1.4 |
| Orange (1) | 75.6 | 2.3 | 84.5 | 0.8 | 91.8 | 1.1 | 102.7 | 1.2 |
| Wake (1) | 599.0 | 3.2 | 700.8 | 1.3 | 798.5 | 1.0 | 880.8 | 1.6 |
| Other (2) | 51.5 | 4.2 | 63.2 | 0.8 | 68.8 | 0.9 | 75.0 | 1.5 |
| Total | 1,008.6 | 2.9 | 1,163.4 | 1.2 | 1,313.8 | 0.9 | 1,440.0 | 1.4 |

(1) Only Durham, Orange and Wake counties are entirely contained in the TRMv6 model area. The population in the remaining counties represents only the portion within the TRM model boundaries.

(2) Other includes Chatham, Franklin, Granville, Harnett, Nash, and Person Counties

Note: AAPC is an abbreviation for Average Annual Percent Change

The two counties that account for most of the difference are Durham and Wake. On a total basis in 2025 the difference in employment for all counties is 41.1 thousand, with Durham accounting for 15.1 thousand and Wake 17.1 thousand of this. A similar trend occurs in both 2035 and 2045 as well.

**Table 4.8** presents the employment growth forecasts by region in the Detailed Study Area for the 2021 T&R Study and current study, and **Table 4.9** shows the differences in employment between the 2021 T&R Study and current study. Starting from a base of 2020, the current study shows more job growth in the early term compared to the 2021 T&R Study. Most of this is due to a COVID-19 rebound, and by 2025 the current study forecasts jobs to be slightly higher at 380.1 thousand compared to 372.8 thousand in the older study. Growth rates beyond 2025 are very similar, with the current study showing 1.5 percent per year until 2035 and then 1.0 percent per year to 2045, while the older study showed 1.3 percent per year to 2035 and then 1.1 percent per year to 2045. On a difference basis, the current study is slightly higher in all three years at 7.3 thousand in 2025, 14.9 thousand in 2035, and 14.1 thousand in 2045. Most of this is coming from South Wake and East Wake regions.

**Table 4.8 – Detailed Study Area Employment Forecasts by Region (000)**

| | 2021 Study | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Region Number and Name** | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
| 1 Regional Core | 129.5 | 0.4 % | 132.2 | 1.1 % | 148.1 | 0.9 % | 162.1 | 0.9 % |
| 2 North of US 1 | 29.4 | 1.3 | 31.8 | 0.8 | 34.5 | 0.7 | 37.1 | 0.9 |
| 3 South Wake | 42.0 | 1.7 | 46.4 | 1.4 | 53.1 | 1.2 | 59.6 | 1.4 |
| 4 Johnston | 16.8 | 5.3 | 23.0 | 3.0 | 30.9 | 2.1 | 38.2 | 3.2 |
| 5 East Wake | 14.5 | 3.8 | 18.1 | 2.7 | 23.6 | 2.0 | 28.8 | 2.7 |
| 6 Inner Ring | 109.4 | 1.7 | 121.3 | 1.0 | 134.2 | 0.9 | 146.5 | 1.1 |
| Total | 341.7 | 1.5 | 372.8 | 1.3 | 424.5 | 1.1 | 472.4 | 1.3 |

| | Current Study | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Region Number and Name** | 2020 | AAPC 2020-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2020-45 |
| 1 Regional Core | 113.7 | 2.9 % | 131.1 | 1.4 % | 151.1 | 1.0 % | 166.1 | 1.5 % |
| 2 North of US 1 | 31.4 | 2.1 | 34.8 | 0.9 | 38.1 | 0.7 | 40.9 | 1.1 |
| 3 South Wake | 42.7 | 3.7 | 51.3 | 1.5 | 59.5 | 1.1 | 66.5 | 1.8 |
| 4 Johnston | 16.4 | 7.3 | 23.3 | 2.2 | 28.9 | 1.2 | 32.6 | 2.8 |
| 5 East Wake | 16.6 | 7.1 | 23.4 | 2.5 | 29.9 | 1.7 | 35.4 | 3.1 |
| 6 Inner Ring | 99.9 | 3.1 | 116.2 | 1.3 | 131.8 | 1.0 | 145.0 | 1.5 |
| Total | 320.8 | 3.5 | 380.1 | 1.5 | 439.3 | 1.0 | 486.5 | 1.7 |

Note: AAPC is an abbreviation for Average Annual Percent Change

**Table 4.9 – Detailed Study Area Employment Differences by Region (000)**

| Region Number and Name | 2025 | | | 2035 | | | 2045 | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2021 Study | Current Study | Difference | 2021 Study | Current Study | Difference | 2021 Study | Current Study | Difference |
| 1 Regional Core | 132.2 | 131.1 | (1.2) | 148.1 | 151.1 | 2.9 | 162.1 | 166.1 | 4.0 |
| 2 North of US 1 | 31.8 | 34.8 | 3.0 | 34.5 | 38.1 | 3.6 | 37.1 | 40.9 | 3.8 |
| 3 South Wake | 46.4 | 51.3 | 4.9 | 53.1 | 59.5 | 6.4 | 59.6 | 66.5 | 6.9 |
| 4 Johnston | 23.0 | 23.3 | 0.3 | 30.9 | 28.9 | (2.1) | 38.2 | 32.6 | (5.6) |
| 5 East Wake | 18.1 | 23.4 | 5.2 | 23.6 | 29.9 | 6.3 | 28.8 | 35.4 | 6.6 |
| 6 Inner Ring | 121.3 | 116.2 | (5.1) | 134.2 | 131.8 | (2.4) | 146.5 | 145.0 | (1.5) |
| Total | 372.8 | 380.1 | 7.3 | 424.5 | 439.3 | 14.9 | 472.4 | 486.5 | 14.1 |

With limited exceptions, the updated estimates for population, households, and employment are marginally higher than the projections used in the 2021 T&R study. The updated estimates also result in similar or slightly higher projected growth rates for population, households, and employment in the Detail Study Area and the counties most relevant to the Triangle Expressway system. As a result, CDM Smith made no revisions to the trip tables used in the 2021 T&R study based the updated socioeconomic forecasts in the study area.

## 4.2 Changes to Roadway Improvements Assumptions

Since completion of the 2021 T&R Study, updated versions of the NCDOT STIP and the CAMPO and DCHC MTPs have been adopted. The future-year travel demand model roadway networks used in the current study were updated to reflect assumptions from the following sources:

- ***2024-2033 NC State Transportation Improvement Program (STIP)*** and interactive maps as of July 2023,
- NC Capital Area Metropolitan Planning Organization (CAMPO) and Durham - Chapel Hill – Carrboro Metropolitan Planning Organization (DCHC MPO) ***2050 Metropolitan Transportation Plan (MTP)*** and interactive maps as of July 2023.

**Table 4.10** presents a list of roadway improvement projects for which the expected timeframe for completion changed between the completion of the 2021 T&R Study and the current approved STIP and MTPs. The table indicates the model-year in which each improvement was assumed in the 2021 T&R Study and the current study. Improvements are organized alphabetically by STIP/MTP project ID and by model year. No changes were made to the 2025 roadway networks for the current study. "CTP" indicates Comprehensive Transportation Plans that are not fiscally constrained and do not have a fixed future date by which the facilities would be complete. "NA" indicates an improvement is no longer found in any currently approved STIP/MTP document. Projects with these designations were removed from the future-year travel demand model roadway networks used in the current study.

**Table 4.10 – Changes to Roadway Improvement Assumptions**

| STIP/MTP ID | Roadway | Location | Description | Model Year 2021 Study | Model Year Current Study |
|---|---|---|---|---|---|
| A114c | Ten Ten Rd | Holly Springs Rd and Kildare Farm Rd | Widen from 2 to 4 lanes | 2035 | CTP |
| A136a | Lake Wheeler Rd | Tryon Rd to Penny Rd | Widen from 2 to 4 lanes | 2035 | 2045 |
| A136c | Lake Wheeler Rd | Ten Ten Rd to Hilltop-Needmore Rd | Widen from 2 to 4 lanes | 2035 | 2045 |
| A137c | Old Stage Rd | Rock Service Station to NC 42 | Widen from 2 to 4 lanes | 2035 | 2045 |
| A138d | White Oak-Guy Rd Connector | White Oak Rd to Guy Rd | Construct 4 lanes on new location | 2035 | 2045 |
| A140a | Vandora Springs Rd & | Timber Dr to Old Stage Rd | Widen from 2 to 4 lanes | 2035 | NA |
| A140b | Vandora Springs Rd & | Old Stage Rd to U.S. 401 | Widen from 2 to 4 lanes | 2035 | 2045 |
| A143a | White Oak Rd | U.S. 70 to I-540 | Widen from 2 to 4 lanes | 2035 | 2045 |
| A143b | White Oak Rd | I-540 to NC 42 (Johnston Co) | Widen from 2 to 4 lanes | 2035 | 2045 |
| A163c | Friendship Rd | Richardson Rd to Old Holly Springs | Widen from 2 to 4 lanes | 2035 | 2045 |
| A165a2b | Airport Blvd Extension | Church St to NC 56 | Construct 4 lanes on new location | 2035 | 2045 |
| A168a | Green Level Church Rd | Green Level West to Jenks Rd | Widen from 2 to 4 lanes | 2035 | 2045 |
| A203 | Auburn-Knightdale Rd | Grasshopper Rd to Raynor Rd | Widen from 2 to 4 lanes | 2035 | 2045 |
| A217a2 | Sunset Lake Rd | Main St to Edwards Dr / Bellagio Dr | Widen from 2 to 4 lanes | 2035 | 2045 |
| A217b | Sunset Lake Rd Extension | Old Holly Springs Apex to Main St | Construct 4 lanes on new location | 2035 | 2045 |
| A219b | McCrimmon Parkway | Louis Stephens Rd to NC 55 | Construct 4 lanes on new location | 2035 | 2045 |
| A41 | Kildare Farm Rd | Ten Ten Rd to Kildare Farm | Widen from 2 to 4 lanes | 2035 | 2045 |
| A544b | Avent Ferry Connector | Holly Springs Rd to Avent Ferry Rd | Construct 4 lanes on new location | 2035 | CTP |
| A544c2 | Avent Ferry Connector | Avent Ferry Rd to Rex Rd | Widen from 2 to 4 lanes | 2035 | CTP |
| A617a | U.S. 401 Bypass | U.S. 401 to NC 55 | Construct 6 lanes on new location | 2035 | 2045 |
| A619b | U.S. 401 | U.S. 401 Bypass to NC 55/NC 42 | Widen from 4 to 6 lanes | 2035 | 2045 |
| A66a | O'Kelley Chapel Rd | Alston Avenue to NC 55 | Widen from 2 to 4 lanes | 2035 | 2045 |
| A66b | O'Kelley Chapel Rd | Alston Avenue to NC 751 | Widen from 2 to 4 lanes | 2035 | CTP |
| F41 | I-40 Managed Lanes | Wade Avenue to Johnston County | Construct 2 Managed Lanes | 2035 | 2045 |
| F42b | I-540 Managed Lanes | I-40 to U.S. 64 Bypass | Construct 2 Managed Lanes | 2035 | 2045 |
| I-5702 | I-40 Managed Lanes | Durham County Line to Wade | Construct 2 Managed Lanes | 2035 | 2045 |
| A149a | Poole Rd | I-540 to Martin Pond Rd | Widen from 2 to 4 lanes | 2045 | CTP |
| A172 | Kelly Rd | Jenks Rd to Old U.S. 1 | Widen from 2 to 4 lanes | 2045 | CTP |
| A178a | Olive Chapel Rd | Kelly Rd to NC 55 | Widen from 2 to 4 lanes | 2045 | CTP |
| A178b | Olive Chapel Rd | Richardson Rd to Kelly Rd | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A178c | Olive Chapel Rd | New Hill Olive Chapel Rd to | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A179a1 | Richardson Rd | U.S. 64 (West) to Olive Chapel Rd | Construct 2 lanes on new location | 2045 | 2035 |
| A179b | Richardson Rd | Olive Chapel Rd to Humie Olive Rd | Widen from 2 to 4 lanes | 2045 | CTP |
| A179c | Richardson Rd | Humie Olive Rd to Old U.S. 1Highway | Construct 4 lanes on new location | 2045 | CTP |
| A184 | Apex Barbecue Rd | Old U.S. 1to Olive Chapel Rd | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A186a | Friendship Rd | Friendship Rd to Winding Way | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A186b | Friendship Rd | Winding Rd to Old U.S. 1 | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A187a | Apex Peakway | Olive Chapel Rd to Laura Duncan Rd | Widen from 2 to 4 lanes | 2045 | CTP |
| A187c | Apex Peakway | Broadstone Way to Old U.S. 1 | Widen from 2 to 4 lanes | 2045 | CTP |
| A187d | Apex Peakway | Old U.S. 1to Olive Chapel Rd | Widen from 2 to 4 lanes | 2045 | CTP |
| A192 | Graham Newton Rd | Penny Rd to Optimist Farm Rd | Widen from 2 to 4 lanes | 2045 | NA |
| A197b | Cent Campus Connector | Main Campus Dr Connector to I-40 | Construct 4 lanes on new location | 2045 | NA |
| A214 | Garner Rd | Tryon Rd to Rock Quarry Rd | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A237b | Old Apex Rd | Cary Parkway to Laura Duncan Rd | Widen from 2 to 4 lanes | 2045 | 2035 |
| A27a | Louis Stephens Dr Extension | Wake County Line to Kit Creek Rd | Widen from 2 to 4 lanes | 2045 | CTP |
| A27b | Louis Stephens Dr Extension | Kit Creek Rd to O'Kelly Chapel Rd | Widen from 2 to 4 lanes | 2045 | CTP |
| A34 | Cary Parkway | Evans Rd to Harrison Ave | Widen from 2 to 4 lanes | 2045 | CTP |
| A36c | Chatham St | N.E. Maynard Rd to I-40 Bridge | Widen from 2 to 4 lanes | 2045 | 2035 |
| A38 | Tryon Rd | U.S. 64 to Kildare Farm Rd | Widen from 2 to 6 lanes | 2045 | 2035 |
| A400a | Ten Ten Rd | Bells Lake Rd to Old Stage Rd | Widen from 2 to 4 lanes | 2045 | CTP |
| A400b | Ten Ten Rd | Old Stage Rd to NC 50 | Widen from 2 to 4 lanes | 2045 | CTP |
| A426a | NC 55 (Main St) | Sunset Lake Rd to Technology Dr | Widen from 2 to 4 lanes | 2045 | 2035 |
| A42b | Penny Rd | Kildaire Farm Rd to Holly Springs Rd | Widen from 2 to 4 lanes | 2045 | CTP |
| A443a | Jenks Rd | NC 55 to Wimberly Rd | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A443b | Jenks Rd | Wimberly Rd to U.S. 64 | Widen from 2 to 4 lanes | 2045 | CTP |
| A510 | Cass Holt Rd | Avent Ferry Rd to NC 42 | Widen from 2 to 4 lanes | 2045 | CTP |
| A520a | Pleasant Grove Church Rd | Nelson Rd to Airport Blvd | Widen from 2 to 4 lanes | 2045 | CTP |
| A520b | Pleasant Grove Church Rd | Airport Blvd to Aviation Parkway | Construct 2 lanes on new location | 2045 | CTP |
| A539 | Banks Rd | U.S. 401to Fanny Brown Rd | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A540a | Rock Service Station | Old Stage Rd to NC 42 | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A540b | Rock Service Station | NC 42 to Mt Pleasant Rd | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A549 | Wimberley Rd | Jenks Rd to Green Level West Rd | Widen from 2 to 3 lanes | 2045 | CTP |
| A571 | Slater Rd | Airport Blvd to West of NC 540 | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A578 | Auburn Church Rd | Jones SaU.S.age Rd to Garner Rd | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A581 | Bethlehem Rd | Old Faison Rd to Grasshopper Rd | Widen from 2 to 3 lanes (turn lane) | 2045 | CTP |
| A675a | Morrisville East Connector | Airport Blvd to Nova Dr | Construct 2 lanes on new location | 2045 | CTP |
| A677 | Marcom Dr Extension | Watkins Rd to Sorrell Grove Church | Construct 2 lanes on new location | 2045 | CTP |
| A76 | Optimist Farm Rd | Lake Wheeler Rd to Sunset Lake Rd | Widen from 2 to 4 lanes | 2045 | CTP |
| Jhns8 | Cornwallis Rd | NC 42 to Old Drugstore Rd | Widen from 2 to 4 lanes | 2045 | CTP |
| Jhns9 | Old Drugstore Rd | NC 42 to NC 50 | Widen from 2 to 4 lanes | 2045 | CTP |

Note: "CTP" indicates Comprehensive Transportation Plans that are not fiscally constrained and do not have a fixed future date by which the facilities would be complete. "NA" indicates an improvement is no longer found in any currently approved STIP/MTP document.

The combined impact of these changes was tested for model years 2035 and 2045. The combined impact of the roadway improvement changes in 2035 was an increase in systemwide transactions of 3.9 percent and 5.7 percent in additional gross revenue. The most notable changes to roadway improvement assumptions contributing to these impacts were delays in expected completion of I-40 managed lanes from Johnston County to Durham County (F41 and I-5702) and delays in several widenings to facilities parallel to the Triangle Expressway system including Ten Ten Road (A114c), Green Level Church Road (A168a), and Auburn-Knightdale Road (A203). The combined impact of the roadway improvement changes in 2045 was an increase in systemwide transactions of 0.9 percent and 1.3 percent in additional gross revenue.

## 4.3 Other Model Inputs

### *4.3.1 Inflation Rates*

For this study, estimated future rates of inflation were updated using recent CPI forecasts available from Moody's Analytics for the Raleigh MSA. **Table 4.11** shows a comparison of the prior and updated estimated inflation rates. The revisions to historical and near-term CPI forecasts result in net increases in cumulative inflation over those used in the 2021 T&R Study of 8.0 percent in 2025, 5.8 percent in 2035 and 8.2 percent in 2045.

**Table 4.11 - Estimated Annual Inflation Rate**

| | Average Annual Inflation | |
|---|---|---|
| **Year Range** | 2021 Study | Current Study |
| 2016-2020 | 1.3% | 0.5% |
| 2020-2025 | 2.5% | 4.8% |
| 2025-2035 | 2.2% | 2.0% |
| 2035-2045 | 2.1% | 2.4% |

Source: Moody's Analytics Raleigh MSA Forecasts from January 2020 and May 2023

### *4.3.2 Value of time (VOT) and Vehicle Operating Costs (VOC)*

**Table 4.12** summarizes the VOT values used by model year and trip purpose, as well as the updated VOC used in this forecast by vehicle type. The net changes to the CPI assumptions described in section 4.3.1 were applied to the future model-year VOT used in this forecast. As a result, VOT values in Table 4.12 are higher than the values used in the 2021 T&R Study by 8.0 percent in 2025, 5.8 percent in 2035 and 8.2 percent in 2045.

VOC was updated with the CPI net increases and changes to the EIA fuel price forecasts. The VOC per-mile values for passenger cars (Class 1) range from $0.220 in 2025 to $0.303 in 2045, an increase of 38 percent over the 20-year period. Commercial vehicle (Classes 2 &3) per-mile values range from $0.926 in 2025 to $1.34 in 2045, increasing by almost 50 percent during the forecast period. Compared to the 2021 T&R Study, VOC increased by 4 percent for passenger cars and 27

percent for commercial vehicles in 2025 and decreased by around 10% for passenger cars and increased by 10% for commercial vehicles in 2035 and 2045.

**Table 4.12 – Current Study Value of Time and Vehicle Operating Costs**

| | 2025 | 2035 | 2045 |
|---|---|---|---|
| **Value Of Time ($/minute)** | | | |
| Non-Airport | | | |
| Commute | $0.411 | $0.500 | $0.631 |
| Work-Based Other | 0.529 | 0.644 | 0.812 |
| Other | 0.380 | 0.462 | 0.583 |
| Airport | | | |
| Commute | $0.456 | $0.555 | $0.700 |
| Work-Based Other | 0.439 | 0.534 | 0.674 |
| Other | 0.444 | 0.541 | 0.682 |
| | | | |
| **Vehicle Operating Cost ($/mile)** | | | |
| Toll Class 1 | $0.220 | $0.244 | $0.303 |
| Toll Class 2 & 3 | 0.926 | 1.081 | 1.384 |

### *4.3.3 Projected ETC Market Share*

**Table 4.13** shows the assumed percent of travelers who have ETC transponders, by vehicle type and by model year in the 2021 T&R Study and the current study. Based on the recent historical ETC market share trends on Triangle Expressway described in Section 2.2, model inputs for ETC market share for Class 1 vehicles were reduced 4.0 percent in each model year from the values used in the 2021 T&R study. No change was made to ETC market share inputs for Class 2 and Class 3 vehicles.

**Table 4.13 – Average Weekday ETC Market Share Model Inputs**

| | 2021 T&R Study | | Current Study | |
|---|---|---|---|---|
| **Model Year** | Class 1 | Classes 2 & 3 | Class 1 | Classes 2 & 3 |
| 2025 | 66.3% | 50.6% | 62.3% | 50.6% |
| 2035 | 71.4% | 61.9% | 67.4% | 61.9% |
| 2045 | 74.8% | 70.3% | 70.8% | 70.3% |

## 4.4 Revised Assumptions for Commuting and Work from Home

In the 2021 T&R study, CDM Smith adjusted future-year trip tables in the travel demand model to reflect the impacts of COVID-19. The first adjustment was a two-year delay in economic growth, and the second was a 4 percent reduction in peak-period, work-related trips to reflect the post-COVID long-term increase in the rate of working from home. This section describes observed hourly traffic samples on Triangle Expressway from 2019 to 2023, and publicly available results of travel surveys conducted in the Raleigh area that were used as the basis of revisions to these assumptions.

### *4.4.1 Raleigh-Area Travel Surveys*

Results from two source of information, the Census' annual American Community Survey (ACS) and the Triangle Travel Survey (TTS), on recent Triangle Region commuting patterns, with a focus on working from home, are summarized below. Overall, the prevalence of working from home has decreased from its pandemic high. However, as of the latest available data, work-from-home rates remain far above pre-pandemic levels. Similarly, commuting to work has increased from its pandemic era low, but remains significantly below pre-pandemic levels.

ACS queries the means of transportation to work for all employed people aged 16 years and above. "Worked from home" is one of the possible answers. The information below stems from the ACS one-year summary data. **Table 4.14** shows that the proportion of employed people working from home increased more than threefold between 2019 and 2021, reaching 30.6 percent in Durham County and 35.1 percent in Wake County. By 2022, those increases moderated to 22.6 percent in Durham County and 28.9 percent in Wake County.

From 2019 to 2021, the proportion of workers that worked from home increased by 23.5 percentage points in Durham County and by 24.1 percentage points in Wake County.

**Table 4.14: Total Workers and Percent Working from Home - 2019, 2021, and 2022**

| | 2019 | | 2021 | | 2022 | |
|---|---|---|---|---|---|---|
| County (1) | Workers | Worked from home | Workers | Worked from home | Workers | Worked from home |
| Durham County | 163,535 | 7.10% | 163,289 | 30.60% | 181,143 | 22.60% |
| Orange County | 72,803 | 11.00% | 71,761 | 35.20% | 75,737 | 26.10% |
| Wake County | 581,238 | 11.00% | 591,550 | 35.10% | 623,775 | 28.90% |

(1) Data is limited to Durham County, Orange County, and Wake County due to incomplete ACS data for other counties in the TRM model area.

Source: American Community Survey One-year Summary files for 2019, 2021, and 2022

Resource Systems Group conducted the Triangle Travel Survey, a recurrent Household Travel Survey (HTS) Program in Raleigh-Durham, NC, which was administered beginning in 2016. **Table 4.15** shows the results of that survey from Fall 2018, Spring 2021, and Fall 2022 as related to frequency of commuting. Between Fall 2018 and Spring 2021 the proportion of those surveyed who commuted four or more days per week was reduced by half from 68 percent to 34 percent, and the proportion of those surveyed who never commuted to work tripled from 14 percent to 42 percent. By Fall 2022, 68 percent of those sampled were commuting at least one day per week, which is 16 percentage points below pre-COVID levels, but up 16 percentage points from Spring 2021.

**Table 4.15: Triangle Travel Survey Frequency of Commuting by Survey Year**

| Survey Administration | 4+ days / week | 1-3 days per week | Less than weekly | Never | Sample Size |
|---|---|---|---|---|---|
| Fall 2018 | 68% | 16% | 2% | 14% | 1,602 |
| Spring 2021 | 34% | 18% | 6% | 42% | 1,262 |
| Fall 2022 | 44% | 24% | 4% | 28% | 1,163 |

Source: There's No Place Like Home: A Multi-Survey Perspective on Teleworking in the Post-Pandemic Era (https://itre.ncsu.edu/wp-content/uploads/2023/01/Rosenson_TRB_Presentation.pdf)

### *4.4.2 Triangle Expressway System Transactions by Time of Day*

**Table 4.16** shows average weekday traffic by direction and time of day for the month of May in each year between 2019 and 2023 at selected mainline toll locations on Triangle Expressway. Also included are average weekday systemwide total traffic volumes for all ramp and mainline tolling locations.

At each of the three mainline locations the largest negative impacts were in the northbound direction in the AM peak period (6am-10am) and in the southbound direction in the PM peak period (3pm-7pm). These represent the predominant travel patterns for commute trips on the Triangle Expressway system. As of May 2023, peak-period, peak-direction traffic recovered substantially, but remained below 2019 levels by more than 20 percent at higher volume locations in the middle and northern sections of Triangle Expressway, and less so at the southern-most mainline segment. Continued strong recovery occurred through May 2023 at each mainline location shown in Table 4.16 with year-over-year growth in peak-period peak-direction traffic ranging from 16 percent to 30 percent over May 2022.

Peak-period traffic in the non-peak direction and traffic in the off-peak periods experienced strong growth through May 2023, resulting in average weekday traffic volumes that exceeded May 2019 at all locations.

AM and PM peak-period traffic for May 2023 at all toll locations combined was 11.5 percent below May 2019 levels. Off-peak period traffic for May 2023 was 14.8 percent above May 2019 levels. Average Weekday systemwide traffic for May 2023 was 3.4 percent below May 2019 levels. Year-over-year growth between May 2022 and May 2023 for traffic at all tolling locations combined was 16.5 percent.

**Table 4.16: Triangle Expressway Average Weekday Traffic by Time of Day – 2019 to 2023**

| Toll NC 540 Mainline Toll Location | Dir. | Time of Day (2) | 2019 | YoY Growth | 2020 | YoY Growth | 2021 | YoY Growth | 2022 | YoY Growth | 2023 | 2019-2023 Growth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T13/T14 - At Interchange with Toll NC 885 | NB | AM Peak | 2,920 | -41.3% | 1,714 | 48.3% | 2,542 | 13.7% | 2,890 | 6.2% | 3,069 | 5.1% |
| | | PM Peak | 9,302 | -68.7% | 2,913 | 65.6% | 4,824 | 28.2% | 6,186 | 18.2% | 7,310 | -21.4% |
| | | Off-Peak | 6,935 | -49.7% | 3,488 | 53.9% | 5,369 | 17.2% | 6,290 | 13.2% | 7,118 | 2.6% |
| | | 24 Hours | 19,157 | -57.6% | 8,115 | 56.9% | 12,735 | 20.7% | 15,365 | 13.9% | 17,497 | -8.7% |
| | SB | AM Peak | 9,086 | -71.4% | 2,601 | 60.6% | 4,178 | 34.8% | 5,633 | 17.0% | 6,592 | -27.4% |
| | | PM Peak | 3,653 | -47.1% | 1,933 | 77.5% | 3,431 | 14.0% | 3,909 | 7.0% | 4,182 | 14.5% |
| | | Off-Peak | 6,298 | -47.0% | 3,339 | 54.2% | 5,148 | 13.2% | 5,825 | 11.3% | 6,482 | 2.9% |
| | | 24 Hours | 19,037 | -58.6% | 7,874 | 62.0% | 12,756 | 20.5% | 15,368 | 12.3% | 17,257 | -9.4% |
| | Total | AM Peak | 12,007 | -64.1% | 4,316 | 55.7% | 6,720 | 26.8% | 8,524 | 13.3% | 9,661 | -19.5% |
| | | PM Peak | 12,955 | -62.6% | 4,846 | 70.3% | 8,255 | 22.3% | 10,095 | 13.8% | 11,492 | -11.3% |
| | | Off-Peak | 13,233 | -48.4% | 6,827 | 54.1% | 10,517 | 15.2% | 12,115 | 12.3% | 13,600 | 2.8% |
| | | 24 Hours | 38,194 | -58.1% | 15,988 | 59.4% | 25,492 | 20.6% | 30,733 | 13.1% | 34,754 | -9.0% |
| T17/T18 - North of Green Level West Rd | NB | AM Peak | 12,226 | -70.5% | 3,601 | 59.1% | 5,731 | 33.7% | 7,662 | 22.7% | 9,404 | -23.1% |
| | | PM Peak | 3,669 | -40.6% | 2,181 | 72.4% | 3,760 | 17.7% | 4,424 | 14.1% | 5,050 | 37.6% |
| | | Off-Peak | 6,126 | -36.8% | 3,870 | 50.3% | 5,817 | 12.1% | 6,523 | 14.7% | 7,480 | 22.1% |
| | | 24 Hours | 22,021 | -56.2% | 9,652 | 58.6% | 15,308 | 21.6% | 18,609 | 17.9% | 21,934 | -0.4% |
| | SB | AM Peak | 2,849 | -29.5% | 2,009 | 47.4% | 2,962 | 10.8% | 3,281 | 13.9% | 3,736 | 31.1% |
| | | PM Peak | 12,880 | -71.2% | 3,714 | 74.1% | 6,466 | 27.8% | 8,265 | 23.2% | 10,184 | -20.9% |
| | | Off-Peak | 7,129 | -44.5% | 3,956 | 58.0% | 6,249 | 15.5% | 7,217 | 16.5% | 8,409 | 18.0% |
| | | 24 Hours | 22,858 | -57.7% | 9,679 | 62.0% | 15,676 | 19.7% | 18,763 | 19.0% | 22,329 | -2.3% |
| | Total | AM Peak | 15,075 | -62.8% | 5,610 | 54.9% | 8,693 | 25.9% | 10,943 | 20.1% | 13,140 | -12.8% |
| | | PM Peak | 16,549 | -64.4% | 5,895 | 73.5% | 10,226 | 24.1% | 12,689 | 20.1% | 15,234 | -7.9% |
| | | Off-Peak | 13,255 | -41.0% | 7,826 | 54.2% | 12,066 | 13.9% | 13,740 | 15.6% | 15,889 | 19.9% |
| | | 24 Hours | 44,879 | -56.9% | 19,331 | 60.3% | 30,985 | 20.6% | 37,373 | 18.4% | 44,263 | -1.4% |
| T33/T34 - North of NC 55 Bypass | NB | AM Peak | 5,873 | -67.3% | 1,918 | 75.5% | 3,367 | 26.6% | 4,264 | 30.9% | 5,580 | -5.0% |
| | | PM Peak | 1,889 | -35.4% | 1,220 | 73.8% | 2,120 | 8.7% | 2,305 | 24.4% | 2,867 | 51.8% |
| | | Off-Peak | 3,026 | -31.4% | 2,075 | 51.0% | 3,133 | 6.4% | 3,333 | 22.7% | 4,092 | 35.2% |
| | | 24 Hours | 10,788 | -51.7% | 5,212 | 65.4% | 8,619 | 14.9% | 9,902 | 26.6% | 12,539 | 16.2% |
| | SB | AM Peak | 1,480 | -31.4% | 1,015 | 60.6% | 1,631 | 12.2% | 1,830 | 21.3% | 2,220 | 50.0% |
| | | PM Peak | 4,976 | -57.2% | 2,130 | 71.5% | 3,653 | 20.6% | 4,405 | 16.3% | 5,124 | 3.0% |
| | | Off-Peak | 3,552 | -35.8% | 2,279 | 54.9% | 3,531 | 12.4% | 3,970 | 21.4% | 4,821 | 35.7% |
| | | 24 Hours | 10,008 | -45.8% | 5,424 | 62.5% | 8,815 | 15.8% | 10,205 | 19.2% | 12,166 | 21.6% |
| | Total | AM Peak | 7,352 | -60.1% | 2,933 | 70.4% | 4,997 | 21.9% | 6,094 | 28.0% | 7,801 | 6.1% |
| | | PM Peak | 6,865 | -51.2% | 3,349 | 72.4% | 5,773 | 16.2% | 6,709 | 19.1% | 7,991 | 16.4% |
| | | Off-Peak | 6,579 | -33.8% | 4,354 | 53.1% | 6,663 | 9.6% | 7,303 | 22.0% | 8,913 | 35.5% |
| | | 24 Hours | 20,796 | -48.9% | 10,636 | 63.9% | 17,434 | 15.3% | 20,107 | 22.9% | 24,705 | 18.8% |
| System Total (1) | Total | AM Peak | 64,284 | -63.1% | 23,719 | 58.6% | 37,620 | 26.2% | 47,480 | 18.4% | 56,199 | -12.6% |
| | | PM Peak | 72,530 | -64.2% | 25,947 | 72.1% | 44,654 | 24.3% | 55,517 | 16.9% | 64,914 | -10.5% |
| | | Off-Peak | 60,157 | -42.4% | 34,663 | 53.2% | 53,113 | 13.4% | 60,252 | 14.6% | 69,076 | 14.8% |
| | | 24 Hours | 196,971 | -57.2% | 84,329 | 60.5% | 135,387 | 20.6% | 163,249 | 16.5% | 190,189 | -3.4% |

(1) Systemwide total transactions include all mainline and ramp toll zones except T15/T16 North of Morrisville Parkway which opened to traffic in 2020.

(2) AM Peak = 6am to 10am, PM Peak = 3pm to 7pm, Off-Peak = All hours not included in AM and PM peaks.

#### *4.4.3 Revised Trip Table Adjustments*

For the 2021 T&R Study, CDM Smith made a four percent reduction to work-related trips in peak-period trip tables representing commute-to-work and non-home based trips (likely business-related trips) to all future model years to account for expected long-term changes in telecommuting rates. Based on the results of the travel surveys in the study area and observed traffic trends on Triangle Expressway, CDM Smith revised this adjustment to work-related trips in the peak-period trip tables from -4.0 percent to -15.0 percent to account for the persistent negative impacts to peak-period peak-direction traffic on Triangle Expressway. Additionally, CDM Smith applied a 6.0 percent increase to non-work related trips in the off-peak period trip tables. Both adjustments were made to all future model years (2025, 2035, and 2045). In the absence of a full re-calibration of the model to a post-pandemic condition, these adjustments were made to the trip tables globally to reflect more closely observed system-wide transactions and revenue trends on Triangle Expressway overall. No adjustments were made to reflect differing impacts by location.

# 5. Traffic and Revenue Forecasts

Estimated annual traffic and revenue forecasts are presented in this section. First, some key assumptions not already covered in prior sections are summarized.

## 5.1 Forecast Assumptions

Traffic and revenue estimates for the Triangle Expressway and Complete 540 Phases 1 and 2 are predicated on the following basic assumptions, which are considered reasonable for purpose of the this forecast:

- Complete 540 Phase 1 is assumed to open on July 1, 2024, and Complete 540 Phase 2 is assumed to open on January 1, 2029.
- No changes have been made to ramp-up assumptions used in the 2021 T&R Study.
- Highway and other transportation improvements as set forth in Table 4.10 will be implemented within the time frames assumed in that table. No other transportation improvement projects, particularly new roads, additional road capacity or new interchanges will be constructed during the forecast period, other than those shown in Table 4.10.
- The annual rate of inflation will be as shown in Table 4.11 for purposes of the forecast.
- Estimated method-of-payment market shares among ETC and BBM transactions will be as shown in Table 4.13.
- The Triangle Expressway will continue to be well maintained, efficiently operated, and effectively signed and promoted to encourage maximum usage.
- Motor fuel will remain in adequate supply throughout the forecast period. Fuel price increases will not significantly exceed the overall rate of inflation. Fuel price forecasts provided by the U.S. Energy Information Administration through 2050 will generally be experienced.

- No national, state, or regional emergency will arise that would abnormally restrict the use of motor vehicles. Future transportation technology changes will not significantly negatively impact traffic and revenue on Triangle Expressway over the projection period.

### *5.1.1 Toll Schedule*

The toll rate schedule for the Triangle Expressway System including Complete 540 Phase 1 and Phase 2 used in the 2021 T&R Study has been extended through 2064 for the purposes of this forecast. No other changes have been made to the toll rate schedule used in the 2021 T&R Study for any part of the Triangle Expressway system including Complete 540 Phase 1 and Phase 2. The extended toll rate schedule used for the current study is shown in **Table 5.1** for the Triangle Expressway and in **Table 5.2** for Complete 540 Phase 1 and Phase 2.

### *5.1.2 Collected Revenue*

Leakage adjustments due to unbillable and uncollectible BBM transactions, and processing fee revenue from late BBM invoice payments are applied to the estimated gross toll revenue forecasts. The adjustments used in the 2021 T&R Study were based on seven years of actual experience on the Triangle Expressway, provided by NCTA. That forecast assumed that toll revenue collection, particularly as related to BBM transactions and processing fee revenue, will continue to be collected at similar rates over the forecast period.

Temporary COVID-related changes to BBM invoicing and related enforcement measures resulted in decreased rates of collection of BBM invoice revenue between March 2020 and February 2022. Based on the most recent available data, revenue collection rates on BBM invoice revenue are 4.1 percentage points below pre-COVID historical averages. Reinstatement of North Carolina Division of Motor Vehicles (NCDMV) holds on unpaid BBM invoices for in-state customers will resume in full in October 2023. This is the final remaining temporary COVID-related policy change related to BBM invoices to be restored to pre-COVID status.

Installation of improved roadside tolling equipment resulted in improved license plate image capture and reduced leakage due to unbillable transactions (rejects)beginning in fall of 2021. Based on data for the most recent available 24-month period, the rate of rejects has improved by 2.5 percentage points compared with historical data prior to that period.

The T&R forecast in the current study assumes the resumption of normal collections policies, in combination with improved license plate image capture rates, will result in BBM revenue collection rates improving to pre-COVID historical norms by FY 2026.

**Table 5.1**
**Assumed Class 1 Toll Rates By Year**
**Triangle Expressway Toll Zones**

| Calendar | T01/T02 | | T09/T10 | | T05/T06 | | T13/T14 | | T15/T16 | | T17/T18 | | T21/T22 | | T25/T26 | | T29/T30 | | T31/T32 | | T33/T34 | | ETC Through Trip via Toll NC 540 (2) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year (1) | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | Toll Rate | Per-mile Rate |
| 2023 | 0.43 | 0.66 | 0.95 | 1.46 | 1.19 | 1.82 | 0.77 | 1.17 | 0.52 | 0.80 | 0.43 | 0.66 | 0.53 | 0.81 | 1.17 | 1.80 | 0.30 | 0.46 | 0.33 | 0.50 | 0.49 | 0.75 | 3.38 | 0.224 |
| 2024 | 0.45 | 0.68 | 0.99 | 1.51 | 1.23 | 1.88 | 0.79 | 1.20 | 0.54 | 0.83 | 0.45 | 0.69 | 0.54 | 0.83 | 1.21 | 1.86 | 0.31 | 0.47 | 0.34 | 0.52 | 0.51 | 0.78 | 3.50 | 0.232 |
| 2025 | 0.46 | 0.70 | 1.01 | 1.55 | 1.27 | 1.94 | 0.81 | 1.24 | 0.55 | 0.85 | 0.46 | 0.71 | 0.56 | 0.86 | 1.25 | 1.91 | 0.32 | 0.49 | 0.35 | 0.53 | 0.52 | 0.80 | 3.59 | 0.238 |
| 2026 | 0.47 | 0.72 | 1.04 | 1.60 | 1.30 | 1.99 | 0.84 | 1.28 | 0.57 | 0.88 | 0.47 | 0.72 | 0.58 | 0.88 | 1.29 | 1.97 | 0.33 | 0.50 | 0.36 | 0.55 | 0.54 | 0.82 | 3.71 | 0.246 |
| 2027 | 0.49 | 0.74 | 1.08 | 1.65 | 1.34 | 2.05 | 0.86 | 1.31 | 0.59 | 0.90 | 0.49 | 0.75 | 0.60 | 0.91 | 1.32 | 2.03 | 0.34 | 0.52 | 0.37 | 0.57 | 0.56 | 0.85 | 3.82 | 0.253 |
| 2028 | 0.50 | 0.76 | 1.11 | 1.70 | 1.38 | 2.12 | 0.88 | 1.35 | 0.61 | 0.93 | 0.50 | 0.77 | 0.61 | 0.93 | 1.36 | 2.09 | 0.35 | 0.53 | 0.38 | 0.58 | 0.57 | 0.87 | 3.92 | 0.260 |
| 2029 | 0.52 | 0.79 | 1.14 | 1.75 | 1.42 | 2.18 | 0.91 | 1.39 | 0.62 | 0.96 | 0.52 | 0.80 | 0.63 | 0.96 | 1.40 | 2.15 | 0.36 | 0.55 | 0.39 | 0.60 | 0.59 | 0.90 | 4.04 | 0.268 |
| 2030 | 0.53 | 0.81 | 1.17 | 1.80 | 1.46 | 2.24 | 0.94 | 1.44 | 0.64 | 0.99 | 0.53 | 0.82 | 0.65 | 0.99 | 1.45 | 2.22 | 0.37 | 0.57 | 0.40 | 0.62 | 0.61 | 0.93 | 4.17 | 0.276 |
| 2031 | 0.54 | 0.83 | 1.21 | 1.85 | 1.51 | 2.31 | 0.97 | 1.48 | 0.66 | 1.01 | 0.55 | 0.85 | 0.67 | 1.02 | 1.49 | 2.29 | 0.38 | 0.59 | 0.42 | 0.64 | 0.63 | 0.96 | 4.30 | 0.285 |
| 2032 | 0.56 | 0.85 | 1.25 | 1.91 | 1.55 | 2.38 | 0.99 | 1.52 | 0.68 | 1.05 | 0.57 | 0.88 | 0.69 | 1.05 | 1.54 | 2.36 | 0.39 | 0.60 | 0.43 | 0.66 | 0.65 | 0.99 | 4.43 | 0.293 |
| 2033 | 0.58 | 0.88 | 1.28 | 1.96 | 1.60 | 2.45 | 1.03 | 1.57 | 0.70 | 1.07 | 0.58 | 0.89 | 0.71 | 1.08 | 1.58 | 2.43 | 0.40 | 0.62 | 0.44 | 0.68 | 0.67 | 1.02 | 4.56 | 0.302 |
| 2034 | 0.60 | 0.91 | 1.32 | 2.02 | 1.64 | 2.52 | 1.06 | 1.62 | 0.72 | 1.11 | 0.60 | 0.92 | 0.73 | 1.11 | 1.63 | 2.50 | 0.41 | 0.63 | 0.45 | 0.70 | 0.69 | 1.05 | 4.70 | 0.311 |
| 2035 | 0.61 | 0.93 | 1.36 | 2.08 | 1.69 | 2.60 | 1.09 | 1.67 | 0.74 | 1.14 | 0.62 | 0.95 | 0.75 | 1.15 | 1.68 | 2.57 | 0.43 | 0.66 | 0.47 | 0.72 | 0.71 | 1.08 | 4.84 | 0.321 |
| 2036 | 0.62 | 0.95 | 1.39 | 2.14 | 1.73 | 2.66 | 1.11 | 1.71 | 0.76 | 1.17 | 0.63 | 0.97 | 0.77 | 1.19 | 1.72 | 2.65 | 0.44 | 0.68 | 0.48 | 0.74 | 0.72 | 1.11 | 4.94 | 0.327 |
| 2037 | 0.64 | 0.99 | 1.42 | 2.19 | 1.76 | 2.71 | 1.14 | 1.76 | 0.77 | 1.19 | 0.65 | 1.00 | 0.78 | 1.20 | 1.75 | 2.70 | 0.45 | 0.69 | 0.49 | 0.75 | 0.74 | 1.14 | 5.05 | 0.334 |
| 2038 | 0.65 | 1.00 | 1.45 | 2.23 | 1.80 | 2.77 | 1.16 | 1.79 | 0.79 | 1.22 | 0.66 | 1.02 | 0.80 | 1.23 | 1.79 | 2.76 | 0.46 | 0.71 | 0.50 | 0.77 | 0.76 | 1.17 | 5.16 | 0.342 |
| 2039 | 0.66 | 1.02 | 1.48 | 2.28 | 1.84 | 2.83 | 1.18 | 1.82 | 0.80 | 1.23 | 0.68 | 1.05 | 0.82 | 1.26 | 1.83 | 2.82 | 0.47 | 0.72 | 0.51 | 0.79 | 0.77 | 1.19 | 5.26 | 0.348 |
| 2040 | 0.68 | 1.05 | 1.51 | 2.33 | 1.88 | 2.90 | 1.21 | 1.86 | 0.82 | 1.26 | 0.69 | 1.06 | 0.83 | 1.28 | 1.86 | 2.86 | 0.48 | 0.74 | 0.52 | 0.80 | 0.79 | 1.22 | 5.37 | 0.356 |
| 2041 | 0.69 | 1.06 | 1.54 | 2.37 | 1.91 | 2.94 | 1.23 | 1.89 | 0.84 | 1.29 | 0.70 | 1.08 | 0.85 | 1.31 | 1.90 | 2.93 | 0.49 | 0.75 | 0.53 | 0.82 | 0.80 | 1.23 | 5.47 | 0.362 |
| 2042 | 0.71 | 1.09 | 1.57 | 2.42 | 1.95 | 3.00 | 1.26 | 1.94 | 0.86 | 1.32 | 0.71 | 1.09 | 0.87 | 1.34 | 1.94 | 2.99 | 0.50 | 0.77 | 0.54 | 0.83 | 0.82 | 1.26 | 5.59 | 0.370 |
| 2043 | 0.72 | 1.11 | 1.61 | 2.48 | 2.00 | 3.08 | 1.29 | 1.99 | 0.87 | 1.34 | 0.74 | 1.14 | 0.89 | 1.37 | 1.98 | 3.05 | 0.51 | 0.79 | 0.56 | 0.86 | 0.84 | 1.29 | 5.72 | 0.379 |
| 2044 | 0.74 | 1.14 | 1.64 | 2.53 | 2.04 | 3.14 | 1.31 | 2.02 | 0.89 | 1.37 | 0.75 | 1.16 | 0.90 | 1.39 | 2.03 | 3.13 | 0.52 | 0.80 | 0.57 | 0.88 | 0.86 | 1.32 | 5.84 | 0.387 |
| 2045 | 0.75 | 1.16 | 1.67 | 2.57 | 2.08 | 3.20 | 1.34 | 2.06 | 0.91 | 1.40 | 0.76 | 1.17 | 0.92 | 1.42 | 2.07 | 3.19 | 0.53 | 0.82 | 0.58 | 0.89 | 0.87 | 1.34 | 5.95 | 0.394 |
| 2046 | 0.77 | 1.19 | 1.70 | 2.62 | 2.12 | 3.26 | 1.37 | 2.11 | 0.93 | 1.43 | 0.77 | 1.19 | 0.94 | 1.45 | 2.11 | 3.25 | 0.54 | 0.83 | 0.59 | 0.91 | 0.89 | 1.37 | 6.07 | 0.402 |
| 2047 | 0.78 | 1.20 | 1.74 | 2.68 | 2.16 | 3.33 | 1.39 | 2.14 | 0.95 | 1.46 | 0.79 | 1.22 | 0.96 | 1.48 | 2.15 | 3.31 | 0.55 | 0.85 | 0.60 | 0.92 | 0.91 | 1.40 | 6.19 | 0.410 |
| 2048 | 0.80 | 1.23 | 1.77 | 2.73 | 2.21 | 3.40 | 1.42 | 2.19 | 0.97 | 1.49 | 0.80 | 1.23 | 0.98 | 1.51 | 2.20 | 3.39 | 0.56 | 0.86 | 0.62 | 0.95 | 0.92 | 1.42 | 6.31 | 0.418 |
| 2049 | 0.81 | 1.25 | 1.81 | 2.79 | 2.25 | 3.47 | 1.45 | 2.23 | 0.99 | 1.52 | 0.82 | 1.26 | 1.00 | 1.54 | 2.24 | 3.45 | 0.57 | 0.88 | 0.63 | 0.97 | 0.94 | 1.45 | 6.44 | 0.426 |
| 2050 | 0.83 | 1.28 | 1.84 | 2.83 | 2.30 | 3.54 | 1.48 | 2.28 | 1.00 | 1.54 | 0.84 | 1.29 | 1.02 | 1.57 | 2.29 | 3.53 | 0.59 | 0.91 | 0.64 | 0.99 | 0.96 | 1.48 | 6.57 | 0.435 |
| 2051 | 0.85 | 1.31 | 1.88 | 2.90 | 2.35 | 3.62 | 1.51 | 2.33 | 1.02 | 1.57 | 0.86 | 1.32 | 1.04 | 1.60 | 2.34 | 3.60 | 0.60 | 0.92 | 0.65 | 1.00 | 0.98 | 1.51 | 6.71 | 0.444 |
| 2052 | 0.86 | 1.32 | 1.91 | 2.94 | 2.39 | 3.68 | 1.54 | 2.37 | 1.04 | 1.60 | 0.87 | 1.34 | 1.06 | 1.63 | 2.38 | 3.67 | 0.61 | 0.94 | 0.67 | 1.03 | 1.00 | 1.54 | 6.83 | 0.452 |
| 2053 | 0.88 | 1.36 | 1.95 | 3.00 | 2.44 | 3.76 | 1.57 | 2.42 | 1.06 | 1.63 | 0.89 | 1.37 | 1.08 | 1.66 | 2.43 | 3.74 | 0.63 | 0.97 | 0.68 | 1.05 | 1.02 | 1.57 | 6.97 | 0.462 |
| 2054 | 0.90 | 1.39 | 1.99 | 3.06 | 2.49 | 3.83 | 1.60 | 2.46 | 1.08 | 1.66 | 0.91 | 1.40 | 1.10 | 1.69 | 2.48 | 3.82 | 0.64 | 0.99 | 0.69 | 1.06 | 1.04 | 1.60 | 7.11 | 0.471 |
| 2055 | 0.92 | 1.42 | 2.03 | 3.13 | 2.54 | 3.91 | 1.63 | 2.51 | 1.10 | 1.69 | 0.93 | 1.43 | 1.13 | 1.74 | 2.53 | 3.90 | 0.65 | 1.00 | 0.71 | 1.09 | 1.06 | 1.63 | 7.25 | 0.480 |
| 2056 | 0.93 | 1.43 | 2.07 | 3.19 | 2.59 | 3.99 | 1.67 | 2.57 | 1.13 | 1.74 | 0.94 | 1.45 | 1.15 | 1.77 | 2.58 | 3.97 | 0.66 | 1.02 | 0.72 | 1.11 | 1.08 | 1.66 | 7.40 | 0.490 |
| 2057 | 0.95 | 1.46 | 2.11 | 3.25 | 2.64 | 4.07 | 1.70 | 2.62 | 1.15 | 1.77 | 0.96 | 1.48 | 1.17 | 1.80 | 2.63 | 4.05 | 0.68 | 1.05 | 0.74 | 1.14 | 1.10 | 1.69 | 7.54 | 0.499 |
| 2058 | 0.97 | 1.49 | 2.16 | 3.33 | 2.69 | 4.14 | 1.73 | 2.66 | 1.17 | 1.80 | 0.99 | 1.52 | 1.20 | 1.85 | 2.68 | 4.13 | 0.69 | 1.06 | 0.75 | 1.16 | 1.12 | 1.72 | 7.69 | 0.509 |
| 2059 | 0.99 | 1.53 | 2.21 | 3.41 | 2.76 | 4.25 | 1.77 | 2.73 | 1.20 | 1.85 | 1.02 | 1.56 | 1.23 | 1.90 | 2.75 | 4.23 | 0.71 | 1.09 | 0.77 | 1.19 | 1.15 | 1.76 | 7.89 | 0.523 |
| 2060 | 1.02 | 1.57 | 2.27 | 3.50 | 2.83 | 4.36 | 1.81 | 2.80 | 1.23 | 1.90 | 1.05 | 1.60 | 1.26 | 1.95 | 2.82 | 4.34 | 0.73 | 1.12 | 0.79 | 1.22 | 1.18 | 1.80 | 8.09 | 0.536 |
| 2061 | 1.04 | 1.60 | 2.32 | 3.56 | 2.89 | 4.44 | 1.86 | 2.86 | 1.26 | 1.93 | 1.05 | 1.61 | 1.28 | 1.96 | 2.87 | 4.41 | 0.74 | 1.14 | 0.81 | 1.24 | 1.21 | 1.86 | 8.25 | 0.546 |
| 2062 | 1.06 | 1.63 | 2.37 | 3.64 | 2.95 | 4.53 | 1.90 | 2.92 | 1.29 | 1.98 | 1.08 | 1.66 | 1.30 | 2.00 | 2.93 | 4.50 | 0.75 | 1.15 | 0.82 | 1.26 | 1.23 | 1.89 | 8.43 | 0.558 |
| 2063 | 1.08 | 1.66 | 2.41 | 3.70 | 3.01 | 4.62 | 1.94 | 2.98 | 1.32 | 2.03 | 1.10 | 1.69 | 1.33 | 2.04 | 2.99 | 4.59 | 0.77 | 1.18 | 0.84 | 1.29 | 1.26 | 1.93 | 8.61 | 0.570 |
| 2064 | 1.11 | 1.70 | 2.46 | 3.78 | 3.07 | 4.71 | 1.98 | 3.04 | 1.34 | 2.06 | 1.12 | 1.72 | 1.36 | 2.09 | 3.06 | 4.70 | 0.78 | 1.20 | 0.86 | 1.32 | 1.28 | 1.96 | 8.78 | 0.581 |
| **Average Annual Percent Change in Toll Rates** | | | | | | | | | | | | | | | | | | | | | | | | |
| 2023-2025 | 3.4 | 3.0 | 3.1 | 3.0 | 3.3 | 3.2 | 2.6 | 2.9 | 2.8 | 3.1 | 3.4 | 3.7 | 2.8 | 3.0 | 3.4 | 3.0 | 3.3 | 3.2 | 3.0 | 3.0 | 3.0 | 3.3 | 3.1 | 3.1 |
| 2025-2035 | 2.9 | 2.9 | 3.0 | 3.0 | 2.9 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 2.9 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.1 | 3.2 | 3.0 | 3.0 | 3.0 |
| 2035-2045 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.1 |
| 2045-2064 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 |
| **2023-2045** | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.5 | 2.6 | 2.6 | 2.6 | 2.6 | 2.7 | 2.6 | 2.7 | 2.6 | 2.7 | 2.6 | 2.6 |

(1) Annual toll rate increases are assumed to be implemented on January 1st of each year.
(2) Through-trip toll rates and distances, shown in this table, exclude the Toll NC 885 portion of Triangle Expressway.

**Table 5.2**
**Assumed Class 1 Toll Rates by Toll Zone**
**Complete 540 Phases 1 and 2**

| | Complete 540 Phase 1 | | | | | | | | | | | | Complete 540 Phase 2 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NC 55 Bypass - Holly Springs Rd. | | Holly Springs Rd.- Bells Lake Rd. | | Bells Lake Rd. - U.S. 401 | | U.S. 401 - Old Stage Rd. | | Old Stage Rd. - NC 50 | | NC 50 - I-40 | | I-40 - White Oak Rd. | | White Oak Rd. - Bus. 70 | | Bus. 70 - Rock Quarry Rd. | | Rock Quarry Rd. - Auburn Knightdale Rd. | | Auburn Knightdale Rd. - Poole Rd. | | Poole Rd. - Knightdale Bypass | | ETC Through Trip via Complete 540 Phase 1 | | ETC Through Trip via Complete 540 Phase 2 | |
| Calendar Year (1) | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | Toll Rate | Per-mile Rate | Toll Rate | Per-mile Rate |
| 2024 (2) | 0.72 | 1.11 | 0.66 | 1.02 | 0.63 | 0.97 | 0.51 | 0.79 | 0.97 | 1.49 | 0.58 | 0.89 | - | - | - | - | - | - | - | - | - | - | - | - | 4.07 | 0.238 | - | - |
| 2025 | 0.74 | 1.14 | 0.68 | 1.05 | 0.65 | 1.00 | 0.52 | 0.80 | 1.00 | 1.54 | 0.60 | 0.92 | - | - | - | - | - | - | - | - | - | - | - | - | 4.19 | 0.245 | - | - |
| 2026 | 0.77 | 1.19 | 0.70 | 1.08 | 0.67 | 1.03 | 0.54 | 0.83 | 1.03 | 1.59 | 0.62 | 0.95 | - | - | - | - | - | - | - | - | - | - | - | - | 4.33 | 0.253 | - | - |
| 2027 | 0.79 | 1.22 | 0.73 | 1.12 | 0.69 | 1.06 | 0.55 | 0.85 | 1.06 | 1.63 | 0.64 | 0.99 | - | - | - | - | - | - | - | - | - | - | - | - | 4.46 | 0.261 | - | - |
| 2028 | 0.81 | 1.25 | 0.74 | 1.14 | 0.71 | 1.09 | 0.57 | 0.88 | 1.09 | 1.68 | 0.65 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - | 4.57 | 0.267 | - | - |
| 2029 (3) | 0.84 | 1.29 | 0.77 | 1.19 | 0.73 | 1.12 | 0.59 | 0.91 | 1.12 | 1.72 | 0.67 | 1.03 | 0.62 | 0.95 | 0.46 | 0.71 | 0.33 | 0.51 | 0.70 | 1.08 | 0.47 | 0.72 | 0.26 | 0.40 | 4.72 | 0.276 | 2.84 | 0.276 |
| 2030 | 0.86 | 1.32 | 0.79 | 1.22 | 0.75 | 1.16 | 0.60 | 0.92 | 1.16 | 1.79 | 0.69 | 1.06 | 0.64 | 0.99 | 0.48 | 0.74 | 0.34 | 0.52 | 0.72 | 1.11 | 0.48 | 0.74 | 0.26 | 0.40 | 4.85 | 0.284 | 2.92 | 0.283 |
| 2031 | 0.89 | 1.37 | 0.82 | 1.26 | 0.78 | 1.20 | 0.62 | 0.95 | 1.20 | 1.85 | 0.72 | 1.11 | 0.66 | 1.02 | 0.49 | 0.75 | 0.36 | 0.55 | 0.75 | 1.16 | 0.50 | 0.77 | 0.27 | 0.42 | 5.03 | 0.294 | 3.03 | 0.294 |
| 2032 | 0.92 | 1.42 | 0.84 | 1.29 | 0.80 | 1.23 | 0.64 | 0.99 | 1.23 | 1.89 | 0.74 | 1.14 | 0.68 | 1.05 | 0.51 | 0.79 | 0.37 | 0.57 | 0.77 | 1.19 | 0.51 | 0.79 | 0.28 | 0.43 | 5.17 | 0.302 | 3.12 | 0.303 |
| 2033 | 0.95 | 1.46 | 0.87 | 1.34 | 0.83 | 1.28 | 0.66 | 1.02 | 1.27 | 1.96 | 0.76 | 1.17 | 0.70 | 1.08 | 0.52 | 0.80 | 0.38 | 0.59 | 0.79 | 1.22 | 0.53 | 0.82 | 0.29 | 0.45 | 5.34 | 0.312 | 3.21 | 0.312 |
| 2034 | 0.97 | 1.49 | 0.89 | 1.37 | 0.85 | 1.31 | 0.68 | 1.05 | 1.31 | 2.02 | 0.78 | 1.20 | 0.72 | 1.11 | 0.54 | 0.83 | 0.39 | 0.60 | 0.82 | 1.26 | 0.55 | 0.85 | 0.30 | 0.46 | 5.48 | 0.320 | 3.32 | 0.322 |
| 2035 | 1.00 | 1.54 | 0.92 | 1.42 | 0.88 | 1.36 | 0.70 | 1.08 | 1.34 | 2.06 | 0.81 | 1.25 | 0.74 | 1.14 | 0.55 | 0.85 | 0.40 | 0.62 | 0.84 | 1.29 | 0.56 | 0.86 | 0.31 | 0.48 | 5.65 | 0.330 | 3.40 | 0.330 |
| 2036 | 1.02 | 1.57 | 0.94 | 1.45 | 0.89 | 1.37 | 0.71 | 1.09 | 1.37 | 2.11 | 0.82 | 1.26 | 0.76 | 1.17 | 0.56 | 0.86 | 0.41 | 0.63 | 0.86 | 1.32 | 0.57 | 0.88 | 0.31 | 0.48 | 5.75 | 0.336 | 3.47 | 0.337 |
| 2037 | 1.04 | 1.60 | 0.96 | 1.48 | 0.91 | 1.40 | 0.73 | 1.12 | 1.40 | 2.16 | 0.84 | 1.29 | 0.77 | 1.19 | 0.58 | 0.89 | 0.42 | 0.65 | 0.87 | 1.34 | 0.59 | 0.91 | 0.32 | 0.49 | 5.88 | 0.344 | 3.55 | 0.345 |
| 2038 | 1.07 | 1.65 | 0.98 | 1.51 | 0.93 | 1.43 | 0.75 | 1.16 | 1.43 | 2.20 | 0.86 | 1.32 | 0.79 | 1.22 | 0.59 | 0.91 | 0.43 | 0.66 | 0.89 | 1.37 | 0.60 | 0.92 | 0.33 | 0.51 | 6.02 | 0.352 | 3.63 | 0.352 |
| 2039 | 1.09 | 1.68 | 1.00 | 1.54 | 0.95 | 1.46 | 0.76 | 1.17 | 1.46 | 2.25 | 0.87 | 1.34 | 0.80 | 1.23 | 0.60 | 0.92 | 0.43 | 0.66 | 0.91 | 1.40 | 0.61 | 0.94 | 0.33 | 0.51 | 6.13 | 0.358 | 3.68 | 0.357 |
| 2040 | 1.11 | 1.71 | 1.02 | 1.57 | 0.97 | 1.49 | 0.77 | 1.19 | 1.49 | 2.29 | 0.89 | 1.37 | 0.82 | 1.26 | 0.61 | 0.94 | 0.44 | 0.68 | 0.93 | 1.43 | 0.62 | 0.95 | 0.34 | 0.52 | 6.25 | 0.365 | 3.76 | 0.365 |
| 2041 | 1.13 | 1.74 | 1.03 | 1.59 | 0.99 | 1.52 | 0.79 | 1.22 | 1.51 | 2.33 | 0.91 | 1.40 | 0.83 | 1.28 | 0.62 | 0.95 | 0.45 | 0.69 | 0.95 | 1.46 | 0.63 | 0.97 | 0.35 | 0.54 | 6.36 | 0.372 | 3.83 | 0.372 |
| 2042 | 1.15 | 1.77 | 1.06 | 1.63 | 1.01 | 1.56 | 0.81 | 1.25 | 1.55 | 2.39 | 0.93 | 1.43 | 0.85 | 1.31 | 0.64 | 0.99 | 0.46 | 0.71 | 0.97 | 1.49 | 0.65 | 1.00 | 0.35 | 0.54 | 6.51 | 0.381 | 3.92 | 0.381 |
| 2043 | 1.18 | 1.82 | 1.08 | 1.66 | 1.03 | 1.59 | 0.83 | 1.28 | 1.59 | 2.45 | 0.95 | 1.46 | 0.87 | 1.34 | 0.65 | 1.00 | 0.47 | 0.72 | 0.99 | 1.52 | 0.66 | 1.02 | 0.36 | 0.55 | 6.66 | 0.389 | 4.00 | 0.388 |
| 2044 | 1.20 | 1.85 | 1.10 | 1.69 | 1.05 | 1.62 | 0.84 | 1.29 | 1.62 | 2.49 | 0.97 | 1.49 | 0.89 | 1.37 | 0.66 | 1.02 | 0.48 | 0.74 | 1.01 | 1.56 | 0.68 | 1.05 | 0.37 | 0.57 | 6.78 | 0.396 | 4.09 | 0.397 |
| 2045 | 1.23 | 1.89 | 1.13 | 1.74 | 1.07 | 1.65 | 0.86 | 1.32 | 1.65 | 2.54 | 0.99 | 1.52 | 0.91 | 1.40 | 0.68 | 1.05 | 0.49 | 0.75 | 1.03 | 1.59 | 0.69 | 1.06 | 0.38 | 0.59 | 6.93 | 0.405 | 4.18 | 0.406 |
| 2046 | 1.25 | 1.93 | 1.15 | 1.77 | 1.10 | 1.69 | 0.88 | 1.36 | 1.68 | 2.59 | 1.01 | 1.56 | 0.93 | 1.43 | 0.69 | 1.06 | 0.50 | 0.77 | 1.05 | 1.62 | 0.70 | 1.08 | 0.38 | 0.59 | 7.07 | 0.413 | 4.25 | 0.413 |
| 2047 | 1.28 | 1.97 | 1.17 | 1.80 | 1.12 | 1.72 | 0.90 | 1.39 | 1.72 | 2.65 | 1.03 | 1.59 | 0.95 | 1.46 | 0.71 | 1.09 | 0.51 | 0.79 | 1.07 | 1.65 | 0.72 | 1.11 | 0.39 | 0.60 | 7.22 | 0.422 | 4.35 | 0.422 |
| 2048 | 1.30 | 2.00 | 1.20 | 1.85 | 1.14 | 1.76 | 0.91 | 1.40 | 1.75 | 2.70 | 1.05 | 1.62 | 0.96 | 1.48 | 0.72 | 1.11 | 0.52 | 0.80 | 1.09 | 1.68 | 0.73 | 1.12 | 0.40 | 0.62 | 7.35 | 0.430 | 4.42 | 0.429 |
| 2049 | 1.33 | 2.05 | 1.22 | 1.88 | 1.17 | 1.80 | 0.93 | 1.43 | 1.79 | 2.76 | 1.07 | 1.65 | 0.99 | 1.52 | 0.73 | 1.12 | 0.53 | 0.82 | 1.12 | 1.72 | 0.75 | 1.16 | 0.41 | 0.63 | 7.51 | 0.439 | 4.53 | 0.440 |
| 2050 | 1.36 | 2.09 | 1.25 | 1.93 | 1.19 | 1.83 | 0.95 | 1.46 | 1.82 | 2.80 | 1.09 | 1.68 | 1.00 | 1.54 | 0.75 | 1.16 | 0.54 | 0.83 | 1.14 | 1.76 | 0.76 | 1.17 | 0.42 | 0.65 | 7.66 | 0.448 | 4.61 | 0.448 |
| 2051 | 1.39 | 2.14 | 1.27 | 1.96 | 1.21 | 1.86 | 0.97 | 1.49 | 1.86 | 2.86 | 1.12 | 1.72 | 1.03 | 1.59 | 0.76 | 1.17 | 0.55 | 0.85 | 1.16 | 1.79 | 0.78 | 1.20 | 0.43 | 0.66 | 7.82 | 0.457 | 4.71 | 0.457 |
| 2052 | 1.41 | 2.17 | 1.30 | 2.00 | 1.24 | 1.91 | 0.99 | 1.52 | 1.90 | 2.93 | 1.14 | 1.76 | 1.04 | 1.60 | 0.78 | 1.20 | 0.56 | 0.86 | 1.18 | 1.82 | 0.79 | 1.22 | 0.43 | 0.66 | 7.98 | 0.467 | 4.78 | 0.464 |
| 2053 | 1.44 | 2.22 | 1.32 | 2.03 | 1.26 | 1.94 | 1.01 | 1.56 | 1.94 | 2.99 | 1.16 | 1.79 | 1.07 | 1.65 | 0.79 | 1.22 | 0.58 | 0.89 | 1.21 | 1.86 | 0.81 | 1.25 | 0.44 | 0.68 | 8.13 | 0.475 | 4.90 | 0.476 |
| 2054 | 1.47 | 2.26 | 1.35 | 2.08 | 1.28 | 1.97 | 1.03 | 1.59 | 1.97 | 3.03 | 1.18 | 1.82 | 1.09 | 1.68 | 0.81 | 1.25 | 0.59 | 0.91 | 1.23 | 1.89 | 0.82 | 1.26 | 0.45 | 0.69 | 8.28 | 0.484 | 4.99 | 0.484 |
| 2055 | 1.50 | 2.31 | 1.38 | 2.13 | 1.31 | 2.02 | 1.05 | 1.62 | 2.01 | 3.10 | 1.21 | 1.86 | 1.11 | 1.71 | 0.83 | 1.28 | 0.60 | 0.92 | 1.26 | 1.94 | 0.84 | 1.29 | 0.46 | 0.71 | 8.46 | 0.495 | 5.10 | 0.495 |
| 2056 | 1.53 | 2.36 | 1.40 | 2.16 | 1.34 | 2.06 | 1.07 | 1.65 | 2.05 | 3.16 | 1.23 | 1.89 | 1.13 | 1.74 | 0.84 | 1.29 | 0.61 | 0.94 | 1.28 | 1.97 | 0.86 | 1.32 | 0.47 | 0.72 | 8.62 | 0.504 | 5.19 | 0.504 |
| 2057 | 1.56 | 2.40 | 1.43 | 2.20 | 1.36 | 2.09 | 1.09 | 1.68 | 2.09 | 3.22 | 1.25 | 1.93 | 1.15 | 1.77 | 0.86 | 1.32 | 0.62 | 0.95 | 1.31 | 2.02 | 0.87 | 1.34 | 0.48 | 0.74 | 8.78 | 0.513 | 5.29 | 0.514 |
| 2058 | 1.59 | 2.45 | 1.46 | 2.25 | 1.39 | 2.14 | 1.11 | 1.71 | 2.13 | 3.28 | 1.28 | 1.97 | 1.17 | 1.80 | 0.88 | 1.36 | 0.63 | 0.97 | 1.33 | 2.05 | 0.89 | 1.37 | 0.49 | 0.75 | 8.96 | 0.524 | 5.39 | 0.523 |
| 2059 | 1.63 | 2.51 | 1.50 | 2.31 | 1.43 | 2.19 | 1.14 | 1.75 | 2.18 | 3.36 | 1.31 | 2.02 | 1.20 | 1.85 | 0.90 | 1.39 | 0.65 | 0.99 | 1.36 | 2.10 | 0.91 | 1.40 | 0.50 | 0.77 | 9.19 | 0.537 | 5.52 | 0.536 |
| 2060 | 1.67 | 2.57 | 1.54 | 2.37 | 1.47 | 2.25 | 1.17 | 1.79 | 2.24 | 3.45 | 1.34 | 2.07 | 1.23 | 1.90 | 0.92 | 1.43 | 0.67 | 1.02 | 1.39 | 2.15 | 0.93 | 1.44 | 0.51 | 0.79 | 9.43 | 0.551 | 5.65 | 0.549 |
| 2061 | 1.71 | 2.62 | 1.57 | 2.41 | 1.49 | 2.29 | 1.19 | 1.83 | 2.29 | 3.52 | 1.37 | 2.10 | 1.26 | 1.93 | 0.94 | 1.44 | 0.68 | 1.04 | 1.43 | 2.20 | 0.96 | 1.47 | 0.53 | 0.81 | 9.62 | 0.563 | 5.80 | 0.563 |
| 2062 | 1.74 | 2.67 | 1.60 | 2.46 | 1.52 | 2.33 | 1.22 | 1.87 | 2.34 | 3.59 | 1.40 | 2.15 | 1.29 | 1.98 | 0.96 | 1.47 | 0.69 | 1.06 | 1.46 | 2.24 | 0.98 | 1.50 | 0.54 | 0.83 | 9.82 | 0.574 | 5.92 | 0.575 |
| 2063 | 1.78 | 2.73 | 1.63 | 2.50 | 1.55 | 2.38 | 1.24 | 1.90 | 2.39 | 3.67 | 1.43 | 2.20 | 1.32 | 2.03 | 0.98 | 1.50 | 0.71 | 1.09 | 1.49 | 2.29 | 1.00 | 1.54 | 0.55 | 0.84 | 10.02 | 0.586 | 6.05 | 0.587 |
| 2064 | 1.82 | 2.79 | 1.67 | 2.56 | 1.58 | 2.43 | 1.27 | 1.95 | 2.44 | 3.75 | 1.46 | 2.24 | 1.34 | 2.06 | 1.00 | 1.54 | 0.72 | 1.11 | 1.52 | 2.33 | 1.02 | 1.57 | 0.56 | 0.86 | 10.24 | 0.599 | 6.16 | 0.598 |
| **Average Annual Percent Change in Toll Rates** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2029-2035 | 2.9 | 3.0 | 3.0 | 3.0 | 3.2 | 3.3 | 2.9 | 2.9 | 3.0 | 3.1 | 3.2 | 3.3 | 3.0 | 3.1 | 3.0 | 3.0 | 3.3 | 3.3 | 3.1 | 3.0 | 3.0 | 3.0 | 3.0 | 3.1 | 3.0 | 3.0 | 3.0 | 3.0 |
| 2035-2045 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.1 | 2.0 | 2.1 | 2.1 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 1.9 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 |
| 2045-2064 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 |
| **2029-2045** | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.5 | 2.4 | 2.4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.5 | 2.4 | 2.4 | 2.4 | 2.4 |

(1) Annual toll rate increases are assumed to be implemented on January 1st of each year.
(2) Assumes Complete 540 Phase 1 is opened on July 1, 2024.
(3) Assumes Complete 540 Phase 2 is opened on January 1, 2029.

## 5.2 Updated T&R Forecast

### *5.2.1 Transactions and Gross Revenue Forecast*

Estimated annual transactions and revenue are presented in **Table 5.3**. This forecast assumes full construction of Complete 540 Phase 1 and Phase 2. Complete 540 Phase 1 is assumed to open on July 1, 2024, and Complete 540 Phase 2 is assumed to open on January 1, 2029. All transaction and revenue figures shown in Table 5.3 reflect annual totals, rounded to thousands. Information is shown on a fiscal year basis, with each fiscal year representing the 12 months ending June 30. Forecasts are provided for FY 2024 through FY 2064. The toll revenue in Table 5.3 represents expected toll revenue based on forecast traffic volumes and does not include adjustments for leakage associated with BBM or anticipated processing fee revenue.

Annual transactions are expected to increase from 73.4 million in FY 2024 to 101.6 million in FY 2025 primarily due to the opening of Complete 540 Phase 1 in July 2024. By FY 2030, annual transactions are expected to grow further to 158.7 million, an average annual increase of 9.3 percent per year from FY 2025 to FY 2030, primarily due to the opening of Complete 540 Phase 2 in January 2029.

After FY 2032, transaction and toll revenue growth are not affected by any additional phases of the project or related ramp-up. Annual transactions are expected to increase to 243.7 million in FY 2045 from 176.5 million in FY 2032, an average annual increase of 2.5 percent per year. Gross revenue in that same period is expected to increase by 4.5 percent per year, resulting from the combination of increased transactions and annual toll rate increases. The average toll per transaction will have increased by 2.1 percent per year over that time period. ETC average toll rates will increase by 2.4 percent per year, however, the share of BBM versus ETC transactions will decrease between 2032 and 2045. Specifically, ETC transactions will increase by 3.0 percent per year over those 13 years, while BBM transactions will increase by an average of 1.0 percent per year.

### *5.2.2 Adjusted Revenue*

Annual forecasts of adjusted total revenue are provided in **Table 5.4**. Collected toll revenue reflects gross revenue after adjustments to account for leakage due to unbillable and uncollectible BBM transactions. Also shown in Table 5.4 are estimates of BBM processing fee revenue. This represents revenue from a $6.00 processing fee which is added to BBM invoices which are not paid within the first payment interval. Total collected revenue in the rightmost column represents collected toll revenue after leakage and processing fee revenue.

Estimated gross toll revenue and adjusted toll revenue is shown in **Table 5.5** by fiscal year, split into the revenue generated by Triangle Expressway toll zones, Complete 540 Phase 1 toll zones, and Complete 540 Phase 2 toll zones. In FY 2028, after completion of the ramp-up period on impacts from the opening of Complete 540 Phase 1, gross toll revenue generated on the Triangle Expressway is about 70.2 percent of the total system toll revenue (Triangle Expressway and Complete 540 Phase 1).

Triangle Expressway's share of gross toll revenue decreases to about 58.6 percent in 2035, (as the full Complete 540 will have been in operation for six years) and 57.0 percent in 2045. Also shown is the assumed systemwide leakage, adjusted toll revenue and processing fee revenue for each forecast fiscal year.

## 5.3 T&R Forecast Comparison

**Table 5.6** shows a forecast comparison of transaction and total collected revenue between the 2021 T&R Study and the current study. From FY 2024 to FY 2030, transactions and revenue in the current study are lower than the 2021 T&R Study primarily due to revised assumptions for when Complete 540 Phase 1 and Phase 2 are expected to open. After FY 2032 when revised opening dates no longer affect the comparison, systemwide transactions in the current forecast range from 1.1 percent to 2.2 percent below the 2021 T&R Study. Current study estimates of total collected revenue over this same period exceed 2021 T&R Study estimates by 1.9 percent to 3.5 percent. By FY 2046, current study transaction estimates are 3.7 percent below the 2021 T&R Study forecast and remain so through FY 2064. Beyond FY 2045, current study estimates for total collected revenue are approximately 0.5 percent below the 2021 T&R Study forecast. Total collected revenue in the current study compares more favorably to the 2021 T&R Study forecast than transactions. This is due to a combination of higher truck traffic and lower ETC transaction market share, both of which contribute to higher average tolls. The proportion of total systemwide transactions from commercial vehicles in the current study range from 0.5 percent to 1.2 percent higher than the 2021 T&R Study forecast. Systemwide ETC market share of transactions in the current study range from 3.0 percent to 4.8 percent lower than the 2021 T&R Study forecast.

**Table 5.3: Estimated Annual Transactions and Gross Revenue - Triangle Expressway with Complete 540 Phases 1 and 2**

| Fiscal | Estimated Annual Transactions (000) | | | | Estimated Annual Gross Revenue (000) | | | | Average Toll Per Transaction | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | ETC | BBM | Total | % ETC | ETC | BBM | Total | % ETC | ETC | BBM | Overall |
| 2024 | 49,090 | 24,312 | 73,402 | 66.9 | $37,885 | $30,256 | $68,141 | 55.6 | $ 0.772 | $ 1.245 | $ 0.928 |
| 2025 (1,2) | 69,450 | 32,170 | 101,621 | 68.3 | 55,655 | 42,028 | 97,683 | 57.0 | 0.801 | 1.306 | 0.961 |
| 2026 (2) | 77,768 | 34,707 | 112,474 | 69.1 | 64,504 | 46,923 | 111,427 | 57.9 | 0.829 | 1.352 | 0.991 |
| 2027 (2) | 84,362 | 36,288 | 120,650 | 69.9 | 72,432 | 50,681 | 123,113 | 58.8 | 0.859 | 1.397 | 1.020 |
| 2028 | 88,674 | 36,922 | 125,596 | 70.6 | 78,479 | 53,129 | 131,608 | 59.6 | 0.885 | 1.439 | 1.048 |
| 2029 (2,3) | 98,585 | 40,002 | 138,587 | 71.1 | 87,002 | 57,223 | 144,226 | 60.3 | 0.883 | 1.431 | 1.041 |
| 2030 (2) | 113,681 | 45,061 | 158,742 | 71.6 | 98,851 | 63,201 | 162,052 | 61.0 | 0.870 | 1.403 | 1.021 |
| 2031 (2) | 121,730 | 46,915 | 168,644 | 72.2 | 107,810 | 66,762 | 174,573 | 61.8 | 0.886 | 1.423 | 1.035 |
| 2032 (2) | 128,441 | 48,090 | 176,531 | 72.8 | 116,595 | 69,934 | 186,528 | 62.5 | 0.908 | 1.454 | 1.057 |
| 2033 | 132,738 | 48,234 | 180,972 | 73.3 | 124,200 | 72,120 | 196,320 | 63.3 | 0.936 | 1.495 | 1.085 |
| 2034 | 136,805 | 48,240 | 185,045 | 73.9 | 132,117 | 74,205 | 206,321 | 64.0 | 0.966 | 1.538 | 1.115 |
| 2035 | 141,025 | 48,215 | 189,240 | 74.5 | 140,631 | 76,381 | 217,012 | 64.8 | 0.997 | 1.584 | 1.147 |
| 2036 | 145,282 | 48,521 | 193,803 | 75.0 | 148,632 | 78,751 | 227,383 | 65.4 | 1.023 | 1.623 | 1.173 |
| 2037 | 149,564 | 49,162 | 198,726 | 75.3 | 156,102 | 81,325 | 237,426 | 65.7 | 1.044 | 1.654 | 1.195 |
| 2038 | 153,990 | 49,777 | 203,767 | 75.6 | 164,341 | 84,000 | 248,341 | 66.2 | 1.067 | 1.688 | 1.219 |
| 2039 | 158,551 | 50,403 | 208,954 | 75.9 | 172,708 | 86,563 | 259,271 | 66.6 | 1.089 | 1.717 | 1.241 |
| 2040 | 163,252 | 51,041 | 214,293 | 76.2 | 181,289 | 89,057 | 270,346 | 67.1 | 1.110 | 1.745 | 1.262 |
| 2041 | 168,097 | 51,690 | 219,788 | 76.5 | 190,267 | 91,678 | 281,945 | 67.5 | 1.132 | 1.774 | 1.283 |
| 2042 | 173,092 | 52,352 | 225,443 | 76.8 | 199,871 | 94,511 | 294,382 | 67.9 | 1.155 | 1.805 | 1.306 |
| 2043 | 178,240 | 53,025 | 231,264 | 77.1 | 210,550 | 97,672 | 308,222 | 68.3 | 1.181 | 1.842 | 1.333 |
| 2044 | 183,547 | 53,710 | 237,257 | 77.4 | 221,516 | 100,881 | 322,397 | 68.7 | 1.207 | 1.878 | 1.359 |
| 2045 | 189,308 | 54,438 | 243,746 | 77.7 | 233,061 | 104,016 | 337,077 | 69.1 | 1.231 | 1.911 | 1.383 |
| 2046 | 192,604 | 54,909 | 247,513 | 77.8 | 241,787 | 106,837 | 348,624 | 69.4 | 1.255 | 1.946 | 1.409 |
| 2047 | 193,314 | 55,115 | 248,429 | 77.8 | 247,594 | 109,417 | 357,011 | 69.4 | 1.281 | 1.985 | 1.437 |
| 2048 | 194,319 | 55,352 | 249,671 | 77.8 | 253,860 | 112,040 | 365,900 | 69.4 | 1.306 | 2.024 | 1.466 |
| 2049 | 195,329 | 55,590 | 250,920 | 77.8 | 260,340 | 114,756 | 375,096 | 69.4 | 1.333 | 2.064 | 1.495 |
| 2050 | 196,345 | 55,829 | 252,174 | 77.9 | 267,118 | 117,595 | 384,712 | 69.4 | 1.360 | 2.106 | 1.526 |
| 2051 | 197,366 | 56,069 | 253,435 | 77.9 | 274,078 | 120,511 | 394,589 | 69.5 | 1.389 | 2.149 | 1.557 |
| 2052 | 198,392 | 56,310 | 254,702 | 77.9 | 280,878 | 123,339 | 404,217 | 69.5 | 1.416 | 2.190 | 1.587 |
| 2053 | 199,423 | 56,552 | 255,976 | 77.9 | 287,783 | 126,267 | 414,049 | 69.5 | 1.443 | 2.233 | 1.618 |
| 2054 | 200,460 | 56,795 | 257,256 | 77.9 | 295,119 | 129,284 | 424,402 | 69.5 | 1.472 | 2.276 | 1.650 |
| 2055 | 201,502 | 57,039 | 258,542 | 77.9 | 302,664 | 132,425 | 435,090 | 69.6 | 1.502 | 2.322 | 1.683 |
| 2056 | 202,550 | 57,285 | 259,835 | 78.0 | 310,423 | 135,700 | 446,123 | 69.6 | 1.533 | 2.369 | 1.717 |
| 2057 | 203,603 | 57,531 | 261,134 | 78.0 | 317,997 | 138,844 | 456,841 | 69.6 | 1.562 | 2.413 | 1.749 |
| 2058 | 204,662 | 57,778 | 262,440 | 78.0 | 325,815 | 142,086 | 467,901 | 69.6 | 1.592 | 2.459 | 1.783 |
| 2059 | 205,726 | 58,026 | 263,752 | 78.0 | 335,053 | 145,864 | 480,917 | 69.7 | 1.629 | 2.514 | 1.823 |
| 2060 | 206,795 | 58,275 | 265,070 | 78.0 | 345,647 | 150,288 | 495,935 | 69.7 | 1.671 | 2.579 | 1.871 |
| 2061 | 207,870 | 58,526 | 266,396 | 78.0 | 355,482 | 154,418 | 509,900 | 69.7 | 1.710 | 2.638 | 1.914 |
| 2062 | 208,951 | 58,777 | 267,728 | 78.0 | 364,641 | 158,205 | 522,846 | 69.7 | 1.745 | 2.692 | 1.953 |
| 2063 | 210,038 | 59,030 | 269,068 | 78.1 | 374,144 | 162,136 | 536,281 | 69.8 | 1.781 | 2.747 | 1.993 |
| 2064 | 211,130 | 59,284 | 270,413 | 78.1 | 383,895 | 166,165 | 550,060 | 69.8 | 1.818 | 2.803 | 2.034 |
| **Average Annual Percent Change** | | | | | | | | | | | |
| 2025-35 | 7.3% | 4.1% | 6.4% | | 9.7% | 6.2% | 8.3% | | 2.2% | 1.9% | 1.8% |
| 2035-45 | 3.0% | 1.2% | 2.6% | | 5.2% | 3.1% | 4.5% | | 2.1% | 1.9% | 1.9% |
| 2045-60 | 0.6% | 0.5% | 0.6% | | 2.7% | 2.5% | 2.6% | | 2.1% | 2.0% | 2.0% |
| 2030-60 | 2.0% | 0.9% | 1.7% | | 4.3% | 2.9% | 3.8% | | 2.2% | 2.1% | 2.0% |

(1) Assumes Complete 540 Phase 1 is opened on July 1, 2024.

(2) Ramp up is applied to the first 36-month period of transaction and revenue impacts associated with new toll zones.

(3) Assumes Complete 540 Phase 2 is opened on January 1, 2029.

**Table 5.4: Estimated Adjusted Annual Revenue - Triangle Expressway with Complete 540 Phases 1 and 2**

| Fiscal Year | Computed Gross Revenue ETC | Computed Gross Revenue BBM | Computed Gross Revenue Total | BBM Leakage | Adjusted Toll Revenue | Processing Fees | Total Collected Revenue |
|---|---|---|---|---|---|---|---|
| 2024 | 37,885 | 30,256 | 68,141 | (7,810) | 60,331 | 5,631 | 65,962 |
| 2025 (1,2) | 55,655 | 42,028 | 97,683 | (9,868) | 87,815 | 6,666 | 94,481 |
| 2026 (2) | 64,504 | 46,923 | 111,427 | (10,548) | 100,878 | 6,912 | 107,790 |
| 2027 (2) | 72,432 | 50,681 | 123,113 | (11,393) | 111,720 | 7,037 | 118,757 |
| 2028 | 78,479 | 53,129 | 131,608 | (11,944) | 119,664 | 7,079 | 126,744 |
| 2029 (2,3) | 87,002 | 57,223 | 144,226 | (12,864) | 131,362 | 7,602 | 138,963 |
| 2030 (2) | 98,851 | 63,201 | 162,052 | (14,208) | 147,844 | 8,453 | 156,297 |
| 2031 (2) | 107,810 | 66,762 | 174,573 | (15,008) | 159,564 | 8,757 | 168,321 |
| 2032 (2) | 116,595 | 69,934 | 186,528 | (15,721) | 170,807 | 8,948 | 179,755 |
| 2033 | 124,200 | 72,120 | 196,320 | (16,213) | 180,107 | 8,971 | 189,078 |
| 2034 | 132,117 | 74,205 | 206,321 | (16,681) | 189,640 | 8,972 | 198,612 |
| 2035 | 140,631 | 76,381 | 217,012 | (17,171) | 199,841 | 8,968 | 208,809 |
| 2036 | 148,632 | 78,751 | 227,383 | (17,703) | 209,679 | 9,025 | 218,704 |
| 2037 | 156,102 | 81,325 | 237,426 | (18,282) | 219,144 | 9,144 | 228,288 |
| 2038 | 164,341 | 84,000 | 248,341 | (18,883) | 229,457 | 9,258 | 238,716 |
| 2039 | 172,708 | 86,563 | 259,271 | (19,460) | 239,811 | 9,375 | 249,186 |
| 2040 | 181,289 | 89,057 | 270,346 | (20,020) | 250,326 | 9,493 | 259,819 |
| 2041 | 190,267 | 91,678 | 281,945 | (20,610) | 261,335 | 9,614 | 270,950 |
| 2042 | 199,871 | 94,511 | 294,382 | (21,246) | 273,136 | 9,737 | 282,873 |
| 2043 | 210,550 | 97,672 | 308,222 | (21,957) | 286,265 | 9,862 | 296,127 |
| 2044 | 221,516 | 100,881 | 322,397 | (22,678) | 299,719 | 9,990 | 309,709 |
| 2045 | 233,061 | 104,016 | 337,077 | (23,383) | 313,694 | 10,125 | 323,819 |
| 2046 | 241,787 | 106,837 | 348,624 | (24,017) | 324,607 | 10,213 | 334,820 |
| 2047 | 247,594 | 109,417 | 357,011 | (24,597) | 332,413 | 10,251 | 342,665 |
| 2048 | 253,860 | 112,040 | 365,900 | (25,187) | 340,713 | 10,295 | 351,008 |
| 2049 | 260,340 | 114,756 | 375,096 | (25,797) | 349,298 | 10,340 | 359,638 |
| 2050 | 267,118 | 117,595 | 384,712 | (26,436) | 358,277 | 10,384 | 368,661 |
| 2051 | 274,078 | 120,511 | 394,589 | (27,091) | 367,497 | 10,429 | 377,926 |
| 2052 | 280,878 | 123,339 | 404,217 | (27,727) | 376,490 | 10,473 | 386,963 |
| 2053 | 287,783 | 126,267 | 414,049 | (28,385) | 385,664 | 10,519 | 396,183 |
| 2054 | 295,119 | 129,284 | 424,402 | (29,064) | 395,339 | 10,564 | 405,903 |
| 2055 | 302,664 | 132,425 | 435,090 | (29,770) | 405,320 | 10,609 | 415,929 |
| 2056 | 310,423 | 135,700 | 446,123 | (30,506) | 415,618 | 10,655 | 426,272 |
| 2057 | 317,997 | 138,844 | 456,841 | (31,213) | 425,628 | 10,700 | 436,329 |
| 2058 | 325,815 | 142,086 | 467,901 | (31,942) | 435,960 | 10,746 | 446,706 |
| 2059 | 335,053 | 145,864 | 480,917 | (32,791) | 448,126 | 10,793 | 458,919 |
| 2060 | 345,647 | 150,288 | 495,935 | (33,785) | 462,150 | 10,839 | 472,989 |
| 2061 | 355,482 | 154,418 | 509,900 | (34,714) | 475,186 | 10,885 | 486,072 |
| 2062 | 364,641 | 158,205 | 522,846 | (35,565) | 487,281 | 10,932 | 498,213 |
| 2063 | 374,144 | 162,136 | 536,281 | (36,449) | 499,832 | 10,979 | 510,811 |
| 2064 | 383,895 | 166,165 | 550,060 | (37,355) | 512,706 | 11,027 | 523,732 |

(1) Assumes Complete 540 Phase 1 is opened on July 1, 2024.

(2) Ramp up is applied to the first 36-month period of transaction and revenue impacts associated with new toll zones.

(3) Assumes Complete 540 Phase 2 is opened on January 1, 2029.

**Table 5.5**
**Estimated Adjusted Annual Revenue - Triangle Expressway with Complete 540 Phases 1 & 2**
(Revenue in $000s)

| Fiscal Year | Triangle Expressway Toll Zones | | | Complete 540 Phase 1 Toll Zones | | | Complete 540 Phase 2 Toll Zones | | | Systemwide | | | BBM Leakage | Adjusted Revenue | Processing Fees | Total Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ETC | BBM | Total | ETC | BBM | Total | ETC | BBM | Total | ETC | BBM | Total | | | | |
| 2024 | 37,885 | 30,256 | 68,141 | - | - | - | - | - | - | 37,885 | 30,256 | 68,141 | (7,810) | 60,331 | 5,631 | 65,962 |
| 2025 (1,2) | 43,706 | 33,574 | 77,281 | 11,948 | 8,454 | 20,403 | - | - | - | 55,655 | 42,028 | 97,683 | (9,868) | 87,815 | 6,666 | 94,481 |
| 2026 (2) | 47,489 | 35,193 | 82,683 | 17,015 | 11,729 | 28,744 | - | - | - | 64,504 | 46,923 | 111,427 | (10,548) | 100,878 | 6,912 | 107,790 |
| 2027 (2) | 51,288 | 36,574 | 87,861 | 21,144 | 14,108 | 35,252 | - | - | - | 72,432 | 50,681 | 123,113 | (11,393) | 111,720 | 7,037 | 118,757 |
| 2028 | 54,675 | 37,758 | 92,434 | 23,804 | 15,370 | 39,174 | - | - | - | 78,479 | 53,129 | 131,608 | (11,944) | 119,664 | 7,079 | 126,744 |
| 2029 (2,3) | 57,671 | 38,677 | 96,348 | 25,615 | 15,904 | 41,519 | 3,717 | 2,642 | 6,359 | 87,002 | 57,223 | 144,226 | (12,864) | 131,362 | 7,602 | 138,963 |
| 2030 (2) | 60,919 | 39,604 | 100,523 | 27,731 | 16,527 | 44,258 | 10,201 | 7,070 | 17,271 | 98,851 | 63,201 | 162,052 | (14,208) | 147,844 | 8,453 | 156,297 |
| 2031 (2) | 64,609 | 40,646 | 105,255 | 29,859 | 17,161 | 47,019 | 13,343 | 8,956 | 22,298 | 107,810 | 66,762 | 174,573 | (15,008) | 159,564 | 8,757 | 168,321 |
| 2032 (2) | 68,566 | 41,785 | 110,351 | 32,112 | 17,802 | 49,914 | 15,917 | 10,347 | 26,263 | 116,595 | 69,934 | 186,528 | (15,721) | 170,807 | 8,948 | 179,755 |
| 2033 | 72,704 | 42,908 | 115,612 | 34,367 | 18,427 | 52,794 | 17,129 | 10,785 | 27,914 | 124,200 | 72,120 | 196,320 | (16,213) | 180,107 | 8,971 | 189,078 |
| 2034 | 77,093 | 44,054 | 121,146 | 36,739 | 19,038 | 55,777 | 18,285 | 11,113 | 29,398 | 132,117 | 74,205 | 206,321 | (16,681) | 189,640 | 8,972 | 198,612 |
| 2035 | 81,889 | 45,313 | 127,201 | 39,274 | 19,649 | 58,922 | 19,469 | 11,420 | 30,889 | 140,631 | 76,381 | 217,012 | (17,171) | 199,841 | 8,968 | 208,809 |
| 2036 | 86,406 | 46,716 | 133,122 | 41,704 | 20,316 | 62,019 | 20,522 | 11,719 | 32,241 | 148,632 | 78,751 | 227,383 | (17,703) | 209,679 | 9,025 | 218,704 |
| 2037 | 90,502 | 48,194 | 138,695 | 43,980 | 21,037 | 65,017 | 21,620 | 12,094 | 33,714 | 156,102 | 81,325 | 237,426 | (18,282) | 219,144 | 9,144 | 228,288 |
| 2038 | 94,893 | 49,577 | 144,470 | 46,605 | 21,906 | 68,511 | 22,843 | 12,516 | 35,360 | 164,341 | 84,000 | 248,341 | (18,883) | 229,457 | 9,258 | 238,716 |
| 2039 | 99,479 | 50,955 | 150,434 | 49,250 | 22,747 | 71,997 | 23,979 | 12,862 | 36,841 | 172,708 | 86,563 | 259,271 | (19,460) | 239,811 | 9,375 | 249,186 |
| 2040 | 104,199 | 52,306 | 156,505 | 51,922 | 23,548 | 75,471 | 25,168 | 13,203 | 38,370 | 181,289 | 89,057 | 270,346 | (20,020) | 250,326 | 9,493 | 259,819 |
| 2041 | 109,035 | 53,666 | 162,702 | 54,718 | 24,391 | 79,109 | 26,513 | 13,621 | 40,135 | 190,267 | 91,678 | 281,945 | (20,610) | 261,335 | 9,614 | 270,950 |
| 2042 | 114,149 | 55,104 | 169,253 | 57,797 | 25,331 | 83,127 | 27,925 | 14,076 | 42,002 | 199,871 | 94,511 | 294,382 | (21,246) | 273,136 | 9,737 | 282,873 |
| 2043 | 119,873 | 56,777 | 176,650 | 61,250 | 26,379 | 87,628 | 29,427 | 14,517 | 43,944 | 210,550 | 97,672 | 308,222 | (21,957) | 286,265 | 9,862 | 296,127 |
| 2044 | 125,825 | 58,526 | 184,351 | 64,666 | 27,348 | 92,014 | 31,025 | 15,007 | 46,032 | 221,516 | 100,881 | 322,397 | (22,678) | 299,719 | 9,990 | 309,709 |
| 2045 | 131,870 | 60,096 | 191,966 | 68,392 | 28,373 | 96,765 | 32,799 | 15,547 | 48,346 | 233,061 | 104,016 | 337,077 | (23,383) | 313,694 | 10,125 | 323,819 |
| 2046 | 136,524 | 61,570 | 198,094 | 71,260 | 29,331 | 100,592 | 34,003 | 15,935 | 49,939 | 241,787 | 106,837 | 348,624 | (24,017) | 324,607 | 10,213 | 334,820 |
| 2047 | 139,800 | 63,055 | 202,855 | 72,995 | 30,056 | 103,051 | 34,799 | 16,306 | 51,105 | 247,594 | 109,417 | 357,011 | (24,597) | 332,413 | 10,251 | 342,665 |
| 2048 | 143,369 | 64,582 | 207,950 | 74,799 | 30,758 | 105,557 | 35,692 | 16,700 | 52,392 | 253,860 | 112,040 | 365,900 | (25,187) | 340,713 | 10,295 | 351,008 |
| 2049 | 147,021 | 66,142 | 213,163 | 76,684 | 31,503 | 108,187 | 36,635 | 17,111 | 53,746 | 260,340 | 114,756 | 375,096 | (25,797) | 349,298 | 10,340 | 359,638 |
| 2050 | 150,768 | 67,756 | 218,524 | 78,719 | 32,270 | 110,989 | 37,630 | 17,569 | 55,199 | 267,118 | 117,595 | 384,712 | (26,436) | 358,277 | 10,384 | 368,661 |
| 2051 | 154,763 | 69,473 | 224,237 | 80,735 | 33,030 | 113,765 | 38,579 | 18,007 | 56,587 | 274,078 | 120,511 | 394,589 | (27,091) | 367,497 | 10,429 | 377,926 |
| 2052 | 158,582 | 71,107 | 229,688 | 82,842 | 33,861 | 116,704 | 39,454 | 18,371 | 57,825 | 280,878 | 123,339 | 404,217 | (27,727) | 376,490 | 10,473 | 386,963 |
| 2053 | 162,431 | 72,754 | 235,185 | 84,914 | 34,703 | 119,617 | 40,437 | 18,809 | 59,247 | 287,783 | 126,267 | 414,049 | (28,385) | 385,664 | 10,519 | 396,183 |
| 2054 | 166,650 | 74,518 | 241,167 | 86,925 | 35,475 | 122,400 | 41,544 | 19,292 | 60,836 | 295,119 | 129,284 | 424,402 | (29,064) | 395,339 | 10,564 | 405,903 |
| 2055 | 170,905 | 76,329 | 247,234 | 89,158 | 36,346 | 125,504 | 42,601 | 19,751 | 62,352 | 302,664 | 132,425 | 435,090 | (29,770) | 405,320 | 10,609 | 415,929 |
| 2056 | 175,254 | 78,213 | 253,466 | 91,468 | 37,257 | 128,724 | 43,702 | 20,231 | 63,933 | 310,423 | 135,700 | 446,123 | (30,506) | 415,618 | 10,655 | 426,272 |
| 2057 | 179,608 | 80,086 | 259,694 | 93,647 | 38,068 | 131,715 | 44,742 | 20,691 | 65,433 | 317,997 | 138,844 | 456,841 | (31,213) | 425,628 | 10,700 | 436,329 |
| 2058 | 184,046 | 81,947 | 265,994 | 95,942 | 38,952 | 134,895 | 45,827 | 21,186 | 67,013 | 325,815 | 142,086 | 467,901 | (31,942) | 435,960 | 10,746 | 446,706 |
| 2059 | 189,309 | 84,137 | 273,446 | 98,691 | 40,001 | 138,693 | 47,053 | 21,725 | 68,778 | 335,053 | 145,864 | 480,917 | (32,791) | 448,126 | 10,793 | 458,919 |
| 2060 | 195,356 | 86,713 | 282,068 | 101,860 | 41,189 | 143,049 | 48,431 | 22,387 | 70,818 | 345,647 | 150,288 | 495,935 | (33,785) | 462,150 | 10,839 | 472,989 |
| 2061 | 200,940 | 89,091 | 290,031 | 104,801 | 42,313 | 147,114 | 49,741 | 23,014 | 72,755 | 355,482 | 154,418 | 509,900 | (34,714) | 475,186 | 10,885 | 486,072 |
| 2062 | 206,130 | 91,282 | 297,411 | 107,505 | 43,352 | 150,857 | 51,006 | 23,572 | 74,578 | 364,641 | 158,205 | 522,846 | (35,565) | 487,281 | 10,932 | 498,213 |
| 2063 | 211,516 | 93,555 | 305,071 | 110,315 | 44,429 | 154,744 | 52,313 | 24,153 | 76,466 | 374,144 | 162,136 | 536,281 | (36,449) | 499,832 | 10,979 | 510,811 |
| 2064 | 217,044 | 95,884 | 312,928 | 113,199 | 45,532 | 158,731 | 53,653 | 24,748 | 78,401 | 383,895 | 166,165 | 550,060 | (37,355) | 512,706 | 11,027 | 523,732 |

(1) Assumes Complete 540 Phase 1 is opened on July 1, 2024.
(2) Ramp up is applied to the first 36-month period of transaction and revenue impacts associated with new toll zones.
(3) Assumes Complete 540 Phase 2 is opened on January 1, 2029.

**Table 5.6: Transaction and Revenue Forecast Comparison – 2021 T&R Study and Current Study**

| | Total Transactions | | | | Total Collected Revenue | | | |
|---|---|---|---|---|---|---|---|---|
| FY | 2021 T&R Study | Current Study | Difference | Percent Difference | 2021 T&R Study | Current Study | Difference | Percent Difference |
| 2024 (1) | 103,537 | 73,402 | (30,135) | -29.1% | $91,489 | $65,962 | (25,527) | -27.9% |
| 2025 (2) | 115,647 | 101,621 | (14,026) | -12.1% | 104,634 | 94,481 | (10,152) | -9.7% |
| 2026 | 123,931 | 112,474 | (11,457) | -9.2% | 114,984 | 107,790 | (7,194) | -6.3% |
| 2027 (1) | 151,586 | 120,650 | (30,936) | -20.4% | 135,189 | 118,757 | (16,432) | -12.2% |
| 2028 | 161,912 | 125,596 | (36,316) | -22.4% | 145,056 | 126,744 | (18,312) | -12.6% |
| 2029 (2) | 169,845 | 138,587 | (31,259) | -18.4% | 154,114 | 138,963 | (15,151) | -9.8% |
| 2030 | 175,004 | 158,742 | (16,262) | -9.3% | 162,132 | 156,297 | (5,835) | -3.6% |
| 2031 | 178,097 | 168,644 | (9,453) | -5.3% | 169,471 | 168,321 | (1,150) | -0.7% |
| 2032 | 181,300 | 176,531 | (4,769) | -2.6% | 177,281 | 179,755 | 2,474 | 1.4% |
| 2033 | 184,619 | 180,972 | (3,647) | -2.0% | 185,097 | 189,078 | 3,981 | 2.2% |
| 2034 | 188,059 | 185,045 | (3,014) | -1.6% | 193,345 | 198,612 | 5,267 | 2.7% |
| 2035 | 191,529 | 189,240 | (2,289) | -1.2% | 202,001 | 208,809 | 6,808 | 3.4% |
| 2036 | 196,024 | 193,803 | (2,221) | -1.1% | 211,335 | 218,704 | 7,369 | 3.5% |
| 2037 | 201,585 | 198,726 | (2,859) | -1.4% | 221,529 | 228,288 | 6,759 | 3.1% |
| 2038 | 207,228 | 203,767 | (3,461) | -1.7% | 232,525 | 238,716 | 6,191 | 2.7% |
| 2039 | 213,057 | 208,954 | (4,103) | -1.9% | 243,641 | 249,186 | 5,544 | 2.3% |
| 2040 | 219,080 | 214,293 | (4,787) | -2.2% | 255,031 | 259,819 | 4,788 | 1.9% |
| 2041 | 225,302 | 219,788 | (5,515) | -2.4% | 267,021 | 270,950 | 3,929 | 1.5% |
| 2042 | 231,732 | 225,443 | (6,289) | -2.7% | 279,895 | 282,873 | 2,978 | 1.1% |
| 2043 | 238,377 | 231,264 | (7,113) | -3.0% | 294,214 | 296,127 | 1,913 | 0.7% |
| 2044 | 245,245 | 237,257 | (7,988) | -3.3% | 308,989 | 309,709 | 720 | 0.2% |
| 2045 | 252,722 | 243,746 | (8,976) | -3.6% | 324,524 | 323,819 | (704) | -0.2% |
| 2046 | 256,998 | 247,513 | (9,485) | -3.7% | 336,269 | 334,820 | (1,449) | -0.4% |
| 2047 | 257,903 | 248,429 | (9,474) | -3.7% | 344,079 | 342,665 | (1,414) | -0.4% |
| 2048 | 259,193 | 249,671 | (9,521) | -3.7% | 352,486 | 351,008 | (1,477) | -0.4% |
| 2049 | 260,489 | 250,920 | (9,569) | -3.7% | 361,178 | 359,638 | (1,540) | -0.4% |
| 2050 | 261,791 | 252,174 | (9,617) | -3.7% | 370,265 | 368,661 | (1,604) | -0.4% |
| 2051 | 263,100 | 253,435 | (9,665) | -3.7% | 379,597 | 377,926 | (1,671) | -0.4% |
| 2052 | 264,415 | 254,702 | (9,713) | -3.7% | 388,700 | 386,963 | (1,737) | -0.4% |
| 2053 | 265,738 | 255,976 | (9,762) | -3.7% | 397,979 | 396,183 | (1,796) | -0.5% |
| 2054 | 267,066 | 257,256 | (9,811) | -3.7% | 407,773 | 405,903 | (1,871) | -0.5% |
| 2055 | 268,402 | 258,542 | (9,860) | -3.7% | 417,878 | 415,929 | (1,949) | -0.5% |
| 2056 | 269,744 | 259,835 | (9,909) | -3.7% | 428,295 | 426,272 | (2,022) | -0.5% |
| 2057 | 271,092 | 261,134 | (9,958) | -3.7% | 438,424 | 436,329 | (2,095) | -0.5% |
| 2058 | 272,448 | 262,440 | (10,008) | -3.7% | 448,879 | 446,706 | (2,173) | -0.5% |
| 2059 | 273,810 | 263,752 | (10,058) | -3.7% | 461,187 | 458,919 | (2,269) | -0.5% |
| 2060 | 275,179 | 265,070 | (10,109) | -3.7% | 475,216 | 472,989 | (2,227) | -0.5% |

(1) The 2021 T&R Study assumed Complete 540 Phase 1 would open on July 1, 2023, and Phase 2 would open on July 1, 2026.

(2) The current study assumes Complete 540 Phase 1 will open on July 1, 2024, and Phase 2 will open on January 1, 2029.

## Disclaimer

CDM Smith used currently-accepted professional practices and procedures in the development of the traffic and revenue estimates in this report. However, as with any forecast, it should be understood that differences between forecasted and actual results may occur, as caused by events and circumstances beyond the control of the forecasters. In formulating the estimates, CDM Smith reasonably relied upon the accuracy and completeness of information provided (both written and oral) by NCTA. CDM Smith also relied upon the reasonable assurances of independent parties and is not aware of any material facts that would make such information misleading.

CDM Smith made qualitative judgments related to several key variables in the development and analysis of the traffic and revenue estimates that must be considered as a whole; therefore, selecting portions of any individual result without consideration of the intent of the whole may create a misleading or incomplete view of the results and the underlying methodologies used to obtain the results. CDM Smith gives no opinion as to the value or merit of partial information extracted from this report

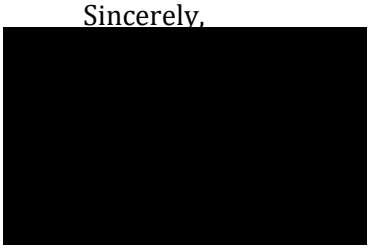
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CDM Smith is not, and has not been, a municipal advisor as defined in Federal law (the Dodd Frank Bill) to NCTA and does not owe a fiduciary duty pursuant to Section 15B of the Exchange Act to NCTA with respect to the information and material contained in this report. CDM Smith is not recommending and has not recommended any action to NCTA. NCTA should discuss the information and material contained in this report with any and all internal and external advisors that it deems appropriate before acting on this information.

Sincerely,



cc: Scott Allaire

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*Final Report*

# Triangle Expressway and Complete 540 Phases 1 & 2 Traffic and Revenue Study







January 2021




Prepared for

NORTH CAROLINA Turnpike Authority

**North Carolina Department of Transportation**

CDM Smith

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# Chapter 1
# Introduction

This report documents the ***Triangle Expressway and Complete 540 Phases 1&2 Traffic and Revenue Study*** conducted for the North Carolina Turnpike Authority (NCTA) and the North Carolina Department of Transportation (NCDOT). The purpose of the study was to develop a 40-year (fiscal years 2021 through 2060) annual traffic and toll revenue forecast for Triangle Expressway with Complete 540 Phase 1 and Phase 2. The traffic and toll revenue forecast presented in this study is suitable for use in support of project financing.

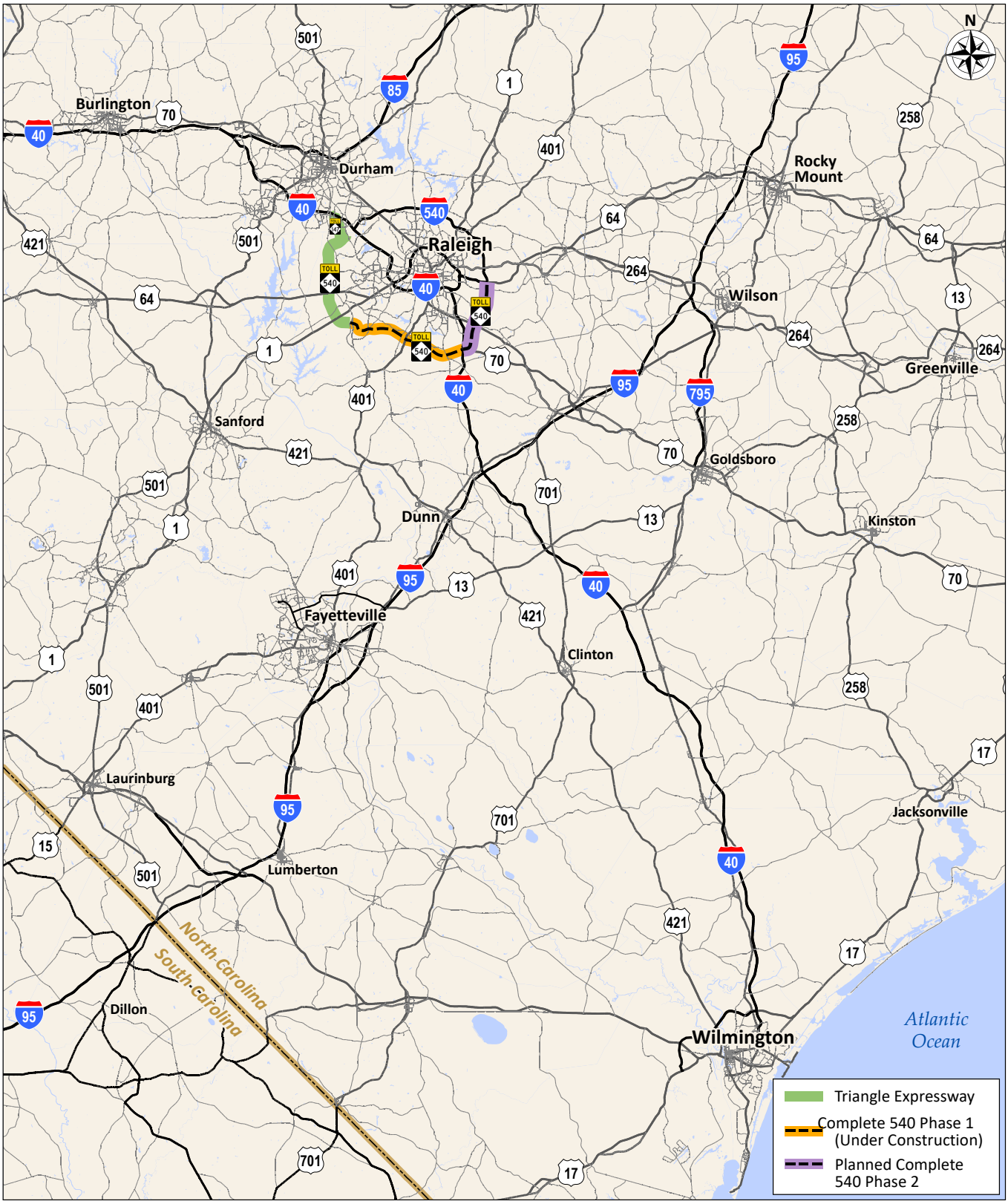
**Figure 1.1** shows the location of the existing Triangle Expressway, Complete 540 Phase 1 (currently under construction), and the planned Complete 540 Phase 2 within North Carolina and the connecting roadway system. The Triangle Expressway and Complete 540 Phases 1 and 2 are in the greater Raleigh area. The completion of Complete 540 Phases 1 and 2 would complete the 540 Outer Loop, which would consist of Interstate 540, the Triangle Expressway and Complete 540 Phases 1 and 2, also known as the Southern and Eastern Wake Expressway, respectively. Interstate 540, on the northern side of Raleigh is a toll-free roadway, while the Triangle Expressway is a toll road that opened in its entirety in early 2013. Complete 540 Phases 1 and 2 are being implemented as tolled extensions of the Triangle Expressway.

Complete 540 Phase 1, which is currently expected to open July 1, 2023, will extend the Triangle Expressway by about 17.1 miles from its current southern terminus at the NC 55 Bypass in Apex, NC to I-40 and US 70, south of Raleigh. In central and eastern North Carolina, I-40 is an important road that connects inland communities such Winston-Salem, Greensboro, Durham, and Raleigh, to shore points, including Wilmington and numerous recreational areas in southwestern NC. Upon completion, the Triangle Expressway and Complete 540 Phase 1 will provide an alternative route for longer-distance trips, avoiding the more congested sections of I-40 serving local movements in the Raleigh area.

The planned Complete 540 Phase 2 would complete the I-540/Toll NC 540 outer beltway around the greater Raleigh area by extending Toll NC 540 from the eastern terminus of Phase 1 at I-40/US 70 in Clayton to Interstate 540 at the interchange with U.S. 64/U.S. 264/I-87 near Knightdale. Complete 540 Phases 1 and 2 will provide improved connectivity for local residents, including those in Apex, Cary, Holly Springs, Fuquay- Varina, , Garner, Clayton, and Knightdale.

## 1.1 Project Description

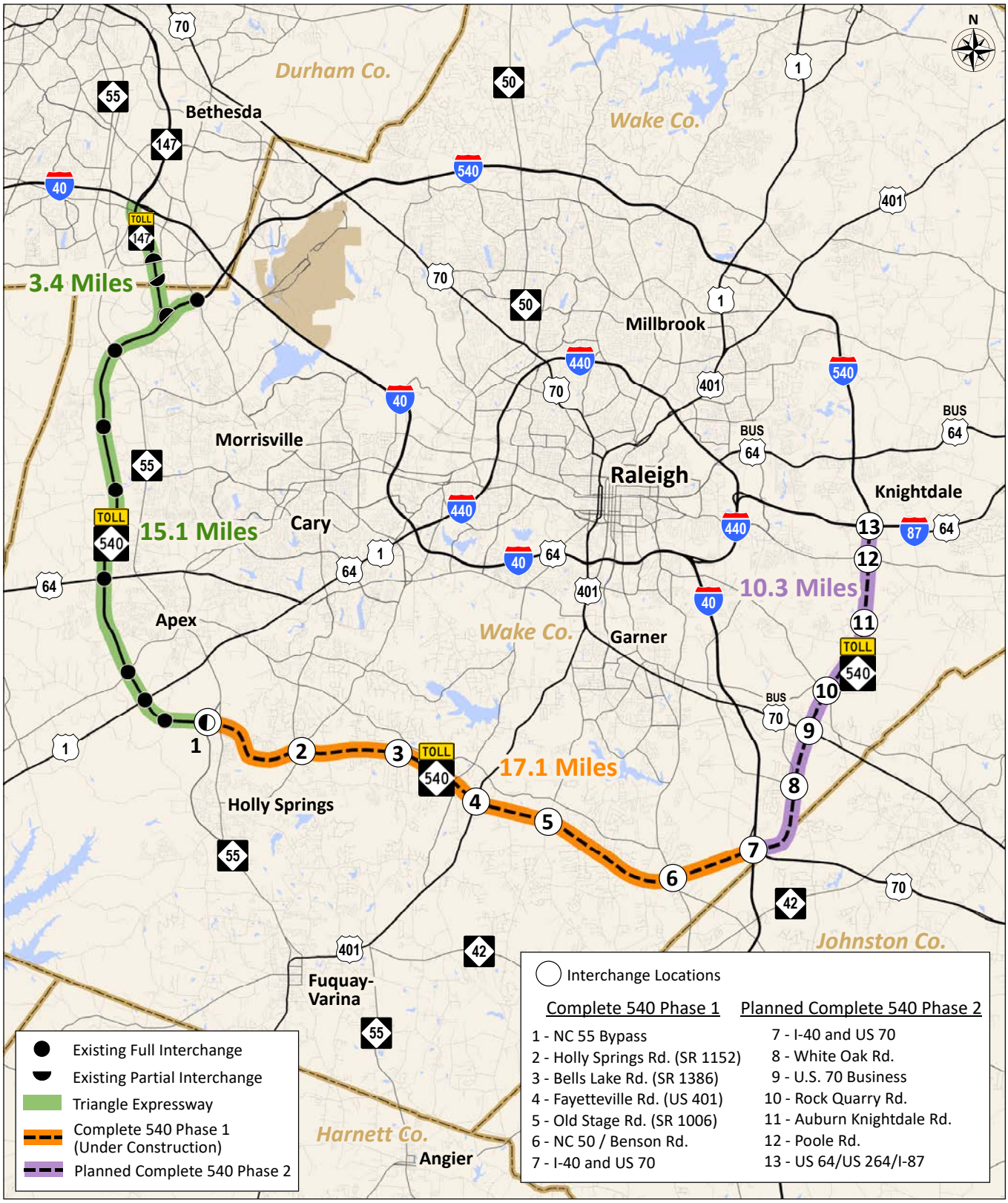
**Figure 1.2** shows the general alignment of the existing Triangle Expressway, Complete 540 Phase 1, and the proposed Complete 540 Phase 2. The Triangle Expressway is a 6-lane, 18.5-mile toll road, consisting of Toll NC 540 and Toll NC 147. Toll NC 147 is about 3.4 miles in length and extends from I-40 to the north and Toll NC 540 to the south. Toll NC 540 is about 15.1 miles in length and terminates at NC 54 in the north and NC 55 Bypass in the south. The posted speed limit is 70 miles per hour (mph).




CDM Smith

# REGIONAL MAP

FIGURE 1.1




CDM Smith

# PROJECT LOCATION MAP

FIGURE 1.2

Complete 540 Phase 1 is being constructed as a 6-lane, limited-access toll road which will extend from its western terminus at the NC 55 Bypass to its western terminus at the I-40/US 70 interchange, a total distance of about 17.1 miles. Five intermediate interchanges will be provided between the NC 55 Bypass and I-40/US 70 interchanges. The speed limit is planned to be posted at 70 mph on Complete 540 Phase 1. Complete 540 Phase 2 is planned as a 6-lane, limited-access toll road which would extend from its southern terminus at the I-40/US 70 interchange to its northern terminus at U.S. 64/U.S. 264/I-87 near Knightdale, a total distance of about 10.3 miles. Five intermediate interchanges would be provided between the I-40/US 70 and U.S. 64/U.S. 264/I-87 interchanges. The speed limit is planned to be posted at 70 mph on Complete 540 Phase 2.

Tolls are currently collected on the Triangle Expressway at toll zones sited on a mix of mainline and ramp locations, via an electronic toll collection (ETC) program named NC Quick Pass®, and a license plate image program named Bill by Mail (BBM). There are no physical toll booths on the Triangle Expressway; all tolls are collected via equipment located on overhead gantries at each toll zone. ETC transactions, including NC Quick Pass®, require motorists to have a transponder. The transponder automatically deducts tolls from a pre-paid account. Transponders from the following programs are accepted on the Triangle Expressway:

- NC Quick Pass®
- Florida SunPass®
- Georgia Peach Pass®
- E-ZPass®

If a motorist doesn't have a transponder, high-speed cameras mounted on gantries record the license plate and an invoice is mailed to the registered owner through the BBM program. ETC transactions receive an automatic 35 percent discount from the BBM toll. No toll-free movements are available on the Triangle Expressway.

Complete 540 Phases 1 and 2 would utilize the same payment system as the Triangle Expressway, with toll zones located on each mainline section. No toll-free movements would be permitted on Complete 540 Phases 1 and 2.

## 1.2 Work Scope

The work scope was comprised of the following tasks.

Task 1: Data Collection and Summarization

Task 2: Corridor Growth Analysis

Task 3: Triangle Regional Model Calibration and Refinement

Task 4: Traffic and Toll Revenue Analysis

Task 5: Traffic and Toll Revenue Sensitivity Tests

### Task 1: Data Collection and Summarization

Subtask 1.1: Obtain Available Traffic Counts and Toll Revenue Data

- CDM Smith coordinated with the NCDOT Traffic Survey Group to obtain Raleigh-area hourly traffic count data collected in fall 2019.

- CDM Smith obtained updated toll transaction and revenue data for the Triangle Expressway from the NCTA. In addition, CDM Smith received data on leakage and fee revenue associated with BBM transactions on the Triangle Expressway.

Subtask 1.2: HERE Travel Speed Data

- Updated travel speed data was obtained in the study area from HERE via the Regional Integrated Transportation Information System (RITIS) with the permission of the NCDOT.

Subtask 1.3: Streetlight Data

- Origin-destination data was obtained from StreetLight Data, Inc. for travel patterns and trip distances for movements on Triangle Expressway and selected area roads.

Subtask 1.4: Future Roadway Improvements

- Future roadway improvement projects were reviewed and checked against assumed improvements in the TRMv6. The following sources were used to identify planned roadway improvements.
    - ***2020-2029 NC State Transportation Improvement Program (STIP)*** and amendments through October 2020.
    - NC Capital Area Metropolitan Planning Organization (CAMPO) and Durham - Chapel Hill – Carrboro Metropolitan Planning Organization (DCHC MPO) ***Transportation Improvement Program (TIP)*** and interactive map.
    - CAMPO and DCHC MPO long range plan – the 2045 ***Metropolitan Transportation Plan*** and interactive map.

  CDM Smith coordinated with NCDOT/NCTA staff and/or MPO staff to identify needed changes to the TRMv6 model to reflect the current understanding of improvement completion dates or definitions.

### Task 2: Corridor Growth Analysis

Economic growth forecasts are one of the most important elements of a traffic and toll revenue forecast, particularly for new toll facilities. Traffic demand and travel patterns in regional models, such as the TRMv6, are based on forecasts of socioeconomic variables such as population, number of households, and employment. CDM Smith employed Dr. Steven Appold, an economist with local expertise, to conduct an independent analysis of the land-use and socioeconomic growth forecasts assumed in the TRMv6. Dr. Appold reviewed the forecasts and recommended adjustments where appropriate. The resulting revised socioeconomic forecasts were used in adjusting the TRMv6 trip tables to reflect the changed assumptions in variables such as population, households, and employment. The economic review focused on the Triangle Expressway and Complete 540 corridors.

### Task 3: Triangle Regional Model Refinement and Calibration

The TRMv6 was used to analyze the traffic and toll revenue potential of the Triangle Expressway and Complete 540. Model supported years included 2013, 2025, 2035, and 2045.

The TRMv6 model years were reviewed to identify necessary changes to improve network detail and more accurate route choice in the immediate project vicinity. These reviews included planned roadway improvements, the size of traffic analysis zones, centroid locations, road capacities, and speed limits.

Trip tables were modified to reflect socioeconomic adjustments recommended by Dr. Appold.

A 2019 model year was created by CDM Smith to use as a calibration year. Traffic assignments were calibrated to reflect actual ground conditions including traffic volumes, travel speeds, ETC market share, and trip distance at selected locations. Calibration adjustments were carried through to future year assignments.

### Task 4: Traffic and Toll Revenue Analysis

Traffic assignments were conducted using the refined and calibrated TRMv6, incorporating the adjusted trip tables, and using CDM Smith toll diversion algorithms. The assignments included model inputs developed by CDM Smith and Resource Systems Group (RSG), including motorist value of time (VOT), motor vehicle operating cost (VOC), toll rate schedules, and NC Quick Pass® and BBM market shares.

COVID-19 impacts were estimated and applied to the traffic and revenue forecast based on recent actual traffic on Triangle Expressway, estimated near-term recovery patterns for traffic in the region, estimated slowdown in economic growth through 2025, and estimated long-term changes in trends of study-area employees working from home.

Annual traffic and gross toll revenue forecasts were developed for the model assignment years and the intermediate years. Net revenue was subsequently developed to incorporate adjustments reflecting expected toll-revenue leakage, and fee revenue. Estimated rates of revenue leakage and fee revenue were based on actual experience from the Triangle Expressway.

### Task 5: Traffic and Toll Revenue Sensitivity Tests

There is considerable uncertainty in traffic forecasts as they are dependent on many variables, particularly on new facilities. It is standard practice in investment-grade traffic and revenue studies to include traffic and toll revenue sensitivity testing. The purpose is to help financial analysts assess the potential risk associated with the Project's traffic and revenue forecasts by testing the impact of changes to key variables. Key variables tested include lower economic growth, lower motorist VOTs, higher fuel prices and higher ETC market share.

One additional test was conducted to estimate the impact of project number U-5966 in the ***2020-2029 NC State Transportation Improvement Program (STIP),*** an approximately 1.6-mile toll-free extension of NC 147, from the southern end of Toll NC 147 to McCrimmon Parkway and Little Road. This improvement, while planned, does not have current committed funding, and the completion of the project is expected to have positive transaction and toll revenue impacts on the Triangle Expressway.

## 1.3 Report Structure

This report consists of seven chapters.

### Chapter 1: Introduction

Chapter 1 describes the purpose of the study, provides a description of the project, the work scope, and structure of the report.

### Chapter 2: Existing Conditions

This chapter presents information regarding the existing conditions on the Triangle Expressway and other roads in the Complete 540 study area. Information provided for the Triangle Expressway includes its toll collection system and current toll schedule; historical traffic volumes and traffic characteristics; travel patterns; and historical transaction and toll revenue. Recent traffic volumes and travel times are provided for many area roads in the Triangle Expressway and Complete 540 study area.

### Chapter 3: Independent Economic Review

This chapter summarizes the work of the independent economist, Dr. Stephen Appold, who reviewed socioeconomic assumptions in the TRMv6, and created revised socioeconomic inputs, including population, number of households and employment, for each of the supported model years. The revised socioeconomic inputs to the TRMv6 are summarized; and the changes, compared to the original inputs, are quantified. In addition, Dr. Appold developed a set of socioeconomic inputs to the TRMv6 to create a model year 2019 for calibration purposes. This chapter describes the process Dr. Appold used to develop the 2019 socioeconomic dataset.

This chapter also addresses observed COVID-19-related impacts on various economic indicators including GDP and employment, as well as rates of remote work among area employees by employment sector.

### Chapter 4: Stated Preference Survey

This chapter summarizes the Resource Systems Group (RSG) work in developing estimates of motorists' willingness to pay tolls, or value of time (VOT), within the study area. These estimates are based on a stated preference (SP) survey conducted by RSG in January and February of 2018. The SP survey is described along with the survey analysis, and the resulting estimation of VOT by market segment.

### Chapter 5: Model Development

This chapter describes the TRMv6 and modifications made to the model by CDM Smith including: (1) the model calibration process and calibration metrics; (2) network refinements including planned roadway improvement assumptions; (3) updates to key modeling inputs and assumptions such as VOT, VOC and inflation; and (4) adjustments to future-year model trip tables to reflect estimated COVID-19 related impacts on travel demand.

### Chapter 6:Traffic and Toll Revenue Forecast

Key inputs and assumptions are provided, including toll schedules, toll zone locations, VOT, vehicle operating costs (VOC), and annual inflation. A toll sensitivity curve is provided, demonstrating the revenue potential of the facility across various toll rate levels. The development of the traffic and toll revenue forecast is described, including how the model weekday traffic output is converted into annual traffic and toll revenue forecasts. Estimated annual toll transactions and toll revenue are provided from FY 2021 through FY 2060. Adjusted annual traffic and revenue forecasts are also provided that account for leakage and fee revenue associated with BBM transactions. In addition, time-distance comparisons are provided for selected movements, comparing travel on the Triangle Expressway and/or Complete 540 Phase 1 with a trip using the best toll-free alternative route.

### Chapter 7: Sensitivity Tests

Five tests were conducted to determine the impact on forecast traffic and toll revenue if key assumptions were changed. Four of the tests focused on situations that impose negative stress on the baseline traffic and toll revenue forecasts. The fifth test estimated the potential impacts of a planned roadway improvement excluded from the baseline traffic and toll revenue forecasts. The five tests are:

1. Reduce the trip table by 30 percent to reflect lower economic growth
2. Reduce the motorist VOT for all classes by 25 percent
3. Increase ETC market share by 10 percent
4. Increase fuel costs by 50 percent
5. NC 147 extension (U-5966) opens 1/1/2030

# Chapter 2
# Existing Conditions

This Chapter describes existing and historical conditions on the Triangle Expressway, and in the Triangle Expressway and Complete 540 study area. Triangle Expressway traffic volumes, toll rates, toll revenue, travel patterns and other traffic characteristics are described. Traffic volumes and travel times by time period are described in the study corridor.

## 2.1 The Triangle Expressway

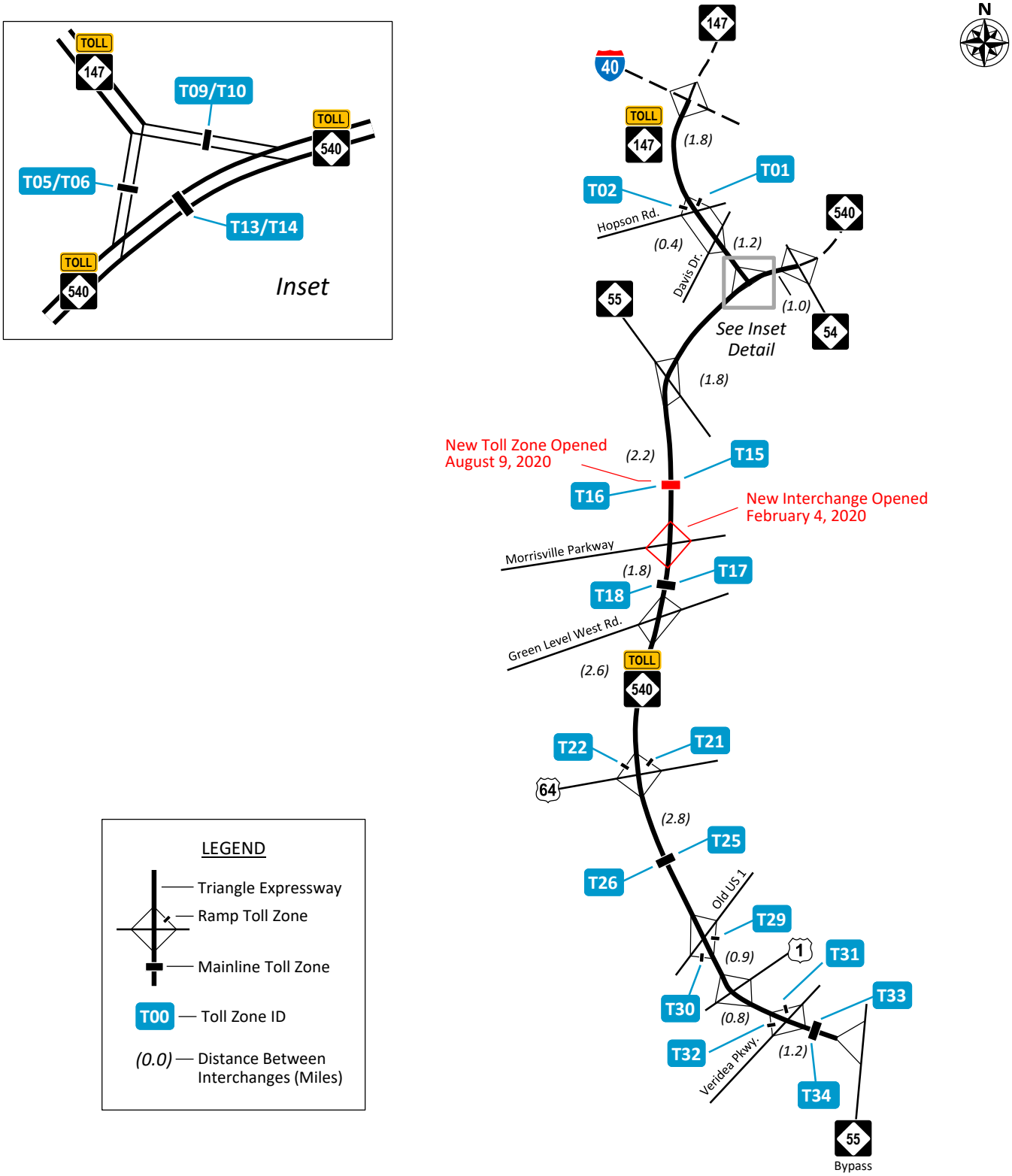
The Triangle Expressway is a six-lane, 18.5-mile toll road, consisting of Toll NC 540 and Toll NC 147 (please refer to Figure 1.2 in Chapter 1). Toll NC 147 is about 3.4 miles in length and extends from I-40 in the north to Toll NC 540 in the south. Toll NC 540 is about 15.1 miles in length and extends from NC 54 in the north to NC 55 Bypass in the south. The speed limit is posted at 70 miles per hour (mph). The road provides a high-speed connection from communities to the south and west of Raleigh (such as Fuquay-Varina, Holly Springs and Apex), to Interstate 40 (I-40), Research Triangle Park (RTP) and the Raleigh-Durham International Airport. Toll NC 540 is part of the 540 Raleigh Outer Loop.

The primary competing roadway to the Triangle Expressway is NC 55 and the NC 55 Bypass, which closely parallels the Triangle Expressway. NC 55 and the Bypass generally provide two through travel lanes per direction, with the intermittent provision of left, right and center turn lanes. There are some single-lane sections of NC 55. Posted speed limits range from 35 to 55 mph on NC 55 in the Triangle Expressway corridor. There are 13 signalized intersections on NC 55 and the Bypass between the southern end of Toll NC 540 and U.S. 64, another 13 between U.S. 64 and the interchange with Toll NC 540 near Morrisville, and 10 between the Toll NC 540 interchange and I-40 near Research Triangle Park.

The Triangle Expressway opened in three segments, as shown in Table 2.1. The entire project was opened to tolled traffic on January 2, 2013. A full-access interchange with Veridea Parkway opened on April 4, 2017. The most recent improvement to the Triangle Expressway was the completion of the Morrisville Parkway interchange which opened to traffic on February 4, 2020. A new mainline tolling location north of the new Morrisville Parkway interchange began collecting tolls on August 9, 2020. The Triangle Expressway toll zones, including these recent improvements, are shown in Figure 2.1.

### 2.1.1 Triangle Expressway Toll Collection, Toll Schedule and Historical Rate Increases

The Triangle Expressway features an all-electronic tolling system (AET), designed to reduce traffic delays and promote safety. This system allows motorists to pay their toll without stopping or slowing down. Tolls are collected via NC Quick Pass, NCTA's electronic toll collection (ETC) program, or by a video toll collection system named Bill by Mail (BBM). No conventional toll plazas are located on the Triangle Expressway; instead, toll collection equipment is located on overhead gantries.




# TRIANGLE EXPRESSWAY TOLL ZONES AND RECENT IMPROVEMENTS

FIGURE 2.1

**Table 2.1**
**Triangle Expressway Construction History**

| Improvement | Opening Date | Tolling Began | Location |
|---|---|---|---|
| Segment 1 | December 8, 2011 | January 3, 2012 | Toll NC 540 between NC 55 and NC 54<br>Toll NC 147 between I-40 and Toll NC 540 |
| Segment 2 | August 1, 2012 | August 2, 2012 | Toll NC 540 between NC 55 and U.S. 64 in Apex |
| Segment 3 | December 12, 2012 | January 2, 2013 | Toll NC 540 between U.S. 64 and NC 55 Bypass near Holly Springs |
| Veridea Parkway Interchange | April 4, 2017 | April 4, 2017 | Full access interchange at Toll NC 540 and Veridea Parkway |
| Morrisville Parkway Interchange | February 4, 2020 | August 9, 2020 | Full access interchange at Toll NC 540 and Morrisville Parkway |

The following describes the three toll classes on the Triangle Expressway:

- Class 1 (2-axle vehicles): includes all two-axle vehicles regardless of the number of tires.
- Class 2 (3-axle vehicles): includes all three-axle vehicles including two-axle vehicles towing a single-axle trailer.
- Class 3 (4-or-more axle vehicles): includes all vehicles with four or more axles (4+) including two-axle vehicles towing a dual-axle trailer.

Class 2 toll rates are twice the Class 1 toll rate, and Class 3 toll rates are four times the Class 1 toll rate.

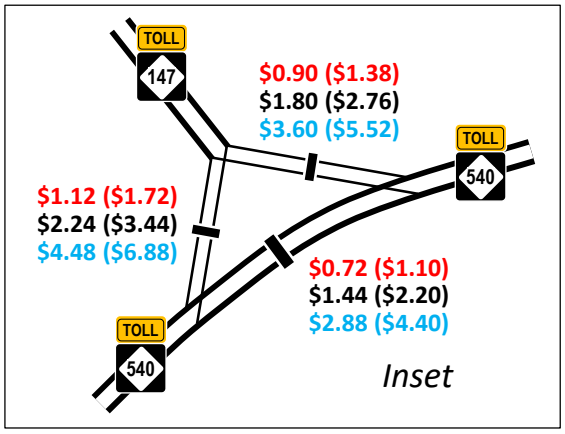
Motorists who pay with NC Quick Pass (or E-ZPass, Florida SunPass, or Georgia Peach Pass) receive an automatic 35 percent discount from the BBM toll rates for all vehicle classes. **Figure 2.2** illustrates all the states that have interoperable transponder programs with NC Quick Pass.

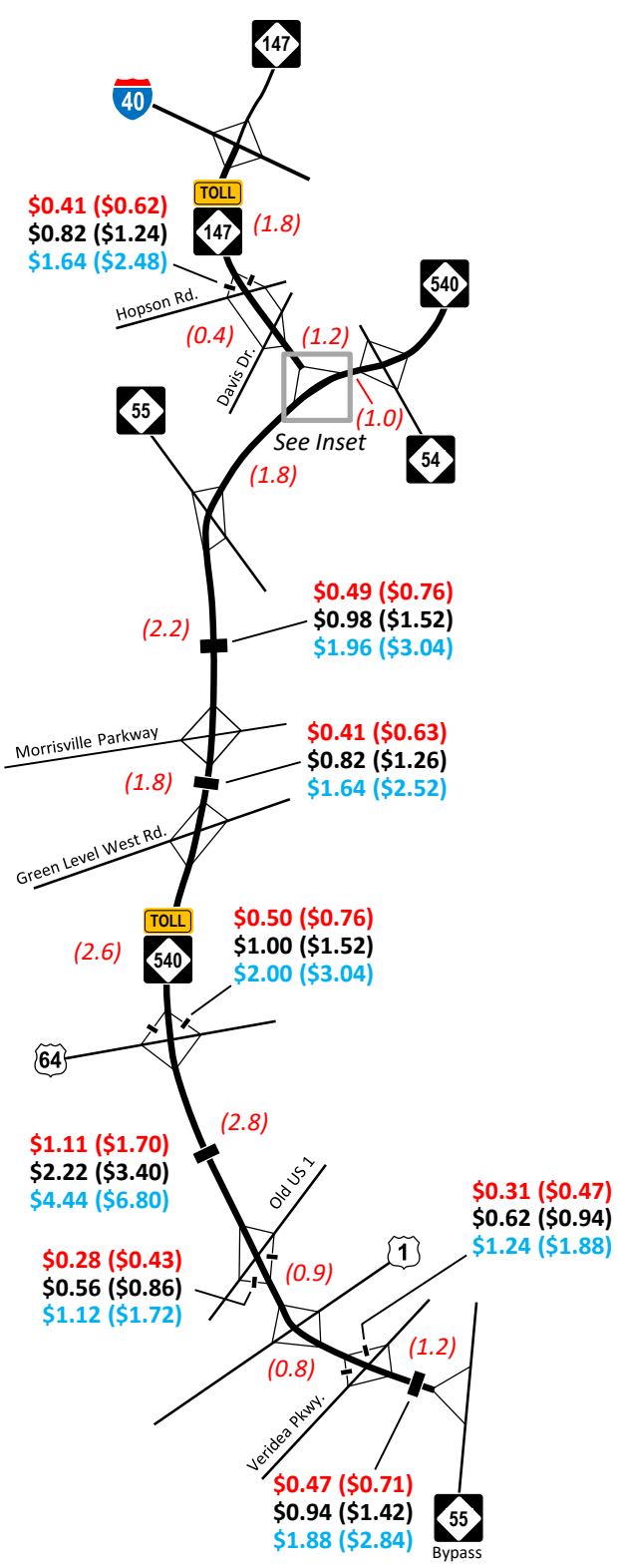



Figure 2.2
**NC Quick Pass Interoperability**

Beginning in August 2017, motorists were able to obtain a **NC Quick Pass Sticker Transponder** at no cost. It is accepted for toll-road payment in North Carolina, and where Florida SunPass and Georgia Peach Pass are accepted. For $7.40 plus tax, motorists may obtain a **NC Quick Pass E-ZPass Interior Transponder** that is valid for toll-road payment in North Carolina and wherever E-ZPass, Florida SunPass or Georgia Peach Pass are accepted.

Triangle Expressway toll zones, and 2021 ETC and BBM toll rates are shown in **Figure 2.3**. A through trip on Toll NC 540 (15.1 miles between NC 55 Bypass and NC 54) in 2020 costs $3.20 for a passenger car with a transponder, which is equal to $0.212 per mile. A 5-axle truck with a transponder, making the same trip, would pay $12.80, or $0.848 per mile.




**2021**
**Through Trip ETC Toll Rates**

| Vehicle Class | Via Toll NC 540 Toll | Toll Per Mile |
|---|---|---|
| Class 1 | $3.20 | $0.212 |
| Class 2 | $6.40 | $0.424 |
| Class 3 | $12.80 | $0.848 |

LEGEND

- Triangle Expressway
- Ramp Toll Zone
- Mainline Toll Zone
- (0.0) Distance Between Interchanges (Miles)

Toll Rates

| ETC | BBM | |
|---|---|---|
| $0.00 ($0.00) | | - Class 1 |
| $0.00 ($0.00) | | - Class 2 |
| $0.00 ($0.00) | | - Class 3 |

# TRIANGLE EXPRESSWAY: 2021 ETC AND BBM TOLL RATES

FIGURE 2.3

Toll rates increase annually in accordance with an approved toll schedule adopted by the NCTA Board of Directors. **Table 2.2** shows the annual historical toll rate increases on the Triangle Expressway from 2013 to 2021 for an ETC-equipped passenger car. It also shows the cost of a through trip on Toll NC 540 for an ETC-equipped passenger car, and the equivalent per-mile toll rate. Currently, a through trip on Toll NC 540 incurs tolls at five locations. Minor variations in the annual rate-of-increase of the though-trip toll between 2013 and 2021 result from rounding to the nearest penny at each of the five locations. Annual toll rate increases in future years are provided in Chapter 6.

**Table 2.2**
**Historical Toll Rate Increases (1)**
**on the Triangle Expressway**

| Calendar Year | Passenger-Car ETC Through Trip Toll on Toll NC 540 | | Percent Annual Toll Increase |
|---|---|---|---|
| | Toll (2) | Per-mile Toll Rate | |
| 2013 | $ 2.34 | $ 0.155 | |
| 2014 | 2.46 | 0.163 | 5.1 % |
| 2015 | 2.59 | 0.172 | 5.3 |
| 2016 | 2.70 | 0.179 | 4.2 |
| 2017 | 2.78 | 0.184 | 3.0 |
| 2018 | 2.89 | 0.191 | 4.0 |
| 2019 | 2.99 | 0.198 | 3.5 |
| 2020 | 3.10 | 0.205 | 3.7 |
| 2021 | 3.20 | 0.212 | 3.2 |

(1) Tolls increase on January 1st of each year.
(2) Class 1 Toll (2-axle vehicle) on the 15.1 mile Toll NC 540 portion of the Triangle Expressway.

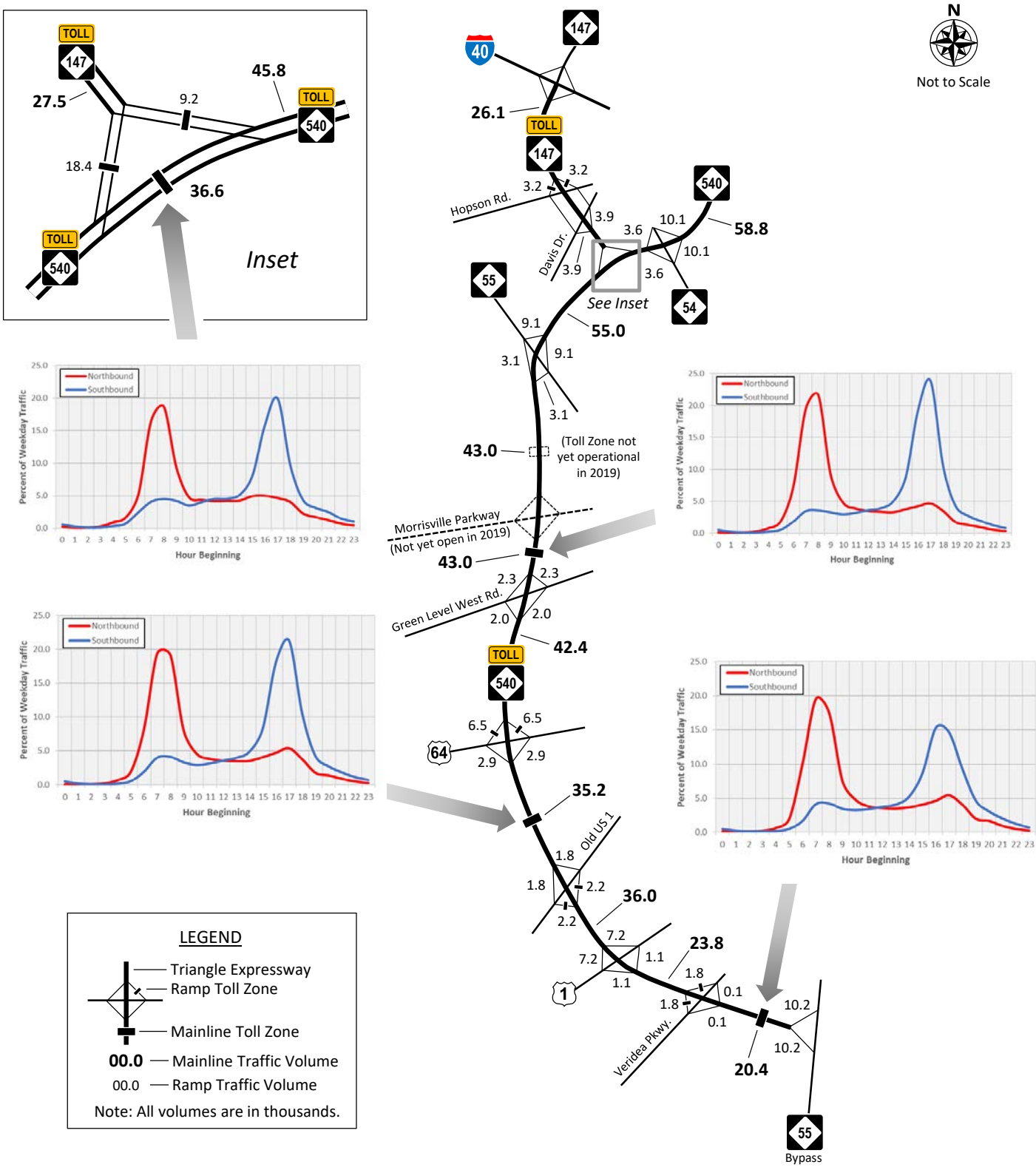
### 2.1.2 Triangle Expressway Traffic Volumes and Characteristics

Based on data provided by NCTA, CDM Smith developed a balanced profile of 2019 average weekday traffic on the Triangle Expressway. Annual average weekday traffic (AAWDT) volumes for 2019 are shown in **Figure 2.4**. Weekday traffic is important because about 83 percent of all Triangle Expressway toll transactions occur on weekdays. Traffic volumes build steadily from the south to the north on the Triangle Expressway, ranging from 20,400 vehicles per weekday at the southernmost mainline section to 55,000 on the mainline section between NC 55 and Toll NC 147.

Also shown in Figure 2.4 is the hourly weekday traffic distribution, by direction, at four mainline toll-zone locations. The hourly traffic distributions are based on traffic data between November 18, 2019 and December 16, 2019. There is a sharp peaking characteristic to Triangle Expressway traffic, consistent with a commuter-based road. Northbound traffic peaks in the morning, while southbound traffic peaks in the afternoon. There is relatively low traffic demand during the midday.

Northbound traffic at the four selected mainline sections peaks between 7 AM and 9 AM, comprising from 35 to 41 percent of total weekday traffic volumes at each location. Northbound peak-hour traffic volumes comprise 19 to 22 percent of the total weekday volumes at each of the selected mainlines.

Southbound mainline traffic on the Triangle Expressway peaks sharply between 5 PM and 6 PM, comprising 16 to 23 percent of the weekday southbound traffic, as seen at the selected locations. Southbound peak-period traffic, between 4 PM and 7 PM, accounts for 42 to 51 percent of weekday southbound traffic at these locations.




# TRIANGLE EXPRESSWAY: 2019 AVERAGE WEEKDAY TRAFFIC AND HOURLY DISTRIBUTION

FIGURE 2.4

Monthly traffic variations on the Triangle Expressway are shown in **Figure 2.5** and daily variations are shown in **Figure 2.6**. Cars and trucks show similar monthly patterns, with traffic volumes highest in the spring, summer and fall, and somewhat lower from December through February. Cars and trucks also have similar daily-variation patterns, with the highest traffic volumes occurring on Tuesdays, Wednesdays and Thursdays. Weekend traffic volumes for both passenger cars and trucks are lower than the weekday volumes.

**Table 2.3** shows the proportion of cars and trucks on the Triangle Expressway from 2013 through October 2020. Passenger cars have consistently comprised 96 to 97 percent of total transactions. Truck transactions totaled approximately three percent in 2013, and approximately four percent in 2019. Large trucks (four-or-more axles) represented 65 percent of total truck transactions in 2013, and 69 percent in 2019.

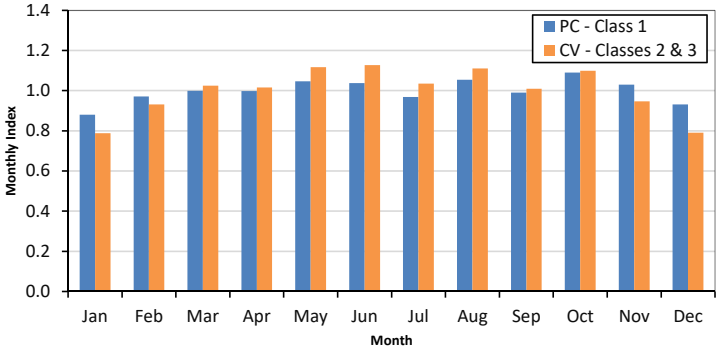



Figure 2.5
**Seasonal Variation of Toll Transactions on Triangle Expressway**

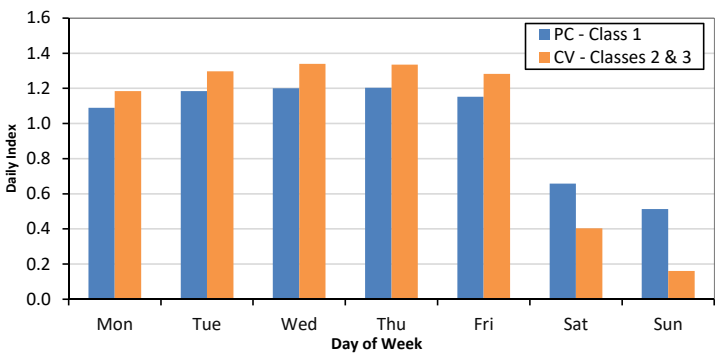



Figure 2.6
**Daily Variation of Toll Transactions on Triangle Expressway**

**Table 2.3**
**Annual Vehicle Class Distribution on The Triangle Expressway by Toll Class**
(all transactions in thousands)

| | Passenger-Car Transactions | | Truck Transactions | | | | | | All Transactions | |
|---|---|---|---|---|---|---|---|---|---|---|
| Calendar Year | Class 1 2-axle Vehicles | Percent of Total Vehicles | Class 2 3-axle Vehicles | Percent of Total Vehicles | Class 3 4 or-more Axle Vehicles | Percent of Total Vehicles | Class 2 & 3 All Trucks | Percent of Total Vehicles | All Vehicles | Percent of Total Vehicles |
| 2013 | 22,298 | 96.7 % | 268 | 1.2 % | 493 | 2.1 % | 761 | 3.3 % | 23,059 | 100.0 % |
| 2014 | 29,641 | 96.7 | 357 | 1.2 | 652 | 2.1 | 1,010 | 3.3 | 30,650 | 100.0 |
| 2015 | 37,050 | 96.7 | 427 | 1.1 | 842 | 2.2 | 1,268 | 3.3 | 38,319 | 100.0 |
| 2016 | 43,568 | 96.3 | 566 | 1.3 | 1,110 | 2.5 | 1,676 | 3.7 | 45,244 | 100.0 |
| 2017 | 47,599 | 96.2 | 602 | 1.2 | 1,258 | 2.5 | 1,861 | 3.8 | 49,460 | 100.0 |
| 2018 | 51,096 | 96.2 | 644 | 1.2 | 1,381 | 2.6 | 2,025 | 3.8 | 53,121 | 100.0 |
| 2019 | 55,915 | 96.2 | 677 | 1.2 | 1,539 | 2.6 | 2,215 | 3.8 | 58,130 | 100.0 |
| 2020 (1) | 33,198 | 94.4 | 571 | 1.6 | 1,391 | 4.0 | 1,962 | 5.6 | 35,161 | 100.0 |

(1) 2020 Transactions represent a partial year through October 2020.
Source: NCTA

### 2.1.3 Travel Patterns on the Triangle Expressway

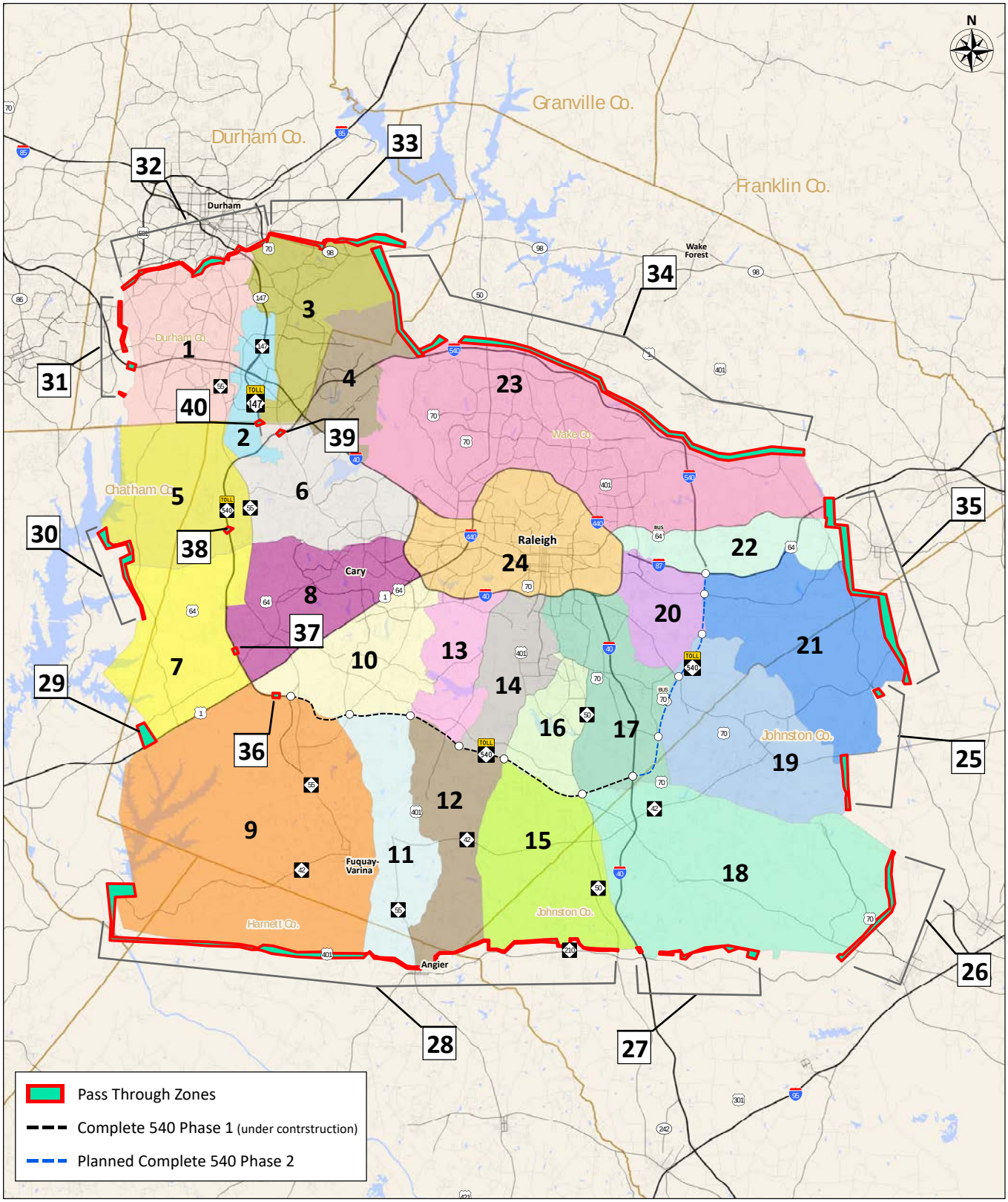
StreetLight Data, Inc. provided CDM Smith with a full year of 2019 travel pattern data in the study area. This data provided insights into travel patterns by the time periods used in the travel demand model as well as average days (Tuesday, Wednesday and Thursday). Similar to license-plate matching surveys, geospatial information is gathered from sources such as mobile phones, GPS devices, connected cars and commercial vehicles. Unique identifiers are used to determine individual trips. A map of the full zone system is presented in **Figure 2.7**

The StreetLight data helped determine what proportion of trips on the Triangle Expressway are either long-distance or through trips. **Figures 2.8 and 2.9** illustrate samples of the StreetLight data. The data is used in a similar manner to a "select link" analysis, where the selected link is identified by a star in each figure.

Figure 2.8 illustrates northbound Triangle Expressway travel patterns during an average weekday, based on all vehicles identified on the mainline section between the NC 55 Bypass and U.S. 1. This section of roadway has the lowest weekday traffic volume of any mainline section. Figure 2.8 shows the percent of all vehicles detected at the select link, at each of the mainline locations to the north of the select link. For example, 50 percent of all vehicles identified at the select link location were also identified on the mainline section between Green Level West Road and NC 55, and 22 percent were identified on the mainline section between Toll NC 147 and NC 54. Approximately 42 percent of the northbound vehicles detected on the southernmost section of the Triangle Expressway made a trip of approximately 15 miles, past the NC 55 interchange and continuing on either Toll NC 147 or Toll NC 540.

Figure 2.9 illustrates weekday travel patterns in the southbound direction from the select link location on Toll NC 540 between NC 54 and Toll NC 147. This point is marked by a star. This mainline section has the second highest weekday traffic volume on the Triangle Expressway. As shown, the majority of traffic identified at this location made short trips on the Triangle Expressway, with 20 percent of vehicles not traveling past the NC 55 interchange, and only 11 percent of the trips traveling all the way to the southernmost mainline section.

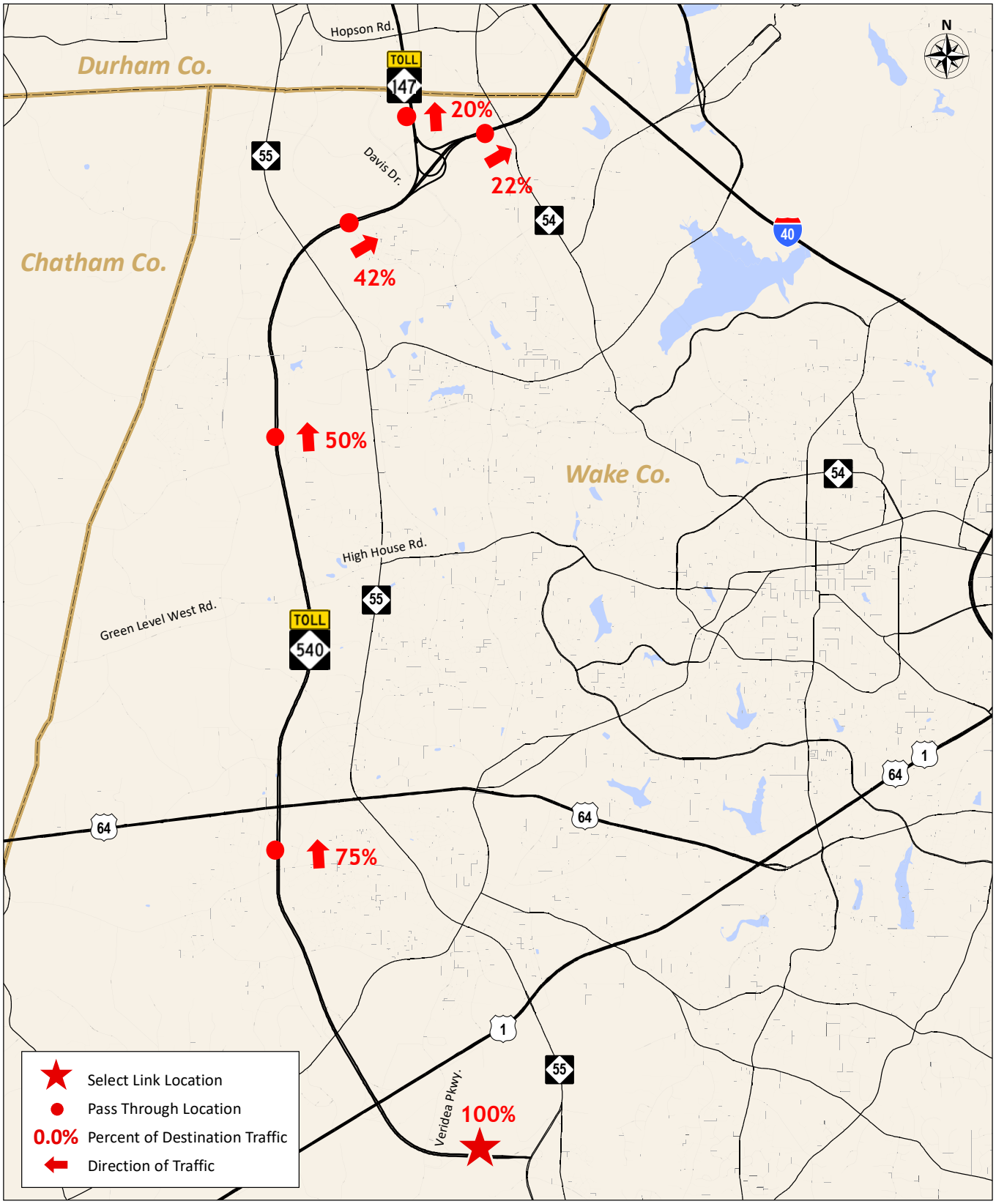
The data provided by Streetlight assisted in identifying travel patterns but does not necessarily represent all vehicle trips. It is limited to the vehicles/motorists that are equipped with active devices that connect to cell towers or satellites.




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## STREETLIGHT DATA ZONES

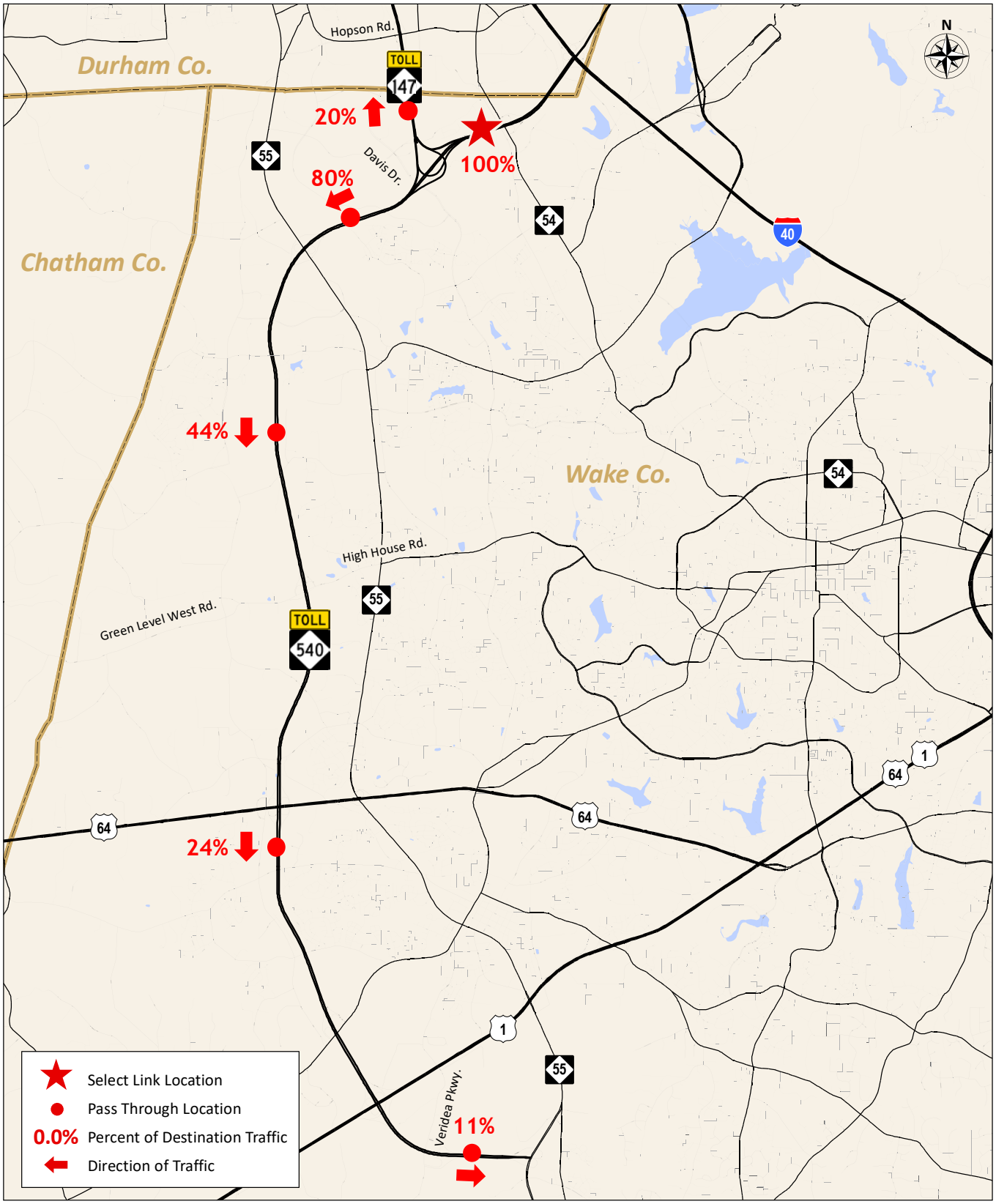
FIGURE 2.7




SOURCE: Streetlight Data, average 2019 all day Tuesday-Thursday traffic.

## STREETLIGHT WEEKDAY TRAVEL PATTERN DISTRIBUTION NORTHBOUND

FIGURE 2.8




SOURCE: Streetlight Data, average 2019 all day Tuesday-Thursday traffic.

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## STREETLIGHT WEEKDAY TRAVEL PATTERN DISTRIBUTION SOUTHBOUND

FIGURE 2.9

### 2.1.4 Triangle Expressway Transactions and Toll Revenue

The Triangle Expressway opened in three phases to tolled traffic, with the final section opening to traffic on December 12, 2012. Tolling began on January 2, 2013, on the last section. Annual toll transactions and collected toll revenue from 2013 through October 2020 are shown in **Table 2.4**. Strong growth in transactions and toll revenue occurred from 2013 through 2017, which is reflective of the ramp-up period. During this period transactions increased, on average, by 21.0 percent per year and collected toll revenue increased on average, by 30.1 percent per year. Transactions increased quickly due to a long ramp-up period as motorists became familiar with the new road and its benefits, and to positive economic conditions.

**Table 2.4**
**Triangle Expressway Annual Transactions and Collected Toll Revenue**
(transactions and revenue in thousands)

| Calendar Year | Toll Transactions and Year-over-Year Percent Growth | | Collected Toll Revenue and Year-over-Year Percent Growth (1) | | Average Weighted Toll Rate and Year-over-Year Percent Growth (2) | | Percent Annual Toll Increase |
|---|---|---|---|---|---|---|---|
| | Transactions | Growth | Revenue | Growth | Toll Rate | Growth | |
| 2013 | 23,059 | | $ 14,238 | | $ 0.62 | | |
| 2014 | 30,650 | 32.9 % | 21,045 | 47.8 % | 0.69 | 11.2 % | 5.3 % |
| 2015 | 38,319 | 25.0 | 28,779 | 36.7 | 0.75 | 9.4 | 5.3 |
| 2016 | 45,244 | 18.1 | 35,393 | 23.0 | 0.78 | 4.2 | 4.2 |
| 2017 | 49,460 | 9.3 | 40,792 | 15.3 | 0.82 | 5.4 | 3.0 |
| 2018 (3) | 53,121 | 7.4 | 45,061 | 10.5 | 0.85 | 2.9 | 4.0 |
| 2019 | 58,130 | 9.4 | 51,791 | 14.9 | 0.89 | 5.0 | 3.5 |
| 2020 (4) | 35,161 | -- | 32,116 | -- | 0.91 | -- | 3.7 |
| Average Annual Percent Change | | | | | | | |
| 2013-2017 | | 21.0 | | 30.1 | | 7.5 | 4.4 |
| 2017-2019 | | 8.4 | | 12.7 | | 3.9 | 3.7 |

(1) This is toll revenue collected during the indicated year. It does not include fee revenue.
(2) The average weighted toll rate is calculated by dividing total toll revenue for the year by total toll transactions for the year.
(3) Hurricane Florence made landfall near Wilmington on September 14th, 2018.
(4) Represents transactions and revenue through October 2020.

Source: NCTA

Triangle Expressway continued to experience high growth beyond the initial assumed ramp-up period. From 2017 through 2019 transactions increased, on average, by 8.4 percent per year and collected toll revenue increased, on average, 12.7 percent per year. Annual collected toll revenue increased at a faster rate than transactions in part due to programmed toll rate increases, and because the average weighted toll increased faster than the programmed toll rate increases in all years except 2018. The average weighted toll is influenced each year by 1) the mix of ETC and BBM, 2) the mix of the vehicle classes, and 3) the average trip distance made on the Triangle Expressway.

Monthly transactions and collected toll revenue are shown in **Table 2.5** from January 2013 through October 2020. Strong passenger car transaction growth occurred in each month of 2019 compared with the same month in 2018. This trend continued through the first two months of 2020 as passenger-car transactions and toll revenue increased by 5.2 percent and more than 15.7 percent, respectively, compared to the same period in 2019. During the same two-month period, truck transactions and toll revenue increased by 3.6 percent and 12.2 percent, respectively.

March 2020 represents the first month in which the negative impacts of COVID-19 closures can be seen. Impacts to passenger cars peaked in April when year-over-year transactions declined by 63.2 percent. Due in part to the nature of BBM revenue collection via invoicing, the greatest impact to passenger car toll revenue occurred in May 2020. Transaction impacts related to COVID-19 impacts steadily improved between April and July. COVID-19 impacts on commercial vehicle traffic were less immediate following statewide school and business closures and less severe in general. COVID-19 related impacts to commercial vehicles peaked in May when year-over-year for transactions and revenue were –25.0 percent and –22.2 percent, respectively. Commercial vehicle transactions recovered to positive year-over-year growth in July at 2.6 percent.

A notable improvement in year-over-year transaction growth can be observed beginning in August 2020 and extending through October 2020. This is the result of toll transactions being collected at the new mainline toll zone north of the Morrisville Parkway interchange beginning on August 9, 2020. Since tolls at the adjacent mainline toll zones were adjusted, collected total toll revenues were unaffected. Year-over-year revenue for these same months show modest improvement with systemwide collected total toll revenue in October 2020 down 34.8 percent from October 2019, a 2 percent improvement from the plateau of approximately -37 percent from June through September.

**Table 2.6** shows the systemwide percent of transactions attributed to cars and trucks by method of payment (ETC and BBM). Transactions in Table 2.6 represent ETC market share including transponders detected at the roadside as well as image-based tolls that are subsequently associated with a valid pre-paid transponder account (either in-state or out-of-state) and charged the appropriate ETC toll rate. Among passenger cars, ETC transaction market share grew from 61.7 percent in 2013 to 69.1 percent in 2019. Truck ETC transaction market share grew from 52.4 percent in 2013 to 57.6 percent in 2019.

# Table 2.5
# Triangle Expressway Monthly Transaction and Toll Revenue Trends

## Passenger Cars (Class 1: 2-Axle Vehicles)

| | Toll Transactions (000s) | | | | | | | | | | | Toll Revenue (000s) (1) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Month | 2015 | % Chg | 2016 | % Chg | 2017 (2) | % Chg | 2018 (3) | % Chg | 2019 | % Chg | 2020 (4,5,6) | 2015 | % Chg | 2016 | % Chg | 2017 (2) | % Chg | 2018 (3) | % Chg | 2019 | % Chg | 2020 (4,5,6) |
| January | 2,632 | 15.9 | 3,049 | 14.4 | 3,488 | 5.1 | 3,665 | 21.0 | 4,437 | 5.1 | 4,662 | $ 1,908 | 24.0 | $ 2,366 | 24.2 | $ 2,938 | 6.5 | $ 3,129 | 14.0 | $ 3,566 | 19.9 | $ 4,275 |
| February | 2,244 | 45.6 | 3,267 | 8.3 | 3,540 | 8.5 | 3,840 | 7.6 | 4,132 | 5.4 | 4,354 | 1,779 | 40.4 | 2,499 | 9.4 | 2,734 | 15.7 | 3,163 | 14.7 | 3,629 | 11.7 | 4,053 |
| March | 2,959 | 25.2 | 3,703 | 10.4 | 4,087 | 5.2 | 4,298 | 9.9 | 4,723 | (30.3) | 3,290 | 2,175 | 20.0 | 2,610 | 24.2 | 3,243 | 7.7 | 3,493 | 20.1 | 4,196 | (20.1) | 3,352 |
| April | 3,057 | 19.5 | 3,652 | 4.9 | 3,829 | 10.7 | 4,239 | 9.2 | 4,631 | (63.2) | 1,706 | 2,088 | 24.2 | 2,592 | 10.8 | 2,871 | 15.7 | 3,323 | 19.6 | 3,973 | (37.1) | 2,498 |
| May | 3,138 | 18.9 | 3,732 | 12.6 | 4,204 | 8.5 | 4,560 | 9.4 | 4,987 | (55.6) | 2,215 | 2,053 | 29.0 | 2,649 | 18.3 | 3,135 | 14.7 | 3,596 | 12.1 | 4,031 | (47.6) | 2,112 |
| June | 3,207 | 17.8 | 3,777 | 9.9 | 4,152 | 6.2 | 4,409 | 4.5 | 4,608 | (40.3) | 2,752 | 2,362 | 12.2 | 2,649 | 21.6 | 3,222 | 10.4 | 3,559 | 6.7 | 3,796 | (39.8) | 2,286 |
| July | 3,205 | 10.2 | 3,532 | 8.4 | 3,830 | 10.2 | 4,222 | 10.7 | 4,673 | (37.4) | 2,926 | 2,246 | 13.5 | 2,550 | 19.6 | 3,050 | 12.8 | 3,442 | 17.0 | 4,026 | (40.6) | 2,390 |
| August | 3,293 | 18.8 | 3,912 | 9.0 | 4,263 | 9.1 | 4,650 | 5.8 | 4,920 | (28.6) | 3,515 | 2,416 | 20.3 | 2,905 | 15.3 | 3,350 | 5.2 | 3,523 | 20.3 | 4,236 | (40.7) | 2,514 |
| September | 3,257 | 12.8 | 3,676 | 8.6 | 3,993 | (0.3) | 3,981 | 15.7 | 4,607 | (19.1) | 3,726 | 2,324 | 22.1 | 2,837 | 10.7 | 3,141 | 2.3 | 3,212 | 23.7 | 3,972 | (39.8) | 2,391 |
| October | 3,522 | 12.4 | 3,957 | 9.8 | 4,347 | 10.8 | 4,817 | 7.1 | 5,162 | (21.5) | 4,053 | 2,412 | 22.2 | 2,947 | 13.0 | 3,328 | 11.8 | 3,723 | 13.9 | 4,241 | (38.0) | 2,630 |
| November | 3,221 | 15.8 | 3,730 | 9.2 | 4,074 | 9.1 | 4,446 | 2.7 | 4,564 | | | 2,343 | 18.4 | 2,774 | 14.7 | 3,182 | 14.1 | 3,630 | 5.6 | 3,832 | | |
| December | 3,316 | 8.0 | 3,580 | 5.9 | 3,793 | 4.6 | 3,969 | 12.7 | 4,471 | | | 2,284 | 26.1 | 2,879 | 6.9 | 3,078 | 12.0 | 3,449 | 13.6 | 3,918 | | |
| **Total Year** | 37,050 | 17.6 | 43,568 | 9.3 | 47,599 | 7.3 | 51,096 | 9.4 | 55,915 | (40.6) | 33,198 | $ 26,390 | 22.2 | $ 32,257 | 15.6 | $ 37,275 | 10.6 | $ 41,241 | 15.0 | $ 47,416 | (39.9) | $ 28,500 |
| **Jan-June** | 17,236 | 22.9 | 21,181 | 10.0 | 23,300 | 7.3 | 25,012 | 10.0 | 27,517 | (31.0) | 18,979 | 12,366 | 24.3 | 15,366 | 18.1 | 18,145 | 11.7 | 20,263 | 14.4 | 23,191 | (19.9) | $ 18,575 |

## Commercial Vehicles (Classes 2 and 3: 3-or-more Axle Vehicles)

| | Toll Transactions (000s) | | | | | | | | | | | Toll Revenue (000s) (1) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | 2015 | % Chg | 2016 | % Chg | 2017 (2) | % Chg | 2018 (3) | % Chg | 2019 | % Chg | 2020 (4,5) | 2015 | % Chg | 2016 | % Chg | 2017 (2) | % Chg | 2018 (3) | % Chg | 2019 | % Chg | 2020 (4,5,6) |
| January | 74 | 37.4 | 102 | 20.0 | 122 | 1.8 | 124 | 32.6 | 164 | 3.7 | 170 | $ 152 | 28.4 | $ 195 | 8.2 | $ 211 | 5.7 | $ 223 | 37.0 | $ 305 | 10.1 | 336 |
| February | 59 | 77.7 | 105 | 38.5 | 146 | (2.7) | 142 | 2.7 | 146 | 3.5 | 151 | 109 | 79.6 | 197 | 39.8 | 275 | (4.6) | 262 | 7.4 | 281 | 14.4 | 322 |
| March | 96 | 49.3 | 143 | 24.3 | 178 | (8.5) | 163 | 14.3 | 187 | 3.8 | 194 | 178 | 53.2 | 272 | 26.4 | 344 | (9.5) | 311 | 20.7 | 376 | 1.3 | 381 |
| April | 109 | 28.6 | 140 | 5.7 | 148 | 20.7 | 178 | 2.9 | 184 | (11.4) | 163 | 194 | 36.4 | 265 | 8.1 | 287 | 23.0 | 353 | (2.0) | 345 | 1.9 | 352 |
| May | 116 | 20.8 | 140 | 20.2 | 168 | 17.7 | 198 | 7.6 | 213 | (25.0) | 160 | 220 | 21.9 | 268 | 22.6 | 328 | 18.3 | 388 | 5.5 | 410 | (22.2) | 319 |
| June | 121 | 29.1 | 156 | 12.1 | 175 | 12.1 | 196 | (1.1) | 194 | (3.7) | 187 | 216 | 38.8 | 300 | 11.1 | 334 | 15.6 | 386 | (3.0) | 374 | (9.3) | 339 |
| July | 118 | 20.3 | 142 | 9.1 | 155 | 18.6 | 184 | 7.6 | 198 | 2.6 | 203 | 226 | 20.5 | 273 | 9.1 | 298 | 22.4 | 364 | 14.3 | 416 | (2.1) | 407 |
| August | 120 | 41.2 | 169 | 1.7 | 172 | 14.7 | 197 | 4.9 | 207 | 15.5 | 239 | 234 | 29.6 | 303 | 5.5 | 320 | 15.3 | 368 | 11.5 | 411 | (5.2) | 390 |
| September | 121 | 14.9 | 139 | 10.1 | 153 | 5.2 | 161 | 20.0 | 193 | 21.2 | 234 | 231 | 14.3 | 264 | 14.8 | 303 | (5.4) | 286 | 32.9 | 381 | (2.5) | 371 |
| October | 123 | 31.1 | 161 | 3.5 | 166 | 16.8 | 194 | 7.7 | 209 | 25.4 | 262 | 237 | 20.5 | 285 | 5.1 | 300 | 22.5 | 367 | 11.0 | 408 | (2.1) | 399 |
| November | 102 | 43.5 | 147 | 2.4 | 150 | 4.8 | 157 | 5.8 | 167 | | | 189 | 44.5 | 273 | 4.3 | 284 | (1.5) | 280 | 24.4 | 348 | | |
| December | 110 | 20.5 | 132 | (4.0) | 127 | 1.4 | 129 | 19.7 | 154 | | | 203 | 19.2 | 242 | (2.9) | 235 | (1.2) | 232 | 38.4 | 321 | | |
| **Total Year** | 1,268 | 32.2 | 1,676 | 11.0 | 1,861 | 8.8 | 2,025 | 9.4 | 2,215 | (11.4) | 1,962 | $ 2,389 | 31.3 | $ 3,136 | 12.1 | $ 3,517 | 8.6 | $ 3,820 | 14.5 | $ 4,375 | (17.3) | $ 3,616 |
| **Jan-June** | 575 | 36.8 | 786 | 19.2 | 937 | 6.9 | 1,002 | 28.3 | 1,285 | (4.5) | 1,227 | 1,070 | 40.0 | 1,497 | 18.8 | 1,778 | 28.6 | 2,287 | 9.6 | 2,507 | (18.3) | $ 2,049 |

## Total Vehicles (Classes 1 through 3)

| | Toll Transactions (000s) | | | | | | | | | | | Toll Revenue (000s) (1) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | 2015 | % Chg | 2016 | % Chg | 2017 (2) | % Chg | 2018 (3) | % Chg | 2019 | % Chg | 2020 (4,5,6) | 2015 | % Chg | 2016 | % Chg | 2017 (2) | % Chg | 2018 (3) | % Chg | 2019 | % Chg | 2020 (4,5,6) |
| January | 2,705 | 16.5 | 3,151 | 14.6 | 3,610 | 5.0 | 3,789 | 21.4 | 4,601 | 5.0 | 4,833 | $ 2,060 | 24.3 | $ 2,561 | 23.0 | $ 3,149 | 6.4 | $ 3,352 | 15.5 | $ 3,871 | 19.1 | $ 4,611 |
| February | 2,303 | 46.4 | 3,373 | 9.3 | 3,686 | 8.0 | 3,982 | 7.4 | 4,278 | 5.3 | 4,505 | 1,889 | 42.7 | 2,696 | 11.6 | 3,009 | 13.8 | 3,425 | 14.2 | 3,910 | 11.9 | 4,375 |
| March | 3,055 | 25.9 | 3,847 | 10.9 | 4,265 | 4.6 | 4,461 | 10.0 | 4,909 | (29.0) | 3,484 | 2,353 | 22.5 | 2,883 | 24.4 | 3,587 | 6.1 | 3,804 | 20.2 | 4,571 | (18.4) | 3,732 |
| April | 3,165 | 19.8 | 3,792 | 4.9 | 3,977 | 11.1 | 4,417 | 9.0 | 4,814 | (61.2) | 1,868 | 2,282 | 25.2 | 2,857 | 10.5 | 3,158 | 16.4 | 3,676 | 17.5 | 4,319 | (34.0) | 2,850 |
| May | 3,254 | 19.0 | 3,872 | 12.9 | 4,372 | 8.8 | 4,758 | 9.3 | 5,200 | (54.3) | 2,375 | 2,273 | 28.3 | 2,917 | 18.7 | 3,463 | 15.0 | 3,985 | 11.4 | 4,440 | (45.2) | 2,431 |
| June | 3,328 | 18.2 | 3,933 | 10.0 | 4,326 | 6.4 | 4,605 | 4.3 | 4,802 | (38.8) | 2,938 | 2,578 | 14.4 | 2,950 | 20.6 | 3,556 | 10.9 | 3,944 | 5.7 | 4,170 | (37.0) | 2,625 |
| July | 3,323 | 10.6 | 3,674 | 8.5 | 3,985 | 10.6 | 4,406 | 10.6 | 4,871 | (35.8) | 3,129 | 2,472 | 14.2 | 2,823 | 18.6 | 3,348 | 13.7 | 3,806 | 16.7 | 4,442 | (37.0) | 2,797 |
| August | 3,413 | 19.6 | 4,081 | 8.7 | 4,435 | 9.3 | 4,847 | 5.8 | 5,127 | (26.8) | 3,753 | 2,650 | 21.1 | 3,208 | 14.4 | 3,669 | 6.0 | 3,891 | 19.4 | 4,647 | (37.5) | 2,904 |
| September | 3,378 | 12.9 | 3,815 | 8.7 | 4,146 | (0.1) | 4,142 | 15.9 | 4,800 | (17.5) | 3,960 | 2,555 | 21.4 | 3,101 | 11.1 | 3,443 | 1.6 | 3,498 | 24.4 | 4,353 | (36.5) | 2,762 |
| October | 3,644 | 13.0 | 4,118 | 9.6 | 4,513 | 11.1 | 5,012 | 7.2 | 5,371 | (19.6) | 4,316 | 2,649 | 22.0 | 3,232 | 12.3 | 3,628 | 12.7 | 4,090 | 13.7 | 4,649 | (34.8) | 3,029 |
| November | 3,324 | 16.6 | 3,876 | 9.0 | 4,224 | 9.0 | 4,603 | 2.8 | 4,731 | | | 2,532 | 20.3 | 3,046 | 13.8 | 3,467 | 12.8 | 3,910 | 6.9 | 4,180 | | |
| December | 3,426 | 8.4 | 3,712 | 5.6 | 3,920 | 4.5 | 4,097 | 12.9 | 4,625 | | | 2,487 | 25.5 | 3,121 | 6.2 | 3,313 | 11.1 | 3,681 | 15.2 | 4,239 | | |
| **Total Year** | 38,319 | 18.1 | 45,244 | 9.3 | 49,460 | 7.4 | 53,121 | 9.4 | 58,130 | (39.5) | 35,161 | $ 28,779 | 23.0 | $ 35,393 | 15.3 | $ 40,792 | 10.5 | $ 45,061 | 14.9 | $ 51,791 | (38.0) | $ 32,116 |
| **Jan-June** | 17,811 | 23.3 | 21,967 | 10.3 | 24,237 | 7.3 | 26,013 | 10.0 | 28,604 | (30.1) | 20,003 | 13,435 | 25.5 | 16,863 | 18.1 | 19,923 | 11.4 | 22,186 | 14.0 | 25,282 | (18.4) | $ 20,624 |

(1) Programmed toll increases occurred every year on January 1st.
(2) A new interchange with Veridea Parkway opened in April 2017.
(3) Hurricane Florence made landfall near Wilmington on September 14th, 2018
(4) COVID-19 related transaction and toll revenue impacts began in March 2020.
(5) Morrisville Parkway Interchange ramps open to traffic February 4, 2020. The corresponding mainline toll zone north of the interchange began recording tolled transactions August 9, 2020.
(6) Represents transactions and revenue through October 2020.

**Table 2.6**
**ETC Market Share on the Triangle Expressway**

| Calendar Year | Percent Transactions by Vehicle Type and Method of Payment | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cars (3) | | | Trucks (3) | | | Total | | |
| | ETC | BBM | Total | ETC | BBM | Total | ETC | BBM | Total |
| 2013 | 61.7 | 38.3 | 100.0 | 52.4 | 47.6 | 100.0 | 61.4 | 38.6 | 100.0 |
| 2014 | 63.0 | 37.0 | 100.0 | 54.6 | 45.4 | 100.0 | 62.7 | 37.3 | 100.0 |
| 2015 | 62.6 | 37.4 | 100.0 | 54.6 | 45.4 | 100.0 | 62.3 | 37.7 | 100.0 |
| 2016 | 64.8 | 35.2 | 100.0 | 56.6 | 43.4 | 100.0 | 64.5 | 35.5 | 100.0 |
| 2017 (1) | 66.1 | 33.9 | 100.0 | 56.7 | 43.3 | 100.0 | 65.8 | 34.2 | 100.0 |
| 2018 | 67.4 | 32.6 | 100.0 | 57.2 | 42.8 | 100.0 | 67.0 | 33.0 | 100.0 |
| 2019 | 69.1 | 30.9 | 100.0 | 57.6 | 42.4 | 100.0 | 68.6 | 31.4 | 100.0 |
| 2020 (2) | 67.6 | 32.4 | 100.0 | 59.5 | 40.5 | 100.0 | 67.1 | 32.9 | 100.0 |

(1) NCTA began offering free NC Quick Pass sticker transponders August 30, 2017.
Previously the cost was $5.00.
(2) Partial actual data for 2020 through October.
(3) Cars are Toll Class 1 (2-axle vehicles).
Trucks are Toll Classes 2 and 3 (3-or-more axle vehicles).
Source: NCTA

## 2.2 Study Area Traffic Volumes and Travel Time

The following describes traffic volumes and travel times in the study area.

### 2.2.1 Traffic Volume Data Collection

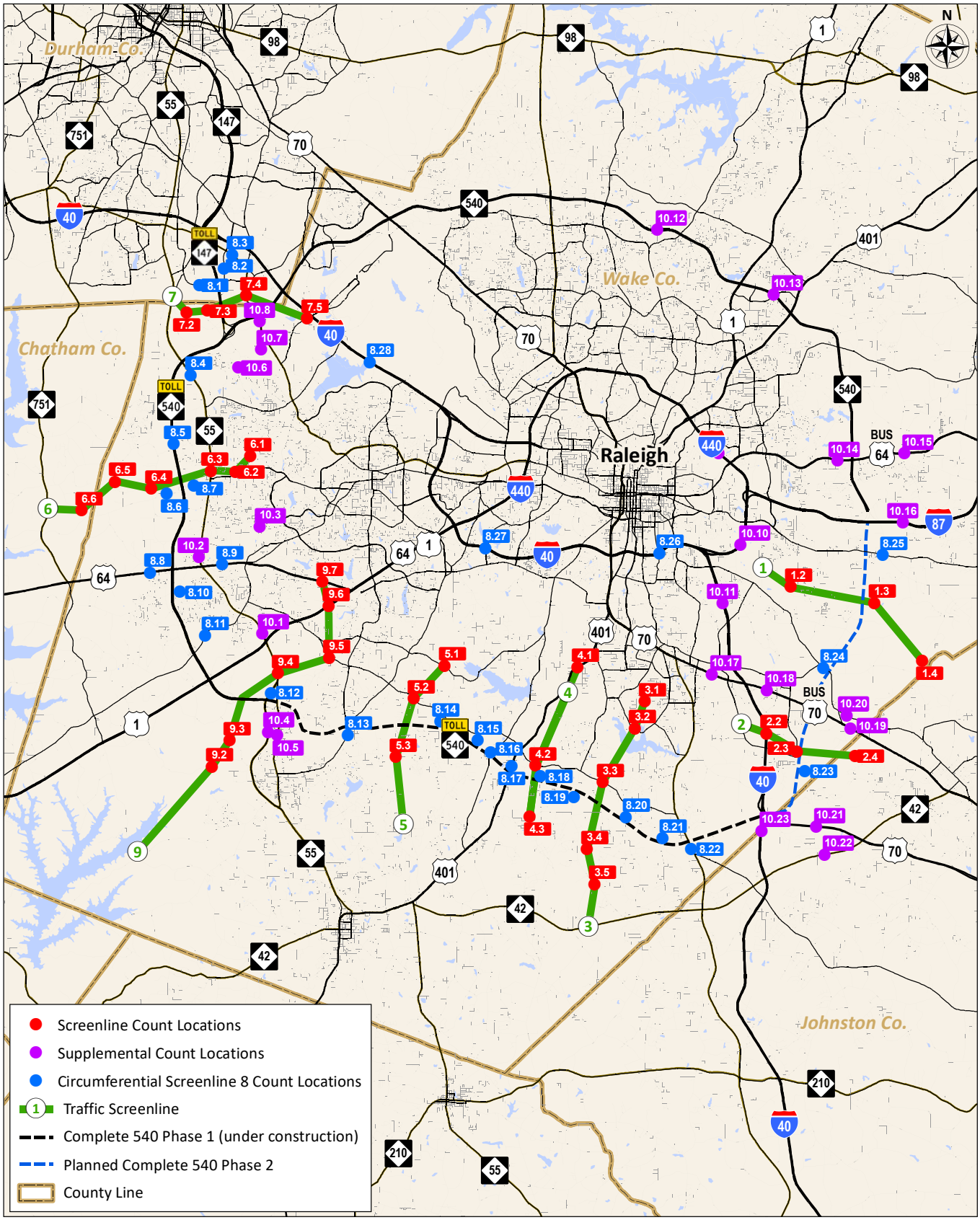
CDM Smith obtained traffic counts from NCDOT Traffic Survey Group to validate TRMv6 assigned weekday traffic volumes at locations in the study area. The following types of traffic counts were used in this study:

1. Weekday traffic count data collected in 15-minute increments by the NCDOT Traffic Survey Group during the fall of 2019.

2. Average annual daily traffic volumes from the NCDOT's Interactive Traffic Volume Map, located on the NCDOT website.

3. As described in Section 2.1.2, the NCTA provided CDM Smith with traffic volume data on the Triangle Expressway at tolled and non-tolled locations.

The NCDOT Traffic Survey Group provided count data at 69 of the 91 locations utilized in model calibration. These counts were provided in 15-minute increments for at least three continuous weekdays (Tuesday, Wednesday and Thursday). All counts were subsequently summarized into existing NCTA toll classes and TRMv6 time periods. For locations where 2019 data was not available, 2016 or 2017 count data at those locations was factored up to estimated 2019 levels using growth rates in AADT at relevant NCDOT count locations. All 91 traffic count locations are shown in **Figure 2.10** and **Table 2.7**.




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# TRAFFIC COUNT LOCATIONS

FIGURE 2.10

**Table 2.7 (Page 1 of 3)**
**Summary of 2019 Weekday Traffic Volumes at Count Locations**

| Location # | Count Location | Average Weekday Traffic (1) | Percent Trucks Weekday (2) |
|---|---|---|---|
| **Screenline 1: East Side of Raleigh, South of Poole Road** | | | |
| 1.1 | S New Hope Rd | 17,538 | 2.6% |
| 1.2 | Barwell Rd | 7,588 | 0.5% |
| 1.3 | Auburn Knightdale Rd | 4,903 | 2.0% |
| 1.4 | Mial Plantation Rd | 6,739 | 1.0% |
| **Screenline 2: East side of Raleigh, South of Business 70** | | | |
| *2.1* | *White Oak Rd (NC 2547)* | *18,393* | *1.0%* |
| *2.2* | *Interstate 40* | *98,547* | *12.5%* |
| *2.3* | *Raynor Rd (NC 2555)* | *5,836* | *1.1%* |
| 2.4 | Guy Rd (NC 2558) | 8,345 | 0.9% |
| **Screenline 3: South of Raleigh, West of NC 50** | | | |
| 3.1 | Timber Dr. | 18,719 | 0.4% |
| 3.2 | Buffalo Rd | 3,588 | 0.1% |
| 3.3 | Ten Ten Rd | 15,568 | 1.5% |
| *3.4* | *Pagan Rd* | *1,720* | *0.3%* |
| 3.5 | Rock Service Station Rd | 4,223 | 7.0% |
| 3.6 | NC 42 | 10,092 | 2.8% |
| **Screenline 4: South of Raleigh, East of US 401** | | | |
| 4.1 | US 401 | 37,708 | 2.1% |
| *4.2* | *Ten Ten Rd* | *17,927* | *1.4%* |
| *4.3* | *Banks Rd* | *6,571* | *1.1%* |
| **Screenline 5: Southwest of Raleigh, East of Holly Springs Road** | | | |
| *5.1* | *Penny Rd* | *10,485* | *0.6%* |
| 5.2 | Ten Ten Rd | 20,292 | 1.6% |
| 5.3 | Optimist Farm Rd | 10,928 | 0.4% |
| 5.4 | Hilltop Needmore Rd | 10,603 | 2.0% |
| **Screenline 6: West of Raleigh, North of High House Road** | | | |
| 6.1 | Davis Dr | 28,004 | 1.1% |
| 6.2 | Louis Stephens Dr | 3,579 | 0.0% |
| 6.3 | NC 55 | 25,774 | 18.9% |
| *6.4* | *Green Level Church Rd* | *8,873* | *0.8%* |
| *6.5* | *White Oak Church Rd* | *743* | *0.1%* |
| 6.6 | Green Level Rd | 2,457 | 1.4% |
| *6.7* | *NC 751* | *8,694* | *2.5%* |

(Continued on next page)

## Table 2.7 (Page 2 of 3)
## Summary of 2019 Weekday Traffic Volumes at Count Locations

| Location # | Count Location | Average Weekday Traffic (1) | Percent Trucks Weekday (2) |
|---|---|---|---|
| **Screenline 7: West of Raleigh, South of Interstate 40** | | | |
| 7.1 | NC 55 (Apex Highway) | 27,163 | 1.7% |
| 7.2 | Louis Stephens Dr | 3,616 | 0.1% |
| 7.3 | Davis Dr | 21,849 | 0.6% |
| 7.4 | NC 54 | 20,818 | 1.1% |
| 7.5 | Airport Blvd | 34,624 | 2.6% |
| **Screenline 8: Circumferential Locations Adjacent to Complete 540 Route** | | | |
| 8.1 | Hopson Rd. | 15,078 | 0.4% |
| 8.2 | Davis Dr | 20,078 | 0.8% |
| 8.3 | NC 54 | 13,174 | 0.4% |
| *8.4* | *NC 55* | *37,106* | *1.9%* |
| *8.5* | *Green Hope School Rd* | *5,737* | *1.0%* |
| 8.6 | Green Level West Rd | 10,233 | 1.7% |
| 8.7 | Green Level West Rd | 13,725 | 1.3% |
| 8.8 | US 64 | 40,456 | 2.6% |
| 8.9 | US 64 | 49,573 | 2.6% |
| 8.10 | Olive Chapel Rd | 10,125 | N/A |
| 8.11 | Old US Highway 1 | 8,168 | 4.9% |
| 8.12 | NC 55 | 32,528 | 3.6% |
| *8.13* | *Holly Springs Rd* | *23,374* | *0.4%* |
| 8.14 | Bells Lake Rd | 6,871 | 0.5% |
| *8.15* | *Johnson Pond Rd* | *4,391* | *0.7%* |
| 8.16 | Lake Wheeler Rd | 8,210 | 0.7% |
| 8.17 | US 401 | 34,468 | 1.4% |
| *8.18* | *Fanny Brown Rd* | *5,174* | *0.3%* |
| 8.19 | Old Stage Rd | 11,209 | N/A |
| *8.20* | *Sauls Rd* | *4,868* | *0.9%* |
| *8.21* | *Jordan Rd* | *2,238* | *0.2%* |
| 8.22 | NC 50 | 19,455 | 1.2% |
| *8.23* | *White Oak Rd.* | *13,972* | *0.6%* |
| 8.24 | Rock Quarry Rd | 6,465 | 1.7% |
| 8.25 | Poole Rd (NC 2555) | 13,092 | 1.3% |
| 8.26 | Interstate 40 | 132,694 | 8.4% |
| 8.27 | Interstate 40 (EB only) | 68,895 | 8.7% |
| 8.28 | Interstate 40 | 199,736 | 5.9% |

(Continued on next page)

**Table 2.7 (Page 3 of 3)**
**Summary of 2019 Weekday Traffic Volumes at Count Locations**

| Location # | Count Location | Average Weekday Traffic (1) | Percent Trucks Weekday (2) |
|---|---|---|---|
| **Screenline 9: South of US 1** | | | |
| 9.1 | New Hill Holleman Road | 7,543 | 4.7% |
| 9.2 | Holly Springs New Hill Road | 8,561 | N/A |
| *9.3* | *Veridea Parkway* | *4,389* | *0.3%* |
| 9.4 | NC 55 | 49,065 | 2.1% |
| 9.5 | Ten Ten Road | 29,339 | 1.4% |
| *9.6* | *US 1* | *99,949* | *7.4%* |
| 9.7 | US 64 | 46,123 | 2.6% |
| **Supplemental Counts** | | | |
| 10.1 | NC 55 | 25,980 | 5.9% |
| 10.2 | NC 55 | 32,437 | 1.5% |
| 10.3 | Davis Drive | 15,628 | 0.6% |
| 10.4 | NC 55 Bypass | 47,741 | 3.0% |
| 10.5 | NC 55 - North of Easton St. | 16,771 | 0.5% |
| 10.6 | Davis Drive | 26,903 | 0.4% |
| *10.7* | *Church Street* | *9,252* | *0.6%* |
| 10.8 | Chapel Hill Road | 27,741 | 2.6% |
| 10.9 | I-440 | 129,328 | 4.4% |
| 10.10 | I-440 | 116,176 | 6.6% |
| 10.11 | I-40 | 117,623 | 8.8% |
| 10.12 | I-540 | 113,863 | 5.6% |
| 10.13 | I-540 | 83,419 | 6.4% |
| 10.14 | US-64 BUS | 31,194 | 2.5% |
| 10.15 | US-64 BUS | 26,386 | 2.5% |
| 10.16 | I-87 | 89,583 | N/A |
| 10.17 | US-70 | 45,592 | 2.6% |
| 10.18 | US-70 | 48,995 | 2.6% |
| 10.19 | US-70 | 32,606 | 2.6% |
| 10.20 | SR 1004 (E Garner Rd) | 8,973 | N/A |
| 10.21 | US-70 | 32,687 | 2.6% |
| 10.22 | NC 42 | 20,412 | N/A |
| *10.23* | *I-40* | *69,225* | *14.5%* |

(1) Represents the average of Tuesday, Wednesday and Thursday traffic count volumes.
(2) Trucks are defined as vehicles with three or more axles.

*Note: Counts in italics represent 2016 or 2017 counts factored to estimated 2019 levels.*

### 2.2.2 Historical Traffic Growth in the Study Area

Traffic growth on I-40 and selected highways and arterials from 2013 to the most currently available year are shown in **Figure 2.11**. The traffic volumes are annual average daily traffic (AADT) volumes provided by the NCDOT Traffic Survey Group.

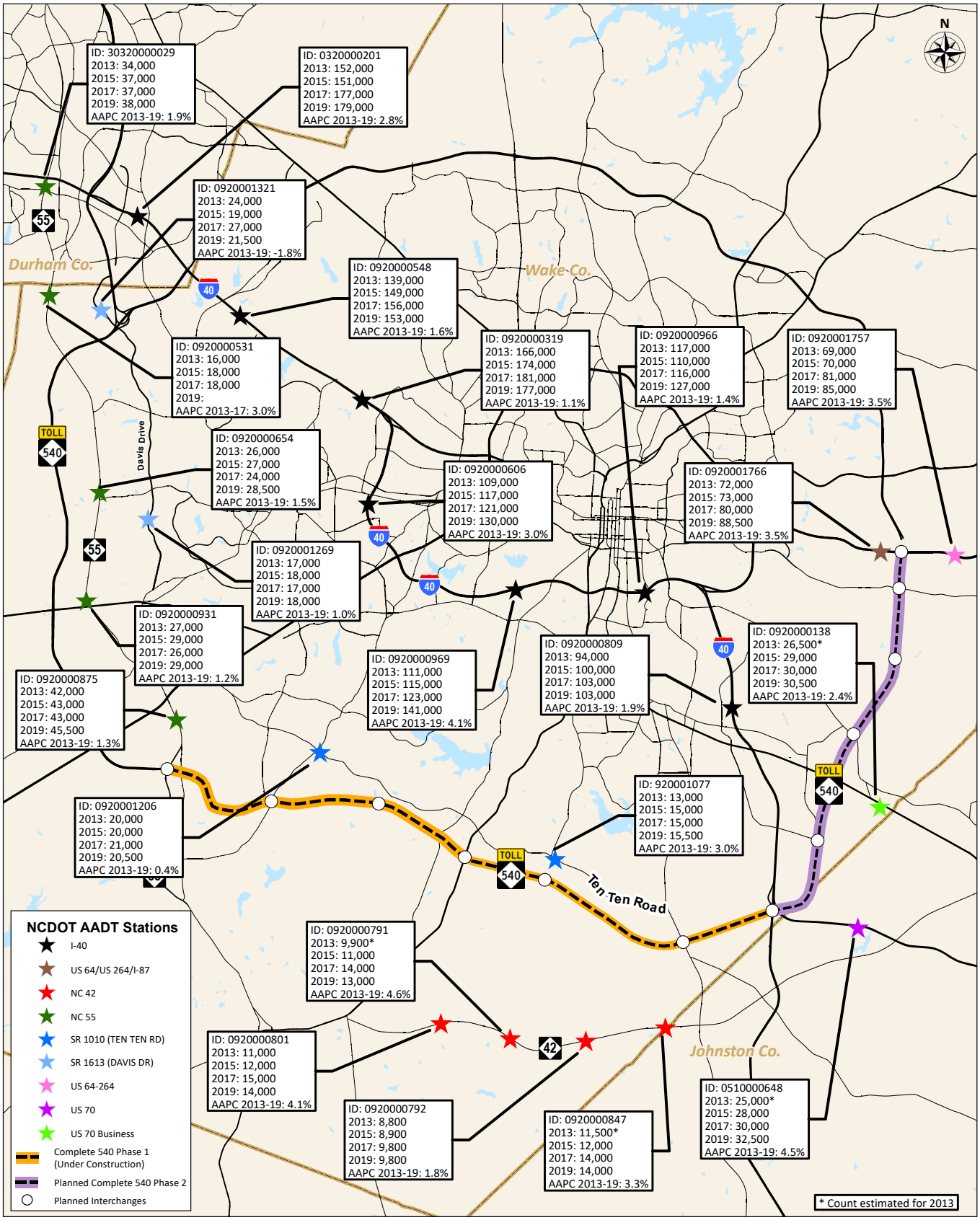
Steady traffic growth occurred on most major roads in the Raleigh area during the six-year period between 2013 and 2019. Growth rates generally ranged from approximately 2 percent to 4 percent per year. Some exceptions to this trend include NC 55 and Davis Drive. AADT growth on these two roads which are parallel to the Triangle Expressway grew at a slower rate than other roads in the region with growth rates at most locations falling between 1 percent and 2 percent per year.

### 2.2.3 Travel Times in the Study Area

Travel speed data was obtained from HERE via Regional Integrated Transportation Information System (RITIS) with permission from NCDOT. Travel speed data was collected for the entire year of 2019. The data consisted of travel speeds and distance by roadway segment based on GPS data, from which travel time can be calculated.

CDM Smith compiled and summarized travel speeds for selected road segments in the study area and used that information to calculate travel times. **Figure 2.12** shows 2019 average free-flow travel times by segment and direction for a sampling of the selected routes. Free-flow travel was identified as the fastest hour of travel of the day for any given location by direction. It should be noted that minor differences in free-flow travel time by direction on a given segment can be attributed to directional variances in the distances provided by HERE. For comparison purposes, **Figure 2.13** and **Figure 2.14** show 2019 average travel times by segment and direction for the same routes during the AM peak hour (7 AM – 8 AM) and the PM peak hour (5 PM – 6 PM). For example, northbound travel times on NC 55 between U.S. 64 and Toll NC 540 averaged 8.5 minutes under free-flow conditions, 9.8 minutes during the AM peak hour, and 10.3 minutes during the PM peak hour.

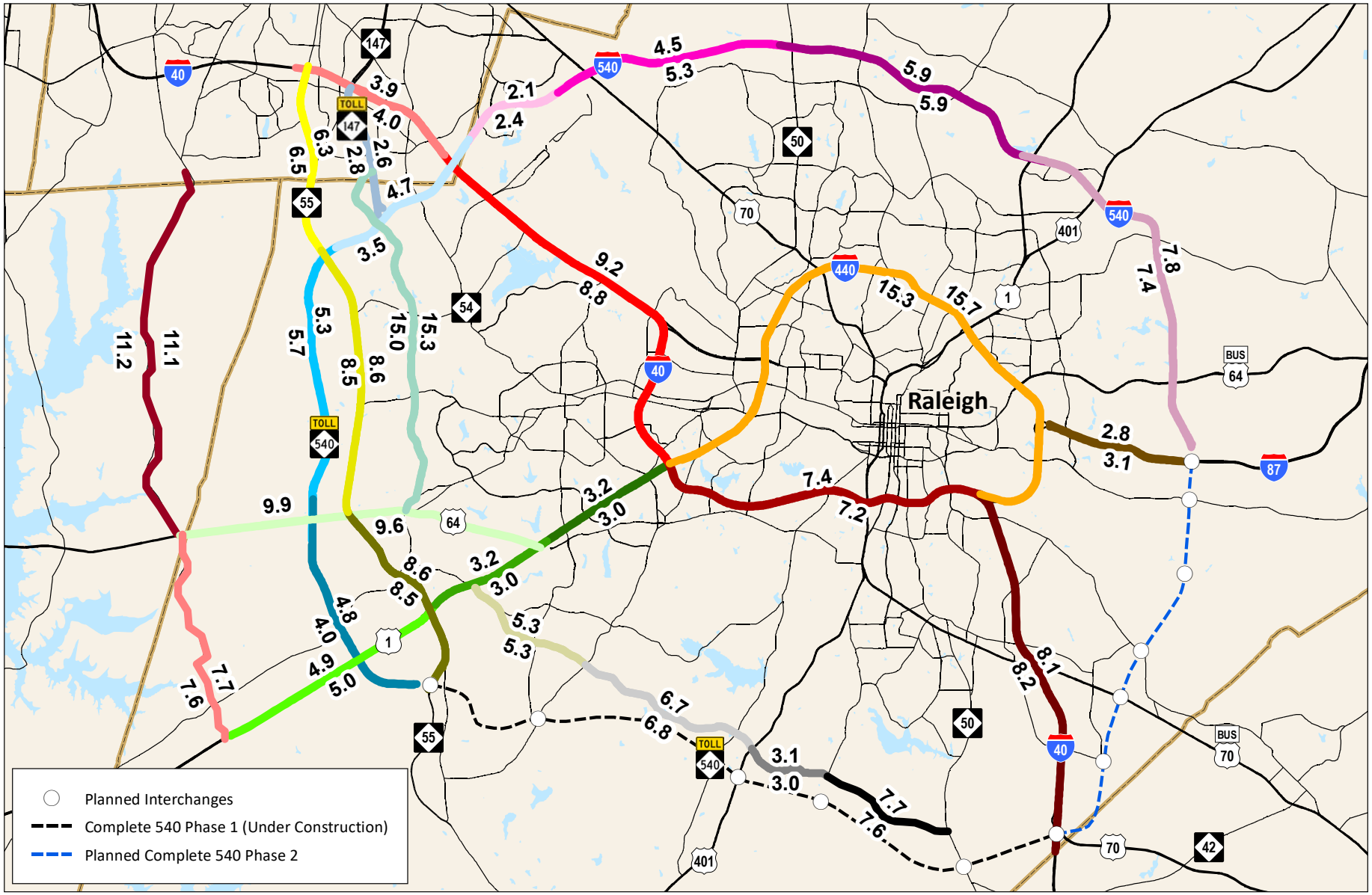
The travel times in Figures 2.12 through 2.14 are high-level summaries. For use in calibrating to 2019, travel times were available in smaller-distance segments.




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# HISTORICAL TRAFFIC GROWTH ON AREA ROADWAYS

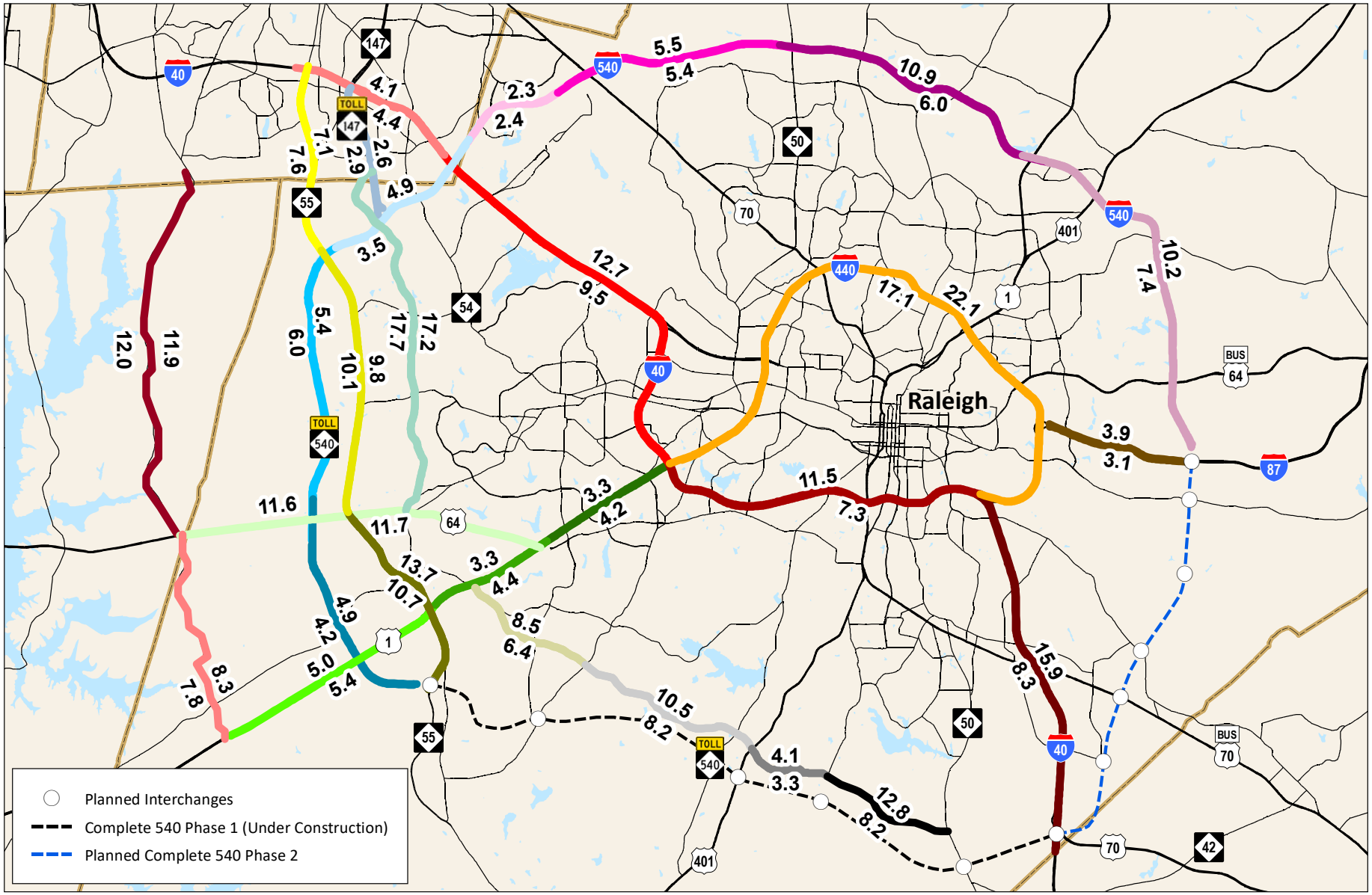
FIGURE 2.11




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## 2019 FREEFLOW TRAVEL TIME (IN MINUTES)

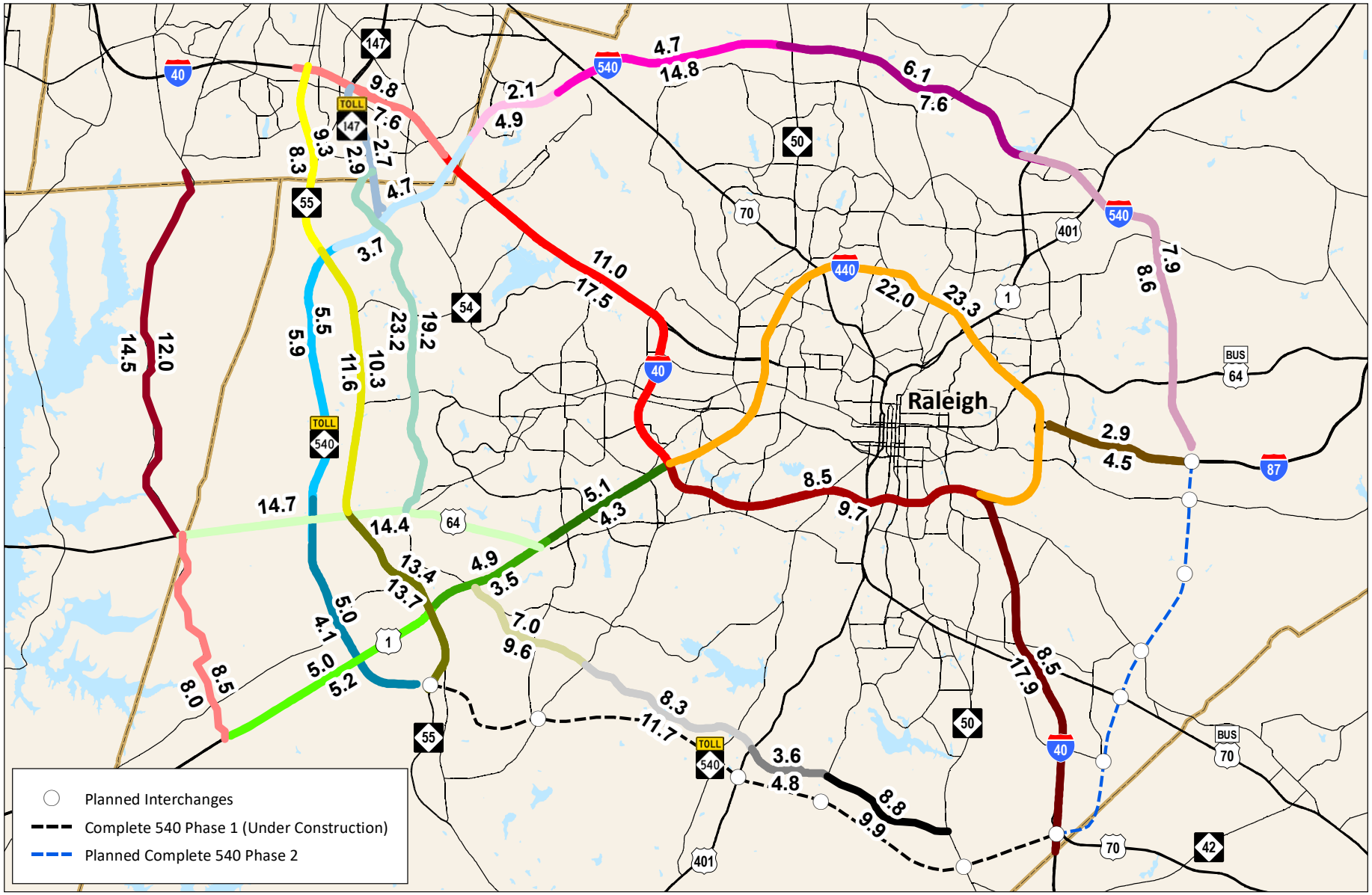
FIGURE 2.12




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## 2019 AM PEAK TRAVEL TIME (IN MINUTES)

FIGURE 2.13




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## 2019 PM PEAK TRAVEL TIME (IN MINUTES)

FIGURE 2.14

# 2.3 COVID-19 Impacts and the Triangle Expressway

## 2.3.1 Timeline of COVID-19 Events Impacting Triangle Expressway

The COVID-19 pandemic is impacting nearly all aspects of society and the economy, including travel. Beginning in March, the pandemic caused significant reductions in transactions and revenue on toll facilities around the U.S., including on the Triangle Expressway. **Table 2.8** provides the timeline of events, mandates, and other announcements related to COVID-19 affecting travel in the Triangle region.

Regionwide travel announcements that resulted in reduced travel on the Triangle Expressway include: the closure of schools beginning on March 16, 2020; the gradual limitation of gatherings in public and closure of specific businesses initiated between March 16 and March 25; and the closure of non-essential businesses on March 30. On March 30, NCTA announced suspension of third-party collection efforts and all processing fees and penalties; this suspension was rescinded on October 26.

## 2.3.2 Impacts of COVID-19 Pandemic on Triangle Expressway Transactions

The impact of the COVID-19 pandemic on passenger car and commercial vehicle transactions on the Triangle Expressway, sorted by ETC vs. BBM, are shown in **Figure 2.15**. The impacts shown are in the chart represent a 7-day rolling average impact for passenger cars and a 21-day rolling average impact for commercial vehicles. Due to the small percentage and variable nature of truck traffic in the corridor, the impacts were less consistent on a day-to-day basis. The percent decrease shown in Figure 2.15 is the difference between actual transactions in 2020 with COVID-19 compared to estimated transactions in 2020 without COVID-19, including growth over 2019. For the purpose of continuity, the transaction impacts shown in Figure 2.15 exclude transactions at the new mainline toll zone north of the Morrisville Parkway interchange which began recording toll transactions on August 9, 2020.

The largest drop in passenger car traffic on the Triangle Expressway occurred the week immediately following the closure of K-12 schools, from an average of –15 percent for week ending March 15 to –52 percent for the week ending March 22. This reflects both the demographics of users of the facility (those with school-aged children), and the relative ability of drivers in the corridor to work from home (many are workers in the Research Triangle Park). By the time non-essential businesses were closed on March 30, transactions dropped by an additional 16 percent (–52 to –68 percent in the week ending April 5).

Total system passenger car impacts are estimated to have bottomed out in mid-April at about –70 percent, meaning that about 30 percent of normal passenger car traffic was retained on the system. Since the most severe impact in mid-April, a gradual recovery can be observed in passenger car traffic.

Gradual re-opening of the region began on May 9, when non-essential businesses were allowed to re-open to 50 percent of capacity, which is reflected in a slightly faster slope of recovery between the week ending May 17 and the week ending June 28 in Figure 2.15. Each increase in traffic on the Triangle Expressway coincides with an announcement of relaxing of restrictions. By mid-July, traffic stabilized at –40 percent from baseline 2020 levels. Modest improvement from this level occurred through October.

The impact of COVID-19 on commercial vehicle traffic on the Triangle Expressway, on a 21-day rolling average, is also shown in Figure 2.15. As witnessed on other toll facilities around the U.S., the impact of COVID-19 has been lower on commercial vehicle traffic overall, resulting in a maximum impact of -35 percent in the week ending April 5, which would be the first 21-day period using data entirely after the beginning of closures in March. Following the Phase 2 reopening of the region on May 23, commercial vehicle traffic recovered to average –15 percent impact as of the week ending June 14. Commercial vehicle traffic impacts hovered between -5 percent and – 10 percent through August and September, followed by a notable improvement back to baseline levels in the last week of October.

**Table 2.8**
**National, North Carolina, Wake County and NCTA Mandates Related to COVID-19 in 2020**

| Date | Location | Description |
|---|---|---|
| March 3 | NC | - First case of COVID-19 in NC identified in Wake County. |
| March 10 | NC | - Gov. Roy Cooper declares state of emergency due to COVID-19 cases. |
| March 13 | USA | - National Emergency declared |
| March 16 | NC | - Executive Order 117: No mass gatherings. K-12 public schools closed |
| March 17 | NC | - Executive Order 118: Close sit-down service at restaurants |
| March 18 | NC | - NC Quick Pass Customer Service Centers have been closed since March 18 to customers.<br>Call center staff operating at reduced levels to maintain social distancing. |
| March 18-20 | USA | - U.S./Canada and U.S./Mexico borders closed for non-essential travel |
| March 25 | NC | - Executive Order 120: Limit gatherings to less than 50 people. Close gyms, movie theaters, parlors, and other similar facilities by 3/25. |
| March 30 | NC/ NCTA | - Executive Order 121: Stay At Home order until April 29, 2020. Only essential business to remain open. Bans gatherings of more than 10 people and directs everyone to physically stay at least 6 feet apart from others.<br>- NCTA Relief Effort: NCTA suspends third-party collection efforts for past due accounts and placement of new DMV vehicle registration hold for past due accounts. |
| April 3 | NCTA | - NCTA Relief Effort: NCTA suspends all processing fees and civil penalties on Bill-by-Mail Invoices. |
| April 9 | NC | - Executive Order 131: Retail stores still operating to implement new social distancing policies. Earlier COVID-19 guidelines mandatory for nursing facilities, and recommends other long-term care facilities to do the same. Issues changes to unemployment benefits that will speed up certain benefit payments to those who are out of work. |
| April 23 | NC | - Executive Order 135: Extends North Carolina's Stay At Home order until May 8. |
| May 9 | NC | - Executive Order 138: Transition to Phase 1 recovery. Stay at home order remains in place. Nonessential businesses allowed to open at 50 percent capacity. Parks, outdoor worship services, and childcare facilities allowed to reopen. |
| May 23 | NC | - Phase 2 Announcement: Transition to Phase 2 recovery. Social gatherings allowed for less than 10 people indoors and less than 25 people outdoors. Indoor sit-down dining reopens. |
| June 24 | NC | - Executive Order 147: North Carolina will remain in Safe at Home Phase 2 for three more weeks (July 17). Face coverings must be worn when people are in public places as officials seek to stabilize concerning trends of increasing viral spread. |
| July 16 | NC | - Executive Order 151: North Carolina extends Safe at Home Phase 2 measures until at least August 7, 2020. |
| July 28 | NC | - Executive Order 153: Restaurants, breweries, wineries, distilleries, shall cease the sale and service of alcoholic beverages for onsite consumption between 11:00 pm and 7:00 am. |
| August 12 | NC | - NCTA reopens Monroe and Charlotte Customer Service Centers to the public. Morrisville Service Center to remain closed to the public. |
| August 14 | Wake County | - Wake County schools postpone return to in-person classes until no sooner than October 22, 2020. |
| October 2 | NC | - Executive Order 169: Revises prohibitions and restrictions that move the state into "Phase 3" measures |
| October 5 | NC | - North Carolina public school districts and charter schools can choose to implement Plan A for elementary schools (grades K-5), which includes important safety measures, such as face coverings, social distancing, symptom screening and cleaning but does not require schools to reduce the number of children in the classroom.<br><br>Other schools are operating on a modified Plan B, which allows children to attend school in person but requires fewer children in the classroom.<br><br>Under both plans, local school districts can provide a remote-learning option for any child who chooses it. In addition, school districts have the option of Plan C – all remote learning – if that's best for them. |
| October 26 | NC | - NCTA rescinds suspension of processing fees and civil penalties on Bill-by-Mail invoices. |
| November 13 | NC | - Executive Order 176: Extends the "Phase 3" order (Executive Order 169).<br>Reduces indoor gathering limits to 10 people. |
| November 23 | NC | - Executive Order 180: Requires face coverings in all public indoor settings, including fitness facilities and restaurants, where non-household members are present.<br>Retail business locations with more than 15,000 square feet of interior space must have a worker at each public entrance open to the public to enforce face covering requirements. |
| December 11 | NC | - Executive Order 181: Implements a modified stay at home order from 10 p.m. and 5 a.m.<br>Requires nighttime closure from 10 p.m. to 5 a.m. for certain businesses and activities<br>Prohibits the sale and service of alcohol for onsite consumption from 9 p.m. to 7 a.m. |

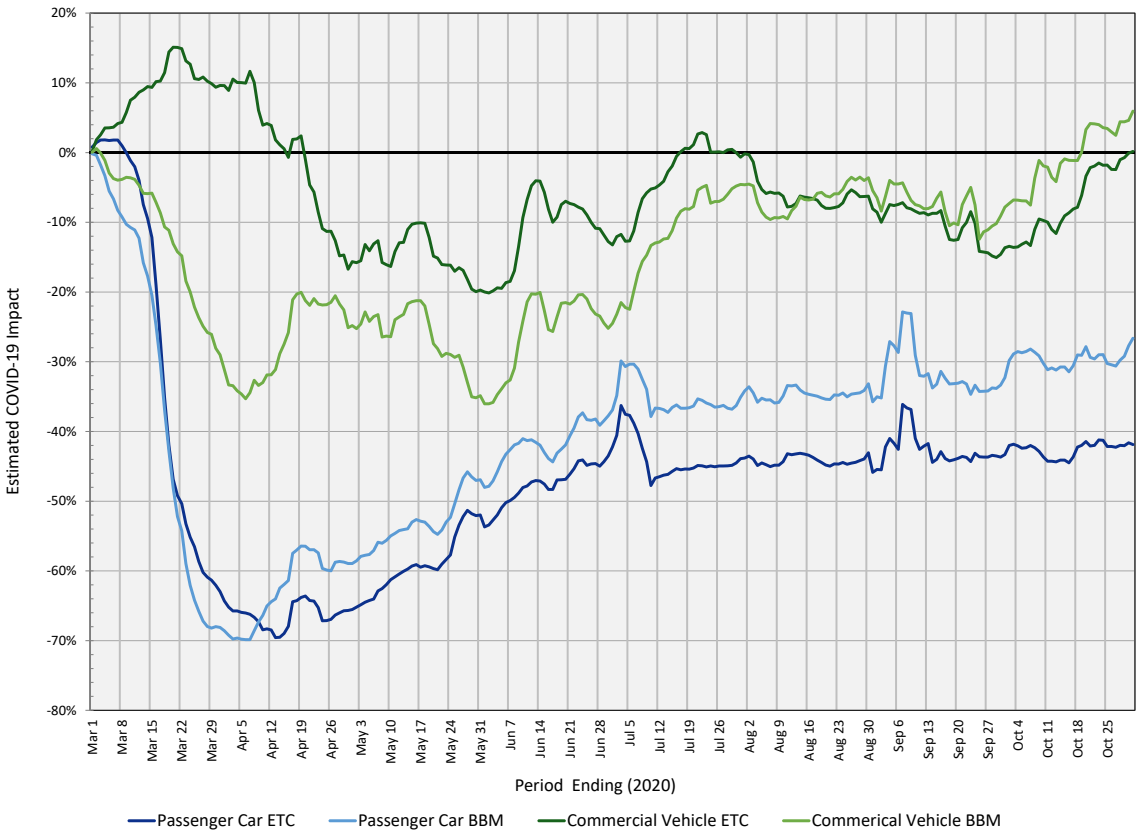



Figure 2.15
**COVID-19 Impacts on Triangle Expressway Transactions by Vehicle Class and Payment Method**

# Chapter 3
# Independent Economic Review

## 3.1 Introduction

Economic growth forecasts are one of the most critical elements of any traffic and revenue forecast. Because of the inherent uncertainty in the economic forecasting process, this has also become an area of considerable review and scrutiny by rating agencies and others in the financial community. CDM Smith engaged Dr. Stephen J. Appold, an economist with local expertise, to conduct an independent analysis of the economic growth forecasts assumed in the Triangle Regional Model version 6 (TRMv6), a key tool for evaluating future travel demand in the region.

The goal of this effort was to evaluate the reasonableness of regional and corridor growth rates contained in the TRMv6 and to adjust where appropriate. In this process Dr. Appold identified and analyzed major employers, employment centers, housing developments, and commercial and retail developments in order to derive an understanding of the economic drivers of the region. He also conducted an analysis of regional and corridor growth rates based on the latest available historic trends and forecasts.

The TRMv6 model uses 2013 as its base year and supports additional model years 2025, 2035 and 2045. Dr. Appold created forecasts for population, households, and employment for 2019, 2025, 2035 and 2045, which were used as input to the TRMv6 model to develop revised trip tables used for this study. CDM Smith requested 2019 socioeconomics to create a Base Year 2019, the last full year before the COVID-19 pandemic, for model calibration.

The TRMv6 model uses estimates of the following key variables as input: households, population, employment by five categories, six earnings variables linked to the employment fields, and school enrollment. This chapter describes the socioeconomic projections assumed in the TRMv6 and the forecasts developed by Dr. Appold, and briefly describes Dr. Appold's process to create 2019 Base Year socioeconomic forecasts.

CDM Smith reviewed Dr. Appold's methodology and forecasts and adopted his forecasts as input to the travel demand modeling conducted in support of this study. A detailed description of the historical growth trends for the region, Dr. Appold's methodology, and his conclusions can be found in his December 2020 memorandum entitled, ***Evaluation of the Socioeconomic Conditions and Forecasts in the Complete 540 Study Area (Phase 2)***.

## 3.2 Socioeconomics for Calibration Year 2019

CDM Smith created a 2019 baseline for model calibration purposes for this study, using socioeconomic inputs developed by Dr. Appold.

### 3.2.1 Households and Population

To estimate the number of households, Dr. Appold consulted 2010 Census data at the block level[1] and added the estimated number of new housing units constructed and occupied between 2010 and 2019. The number of housing units added was estimated using Certificates of Occupancy data for Chatham, Durham, and Orange Counties; county parcel files for Harnett County; county parcel files augmented with supplemental information for Johnston and Wake Counties; and 2010 Census block-level household counts increased by a uniform overall county growth rate for the peripheral counties of Franklin, Granville, Nash, and Person.

After the block level estimates were calculated, the block-level data was allocated to the 2,857 Traffic Analysis Zones (TAZs) contained in the TRMv6. Most Census Blocks fell entirely within a TAZ, but 265 Census Blocks were split into multiple TAZs. After the data was allocated to TAZs, all estimates were then rounded to the nearest whole number. The resulting estimate of 2019 households was then multiplied by the latest available (2011-2015) American Community Survey (ACS) estimates of housing occupancy rates and rounded to the nearest whole number to develop an estimated population living in households.

### 3.2.2 Employment

There are three components of TAZ-level employment estimates: county-level totals, sectoral distribution, and geographic distribution. Dr. Appold used the Quarterly Census of Employment and Wages (QCEW) to generate county-level totals and, following TRMv6 practice, adjusted by $^{100}/_{92}$ (an approximately nine percent increase) to account for employment not covered by unemployment insurance in order to generate county control totals. The QCEW estimates are conservative compared to Bureau of Economic Analysis (BEA) employment estimates.

The TRMv6 model further classifies employment by five sectors: industry, office, high-volume service, low-volume service, and retail. Employment is separated out by sectoral category because each is thought to have different propensities to generate customer (client) traffic. Dr. Appold distributed 2019 employment into the five sectors based on QCEW data to create county-level sectoral distribution.

Geographic distribution is the most challenging portion of developing employment estimates, as there are few sources of data at the sub-county level. Dr. Appold based employment distribution on three sets of information, including: (1) 2017 InfoUSA; (2) the 2013 TRMv6 geographic distributions of employment, and (3) 2017 block-level longitudinal employer-household dynamics (LEHD) origin-destination employment statistics (LODES) data.

Using the three sources generated realistic results which compared well with observation and with each other. The TAZ-level estimates of sector employment correlated moderately well, and all relationships are highly statistically significant.

[1] Census blocks are the smallest geographic area from which the Census Bureau collects data, with a minimum size of 30,000 square feet (0.69 acres).

### 3.2.3 Employment by Earnings

Besides the TAZ-level inputs of employment by the five employment sectors (industry, office, high-volume service, low-volume service, and retail), the TRMv6 model requires an allocation of employment by sector into two earning categories, high and low-wage. Industry and office sectors were combined, as were the high-volume and low-volume service sectors. High and low-wage employment counts are split near the median salary point for each sector. TRMv6 estimated these values for their 2010 and 2013 estimates using the 2010 CTPP version of the ACS data. The 2019 estimates applied the same proportional TAZ-level split found in those earlier estimates.

### 3.2.4 Enrollment

Pre-kindergarten through 12th grade student enrollment was estimated from two North Carolina Department of Instruction reports: month two of the Principal's Monthly Reports for the 2018-2019 school year for public and charter school students and the North Carolina Directory of Non-Public Schools, Conventional Schools Edition, with information for the 2018–2019 school term. The separate enrollment estimates were aggregated and linked to TAZs using public and private school location data obtained from the North Carolina open data portal.

## 3.3 Socioeconomic Forecasts and Adjustments

This section describes the three principal socioeconomic inputs to the TRMv6 model that drive travel demand forecasts: population, households, and employment. The forecasts assumed in the TRMv6 are described, along with the adopted forecasts used in this study. The adopted forecasts were developed by Dr. Appold. The socioeconomic forecasts are described by various geographic areas described in the following subsection.

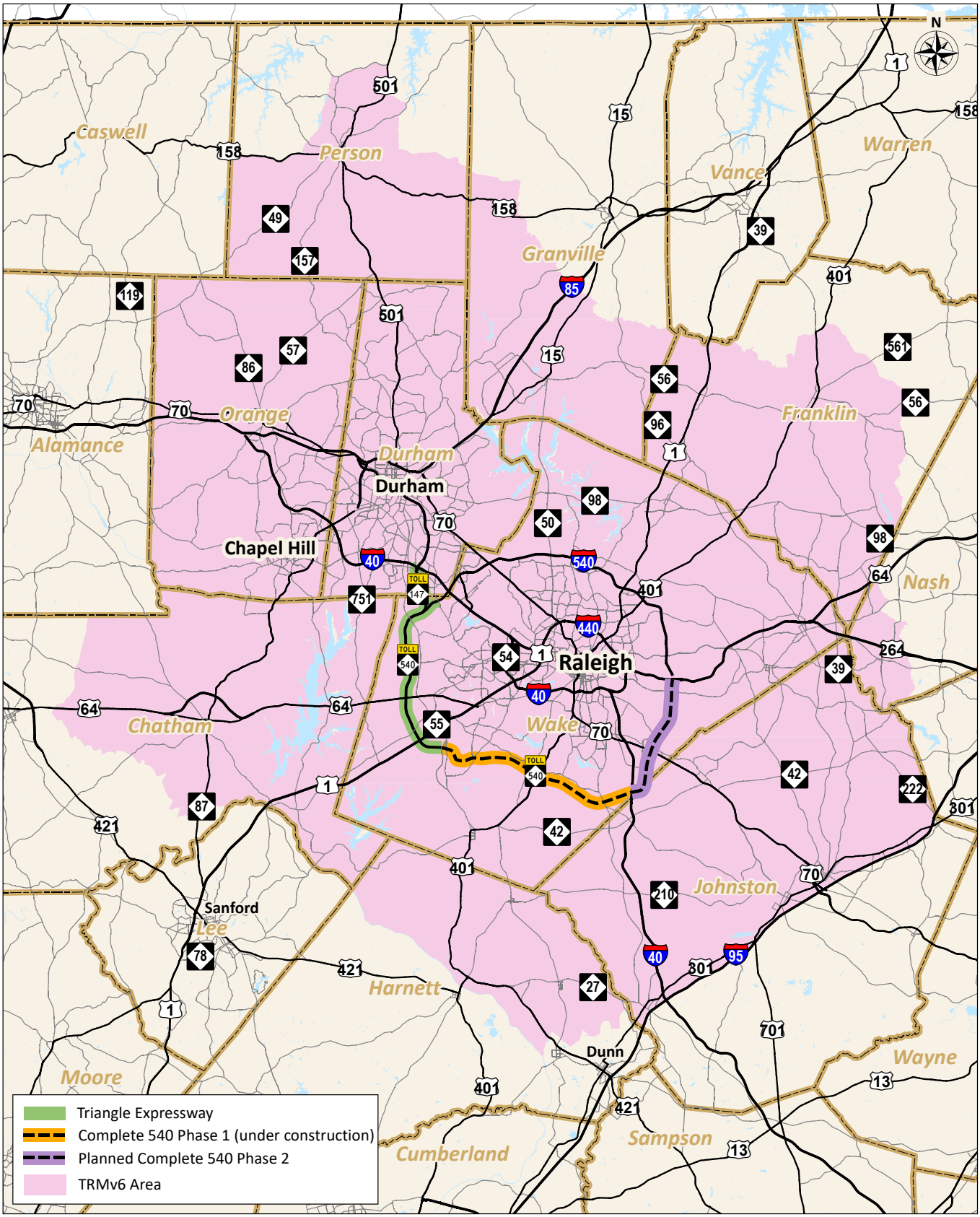
### 3.3.1 TRMv6 Model Area

The TRMv6 includes 10 North Carolina counties comprising 3,379 square miles: Chatham, Durham, Franklin, Graham, Harnett, Johnston, Nash, Orange, Person and Wake. Of the 10 counties, only Durham, Orange and Wake are fully contained within the model area; the other seven counties are only partially included. The area encompassed by the TRMv6 boundary, referred to as the "model area," is shown in **Figure 3.1**. Year 2013 is the official base year. Future year socio-economic and land-use assumptions in the TRMv6 are forecasts.

The TRMv6 contains 2,857 geographic units called Traffic Analysis Zones (TAZs). CDM Smith identified 983 zones in the vicinity of the Triangle Expressway and Complete 540 Phases 1 and 2 as residing in the "Detailed Study Area" or "Study Area". For purposes of summarization, TAZs in the Detailed Study Area were grouped into 43 Superzones and six Regions. **Figure 3.2** illustrates the Superzones and Regions within the Detailed Study Area. The Regions are identified by a color and name, while the Superzones are identified by a number. The following subsections describe the socioeconomic forecasts by County and Region, with figures provided at the Superzone level.

### 3.3.2 Population Forecasts

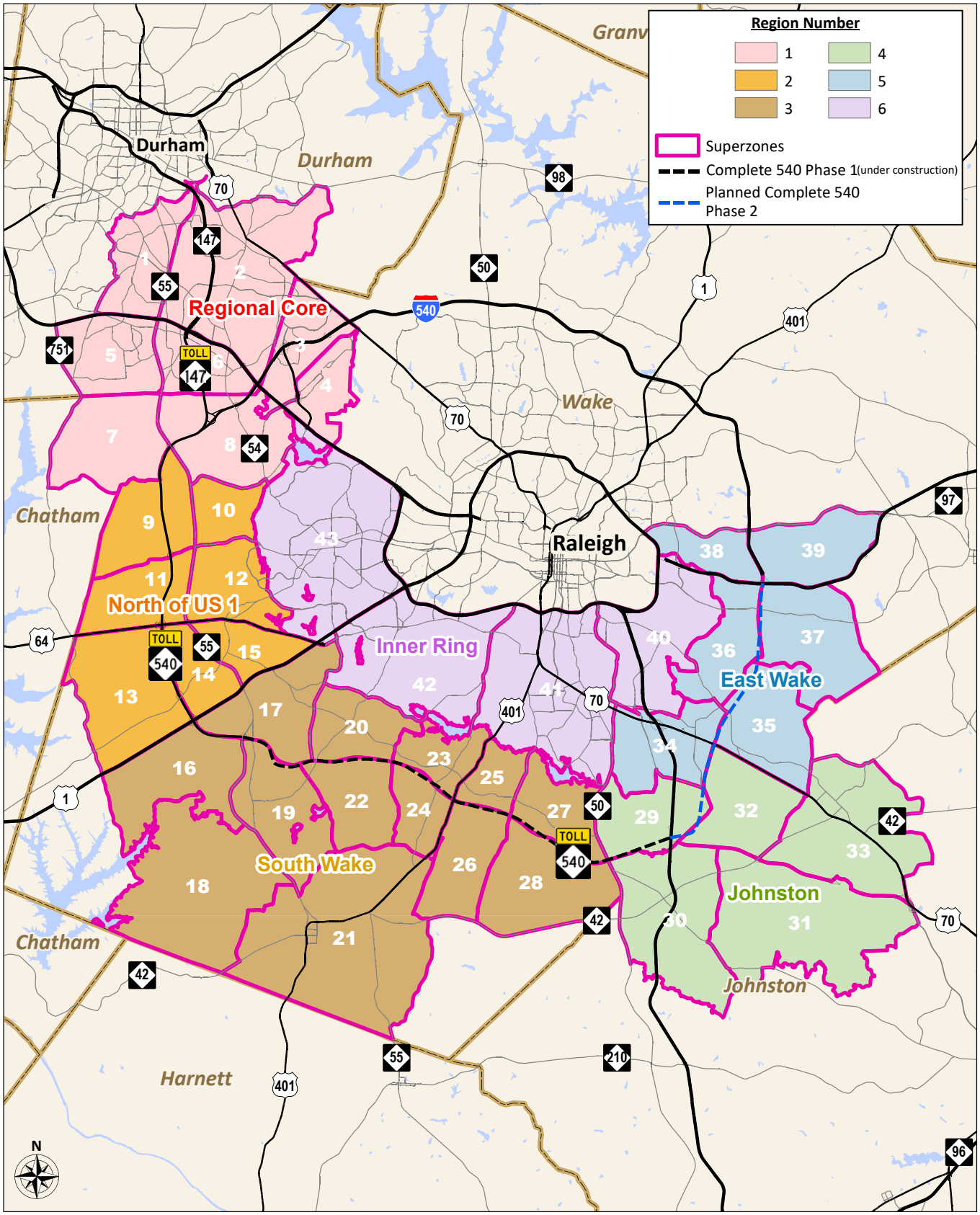
**Table 3.1** presents TRMv6 total population forecasts by county for each model year. The upper portion of Table 3.1 shows the original data set contained in the TRMv6. The lower portion shows the data set adjusted by Dr. Appold and adopted by CDM Smith for use in this study. Population growth rates for each ten-year interval are calculated using average annual percent change (AAPC).




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**TRMV6 MODEL AREA**

FIGURE 3.1




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## REGIONS AND SUPERZONES

FIGURE 3.2

**Table 3.1**
**Model Area Population Forecasts by County - TRMv6 and Adopted Values**
**(population in thousands)**

**TRMv6 Values**

| County (1) | 2019 (2) | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| Chatham | 48.1 | 3.0 % | 57.4 | 2.1 % | 70.7 | 1.7 % | 84.1 | 2.2 % |
| Durham (1) | 305.1 | 1.5 | 333.9 | 1.4 | 383.9 | 1.2 | 433.8 | 1.4 |
| Franklin | 57.6 | 1.8 | 64.2 | 1.5 | 74.5 | 1.3 | 84.7 | 1.5 |
| Granville | 31.2 | 2.1 | 35.5 | 1.3 | 40.3 | 1.1 | 45.2 | 1.4 |
| Harnett | 41.0 | 1.5 | 44.9 | 1.7 | 53.1 | 1.4 | 61.3 | 1.6 |
| Johnston | 177.0 | 2.8 | 209.4 | 2.3 | 263.4 | 1.9 | 317.4 | 2.3 |
| Nash | 3.7 | 4.3 | 4.7 | 1.1 | 5.2 | 1.0 | 5.8 | 1.8 |
| Orange (1) | 136.1 | 1.4 | 147.6 | 1.0 | 162.5 | 0.9 | 177.4 | 1.0 |
| Person | 31.5 | 0.7 | 32.8 | 0.3 | 33.7 | 0.3 | 34.6 | 0.4 |
| Wake (1) | 1,089.3 | 2.1 | 1,236.2 | 1.8 | 1,479.7 | 1.5 | 1,723.2 | 1.8 |
| Total | 1,920.6 | 2.0 | 2,166.6 | 1.7 | 2,567.0 | 1.5 | 2,967.4 | 1.7 |

**Adopted Values**

| County (1) | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| Chatham | 48.1 | 3.9 % | 60.4 | 2.4 % | 76.6 | 2.2 % | 95.5 | 2.7 % |
| Durham (1) | 305.1 | 1.3 | 328.8 | 1.3 | 372.6 | 1.2 | 419.3 | 1.2 |
| Franklin | 57.6 | 2.3 | 66.1 | 1.6 | 77.6 | 1.5 | 90.3 | 1.7 |
| Granville | 31.2 | 5.1 | 42.2 | 2.0 | 51.5 | 1.9 | 62.1 | 2.7 |
| Harnett | 41.0 | 2.5 | 47.5 | 1.6 | 55.5 | 1.5 | 64.2 | 1.7 |
| Johnston | 177.0 | 3.5 | 217.8 | 2.5 | 279.0 | 2.3 | 349.6 | 2.7 |
| Nash | 3.7 | 4.3 | 4.7 | 1.2 | 5.3 | 1.0 | 5.9 | 1.8 |
| Orange (1) | 136.1 | 1.2 | 146.3 | 0.9 | 160.4 | 0.9 | 175.0 | 1.0 |
| Person | 31.5 | 0.0 | 31.5 | 0.0 | 31.5 | 0.0 | 31.6 | 0.0 |
| Wake (1) | 1,089.3 | 1.5 | 1,193.4 | 1.7 | 1,410.8 | 1.6 | 1,647.4 | 1.6 |
| Total | 1,920.6 | 1.8 | 2,138.7 | 1.7 | 2,520.8 | 1.6 | 2,940.8 | 1.7 |

(1) Only Durham, Orange and Wake counties are entirely contained in the TRMv6 model area. The population in the remaining counties represents only the portion within the TRM model boundaries.
(2) TRMv6 2019 Actuals set to match Adopted 2019 Actuals.

Note: AAPC is an abbreviation for Average Annual Percent Change

The official base year for the TRMv6 is 2013. CDM Smith asked Dr. Appold to develop the 2019 socioeconomic variables required by the model, including population, households, and employment for each TAZ so that the model could be updated and validated to 2019 traffic conditions. The 2019 socioeconomic dataset developed by Dr. Appold is used as a common benchmark to measure growth for both the TRMv6 future-year socioeconomic forecasts and Dr. Appold's projections.

The population estimates shown in Table 3-1 reflect the portions of the listed counties that are in the TRMv6 model area. Only Durham, Orange and Wake counties are included in their entirety in the TRMv6 model area. The Triangle Expressway is located in Wake County except for a small portion of Toll NC 147 that is located in southern Durham County. Complete 540 Phase 1 and Phase 2 are both located in southern Wake County, although the southeastern terminus of Phase 1 is located in northern Johnston County.

Population growth rates estimated by Dr. Appold are very similar but lower, in total, between the TRMv6 and adopted forecasts. Compared to the TRMv6 forecasts, the annual rates of adopted population growth are lower in Wake, Durham, and Person Counties for all model years and higher in Johnston, Franklin, and Granville Counties for all model years; Harnett County adopted population growth rates are also slightly higher than the original rates.

The adjustments to population forecasts at a county level are shown in **Table 3.2**. In the model area, total population was consistently adjusted downward by Dr. Appold, largely due to recent revisions of county-level population forecasts by the North Carolina Office of State Budget and Management (OSBM). Both the TRMv6 and adopted forecasts use OSBM projections as their basis for population projections. However, TRMv6 used OSBM figures dating from October 2015, while Dr. Appold used a more recent projection.

When compared with total model-area TRMv6 projections, the adopted population forecast shows approximately 27,900 fewer residents in 2025 and 26,700 fewer in 2045, with greater variation in 2035. These adjustments include lower population growth in the core counties (Durham, Orange, and Wake) and more growth in the suburban counties over the next 20 years. Wake County adopted forecasts include approximately 42,800 fewer residents in 2025 and 75,800 fewer in 2045. Johnston County adopted forecasts in the model area include approximately 8,400 more residents in 2025 and 32,200 more in 2045.

**Table 3.2**
**Model Area Population Adjustments by County**
**(population in thousands)**

| | 2025 | | | 2035 | | | 2045 | | |
|---|---|---|---|---|---|---|---|---|---|
| **County (1)** | TRMv6 | Adopted | Adjustment | TRMv6 | Adopted | Adjustment | TRMv6 | Adopted | Adjustment |
| Chatham | 57.4 | 60.4 | 3.0 | 70.7 | 76.6 | 5.9 | 84.1 | 95.5 | 11.4 |
| Durham (1) | 333.9 | 328.8 | (5.1) | 383.9 | 372.6 | (11.2) | 433.8 | 419.3 | (14.5) |
| Franklin | 64.2 | 66.1 | 1.9 | 74.5 | 77.6 | 3.2 | 84.7 | 90.3 | 5.6 |
| Granville | 35.5 | 42.2 | 6.7 | 40.3 | 51.5 | 11.2 | 45.2 | 62.1 | 16.9 |
| Harnett | 44.9 | 47.5 | 2.6 | 53.1 | 55.5 | 2.4 | 61.3 | 64.2 | 2.8 |
| Johnston | 209.4 | 217.8 | 8.4 | 263.4 | 279.0 | 15.6 | 317.4 | 349.6 | 32.2 |
| Nash | 4.7 | 4.7 | (0.0) | 5.2 | 5.3 | 0.0 | 5.8 | 5.9 | 0.1 |
| Orange (1) | 147.6 | 146.3 | (1.4) | 162.5 | 160.4 | (2.1) | 177.4 | 175.0 | (2.4) |
| Person | 32.8 | 31.5 | (1.3) | 33.7 | 31.5 | (2.2) | 34.6 | 31.6 | (3.0) |
| Wake (1) | 1,236.2 | 1,193.4 | (42.8) | 1,479.7 | 1,410.8 | (68.9) | 1,723.2 | 1,647.4 | (75.8) |
| Total | 2,166.6 | 2,138.7 | (27.9) | 2,567.0 | 2,520.8 | (46.2) | 2,967.4 | 2,940.8 | (26.7) |

(1) Only Durham, Orange and Wake counties are entirely contained in the TRMv6 model area. The population in the remaining counties represents only the portion within the TRM boundaries.

The distribution of population growth by small geographic areas within the model area is very important, as population growth proximate to the Triangle Expressway or Complete 540 corridor impacts potential travel more than population growth further away.

**Table 3.3** presents the population projections within the Detailed Study Area by region for each model year. The Detailed Study Area represents the geography that surrounds the Triangle Expressway and Complete 540 corridor (both Phase 1 and the planned future Phase 2). The upper portion of Table 3.3 shows the original TRMv6 data set. The lower portion shows the adopted data set.

**Table 3.3**
**Detailed Study Area Population Forecasts by Region - TRMv6 and Adopted Values**
**(population in thousands)**

**TRMv6 Values**

| Region Number and Name | 2019 (1) | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 128.0 | (0.8) % | 121.9 | 1.2 % | 137.7 | 1.1 % | 153.4 | 0.7 % |
| 2 North of US 1 | 118.2 | (1.1) | 110.7 | 1.3 | 125.6 | 1.1 | 140.5 | 0.7 |
| 3 South Wake | 153.4 | 4.2 | 196.3 | 2.7 | 255.7 | 2.1 | 315.1 | 2.8 |
| 4 Johnston | 57.8 | 2.6 | 67.6 | 2.4 | 86.0 | 2.0 | 104.4 | 2.3 |
| 5 East Wake | 54.8 | 4.8 | 72.6 | 3.0 | 97.7 | 2.3 | 122.7 | 3.1 |
| 6 Inner Ring | 173.9 | 1.2 | 186.3 | 1.2 | 210.6 | 1.1 | 234.9 | 1.2 |
| Total | 686.1 | 1.6 | 755.4 | 1.9 | 913.2 | 1.6 | 1,071.1 | 1.7 |

**Adopted Values**

| Region Number and Name | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 128.0 | 1.0 % | 135.5 | 1.0 % | 149.6 | 1.0 % | 164.8 | 1.0 % |
| 2 North of US 1 | 118.2 | 0.9 | 124.6 | 1.0 | 137.8 | 1.0 | 152.3 | 1.0 |
| 3 South Wake | 153.4 | 2.6 | 178.7 | 2.6 | 231.5 | 2.2 | 289.0 | 2.5 |
| 4 Johnston | 57.8 | 3.4 | 70.5 | 2.5 | 90.5 | 2.3 | 113.3 | 2.6 |
| 5 East Wake | 54.8 | 3.0 | 65.6 | 3.0 | 87.9 | 2.5 | 112.3 | 2.8 |
| 6 Inner Ring | 173.9 | 1.0 | 184.3 | 1.1 | 206.0 | 1.1 | 229.6 | 1.1 |
| Total | 686.1 | 1.7 | 759.1 | 1.8 | 903.4 | 1.6 | 1,061.3 | 1.7 |

(1) TRMv6 2019 Actuals set to match Adopted 2019 Actuals.
Note: TRMv6 is the Triangle Regional Model version 6
AAPC is an abbreviation for Average Annual Percent Change

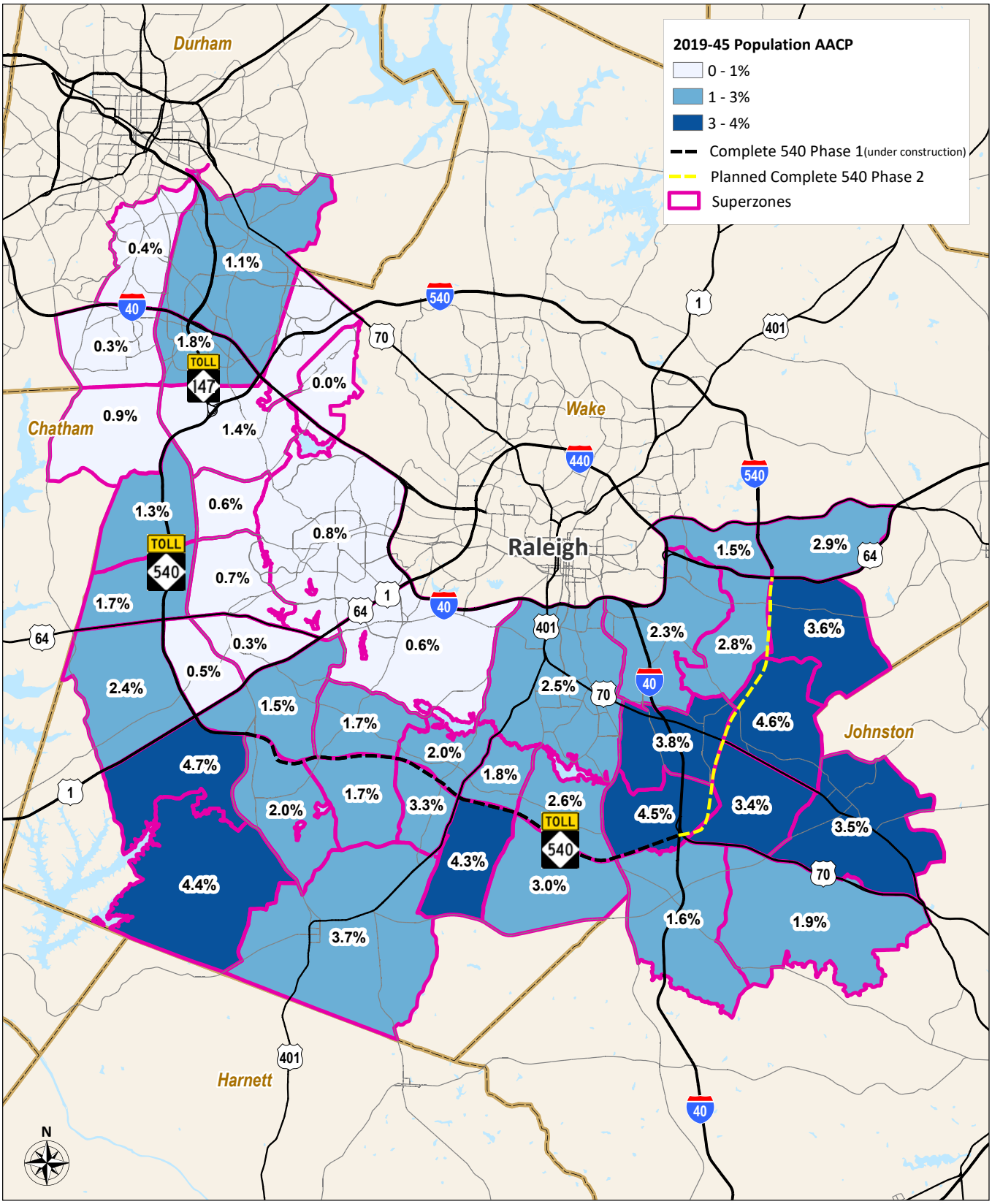
Most notably, the adopted population growth rate was reduced in the adopted forecast for the South Wake region (which encompasses Complete 540 Phase 1) between 2019 and 2025. This resulted in a reduced population forecast in the South Wake region in 2025, 2035 and 2045 compared to the TRMv6 values. Adopted population growth rates were increased in the Johnston region between all model years.

The population adjustments in the Detailed Study Area between the TRMv6 and the adopted values are shown in **Table 3.4** for each of the regions shown in Figure 3.2. Population was reduced in the South Wake region by approximately 17,600 (9.0 percent) in 2025, 24,200 (9.5 percent) in 2035, and 26,100 (8.3 percent) in 2045. Regions with an increase include the Regional Core, North of US 1, and Johnston. The population in the region North of US 1 was increased the most, by approximately 13,800 and 11,800 in 2025 and 2045, respectively, compared to the TRMv6 values. These population increases represent an increase of 12.5 percent in 2025, and 8.4 percent in 2045. Similarly, population in the Regional Core was increased by approximately 13,600 and 11,400 in 2025 and 2045, respectively, compared to the TRMv6 values. These population increases represent an increase of 11.2 percent in 2025, and 7.4 percent in 2045.

**Table 3.4**
**Detailed Study Area Population Adjustments by Region**
**(population in thousands)**

| Region Number and Name | | 2025 | | | 2035 | | | 2045 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | TRMv6 | Adopted | Adjustment | TRMv6 | Adopted | Adjustment | TRMv6 | Adopted | Adjustment |
| 1 | Regional Core | 121.9 | 135.5 | 13.6 | 137.7 | 149.6 | 12.0 | 153.4 | 164.8 | 11.4 |
| 2 | North of US 1 | 110.7 | 124.6 | 13.8 | 125.6 | 137.8 | 12.2 | 140.5 | 152.3 | 11.8 |
| 3 | South Wake | 196.3 | 178.7 | (17.6) | 255.7 | 231.5 | (24.2) | 315.1 | 289.0 | (26.1) |
| 4 | Johnston | 67.6 | 70.5 | 2.9 | 86.0 | 90.5 | 4.5 | 104.4 | 113.3 | 8.9 |
| 5 | East Wake | 72.6 | 65.6 | (7.0) | 97.7 | 87.9 | (9.7) | 122.7 | 112.3 | (10.5) |
| 6 | Inner Ring | 186.3 | 184.3 | (2.1) | 210.6 | 206.0 | (4.7) | 234.9 | 229.6 | (5.3) |
| | Total | 755.4 | 759.1 | 3.7 | 913.2 | 903.4 | (9.9) | 1,071.1 | 1,061.3 | (9.7) |

**Figure 3.3** illustrates the adopted AAPC increase in population by superzone in the Detailed Study Area from 2019 to 2045. The highest growth rates in population are forecast to occur in the southwestern superzones of Wake County and in superzones located southeast of Raleigh in Wake and Johnston counties, following the trend of migration suburbs.




# 2019 - 2045 AVERAGE ANNUAL PERCENT GROWTH IN POPULATION, BY SUPERZONE (ADJUSTED FORECAST)

FIGURE 3.3

### 3.3.3 Household Forecasts

**Table 3.5** presents TRMv6 household forecasts by county for each model year. The upper portion of Table 3.5 shows the original data set contained in the TRMv6. The lower portion shows the data set adjusted by Dr. Appold and adopted by CDM Smith for use in this study. Household growth rates for each ten-year interval are calculated using average annual percent change (AAPC).

Dr. Appold estimates there were 757,200 households in the total model area in 2019 and about 67 percent of those households (504,500) are located in Wake, Johnston, and Harnett Counties. In the adopted forecast (model years 2025, 2035 and 2045), household growth rates are higher in the total model area compared to the TRMv6 forecast, with the largest differences in Wake County and part of Johnston County covered by the model.

**Table 3.5**
**Model Area Household Forecasts by County - TRMv6 and Adopted Values**
**(number of households in thousands)**

**TRMv6 Values**

| County (1) | 2019 (2) | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| Chatham | 20.4 | 3.0 % | 24.4 | 2.0 % | 29.7 | 1.7 % | 35.0 | 2.1 % |
| Durham (1) | 128.1 | 1.4 | 139.1 | 1.3 | 158.5 | 1.2 | 178.0 | 1.3 |
| Franklin | 22.2 | 2.0 | 25.0 | 1.5 | 29.0 | 1.3 | 33.1 | 1.5 |
| Granville | 12.1 | 1.8 | 13.5 | 1.2 | 15.2 | 1.1 | 17.0 | 1.3 |
| Harnett | 15.0 | 2.0 | 16.9 | 1.6 | 19.8 | 1.4 | 22.7 | 1.6 |
| Johnston | 64.0 | 2.9 | 76.0 | 2.2 | 94.9 | 1.8 | 113.7 | 2.2 |
| Nash | 1.6 | 2.1 | 1.8 | 1.1 | 2.0 | 1.0 | 2.2 | 1.3 |
| Orange (1) | 55.5 | 1.6 | 60.9 | 1.0 | 67.0 | 0.9 | 73.2 | 1.1 |
| Person | 13.0 | 0.5 | 13.4 | 0.2 | 13.7 | 0.2 | 14.0 | 0.3 |
| Wake (1) | 425.5 | 2.0 | 479.3 | 1.8 | 570.2 | 1.5 | 662.6 | 1.7 |
| Total | 757.2 | 1.9 | 850.1 | 1.6 | 1,000.0 | 1.4 | 1,151.5 | 1.6 |

**Adopted Values**

| County (1) | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| Chatham | 20.4 | 4.5 % | 26.6 | 2.4 % | 33.8 | 2.4 % | 42.8 | 2.9 % |
| Durham (1) | 128.1 | 0.7 | 133.5 | 0.8 | 145.3 | 1.2 | 164.3 | 1.0 |
| Franklin | 22.2 | 3.0 | 26.6 | 1.7 | 31.5 | 1.7 | 37.5 | 2.0 |
| Granville | 12.1 | 4.8 | 16.1 | 2.0 | 19.6 | 2.0 | 23.8 | 2.6 |
| Harnett | 15.0 | 2.2 | 17.1 | 1.8 | 20.5 | 1.6 | 24.1 | 1.8 |
| Johnston | 64.0 | 4.1 | 81.4 | 2.6 | 105.3 | 2.4 | 134.1 | 2.9 |
| Nash | 1.6 | 0.3 | 1.6 | 1.1 | 1.8 | 1.2 | 2.0 | 1.0 |
| Orange (1) | 55.5 | 1.3 | 59.9 | 1.1 | 67.0 | 1.2 | 75.6 | 1.2 |
| Person | 13.0 | 0.9 | 13.7 | 0.2 | 14.0 | 0.3 | 14.4 | 0.4 |
| Wake (1) | 425.5 | 2.2 | 483.7 | 2.0 | 591.1 | 1.9 | 712.2 | 2.0 |
| Total | 757.2 | 2.1 | 860.1 | 1.8 | 1,029.8 | 1.8 | 1,230.8 | 1.9 |

(1) Only Durham, Orange and Wake counties are entirely contained in the TRMv6 model area. The population in the remaining counties represents only the portion within the TRM model boundaries.
(2) TRMv6 2019 Actuals set to match Adopted 2019 Actuals.

Note: AAPC is an abbreviation for Average Annual Percent Change

The adjustments to the household forecasts at a county level from TRMv6 are shown in **Table 3.6**. In total, the number of households was increased by about 9,900 in 2025, 29,800 in 2035 and 79,300 in 2045. The adopted forecast increased the households in Wake County by 4,400 (0.9 percent) in 2025, 21,000 (3.7 percent) in 2035 and 49,600 (7.5 percent) in 2045. Households in the Johnston County area were increased by 5,400 (7.1 percent) in 2025, 10,500 (11.0 percent) in 2035, and 20,300 (17.9 percent) in 2045 compared to the TRMv6 values.

**Table 3.6**
**Model Area Household Adjustments by County**
**(number of household in thousands)**

| | 2025 | | | 2035 | | | 2045 | | |
|---|---|---|---|---|---|---|---|---|---|
| **County (1)** | TRMv6 | Adopted | Adjustment | TRMv6 | Adopted | Adjustment | TRMv6 | Adopted | Adjustment |
| Chatham | 24.4 | 26.6 | 2.2 | 29.7 | 33.8 | 4.1 | 35.0 | 42.8 | 7.8 |
| Durham (1) | 139.1 | 133.5 | (5.6) | 158.5 | 145.3 | (13.3) | 178.0 | 164.3 | (13.6) |
| Franklin | 25.0 | 26.6 | 1.5 | 29.0 | 31.5 | 2.5 | 33.1 | 37.5 | 4.4 |
| Granville | 13.5 | 16.1 | 2.6 | 15.2 | 19.6 | 4.3 | 17.0 | 23.8 | 6.8 |
| Harnett | 16.9 | 17.1 | 0.2 | 19.8 | 20.5 | 0.7 | 22.7 | 24.1 | 1.4 |
| Johnston | 76.0 | 81.4 | 5.4 | 94.9 | 105.3 | 10.5 | 113.7 | 134.1 | 20.3 |
| Nash | 1.8 | 1.6 | (0.2) | 2.0 | 1.8 | (0.2) | 2.2 | 2.0 | (0.2) |
| Orange (1) | 60.9 | 59.9 | (1.1) | 67.0 | 67.0 | 0.0 | 73.2 | 75.6 | 2.4 |
| Person | 13.4 | 13.7 | 0.3 | 13.7 | 14.0 | 0.2 | 14.0 | 14.4 | 0.4 |
| Wake (1) | 479.3 | 483.7 | 4.4 | 570.2 | 591.1 | 21.0 | 662.6 | 712.2 | 49.6 |
| Total | 850.1 | 860.1 | 9.9 | 1,000.0 | 1,029.8 | 29.8 | 1,151.5 | 1,230.8 | 79.3 |

(1) Only Durham, Orange and Wake counties are entirely contained in the TRMv6 model area. The population in the remaining counties represents only the portion within the TRM model boundaries.

As discussed in Section 3.3.2, population estimates were adjusted downward in several counties or portions of counties in the model area. The downward adjustment in population occurred, particularly in Wake County, despite the number of households being adjusted upwards. This occurs because the TRMv6 model holds the population's age distribution constant to a 2010 distribution. Due to an expected aging of the population over time, household composition is also expected to change, resulting in a gradual lowering of average household size in Dr. Appold's adjustments. Both the TRMv6 model and Dr. Appold's projections use the same source information to calculate population estimates, which are then used to estimate the number of households. But assuming a smaller household size over time as compared to TRMv6 results in more households to reach the estimated population numbers.

**Table 3.7** presents the Detailed Study Area household projections by region for each model year. The upper portion of Table 3.7 shows the original model data set. The lower portion shows the adjusted data set adopted for this study.

Within the detailed study area, the adopted forecast has a higher rate of annual growth between all model years compared to the TRMv6 forecast. Although a few regions were reduced from their TRMv6 values in 2025, by 2045, all the regions in the Detailed Study Area are higher, with Region 2 (North of US 1), Region 3 (South Wake), and Region 4 (Johnston) totals increased by Dr. Appold by the greatest amount.

**Table 3.7**
**Detailed Study Area Household Forecasts by Region - TRMv6 and Adopted Values**
**(number of households in thousands)**

**TRMv6 Values**

| Region Number and Name | 2019 (1) | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 53.1 | -0.8 % | 50.6 | 1.1 % | 56.6 | 1.0 % | 62.6 | 0.6 % |
| 2 North of US 1 | 41.5 | -0.9 | 39.2 | 1.3 | 44.6 | 1.2 | 50.0 | 0.7 |
| 3 South Wake | 53.5 | 4.2 | 68.6 | 2.6 | 88.9 | 2.2 | 110.9 | 2.8 |
| 4 Johnston | 20.9 | 2.7 | 24.5 | 2.4 | 31.0 | 1.9 | 37.5 | 2.3 |
| 5 East Wake | 19.4 | 5.0 | 26.0 | 2.9 | 34.7 | 2.3 | 43.5 | 3.1 |
| 6 Inner Ring | 67.4 | 1.5 | 73.9 | 1.2 | 83.2 | 1.1 | 92.6 | 1.2 |
| Total | 255.7 | 1.7 | 282.7 | 1.8 | 339.1 | 1.6 | 397.1 | 1.7 |

**Adopted Values**

| Region Number and Name | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 53.1 | 0.8 % | 55.7 | 0.9 % | 60.6 | 1.1 % | 67.4 | 0.9 % |
| 2 North of US 1 | 41.5 | 1.3 | 44.9 | 1.3 | 51.3 | 1.3 | 58.6 | 1.3 |
| 3 South Wake | 53.5 | 3.7 | 66.6 | 3.1 | 90.8 | 2.7 | 118.1 | 3.1 |
| 4 Johnston | 20.9 | 4.1 | 26.5 | 2.7 | 34.7 | 2.5 | 44.3 | 2.9 |
| 5 East Wake | 19.4 | 4.3 | 25.0 | 3.5 | 35.3 | 2.9 | 46.9 | 3.4 |
| 6 Inner Ring | 67.4 | 1.4 | 73.4 | 1.4 | 84.4 | 1.4 | 96.9 | 1.4 |
| Total | 255.7 | 2.2 | 292.1 | 2.0 | 357.1 | 1.9 | 432.1 | 2.0 |

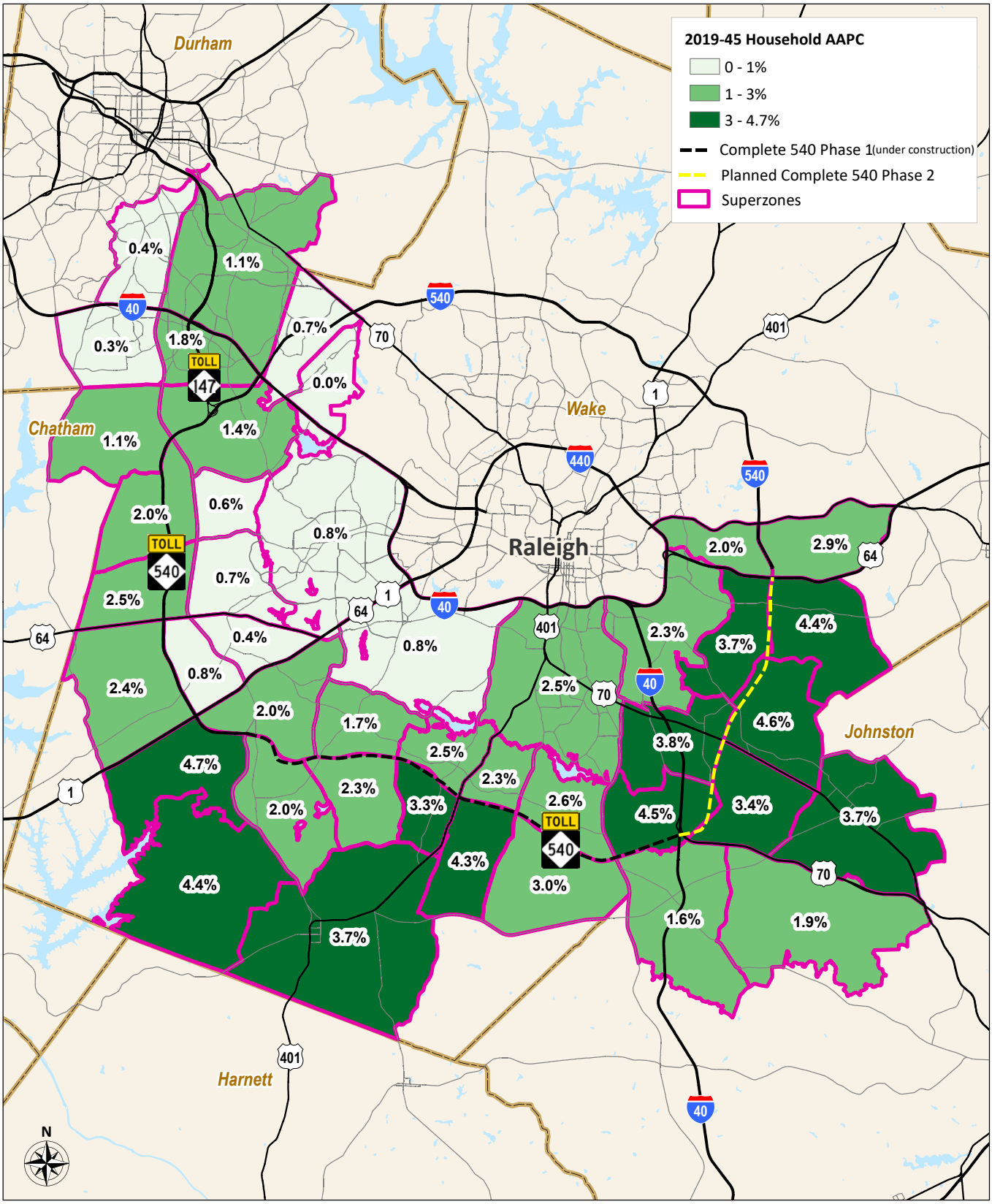
(1) TRMv6 2019 Actuals set to match Adopted 2019 Actuals.
Note: AAPC is an abbreviation for Average Annual Percent Change

Adjustments made to the TRMv6 household forecasts in the Detailed Study Area are shown by region in **Table 3.8**. In the study area, total household forecasts were adjusted upward, although South Wake (Region 3), East Wake (Region 5), and Inner Ring (Region 6) were adjusted slightly downward in 2025. In 2035 and 2045, however, all study area regions had upward adjustments. Within the adjusted data set, the most notable changes were made to Region 2 (North of US 1), which reflects a 2019 baseline update that accounts for recent development. Region 2 (North of US 1), Region 3 (South Wake), and Region 4 (Johnston) show the biggest household adjustments from the TRMv6 model by 2045.

**Table 3.8**
**Detailed Study Area Household Adjustments by Region**
**(number of households in thousands)**

| Region Number | 2025 | | | 2035 | | | 2045 | | |
|---|---|---|---|---|---|---|---|---|---|
| and Name | TRMv6 | Adopted | Adjustment | TRMv6 | Adopted | Adjustment | TRMv6 | Adopted | Adjustment |
| 1 Regional Core | 50.6 | 55.7 | 5.1 | 56.6 | 60.6 | 4.0 | 62.6 | 67.4 | 4.7 |
| 2 North of US 1 | 39.2 | 44.9 | 5.8 | 44.6 | 51.3 | 6.7 | 50.0 | 58.6 | 8.5 |
| 3 South Wake | 68.6 | 66.6 | (2.0) | 88.9 | 90.8 | 1.9 | 110.9 | 118.1 | 7.1 |
| 4 Johnston | 24.5 | 26.5 | 2.0 | 31.0 | 34.7 | 3.7 | 37.5 | 44.3 | 6.8 |
| 5 East Wake | 26.0 | 25.0 | (1.0) | 34.7 | 35.3 | 0.5 | 43.5 | 46.9 | 3.4 |
| 6 Inner Ring | 73.9 | 73.4 | (0.5) | 83.2 | 84.4 | 1.2 | 92.6 | 96.9 | 4.3 |
| Total | 282.7 | 292.1 | 9.4 | 339.1 | 357.1 | 18.0 | 397.1 | 432.1 | 35.0 |

**Figure 3.4** displays the forecasted average annual growth rate in households within the Detailed Study Area for the adopted data set between 2019 and 2045 by superzone. As with population, forecasted household growth rates are smallest in the northwest superzones, which is the portion of the study area that is already the most densely developed and populated. The highest annualized rates of growth are forecast to occur on the eastern and southern sides of the Detailed Study Area, in southern and southeastern Wake County and portions of northern Johnston County. As noted in the previous section, households are forecasted to grow slightly faster than population in many of the superzones due to an anticipated decrease in average household size as the population ages.




## 2019 - 2045 AVERAGE ANNUAL PERCENT GROWTH IN HOUSEHOLDS, BY SUPERZONE (ADJUSTED FORECAST)

FIGURE 3.4

### 3.3.4 Employment Forecasts

**Table 3.9** presents TRMv6 employment projections by county for each model year. The upper portion of Table 3.9 shows the original data set. The lower portion shows the data set adjusted by Dr. Appold. Population growth rates for each ten-year interval are calculated using AAPC.

In total, employment forecasts were adjusted downward in each future year (2025, 2035 and 2045). The employment growth averaged 1.3 percent per year from 2019 to 2045 in the TRMv6 compared to Dr. Appold's estimates of 1.0 percent per year, with a net total reduction of 158,900 jobs in 2045 compared to the original forecast. The total growth in employment was reduced the most in Wake County and increased the most in Johnston County.

**Table 3.9**
**Model Area Employment Forecasts by County - TRMv6 and Adopted Values**
**(employment in thousands)**

**TRMv6 Values**

| County (1) | 2019 (2) | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| Chatham | 10.4 | 3.2 % | 12.6 | 2.0 % | 15.2 | 1.6 % | 17.9 | 2.1 % |
| Durham (1) | 230.0 | 1.3 | 249.2 | 1.7 | 296.1 | 1.5 | 343.1 | 1.6 |
| Franklin | 12.7 | 4.5 | 16.5 | 1.7 | 19.5 | 1.4 | 22.5 | 2.2 |
| Granville | 12.0 | (3.4) | 9.7 | 1.1 | 10.9 | 1.0 | 12.0 | 0.0 |
| Harnett | 8.4 | (2.4) | 7.3 | 1.6 | 8.5 | 1.4 | 9.7 | 0.6 |
| Johnston | 50.0 | 0.2 | 50.6 | 1.5 | 58.8 | 1.3 | 67.1 | 1.1 |
| Nash | 0.8 | (13.3) | 0.3 | 1.0 | 0.4 | 0.8 | 0.4 | (2.6) |
| Orange (1) | 79.7 | 0.1 | 80.3 | 1.6 | 93.7 | 1.3 | 107.1 | 1.1 |
| Person | 9.9 | 1.2 | 10.6 | 0.5 | 11.1 | 0.5 | 11.7 | 0.7 |
| Wake (1) | 624.7 | 1.1 | 668.5 | 1.9 | 804.0 | 1.6 | 939.5 | 1.6 |
| Total | 1,038.6 | 1.0 | 1,105.7 | 1.8 | 1,318.3 | 1.5 | 1,531.0 | 1.5 |

**Adopted Values**

| County (1) | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| Chatham | 10.4 | 1.3 % | 11.2 | 1.7 % | 13.3 | 0.5 % | 14.0 | 1.2 % |
| Durham (1) | 230.0 | 0.7 | 239.7 | 1.0 | 264.8 | 0.7 | 285.3 | 0.8 |
| Franklin | 12.7 | 1.2 | 13.7 | 1.0 | 15.2 | 1.1 | 16.8 | 1.1 |
| Granville | 12.0 | 1.4 | 13.0 | 1.2 | 14.6 | 1.2 | 16.5 | 1.2 |
| Harnett | 8.4 | 2.2 | 9.6 | 0.7 | 10.3 | 0.4 | 10.7 | 0.9 |
| Johnston | 50.0 | 2.4 | 57.6 | 1.7 | 67.9 | 1.3 | 77.5 | 1.7 |
| Nash | 0.8 | 0.4 | 0.8 | 0.3 | 0.8 | 0.2 | 0.9 | 0.3 |
| Orange (1) | 79.7 | 0.9 | 84.0 | 0.8 | 90.9 | 0.9 | 99.3 | 0.8 |
| Person | 9.9 | 0.0 | 9.9 | 0.0 | 9.9 | 0.0 | 9.9 | 0.0 |
| Wake (1) | 624.7 | 1.5 | 682.9 | 1.1 | 763.8 | 1.0 | 841.2 | 1.2 |
| Total | 1,038.6 | 1.3 | 1,122.3 | 1.1 | 1,251.5 | 0.9 | 1,372.1 | 1.1 |

(1) Only Durham, Orange and Wake counties are entirely contained in the TRMv6 model area. The population in the remaining counties represents only the portion within the TRM model boundaries.
(2) TRMv6 2019 Actuals set to match Adopted 2019 Actuals.

Note: AAPC is an abbreviation for Average Annual Percent Change

The adjustments to employment made by Dr. Appold at the county level are shown in **Table 3.10**. Wake County employment was increased by 14,300 (2.1 percent) in 2025 but reduced by 40,200 (5.0 percent) in 2035 and 98,300 (10.5 percent) in 2045. In contrast, employment was adjusted upward in Johnston County (in the portion within the model), by 7,000 in 2025; 9,100 in 2035; and 10,400 in

2045. This represents increases of approximately 14 to 15 percent in each model year compared to the TRMv6 values.

**Table 3.10**
**Model Area Employment Adjustments by County**
**(employment in thousands)**

| | 2025 | | | 2035 | | | 2045 | | |
|---|---|---|---|---|---|---|---|---|---|
| **County (1)** | TRMv6 | Adopted | Adjustment | TRMv6 | Adopted | Adjustment | TRMv6 | Adopted | Adjustment |
| Chatham | 12.6 | 11.2 | (1.4) | 15.2 | 13.3 | (1.9) | 17.9 | 14.0 | (3.9) |
| Durham (1) | 249.2 | 239.7 | (9.5) | 296.1 | 264.8 | (31.3) | 343.1 | 285.3 | (57.8) |
| Franklin | 16.5 | 13.7 | (2.9) | 19.5 | 15.2 | (4.3) | 22.5 | 16.8 | (5.6) |
| Granville | 9.7 | 13.0 | 3.3 | 10.9 | 14.6 | 3.7 | 12.0 | 16.5 | 4.4 |
| Harnett | 7.3 | 9.6 | 2.3 | 8.5 | 10.3 | 1.8 | 9.7 | 10.7 | 1.0 |
| Johnston | 50.6 | 57.6 | 7.0 | 58.8 | 67.9 | 9.1 | 67.1 | 77.5 | 10.4 |
| Nash | 0.3 | 0.8 | 0.5 | 0.4 | 0.8 | 0.5 | 0.4 | 0.9 | 0.5 |
| Orange (1) | 80.3 | 84.0 | 3.7 | 93.7 | 90.9 | (2.8) | 107.1 | 99.3 | (7.8) |
| Person | 10.6 | 9.9 | (0.7) | 11.1 | 9.9 | (1.3) | 11.7 | 9.9 | (1.8) |
| Wake (1) | 668.5 | 682.9 | 14.3 | 804.0 | 763.8 | (40.2) | 939.5 | 841.2 | (98.3) |
| Total | 1,105.7 | 1,122.3 | 16.6 | 1,318.3 | 1,251.5 | (66.8) | 1,531.0 | 1,372.1 | (158.9) |

(1) Only Durham, Orange and Wake counties are entirely contained in the TRMv6 model area. The population in the remaining counties represents only the portion within the TRM model boundaries.

Where Dr. Appold adjusted employment downward, he did so largely because of two characteristics of the TRMv6 model that he believed resulted in unrealistically high employment growth rates. First, the TRMv6 employment projections assume an employment growth rate based upon a data source with a higher population growth rate than used elsewhere in the model. Second, the TRMv6 model does not account for an aging population that will include fewer adults of prime working age and participating in the labor force. The adopted employment forecasts still assume employment growth but assume that the older population distribution will not require as many jobs as the younger population distribution required in the TRMv6. Johnston County employment was adjusted upward because the TRMv6 uses an employment growth trajectory based on 2013 data. Johnston County was slow to recover from recession-based employment losses and had just returned to 2007 employment levels in 2013. Dr. Appold adjusted the Johnston County employment forecast to reflect anticipated continued employment growth.

**Table 3.11** presents the original and adopted employment growth forecasts by region in the Detailed Study Area, and **Table 3.12** shows the corresponding adjustments made to employment in the TRMv6. Employment forecasts were reduced in the total Detailed Study Area in each future model year. In the TRMv6, employment growth in the Detailed Study Area was forecast to average 1.6 percent per year from 2019 to 2045, while the adopted forecast assumes an average annual growth rate of 1.1 percent per year. In 2045 the reduced growth rates result in 74,200 fewer employed people, a 13.6 percent decrease compared to the TRMv6 values in the Detailed Study Area. The largest reductions occur in Region 1 (Regional Core), where the average annual employment growth was reduced from 1.6 percent from 2019 to 2045, to 0.8 percent in the adopted model.

**Table 3.11**
**Detailed Study Area Employment Forecasts by Region - TRMv6 and Adopted Values**
**(employment in thousands)**

**TRMv6 Values**

| Region Number and Name | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 129.5 | 2.3 % | 148.4 | 1.7 % | 176.2 | 1.5 % | 203.9 | 1.8 % |
| 2 North of US 1 | 29.4 | 0.4 | 30.1 | 1.4 | 34.7 | 1.2 | 39.3 | 1.1 |
| 3 South Wake | 42.0 | 3.2 | 50.7 | 2.1 | 62.4 | 1.7 | 74.1 | 2.2 |
| 4 Johnston | 16.8 | 3.7 | 21.0 | 2.6 | 27.1 | 2.1 | 33.2 | 2.7 |
| 5 East Wake | 14.5 | 7.7 | 22.6 | 3.5 | 31.9 | 2.6 | 41.1 | 4.1 |
| 6 Inner Ring | 109.4 | 0.4 | 112.1 | 1.8 | 133.5 | 1.5 | 154.9 | 1.3 |
| Total | 341.7 | 2.0 | 384.9 | 1.9 | 465.7 | 1.6 | 546.6 | 1.8 |

**Adopted Values**

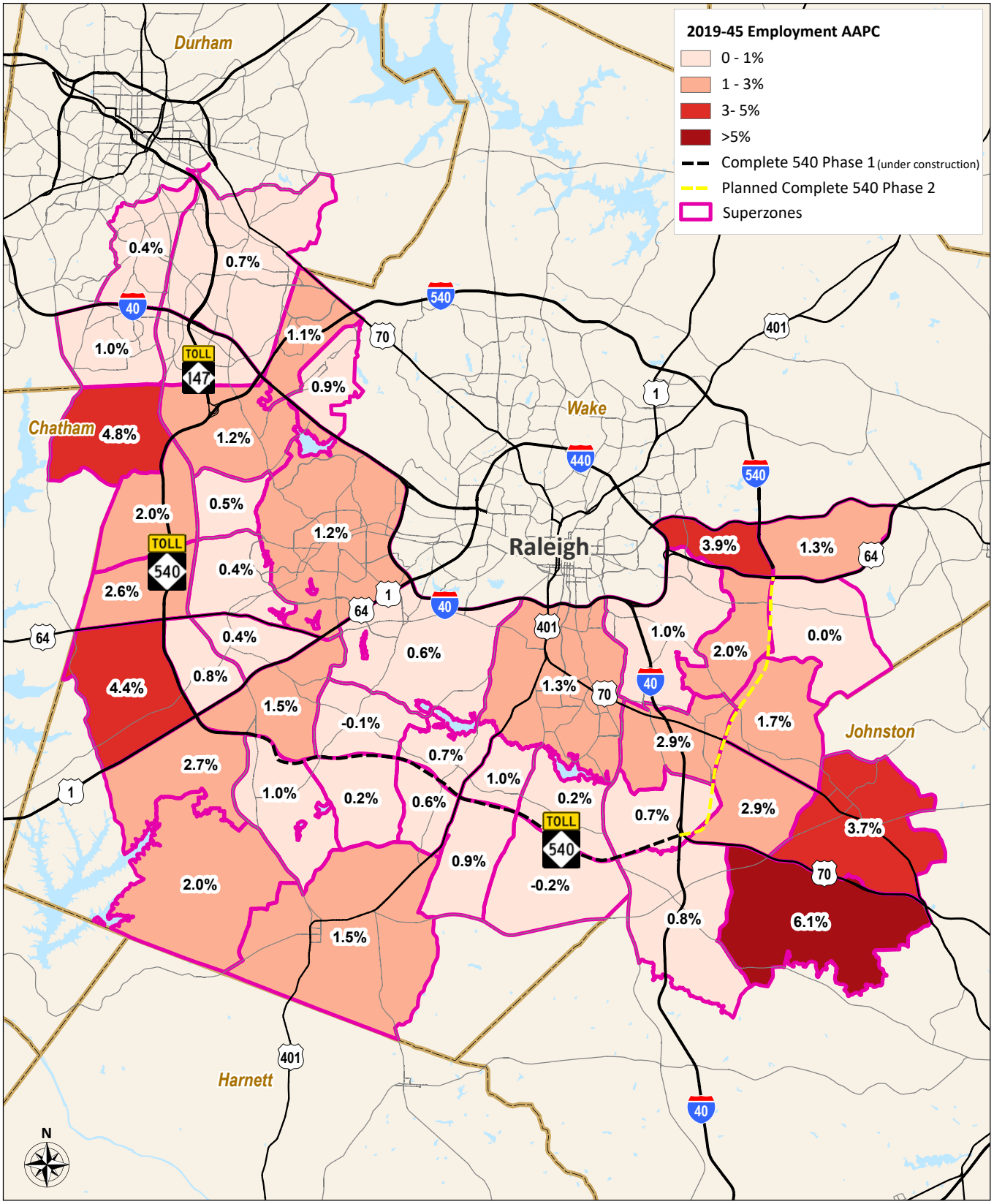
| Region Number and Name | 2019 | AAPC 2019-25 | 2025 | AAPC 2025-35 | 2035 | AAPC 2035-45 | 2045 | AAPC 2019-45 |
|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 129.5 | 0.4 % | 132.2 | 1.1 % | 148.1 | 0.9 % | 162.1 | 0.9 % |
| 2 North of US 1 | 29.4 | 1.3 | 31.8 | 0.8 | 34.5 | 0.7 | 37.1 | 0.9 |
| 3 South Wake | 42.0 | 1.7 | 46.4 | 1.4 | 53.1 | 1.2 | 59.6 | 1.4 |
| 4 Johnston | 16.8 | 5.3 | 23.0 | 3.0 | 30.9 | 2.1 | 38.2 | 3.2 |
| 5 East Wake | 14.5 | 3.8 | 18.1 | 2.7 | 23.6 | 2.0 | 28.8 | 2.7 |
| 6 Inner Ring | 109.4 | 1.7 | 121.3 | 1.0 | 134.2 | 0.9 | 146.5 | 1.1 |
| Total | 341.7 | 1.5 | 372.8 | 1.3 | 424.5 | 1.1 | 472.4 | 1.3 |

Note: AAPC is an abbreviation for Average Annual Percent Change

**Table 3.12**
**Detailed Study Area Employment Adjustments by Region**
**(employment in thousands)**

| Region Number and Name | 2025 TRMv6 | 2025 Adopted | 2025 Adjustment | 2035 TRMv6 | 2035 Adopted | 2035 Adjustment | 2045 TRMv6 | 2045 Adopted | 2045 Adjustment |
|---|---|---|---|---|---|---|---|---|---|
| 1 Regional Core | 148.4 | 132.2 | (16.2) | 176.2 | 148.1 | (28.0) | 203.9 | 162.1 | (41.8) |
| 2 North of US 1 | 30.1 | 31.8 | 1.7 | 34.7 | 34.5 | (0.2) | 39.3 | 37.1 | (2.2) |
| 3 South Wake | 50.7 | 46.4 | (4.3) | 62.4 | 53.1 | (9.3) | 74.1 | 59.6 | (14.5) |
| 4 Johnston | 21.0 | 23.0 | 2.0 | 27.1 | 30.9 | 3.8 | 33.2 | 38.2 | 5.0 |
| 5 East Wake | 22.6 | 18.1 | (4.5) | 31.9 | 23.6 | (8.3) | 41.1 | 28.8 | (12.3) |
| 6 Inner Ring | 112.1 | 121.3 | 9.2 | 133.5 | 134.2 | 0.7 | 154.9 | 146.5 | (8.4) |
| Total | 384.9 | 372.8 | (12.1) | 465.7 | 424.5 | (41.3) | 546.6 | 472.4 | (74.2) |

Employment growth rate projections in the Detailed Study Area between 2019 and 2035 are shown by the 43 Superzones in **Figure 3.5**. The fastest rates of growth are projected to occur on the west side of the Triangle Expressway corridor, and in the area east of I-40 and south of downtown Raleigh.




# 2019 - 2045 AVERAGE ANNUAL PERCENT GROWTH IN EMPLOYMENT BY SUPERZONE (ADJUSTED FORECAST)

FIGURE 3.5

### 3.3.5 Summary of Socioeconomic Forecasts and Adjustments

**Table 3.13** summarizes the TRMv6 and adopted socioeconomic forecasts by model year in the Detailed Study Area. The largest differences between the TRMv6 and adopted forecasts can be traced to the models' different age distribution of the population. TRMv6 holds age distribution constant at 2010 levels throughout the model period, while the adjusted numbers assume forecasts based on an aging population. This aging population results in an upward adjustment of the number of households from the TRMv6 model, by 8.8 percent by 2045, while leaving forecasted population relatively unchanged. The aging population also accounts for the downward adjustments to employment, as the number of people of working age are expected to increase more slowly than the population as a whole. Therefore, the total employment within the study area was adjusted downward by 8.9 percent in 2035, and 13.6 percent in 2045.

**Table 3.13**
**Detailed Study Area - Summary of Socioeconomic Adjustments**
**( Values in thousands)**

| | Forecast Year | | | | AAPC | AAPC | AAPC | AAPC |
|---|---|---|---|---|---|---|---|---|
| **Economic Input** | 2019 (1) | 2025 | 2035 | 2045 | 2019-25 | 2025-35 | 2035-45 | 2019-45 |
| Population | | | | | | | | |
| TRMv6 Values | 686.1 | 755.4 | 913.2 | 1,071.1 | 1.6% | 1.9% | 1.6% | 1.7% |
| Adopted Values | 686.1 | 759.1 | 903.4 | 1,061.3 | 1.7% | 1.8% | 1.6% | 1.7% |
| Difference | - | 3.7 | (9.9) | (9.7) | | | | |
| Percent Difference | - | 0.5% | -1.1% | -0.9% | | | | |
| Households | | | | | | | | |
| TRMv6 Values | 255.7 | 282.7 | 339.1 | 397.1 | 1.7% | 1.8% | 1.6% | 1.7% |
| Adopted Values | 255.7 | 292.1 | 357.1 | 432.1 | 2.2% | 2.0% | 1.9% | 2.0% |
| Difference | - | 9.4 | 18.0 | 35.0 | | | | |
| Percent Difference | - | 3.3% | 5.3% | 8.8% | | | | |
| Employment | | | | | | | | |
| TRMv6 Values | 341.7 | 384.9 | 465.7 | 546.6 | 2.0% | 1.9% | 1.6% | 1.8% |
| Adopted Values | 341.7 | 372.8 | 424.5 | 472.4 | 1.5% | 1.3% | 1.1% | 1.3% |
| Difference | - | (12.1) | (41.3) | (74.2) | | | | |
| Percent Difference | - | -3.1% | -8.9% | -13.6% | | | | |

(1) TRMv6 2019 Actuals set to match Adopted 2019 Actuals.
Note: AAPC is an abbreviation for Average Annual Percent Change

A visual comparison of the population, household and employment forecasts is presented in **Figure 3.6, Figure 3.7,** and **Figure 3.8**, between the TRMv6 and the adopted forecast. As shown the adopted forecasts contain small downward adjustment to population, upward adjustments to households, and downward adjustments to employment.

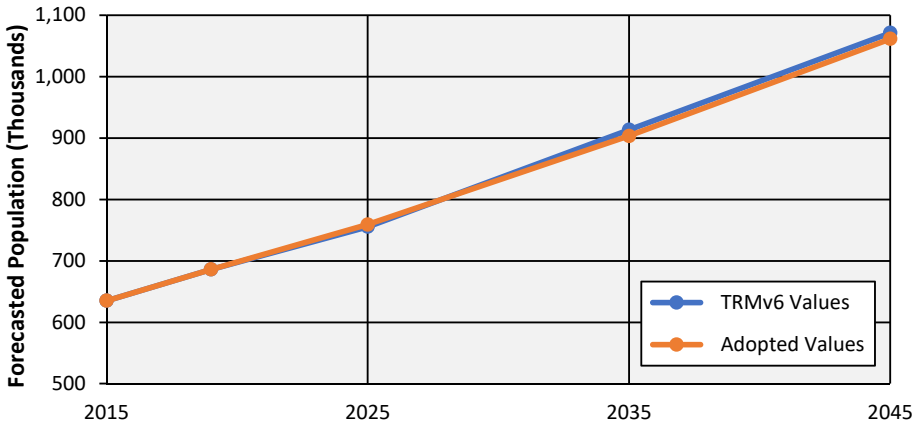



**Figure 3.6**
**Population Growth in Study Area**

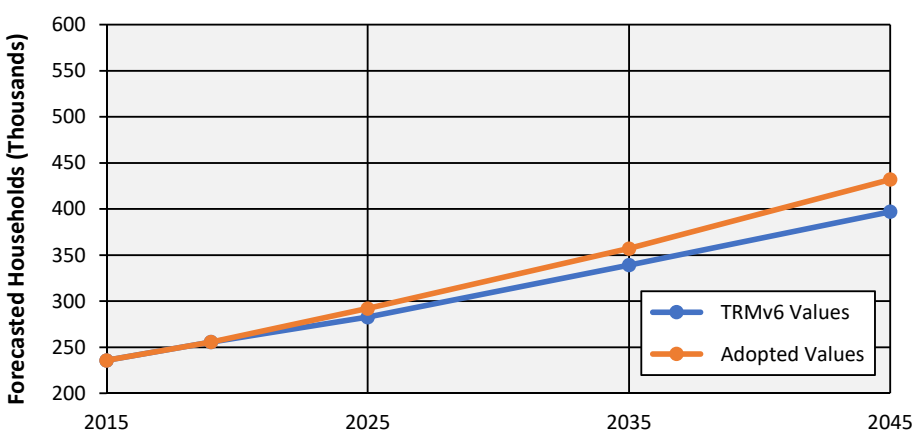



**Figure 3.7**
**Household Growth in Study Area**

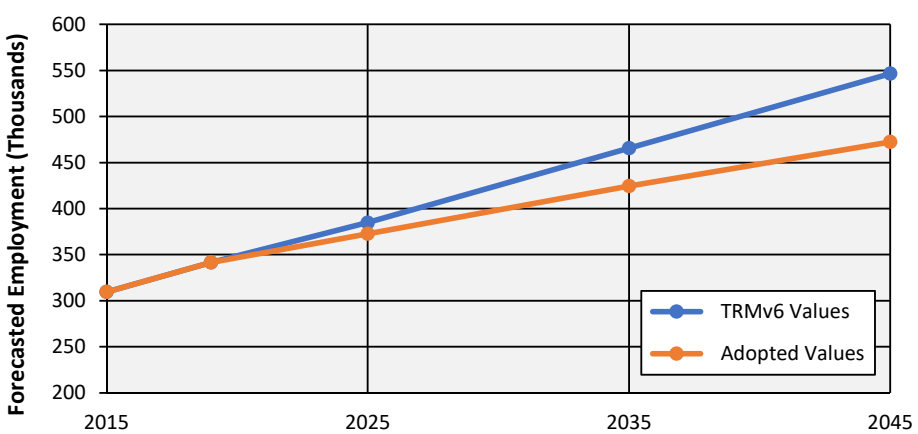



**Figure 3.8**
**Employment Growth in Study Area**

# 3.4 Forecasting in the Age of a Pandemic

The ongoing COVID-19 pandemic has upset traffic forecasting in two fundamental ways. First, the pandemic has brought on significant employment loss and a serious economic contraction of unknown duration, partly because many businesses were either forced to close due to governmental restrictions, while others reduced operations in response to diminished demand. Second, many of those who are still employed are working from home. Both factors have impacted the number of journeys to work, a key component of vehicular travel on freeways.

The following sections address the first concern, employment trends, and then provide some observations about remote work.

## 3.4.1 National Economic Impacts

**Figure 3.9** shows the past and projected growth of real Gross Domestic Product (GDP) for the U.S. economy according the latest available Congressional Budget Office (CBO) analysis which is based on data available as of June 26, 2020. The sharp contraction in economic activity can be seen. In these revisions of its estimates generated in May, CBO has revised downward its estimate of growth in the second half of 2020. Nevertheless, the CBO expects real GDP to recover to its pre-pandemic level by the middle of 2022. Unemployment will likely remain above pre-pandemic levels for several years. (The CBO has not announced a timeline for a subsequent update. As of October 28, no new update has been issued.)

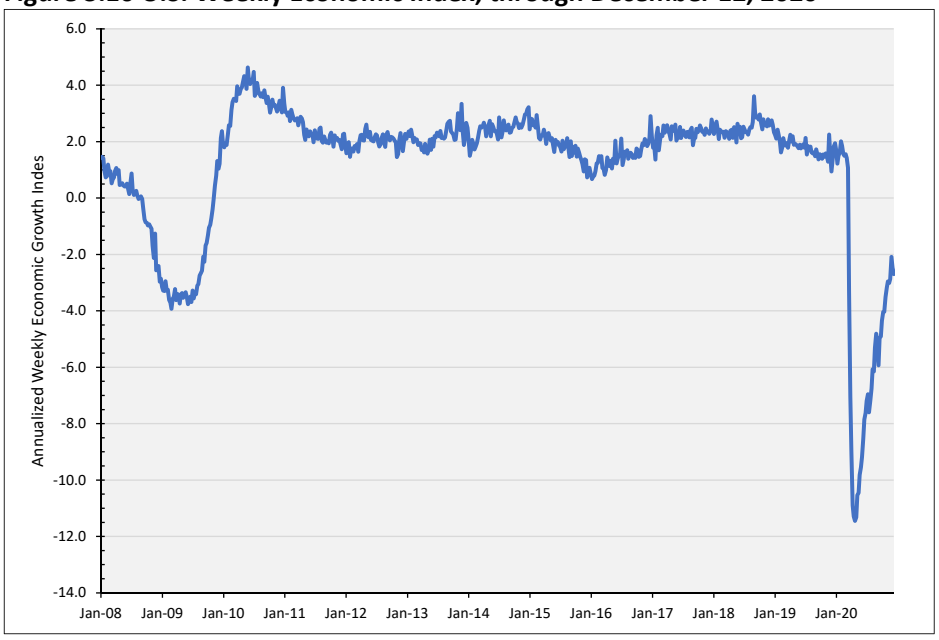
**Figure 3.9 Growth of Real GDP and Real Potential GDP, CBO July 2020**




Source: CBO, An Update to the Economic Outlook: 2020 to 2030, https://www.cbo.gov/publication/56465

The Federal Reserve Bank has been compiling a weekly index of U.S. economic activity based on ten series of consumer behavior and industrial production data sources. These are national data, but are fairly representative of the North Carolina economy as well. The advantage of these data is that they provide a more up-to-date profile of the state of the U.S. economy than the CBO publication. As shown in **Figure 3.10**, annualized economic growth rates are charted so that a reading of 2.00 would imply that the economy was growing at rate which would be equivalent to 2 percent annually, even though that rate was measured for just one week.

**Figure 3.10 U.S. Weekly Economic Index, through December 12, 2020**




Source: Lewis, Daniel J., Mertens, Karel, and Stock, James H., Weekly Economic Index, https://www.newyorkfed.org/research/policy/weekly-economic-index

In order to measure the intensity of recent recessions, "degree-weeks," analogous to the "heating degree days" used. In this measure one percent week of negative growth would be an (annualized) growth rate of -1 percent maintained for one week. Similarly, two percent-weeks of negative growth could be an (annualized) growth rate of -1 percent maintained for two weeks or -2 percent for one week. Just as heating degree days estimate the home fuel needed to bring homes to a neutral temperature, this measure appoximates the growth needed to bring the economy to a neautral level.

The Great Recession and the ongoing pandemic-related recession can clearly be seen in Figure 3.10. From September 2008 through November 2009, the U.S. economy spent 62 continuous weeks with negative growth rates. Taken together, that amounts to a total of 155.4 degree-weeks in negative territory (an approximation of the area between the curve and zero percent growth). Thereafter, came a period of make-up growth, followed by fairly solid growth through 2019. (A period of weakening can be seen in 2016 and by some measures, the economic expansion had begun to slow in 2019.)

More recently, economic growth has been negative since mid-March and in the 39 weeks since there have been 252.0 degree-weeks in negative territory. The rebound in growth has been more rapid than the earlier recession but the economy is still shrinking by this measure. Quarterly measures will

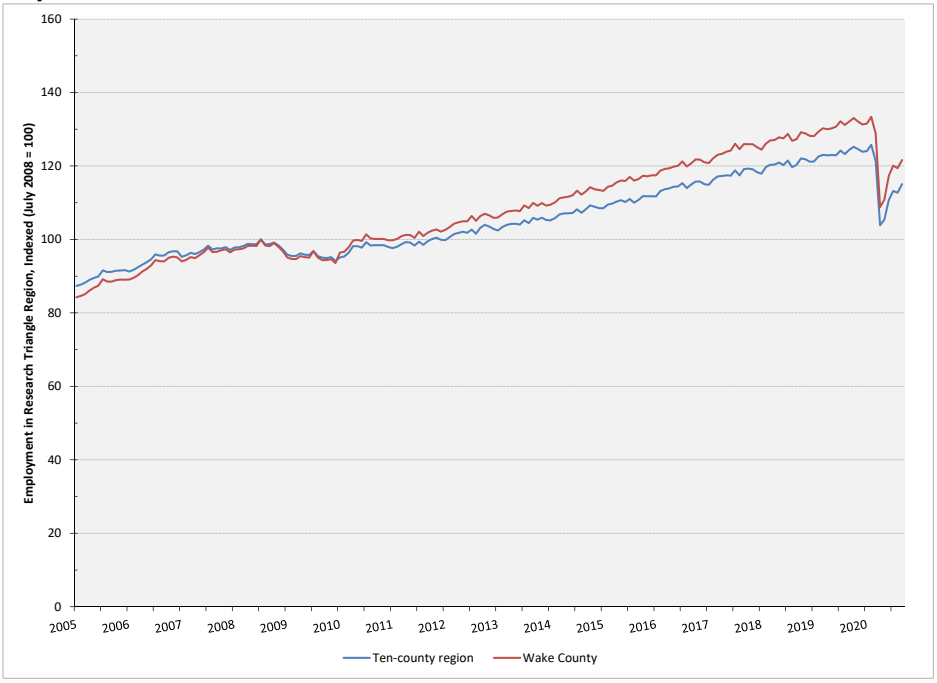
not show the extreme contraction because the deepest point was of relatively short duration. This seems like a much more severe recession than the last and the pattern of recovery may be different.

### 3.4.2 Regional Employment Impacts

**Figure 3.11** charts the employment trajectories for both the ten-county Research Triangle Region and Wake County. Index numbers are used to keep the scales the same. July 2008, the month with the highest pre-Great Recession employment, is set to 100. Employment bottomed out in March 2009. At the end of that 8-month decline, the region's employment was effectively set back 43 months, Wake County's by 21 months. After 21 months, Wake County had regained its pre-recession employment level. After 38 months, the region as a whole had as well. On the basis of this experience, a rule-of-thumb might be the recovery time is equal to the setback, which implies that growth resumed at its former rate.

More recently, employment bottomed out after only two months and set the region back 81 months. However, by September (five months later), the setback had been reduced to 44 to 45 months. If sustained, even at an attenuated rate, the recovery would be much more rapid than in the Great Recession.

**Figure 3.11 Employment in the Research Triangle Region, January 2005-September 2020, Indexed to July 2008**

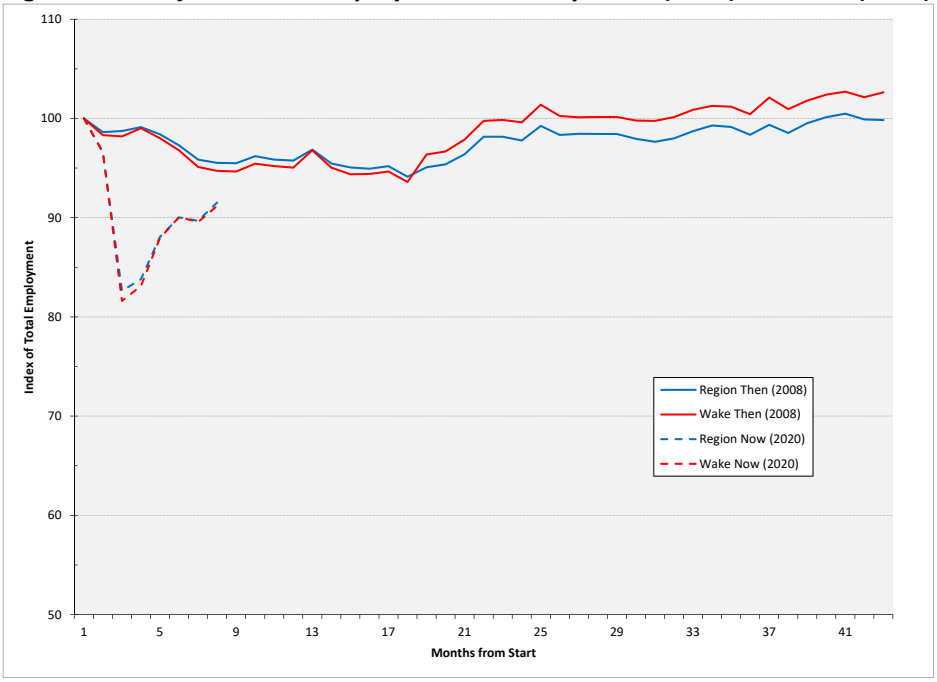



Source: Bureau of Labor Statistics, Local Area Unemployment Statistics, https://download.bls.gov/pub/time.series/la/

**Figure 3.12** charts the employment trajectories setting July 2008 and February 2020, the pre-recession peaks, as 100. The differences in the index paths are striking. Whereas the Great Recession was characterized by, in comparison, relatively mild employment loss with a long, uneven, recovery path, the present recession has been characterized by more rapid, deeper, employment loss with a, so far, relatively rapid recovery. While that recovery has stumbled and the future path is unknown, it

still seems possible that a fairly swift recovery might yet occur. However, to the extent that those who saw evidence of slowing growth before the pandemic hit were correct, the economy may still need to correct those preexisting problems before a full recovery is possible.

**Figure 3.12 Trajectories of Employment Recovery, Then (2008) and Now (2020)**




Source: Bureau of Labor Statistics, Local Area Unemployment Statistics, https://download.bls.gov/pub/time.series/la/

### 3.4.3 Mobility and Engagement Index

The Federal Reserve also maintains an on-going daily Mobility and Engagement Index (MEI) using cell phone location data from Safegraph. The MEI is based on a weighted combination of:

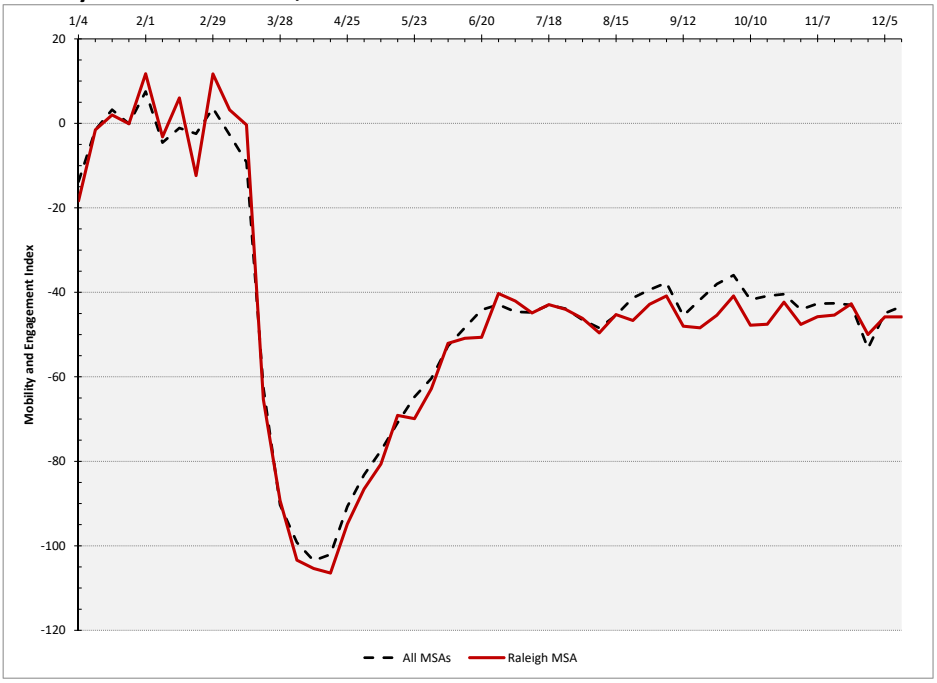
1. Fraction of devices leaving home in a day
2. Fraction of devices away from home for three to six hours at a fixed location
3. Fraction of devices away from home longer than six hours at a fixed location
4. An adjusted average of daytime hours spent at home
5. Fraction of devices taking trips longer than 16 kilometers (10 miles)
6. Fraction of devices taking trips less than 2 kilometers (1.2 miles)
7. Average time spent at locations far from home

The data are scaled so that the daily average measurements for January and February of this year average zero. Data for the Raleigh-Cary Metropolitan Statistical Area (MSA) and all MSAs nation-wide are shown in **Figure 3.13**.

The two data series are roughly consistent. Four time periods can be seen: the period of normal mobility in January and February, the rapid drop off during March and the first half of April, the fairly rapid partial resumption of movement in late April and May, and a plateauing of movement beginning in early June and lasting through the present. Those same patterns are repeated, with some variation, for each of the North Carolina metropolitan areas, indicating limited additional recovery until the

current second wave of infections subsides, or newly approved vaccines are more widely distributed and statewide restrictions are relaxed.

**Figure 3.13 Average Mobility and Engagement Index for Raleigh-Cary MSA and All MSAs, January 4 to December 12, 2020**




### 3.4.4 Remote Work

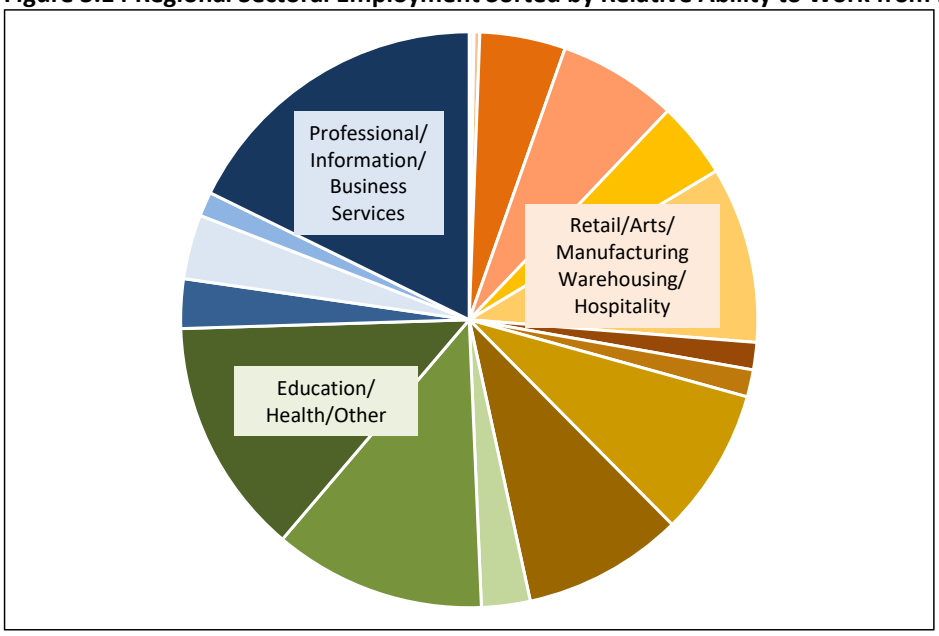
As noted earlier, the updated socioeconomic forecasts developed by Dr. Appold as summarized earlier in this chapter did not take into account any impacts of the ongoing COVID-19 pandemic since there was very limited actual data available on changes at the small area level at the time of his analysis and the situation continues to evolve.

For this study, manual adjustments will be made to the TRMv6 model output trip tables to reflect (1) near-term effects of restrictions on gatherings and travel (2) mid-and longer-term impacts on growth and telecommuting. These adjusted trip tables were then used for the final traffic assignments that form the basis of this traffic and revenue study. The next section is a brief discussion of available information on telecommuting patterns as a result of the pandemic, which will be used to estimate a permanent shift to telecommuting that is not yet recognized in the TRMv6 model.

The pre-pandemic share of employment in the Triangle Region in 18 sectors (e.g., information, education, public administration, accommodations, retail trade, etc.) is grouped into categories by their relative ability to work from home in **Figure 3.14**. Jobs in sectors in yellow/orange/brown hues are diverse (including retail trade, accommodations, food service, and manufacturing), but all tend to require onsite work. However, it is noted that a portion of these jobs would also include back office operations, and engineering and management functions that can be performed from a distance. Another of the largest sectors in this group is public administration, accounting for 9 percent of total employment at the beginning of this year. While many jobs in this sector could be characterized as office work, the nature of the interaction with the public requires onsite work and contact with

others. In total, jobs in these high-contact sectors account for almost half of employment in the Triangle region.

**Figure 3.14 Regional Sectoral Employment Sorted by Relative Ability to Work from Home**

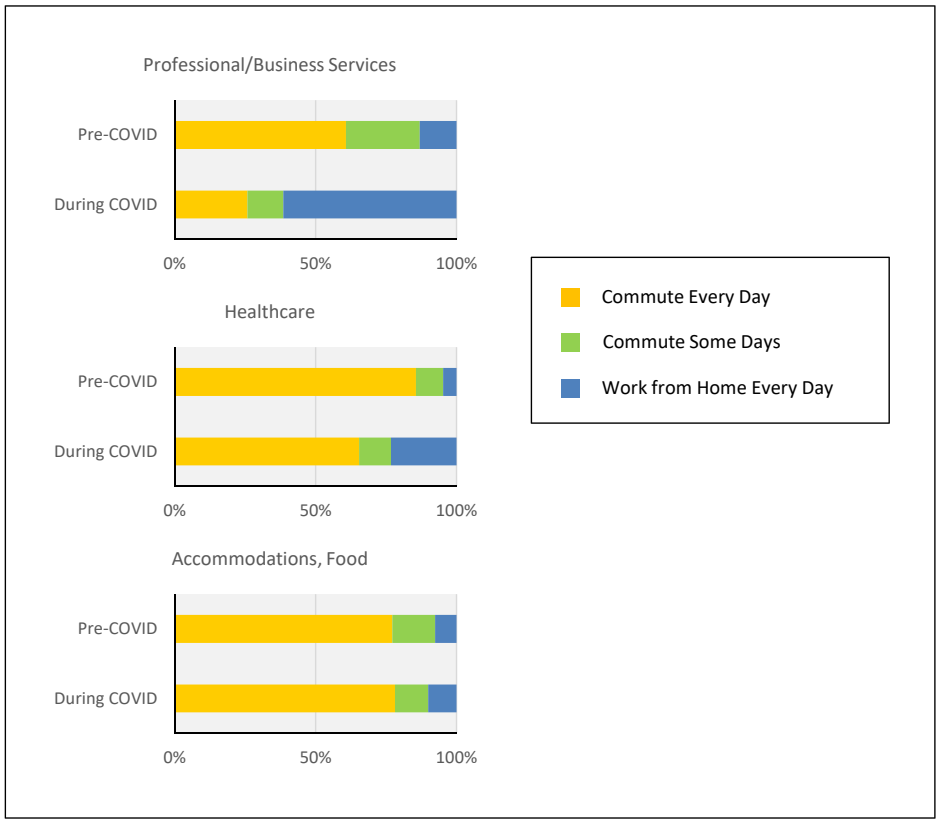



Jobs in sectors in green shades, such as education and healthcare, have in the past also required onsite work, but have found online alternatives during the pandemic. Accounting for about one quarter of all jobs in the region, it is unclear how much of these functions will return fully to in-person services versus optional online service once restrictions are lifted. Finally, jobs in sectors in blue shades are primarily office-type employment that were more easily shifted to work from home when the pandemic started and could see more permanent changes. These sectors represent about a quarter of employment in the region.

According to data from the US Bureau of Labor Statistics' American Time Use Survey, 123,941 (12 percent) of the Triangle Region's employed work force of 1,038,588 telecommuted before the pandemic, while 478,409 (46 percent) potentially could. The implication is that just over a quarter of those who could, actually did so prior to the pandemic. Similarly, 20,300 (16 percent) of the Regional Core mega-zone's employed work force of 129,460 telecommuted before the pandemic, while 61,342 (47 percent) potentially could.

**Figure 3.15** summarizes the share of workers in three major employment sectors by their likelihood to commute every day, commute some days, or work from home every day before the pandemic and during the pandemic. As noted earlier, jobs in professional/business services were most able to shift to partial or full work from home while jobs in accommodations and food industries (where they still existed during the pandemic) were least able to shift.

**Figure 3.15 Percent Commute versus Work from Home Pre- and During Pandemic**




This information, along with employment by sector[1] and recent working papers published by the Dallas Fed[2] [3], were used to estimate the share of workers commuting versus telecommuting before and during the pandemic and the potential for longer term suppression of work-related trips.

The difference in commute versus work from home patterns between February 2020 and May 2020 in each job sector were used to identify the full range of possible patterns when pandemic-related restrictions are lifted. The amount of permanence in the difference between February and May was estimated based on the job sector, taking into account that everyday commuters could shift to both "commute some days" and "work from home every day" categories. A weighted average net reduction in work and business-related trips was calculated from these shifts for a high permanence (7 percent) case and a low permanence (2 percent) case. The results from the high and low cases were averaged to a 4 percent reduction factor in future work and business-related trips within the trip tables used

[1] Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics (LODES), US Census Bureau

[2] Alexander Bick, Adam Blandin and Karel Mertens, "Work from Home After the COVID-19 Outbreak," Federal Reserve Bank of Dallas Working Paper 2017, July 2020, https://www.dallasfed.org/~/media/documents/research/papers/2020/wp2017r1.pdf

[3] David Altig, Jose Maria Barrero, Nick Bloom, Steven J. Davis, Brent Meyer, Emil Mihaylov, and Nick Parker, "Firms Expect Working from Home to Triple," Federal Reserve Bank of Atlanta Macroblog, May 28, 2020, https://www.frbatlanta.org/blogs/macroblog/2020/05/28/firms-expect-working-from-home-to-triple

for the traffic and revenue study. Additional adjustments to the model to reflect slowed economic growth and ongoing COVID impacts will be discussed in Chapter 5, Model Development.

## 3.5 Local Employer Survey

To understand the impacts of COVID-19 on travel patterns within the Triangle Region, local employers representing public and private sectors across multiple industries were surveyed in Fall 2020 about their work from home policies. The survey included a discussion about work from home participation before COVID-19, the impacts to their workforce during COVID-19, and what options are possible after COVID-19 has been managed. Representatives from 15 employers within a total workforce of almost 75,000 in the region participated in this survey (see **Table 3.14**). An anonymized matrix of all survey responses is included in Appendix A.

**Table 3.14**
**Summary Results of Employer Survey**

| Sector | Number of Employers Surveyed | Total Number of Employees | Percent Work from Home Pre-COVID | Potential New Work from Home Policies | Timeframe for Return to Onsite Work |
|---|---|---|---|---|---|
| Private Institutions | 10 | 22,300 | Range 10-42%, Median 10% | Flexible Schedule | Summer 2021 |
| Public Institutions | 5 | 50,600 | Range 2-30%, Median 10% | Close to Pre-COVID | Summer 2021 |

Note: Surveys conducted Fall 2020.

To comply with state and local guidelines put in place during the early spring, employers had to adapt work rules. Most employers reported that before the pandemic, the number of employees working from home averaged around 10 percent. During the pandemic, working from home was normalized, and safety became the priority of employers. Of the employers surveyed, most reported that approximately 70 to 90 percent of their workforce were working from home during the pandemic. Employers that responded to the survey represent different industry fields including technology, research, medical, marketing, and finance. Due to the various industries surveyed, employees who need to be at a physical worksite to perform their assignments have still been reporting to work.

To discuss the impacts of COVID-19, employers were asked a series of questions related to work from home participation. The majority of employers stated that working from home has been positive for employees. Positive benefits for employees and employers included: better productivity while working from home; increased overall flexibility; and amplified attitude toward working. Negative impacts to business observed during this time included: loss of innovation between co-workers and internal groups; less interaction between employees; and more scheduled meetings instead of informal discussions. Employers have distributed internal surveys to understand the impacts of working from home on their employees and their willingness to return to the office. Although answers spanned a wide spectrum, a consistent message that was portrayed from employees was they would like a flexible work schedule in the future with days in the office and the rest working from home.

Determining how to bring employees back to the office and following appropriate guidelines has been the focus for employers. The thresholds being reviewed by employers include federal and local guidelines, corporate medical policies, and employee engagement. Based on survey results, employers

have realized that many systems are already in place to allow work from home to be successful for their employees. Employers suggested that office space will be re-evaluated now that work from home has occurred this long, especially as local offices continue to grow.

Although no timeframe for returning to the office has been established, employers are evaluating this decision continuously. The approximate timeframe most employers are looking to start phasing employees back into the office is Summer 2021. Some employers are using deployment of the vaccine to their workforce and percentage of local population with the vaccine as a benchmark for return to work policies.

# Chapter 4
# Stated Preference Survey

Resource Systems Group, Inc. (RSG) conducted stated preference (SP) surveys in January and February of 2018. The data collected was used to estimate values of time for travelers that currently use or could potentially use the Triangle Expressway, as well as the proposed Complete 540 Phase 1. The estimated values of time were incorporated into the travel demand model to reflect the effects of tolls on route choice. While the SP survey questions focused on use of Triangle Expressway and Complete 540 Phase 1, some of the origins and destinations of survey respondents were in the Complete 540 Phase 2 area. Since the resulting values of time are applied to each traffic analysis zone within the model using income and market segment information for each zone, the results of this survey are considered valid for use in evaluating trips that may also use Complete 540 Phase 2.

This chapter summarizes the stated preference survey report provided by RSG, ***Report: Complete 540 Stated Preference Survey (May 2018)***. Economic growth patterns have been as expected in the region since the time of the original survey and CDM Smith considers the values of time from the 2018 survey appropriate for use (with modest increases to reflect inflation) for this study.

## 4.1 Survey Approach

The survey approach used a computer-assisted self-interview technique developed by RSG, and implemented within their proprietary software, rSurvey™. This software allowed the questionnaire to be customized for each respondent by modifying questions and language based on respondents' specific answers, allowing the presentation of realistic future conditions that correspond with the respondents' previous answers.

Respondents were recruited to take this online survey using multiple methods:

- Postcard invitations mailed to residents of ZIP codes in the study area;
- E-mail invitations sent to members of an online research panel residing in ZIP codes in the study area;
- In-person postcard invitation handout at the Raleigh-Durham International Airport (RDU);
- Invitations mailed with billing statements to NC Quick Pass Bill by Mail customers;
- Invitations mailed with Transponder Fulfillment packets to new NC Quick Pass transponder owners;
- Postcard invitations available at the NC Quick Pass customer service center in Morrisville, North Carolina; and
- Outreach to local businesses and organizations in the study area.

A total of 1,673 travelers completed the stated preference survey in total for all methods. After cleaning the dataset for outliers, completed surveys from 1,542 respondents were used for analysis.

Data from these travelers were analyzed using accepted statistical methods to estimate travelers' sensitivity to travel time and toll cost, while considering other specific traveler characteristics.

## 4.2 Survey Questionnaire

RSG worked closely with NCTA and CDM Smith to develop a questionnaire to meet the objectives of the traffic and revenue study. The questionnaire collected data regarding current travel behaviors and use (or not) of the Triangle Expressway for a recent trip, provided participants with information regarding the Complete 540 project, and used stated preference questions to estimate travelers' value of time and potential to use the proposed Complete 540 Phase 1.

### 4.2.1 Introduction and Qualification Questions

All respondents were initially provided an introductory screen detailing the purpose of the study, the estimated time it will take to complete the survey, and instructions on how to navigate the online survey. Following the introduction, participants were shown trip qualification criteria to determine whether they were eligible to participate in the survey. Qualifying trips met the following conditions:

- Made within the past two months
- Traveled into, around, or through the highlighted area on a map of the Complete 540 Phase 1 corridor, including the existing Triangle Expressway
- Took at least 10 minutes in total door-to-door travel time
- Made on a weekday

To determine if participants' most recent trip was eligible for the survey, they were provided a map highlighting the study area and were asked to confirm if their trip occurred in this region. Respondents who indicated that they did not meet any of the criteria listed above were directed to the survey exit screen and thanked for their participation.

### 4.2.2 Trip Characteristics and Travel Pattern Questions

Respondents were then asked to focus on this recent trip as they continued through the survey. This trip, also known as their reference trip, formed the basis for constructing the rest of the questions in the survey. Respondents were specifically asked to think about their most recent trip and not a typical or average trip that they might make to ensure that the sample included a diverse range of trip types and travel characteristics.

Respondents were asked a series of questions regarding the following characteristics of a one-way portion of their reference trip:

- Vehicle type and number of axles
- Roads used
- Day of week of travel
- Trip purpose
- Airport trip details (if applicable)
- Beginning and ending locations (home, work, or other)

- Trip origin and destination
- Start time of travel
- Triangle Expressway entrance and exit interchanges
- Travel time (trip duration)
- Delays encountered (and delay duration, if any)
- Perceived travel time if an alternative route was used
- Toll costs on the Triangle Expressway
- Vehicle occupancy
- Trip frequency
- Electronic Toll Collection (ETC) transponder ownership

The trip information was used to inform the details of the SP scenarios presented later in the survey.

### 4.2.3 Stated Preference Questions

Participants were next provided a short description of the proposed Complete 540 project and brief instructions for the stated preference questions. The stated preference section involved eight exercises that provided respondents with two choices for making their reference trip again in the future under hypothetical conditions:

- Tolled Route Alternative using the Triangle Expressway, Complete 540, or both
- Toll-Free Route Alternative

In each of the eight SP exercises, travel times and toll costs were varied, and the respondent was asked to pick their preferred option. These exercises allowed RSG to collect quantitative data that can be used to estimate respondents' travel preferences and behavioral responses. An example of this stated preference screen is shown in **Figure 4.1**.




*Source: Resource Systems Group, Inc.*

Figure 4.1
**Sample Survey Screen – Stated Preference Question**

The travel times presented in each exercise were varied around the user's reported travel time from their reference trip. The toll costs varied based on the user reported trip distance and vehicle axles. By varying the travel time and toll cost independently from each other in each experiment, the survey allowed respondents to demonstrate their travel preferences across a range of values of time.

### 4.2.4 Debrief and Opinion Questions

After finishing the SP questions, respondents were asked to answer questions that will help assess the underlying rationale for their choices and to allow RSG to identify any potential strategic bias in their responses. These questions included asking respondents who never chose the tolled alternative for their primary reason, as well as asking respondents how they felt about the proposed Complete 540 project and why they felt that way. Respondents were also asked for their general attitudes on tolls and taxes for highway improvements. Additionally, questions related to the following demographic topics were asked: home ZIP code, gender, age, employment status, household size, household vehicle ownership, and 2017 household income before taxes.

Responses to these questions were used to confirm diversity of the sample respondents, as well as to classify and organize the data to identify any behavioral trends by population. Lastly, respondents were given opportunity to provide comments and feedback regarding the survey and the proposed project. The answers are provided in the full RSG report.

## 4.3 Survey Administration

RSG worked with CDM Smith and NCTA to develop a sampling plan that would produce a comprehensive sample of travelers in the Triangle region. The goal of this plan was to provide representation from different trip purposes, household incomes, and geographies, to accurately reflect behavioral differences. The project team recruited travelers to participate in the SP survey using the distribution methods highlighted in Section 4.1. The survey was administered online through RSG's proprietary software, rSurvey™, from January 17, 2018 through February 19, 2018, and yielded 1,673 completed surveys and 1,542 valid/usable surveys. **Table 4.1** below shows the breakdown of respondents by method of recruitment.

**Table 4.1**
**Completed Surveys by Recruitment Method**

| Administration Method | Completed Surveys | Invalid Surveys | Final Count | Percent |
|---|---|---|---|---|
| Postcard invitations to area residents | 965 | 40 | 925 | 60% |
| Email invitations to online research panel | 377 | 55 | 322 | 21% |
| Postcard handout at RDU Airport | 236 | 30 | 206 | 13% |
| Invitations to Bill by Mail customers | 45 | 5 | 40 | 3% |
| Invitations in Transponder Fulfillment packets | 17 | 1 | 16 | 1% |
| Postcard invitations at customer service center | 5 | 0 | 5 | 0% |
| Outreach to local businesses and organizations | 28 | 0 | 28 | 2% |
| Total | 1,673 | 131 | 1,542 | 100% |

Postcard invitations to area residents generated the most responses, with 60 percent of the total 1,542 usable surveys, while postcard invitations at customer service centers generated the lowest responses with five usable surveys.

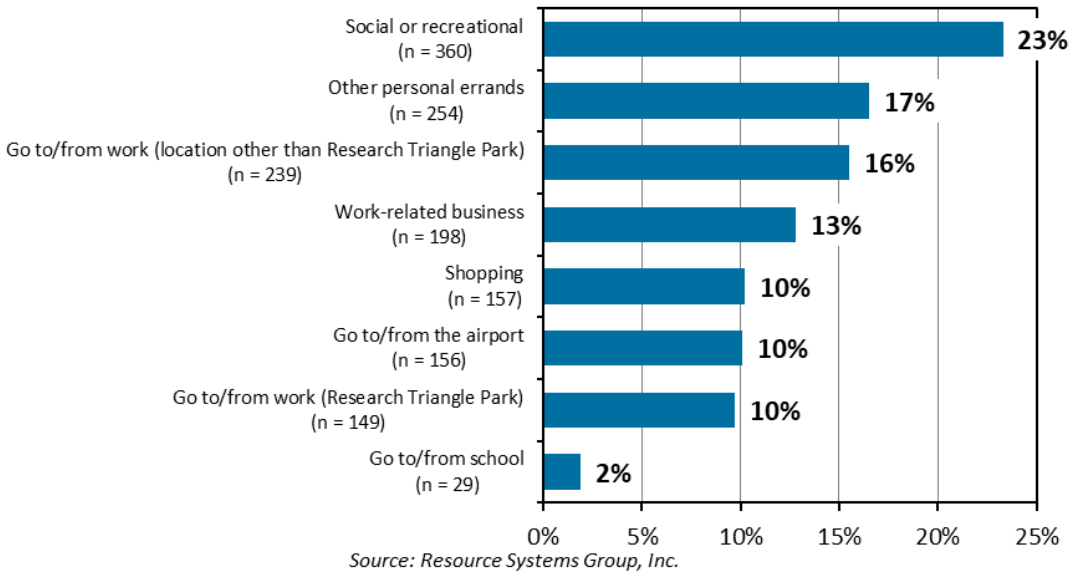
## 4.4 Trip Characteristic Analysis

**Table 4.2** shows the number of respondents who reported reference trips that used the Triangle Expressway and/or the proposed Complete 540 Phase 1, could have used the Triangle Expressway, or didn't use the Triangle Expressway but could use the Complete 540 project. More than half of all respondents (53 percent) completed their reference trip in the potential Complete 540 corridor only, while 40 percent used the Triangle Expressway at some point during their trip. Of the remaining 7 percent that could have used the Triangle Expressway but chose not to, a majority stated they did not want to pay a toll and a third reported that the toll on the Triangle Expressway was not worth the time savings for their trip.

**Table 4.2**
**Corridor Use Type**

| User Type | Count | Percent |
|---|---|---|
| Triangle Expressway User | 614 | 40% |
| Potential Triangle Expressway User | 110 | 7% |
| Potential Complete 540 User | 818 | 53% |
| **Total** | 1,542 | 100% |

Around a quarter of respondents reported their trip purpose was commuting for work (26 percent), with 10 percent traveling to Research Triangle Park (RTP) and 16 percent traveling to work outside RTP. The second most frequent trip purpose category was social or recreational trips, accounting for 23 percent of all trips surveyed. **Figure 4.2** provides a distribution for all trip purposes in detail. For the purposes of the value of time analysis, responses were divided into market segments representing work commute trips, work-related/business trips, airport trips, and other trips.




*Source: Resource Systems Group, Inc.*

Figure 4.2
**Trip Purpose**

Using the latitude and longitude provided by respondents, estimated trip distances were calculated using a Google Maps route-planning algorithm. From this summary, the average calculated trip distance for all respondents was 25 miles, and the average reported travel time for all respondents was 42 minutes. **Table 4.3** shows the mean and median values for both distance and travel time for all respondents by market segment.

**Table 4.3**
**Mean and Median Trip Distance and Reported Travel Time, By Market Segment**

| | Distance (miles) | | Reported Travel Time (minutes) | |
|---|---|---|---|---|
| **Market Segment** | Mean | Median | Mean | Median |
| Work | 24 | 20 | 42 | 40 |
| Work-Related | 26 | 21 | 46 | 40 |
| Airport | 26 | 20 | 39 | 30 |
| Other | 25 | 17 | 42 | 35 |
| All | 25 | 19 | 42 | 35 |

Respondents were asked to provide their entry and exit ramps on the Triangle Expressway, or the ramps they would have used, had they used the Triangle Expressway. **Figure 4.3** shows the distribution of trips to each interchange by entry and exit. The project termini, at NC 55 and at Toll NC 147/ I-40 were the most commonly used, accounting for 30 percent and 32 percent, respectively, of all entries or exits.

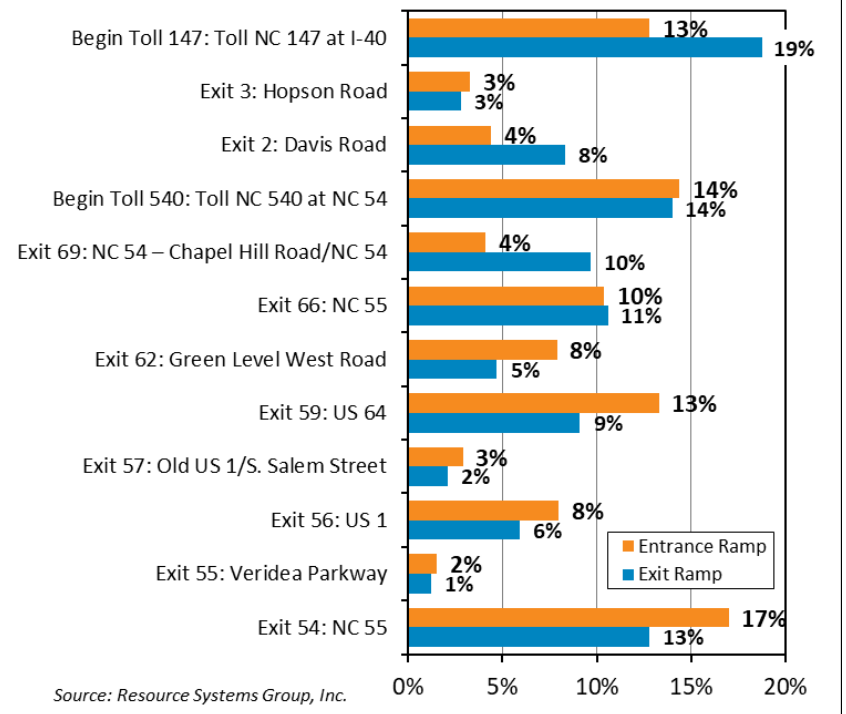



Figure 4.3
**Triangle Expressway Entrance and Exit Locations**

**Figure 4.4** and **Figure 4.5** provide the distribution of reported travel time and amount of perceived delay by market segment, respectively.

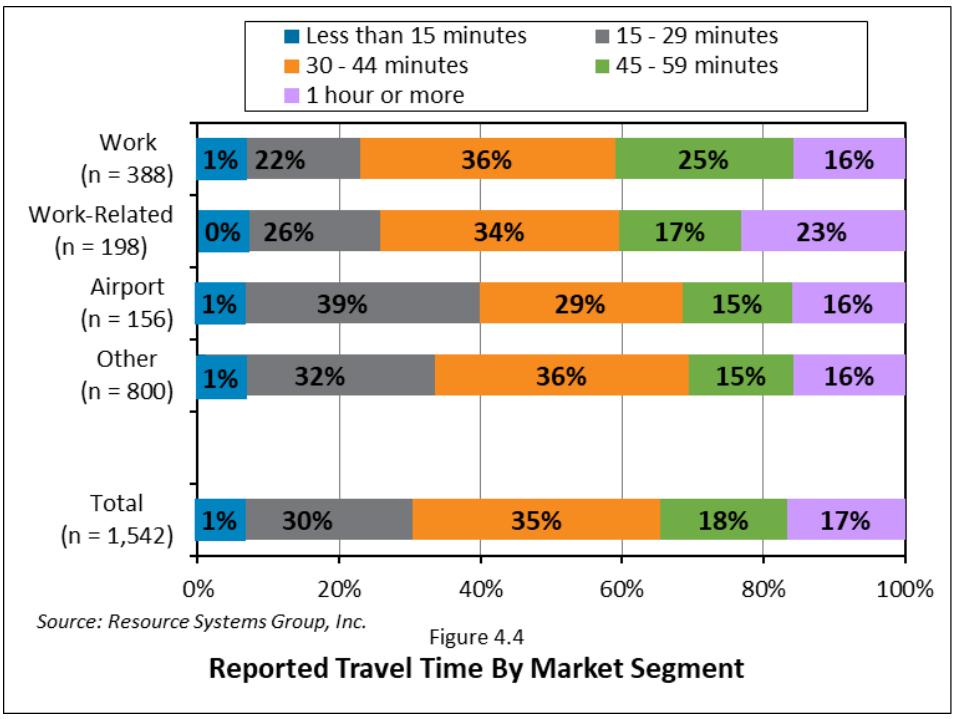



Figure 4.4
**Reported Travel Time By Market Segment**

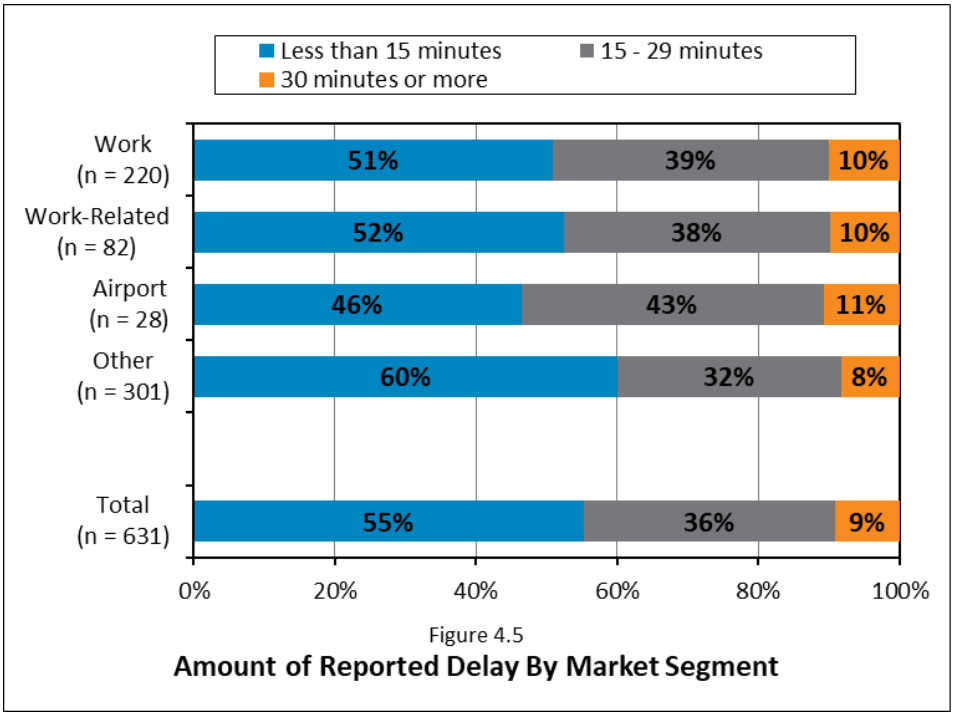



Figure 4.5
**Amount of Reported Delay By Market Segment**

Work and work-related trips experienced the longest travel times with about 40 percent of each of these trips taking travelers 45 minutes or longer. These same market segments also reported the highest delay on their trip, with 57 percent of all work trips reporting delays.

**Figure 4.6** shows the trip frequency by market segment. Trip frequency had significant variation among the four market segments. As expected, work trips are made with the highest frequency, with 69 percent of all work respondents traveling the reference trip four or more times a week. Airport trips had the lowest frequency, with 53 percent traveling the reference trip less than once per month. Interestingly, work-related/business trips similar to the reference trip were made four or more times per week by 17 percent of the respondents in this category.

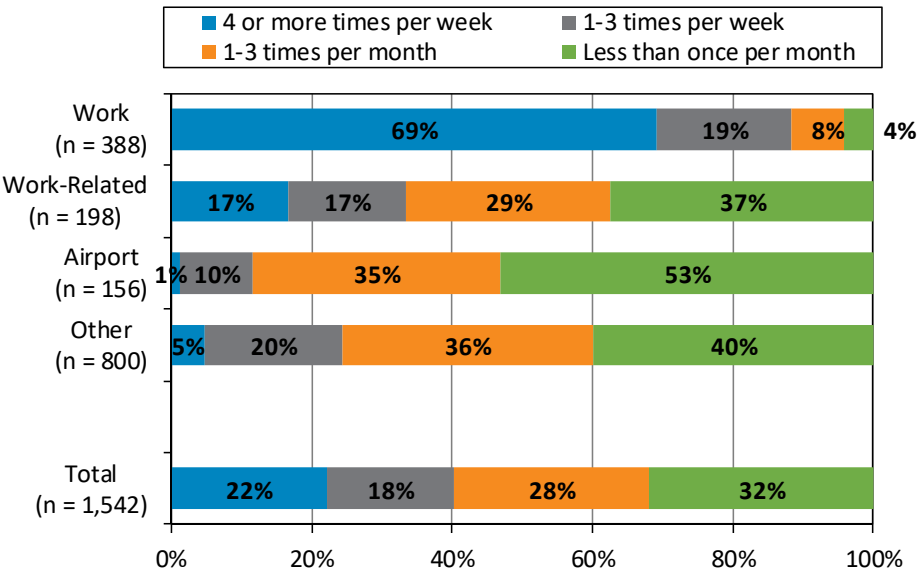



Figure 4.6
**Trip Frequency By Market Segment**

## 4.5 Debrief and Opinion Analysis

In the last section of the survey, respondents were asked to answer a series of debrief questions to provide insight on the underlying reasons for their choices in the SP question. Out of all the respondents, 491 (32 percent) never chose a tolled route for their trip. They were asked to identify their primary reason for never choosing a tolled route. **Table 4.4** provides a summary of their responses; about 44 percent said the time savings presented in the experiments were not worth the toll cost, while 31 percent were opposed to paying tolls.

**Table 4.4**
**Reason for Never Choosing a Tolled Alternative**

| Reason | Count | Percent |
|---|---|---|
| Time savings not worth the toll cost | 219 | 44% |
| Opposed to paying tolls | 153 | 31% |
| Other | 46 | 9% |
| Tolls presented were too high | 29 | 6% |
| Current route is more convenient | 23 | 5% |
| Opposed to toll roads for other reasons | 14 | 3% |
| Opposed to new roads (if potential Complete 540 user) | 4 | 1% |
| Opposed to electonic payment | 3 | 1% |
| Total | 491 | 100% |

In response to the attitudinal question about whether they support or oppose the Complete 540 project, 61 percent said they somewhat favor or strongly favor the project (see **Table 4.5**). These respondents cited less congestion (44 percent) and shorter travel times (34 percent) as primary reasons for their support. The most common reason for those opposed to Complete 540 was general opposition to toll roads (53 percent).

**Table 4.5**
**Project Opinion**

| Project Opinion | Count | Percent |
|---|---|---|
| Strongly favor | 547 | 36% |
| Somewhat favor | 388 | 25% |
| Neutral | 400 | 26% |
| Somewhat opposed | 107 | 7% |
| Strongly opposed | 100 | 7% |
| Total | 1,542 | 100% |

## 4.6 Demographic Analysis

Of the 1,542 survey respondents, more than half of the respondents identified as male (56 percent), and the median age range was 45-54 years old. Most respondents were employed full-time (66 percent), less than half (43 percent) lived in a two-person household, and 52 percent had two household vehicles.

**Table 4.6** provides the distribution of 2017 household income of respondents who chose to answer this question. The median income category of respondents for this survey was in the $100,000 - $124,999 range.

**Table 4.6**
**Reported 2017 Annual Household Income**

| Income Category | Count | Percent |
|---|---|---|
| Less than $15,000 | 12 | 1% |
| $15,000-$24,999 | 27 | 2% |
| $25,000-$34,999 | 37 | 2% |
| $35,000-$49,999 | 93 | 6% |
| $50,000-$74,999 | 202 | 13% |
| $75,000-$99,999 | 230 | 15% |
| $100,000-$124,999 | 214 | 14% |
| $125,000-$149,000 | 145 | 9% |
| $150,000-$199,999 | 182 | 12% |
| $200,000 or more | 155 | 10% |
| Not provided | 245 | 16% |
| Total | 1,542 | 100% |

# 4.7 Model Estimation for Value of Time

The primary purpose of this survey was to estimate value of time for travelers in the Triangle Expressway and Complete 540 corridors. RSG performed statistical analysis and discrete choice model estimation using the SP survey data. The statistical estimation and specification testing were completed using a conventional maximum likelihood procedure that estimated coefficients for a set of multinomial logit (MNL) models. The coefficients are a numerical representation of respondents' sensitivities to variables from the SP experiments (travel time and toll cost) and can be used to calculate value of time for travelers in the study corridor.

## 4.7.1 Specification and Segmentation

Respondents were presented with the following two options in the SP scenarios, based on the details of their reference trips:

- **Use a tolled route** (parts of Triangle Expressway or Complete 540 Phase 1 or both)
- **Use a toll-free route** (respondent's current route, or an alternate toll-free route if they used a toll route in their reference trip)

The MNL model estimates a choice probability for each alternative presented in the SP trade-off exercises. Several model forms were tested using different variables collected from the data. In addition to the travel times and toll costs presented in the SP experiments; trip characteristics, transponder ownership, attitudinal indicators, income, and demographic variables, among others, were tested to determine whether they influence respondents' choices in the SP scenarios. More details on the variables tested within the MNL model are provided in Sections 5.2 and 5.3 of the full RSG report.

The final model specification was selected based on model fit, intuitiveness and reasonableness of the model coefficients, and the expected application of the model results. The data was divided into four market segments, to be carried forth into the traffic and revenue analysis: work commute, work-related, airport, or other. The interaction between toll cost and household income was significant. The relationship indicates that as household income increases, sensitivity to toll prices decreases, but at a rate that is not directly proportional.

## 4.7.2 Willingness to Pay for Travel Time Savings (Value of Time)

In economic theory, the marginal rate of substitution is the amount of one good (i.e., money) that a person would exchange for a second good (i.e., travel time) while maintaining the same level of utility, or satisfaction. The marginal rate of substitution of the travel time and toll cost coefficients from the MNL model provides the implied toll value that travelers would be willing to pay for a given amount of travel time savings.

The resulting value of time by market segment and income level are presented in **Table 4.7**. As expected, work-related/business trips had the highest value of time, followed by trips to/from the airport. Work commute trips have a higher value of time than trips for other purposes. At the survey sample median income of $112,500, work-related trips have a value of time of $24.70 per hour, while commute trips are valued at $18.59 per hour, and trips for other purposes are valued at $17.55.

**Table 4.7**
**Value of Time, By Market Segment and Income**

| Household Income | Value of Time ($/hour) | | | |
|---|---|---|---|---|
| | Work Commute Trips | Work-Related Trips | Airport Trips | Other Trips |
| $15,000 | $10.66 | $14.16 | $11.79 | $10.07 |
| $20,000 | $11.79 | $15.67 | $13.04 | $11.13 |
| $30,000 | $13.39 | $17.79 | $14.81 | $12.64 |
| $42,500 | $14.76 | $19.61 | $16.32 | $13.94 |
| $62,500 | $16.27 | $21.62 | $18.00 | $15.37 |
| $87,500 | $17.60 | $23.38 | $19.47 | $16.62 |
| $112,500 | $18.59 | $24.70 | $20.56 | $17.55 |
| $137,500 | $19.38 | $25.75 | $21.43 | $18.30 |
| $175,000 | $20.33 | $27.01 | $22.48 | $19.20 |
| $200,000 | $20.85 | $27.71 | $23.07 | $19.69 |

## 4.8 Summary and Conclusions

An SP Survey was conducted to estimate value of time for drivers who currently travel in the Triangle region and could potentially use the Triangle Expressway or Phase 1 of the proposed Complete 540. While the original survey focused on use of Triangle Expressway and Complete 540 Phase 1, some of the origins and destinations of survey respondents were in the Complete 540 Phase 2 area. Since the resulting values of time are applied to each traffic analysis zone within the model using income and market segment information for each zone, the results of this survey are considered valid for use in evaluating trips that may also use Complete 540 Phase 2.

The travel preferences from 1,542 drivers were used to develop models to produce estimates of value of time for four trip purpose market segments. The magnitude of the parameters of these models was reasonable, and their signs were intuitively correct. The value of time that was estimated is within the ranges found in other major metropolitan areas across the country, and similar to results from surveys conducted previously in Raleigh prior to the opening of Triangle Expressway and reported in the ***Triangle Expressway Comprehensive Traffic and Revenue Study (2009)***.

RSG developed multinomial logit choice models using the survey data to generate value of time estimates by trip purpose. At the median income level of the sample ($112,500), the value of time estimates were in the range of $17.55 to $24.70 per hour, depending on trip purpose.

These results were the basis for the values of time used in this traffic and revenue study. Further adjustments made for the purposes of this study are described in Chapter 5 (Model Calibration and Refinement).

# Chapter 5
# Model Development

CDM Smith received the latest adopted version of the Triangle Regional Model (TRMv6) from the Institute of Transportation Research and Education (ITRE) at North Carolina State University for use in the traffic forecasting efforts of this study. This version of the model was adopted in May 2019, and the components of the model were received in June 2020.

TRMv6 is a trip-based, four-step travel demand model that uses socioeconomic data and transportation network (roadway and transit) characteristics as primary inputs. The model was originally developed using population, housing, and employment data for 2010, but has been revalidated to a base year of 2013; future years that are supported by ITRE for the model are 2025, 2035, and 2045. CDM Smith and Dr. Steven Appold used this information as a starting point to develop the 2019 base year model and interim year 2020 used for this study. **Figure 5.1** outlines the steps used in refining the TRMv6 for the traffic and revenue study; the boxes shaded in gray describe the four-step modeling process used in TRMv6, while the blue and green boxes describe the specific steps used by CDM Smith to refine and run the model for the traffic and revenue study.

## 5.1 Refinements to Model Inputs

The independent economic forecast, including socioeconomic estimates for 2019, were input to the TRMv6 and revised future trip tables were developed for 2019, 2025, 2035 and 2045 by running TRMv6 in its PopGen and TransCAD software platforms. Trip tables were converted to the Cube software platform for subsequent traffic assignments and 2020 trip tables were developed by interpolating between 2019 and 2025. The Cube traffic assignment was calibrated first against 2019 traffic volumes and then for observed travel speeds using HERE data collected in 2019. Calibration involves modifying inputs such as trip table patterns and other model parameters related to roadway capacity and speeds to reflect observed conditions.

Refinements to the trip tables consisted primarily of a series of select link adjustments to better reflect existing traffic levels on the Triangle Expressway mainline and ramps; and adjustments to model parameters such as values of time, truck shares, and ETC shares were made to produce conditions reflecting an average weekday in calendar year 2019 on the Triangle Expressway as closely as possible.

Refinements to the highway network included the review and disaggregation of traffic analysis zones within the project study area, resulting in 30 additional traffic analysis zones; changes to zonal connectors to improve how traffic is loaded onto the roadway network from traffic analysis zones; changes to speeds on parallel facilities such as NC 55, Davis Drive and Ten Ten Road; and changes to the highway network to simulate 2019 roadway conditions, most notably reinstating I-40 between Lake Wheeler Road and Rock Quarry Road to four lanes in each direction to reflect the completion of the construction activity as part of the Fortify I-40/I-440 project as well as the addition of other minor roads within the project study area.

## 5.2 Calibration

The TRMv6 model was used with Dr. Steven Appold's estimates of socioeconomic data for 2019 to develop regional travel patterns at 2019 levels. Additional calibration efforts involving traffic assignments were then conducted. The calibration process involved adjustments to the model to confirm that it sufficiently represents observed traffic volumes, speeds, and origin-destination travel patterns, prior to being used to predict future traffic conditions.

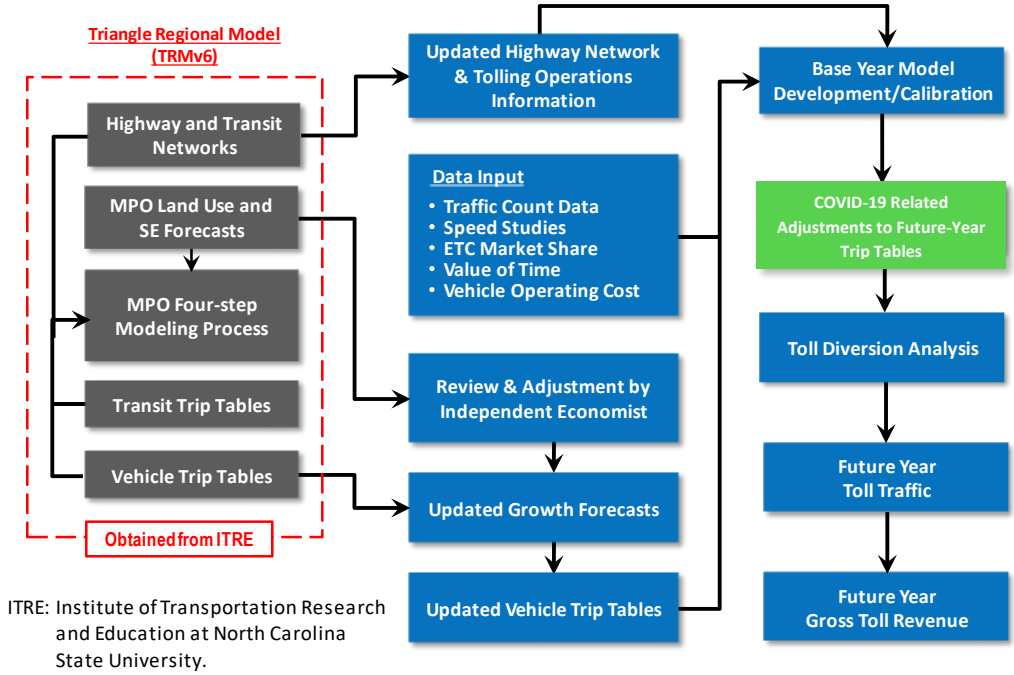



Figure 5.1
**Modeling Process for Toll Road Analysis**

In order to demonstrate that the 2019 base-year model sufficiently represents existing conditions, the following comparisons were made between model results and observed field data:

- Model traffic volume output compared to traffic counts at locations along nine screenlines;
- Model traffic volume output compared to existing traffic volumes on Triangle Expressway;
- Model travel speed output compared to observed 2019 HERE[1] travel speeds; and
- Model travel patterns compared to Streetlight data.

Details of the calibration results are provided below.

[1] HERE is geospatial travel time data obtained under NCDOT license.

## 5.3 Traffic Volume Screenline Calibration Results

The goal of traffic volume calibration was to obtain model-estimated traffic volumes in the study area that match reasonably the actual ground counts on those roadways by direction and for weekday and peak versus off-peak periods (AM, PM, Midday, and Overnight).

The traffic counts collected for this project representing weekdays from fall 2019 are grouped into nine screenlines, depicted in Chapter 2 (Figure 2.10)**.** The counts were obtained from the NCDOT Traffic Survey Group. In some cases, counts collected in 2016 or 2017 were factored to 2019 levels based on growth rates at similar locations where both 2016 and 2019 data was available. In such cases, vehicle class and directional splits by time period from the original counts were preserved. Although the level of difference between counts and assigned volume may vary between individual links, if the total assigned volume crossing the screenline is close to actual counts, the general level of traffic and travel patterns is considered to be well represented by the model.

**Table 5.1** shows the volume calibration results at the weekday level for each screenline. **Table 5.2** shows the percent difference between model volumes and observed counts by time period for each of the screenlines before and after model calibration adjustments. In total, the model volumes are within one percent of the counts at the weekday level after calibration, with all but two screenlines varying by five percent or less. On a time period basis, more than half of the screenlines were calibrated to within five percent of counts and nearly all were within ten percent of counts. There were three screenlines which varied by more than ten percent during the night time period, but these were on a fairly small base of traffic volume. Traffic volume comparisons for individual links by time period and direction are included in **Appendix B.**

**Table 5.1**
**Daily Volume Calibration Results on Screenlines**

| Screenline | Number of Links | Observed Count | Modeled Volume | | | |
|---|---|---|---|---|---|---|
| | | | Before Calibration | Percent Difference | After Calibration | Percent Difference |
| 1 | 8 | 36,768 | 34,882 | -5% | 35,023 | -5% |
| 2 | 8 | 131,121 | 125,703 | -4% | 130,590 | 0% |
| 3 | 12 | 53,910 | 50,440 | -6% | 49,606 | -8% |
| 4 | 6 | 62,206 | 67,687 | 9% | 65,218 | 5% |
| 5 | 8 | 52,309 | 54,384 | 4% | 50,909 | -3% |
| 6 | 18 | 163,847 | 160,771 | -2% | 170,867 | 4% |
| 7 | 12 | 126,541 | 139,315 | 10% | 134,689 | 6% |
| 8 | 50 | 720,865 | 678,698 | -6% | 688,389 | -5% |
| 9 | 12 | 130,952 | 135,873 | 4% | 133,204 | 2% |
| Total | 134 | 1,478,519 | 1,447,753 | -2% | 1,458,495 | -1% |

Source: Observed counts represent fall 2019 traffic counts provided by NCDOT Traffic Survey Group. Triangle Expressway traffic volumes provided by NCTA.

**Table 5.2**
**Volume Calibration Results by Time Period on Screenlines**

| Screenline | Number of Links | AM Observed Count | AM Modeled Volume | AM Percent Difference | PM Observed Count | PM Modeled Volume | PM Percent Difference | MD Observed Count | MD Modeled Volume | MD Percent Difference | NT Observed Count | NT Modeled Volume | NT Percent Difference |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8 | 8,548 | 9,055 | 6% | 8,861 | 9,358 | 6% | 12,118 | 11,048 | -9% | 7,241 | 5,562 | -23% |
| 2 | 8 | 31,491 | 31,566 | 0% | 39,250 | 41,125 | 5% | 37,962 | 36,946 | -3% | 22,416 | 20,954 | -7% |
| 3 | 12 | 11,808 | 12,299 | 4% | 15,122 | 14,580 | -4% | 17,711 | 15,244 | -14% | 9,269 | 7,482 | -19% |
| 4 | 6 | 15,433 | 15,671 | 2% | 18,078 | 19,747 | 9% | 19,392 | 19,140 | -1% | 9,302 | 10,660 | 15% |
| 5 | 8 | 11,597 | 11,233 | -3% | 15,520 | 14,911 | -4% | 16,825 | 16,498 | -2% | 8,367 | 8,267 | -1% |
| 6 | 18 | 46,841 | 49,362 | 5% | 39,483 | 40,764 | 3% | 56,864 | 59,686 | 5% | 20,658 | 21,055 | 2% |
| 7 | 12 | 35,549 | 37,515 | 6% | 31,604 | 33,197 | 5% | 45,727 | 47,994 | 5% | 13,661 | 15,984 | 17% |
| 8 | 50 | 183,094 | 172,109 | -6% | 208,330 | 206,773 | -1% | 216,999 | 203,082 | -6% | 112,441 | 106,427 | -5% |
| 9 | 12 | 34,652 | 34,477 | -1% | 36,240 | 38,715 | 7% | 40,213 | 38,563 | -4% | 19,846 | 21,449 | 8% |
| Total | 134 | 379,015 | 373,287 | -2% | 412,489 | 419,169 | 2% | 463,811 | 448,200 | -3% | 223,203 | 217,838 | -2% |

Source: Observed counts represent fall 2019 traffic counts provided by NCDOT Traffic Survey Group. Triangle Expressway traffic volumes provided by NCTA.

## 5.4 Triangle Expressway Traffic Volume Calibration Results

**Table 5.3** shows the traffic volumes (assigned versus observed) on the existing Triangle Expressway toll facility by direction for an average weekday. As part of the calibration process, select link adjustments were made to the trip tables to better replicate traffic volumes on ramps and mainlines. Nearly all daily mainline model volumes on the Triangle Expressway (those in bold in Table 5.3) were calibrated to within ten percent of the counts. Any remaining differences between modeled volumes and observed counts were used to develop adjustments that were applied to future year model output.

## 5.5 Speed Calibration

The primary objective of speed calibration was to ensure that the speeds estimated by the travel demand model closely replicate the observed speeds and that the model exhibits congestion at locations where there is actual congestion, while not showing congestion where there is no congestion in the field. CDM Smith compiled observed directional travel speed data from HERE for the year 2019 along the major roadways in the study area and summarized it for the eight time periods in the model, by segment. The resulting speed profiles (color-coded "heat" maps) served as the basis for comparison with the model-estimated speeds.

In addition to changes in the free-flow speeds of selected roadways, adjustments were made to the volume-delay curves at key bottleneck locations to enable the model to better reflect the congestion on the roadways based on observed speed data from HERE. The model calibration process was an iterative process recognizing that adjustments to speed affected the assigned traffic volumes, and changes to assigned traffic volumes resulted in changes in speeds on roadways. The iterative process ensured that adjustments made to improve speeds were not detrimental to the estimated volumes. **Table 5.4** shows the results of the speed calibration by roadway by direction. In general, most of the model-estimated speeds are within five miles per hour (mph) at the overall corridor level, although there were a few segments where this could not be achieved without considerably affecting the volume calibration.

**Table 5.3**
**Volume Calibration Results by Time Period on Triangle Expressway**

| | | Weekday | | |
|---|---|---|---|---|
| Link Description | Link Dir/Type | Observed Count | Modeled Volume | Percent Difference |
| On from NC 55 NB | NB Ramp | 8,019 | 7,965 | -1% |
| On from NC 55 SB | NB Ramp | 2,144 | 2,588 | 21% |
| **Mainline Between NC 55 SB On and Veridea Off** | **NB Mainline** | **10,163** | **10,554** | **4%** |
| Off to Veridea | NB Ramp | 101 | 166 | 64% |
| On from Veridea | NB Ramp | 1,984 | 3,003 | 51% |
| **Mainline Between Veridea On and U.S. 1 NB Off** | **NB Mainline** | **12,046** | **13,390** | **11%** |
| Off to U.S. 1 NB | NB Ramp | 937 | 1,184 | 26% |
| Off to U.S. 1 SB | NB Ramp | 382 | 429 | 12% |
| On from U.S. 1 | NB Ramp | 7,073 | 5,382 | -24% |
| **Mainline Between U.S. 1 On NB and S Salem St Off** | **NB Mainline** | **17,800** | **17,159** | **-4%** |
| Off to S Salem St | NB Ramp | 2,177 | 2,775 | 27% |
| On from S Salem St | NB Ramp | 1,746 | 2,137 | 22% |
| **Mainline Between S Salem St NB On and U.S. 64 NB Off** | **NB Mainline** | **17,369** | **16,522** | **-5%** |
| Off to U.S. 64 | NB Ramp | 2,748 | 4,652 | 69% |
| On from U.S. 64 | NB Ramp | 6,523 | 8,814 | 35% |
| **Mainline Between U.S. 64 SB On and Green Level West Off** | **NB Mainline** | **21,144** | **20,684** | **-2%** |
| Off to Green Level West | NB Ramp | 1,990 | 3,895 | 96% |
| On from Green Level West | NB Ramp | 2,200 | 4,096 | 86% |
| **Mainline Between Green Level W On and NC 55 Off** | **NB Mainline** | **21,354** | **20,886** | **-2%** |
| Off to NC 55 | NB Ramp | 2,908 | 3,318 | 14% |
| On from NC 55 | NB Ramp | 8,997 | 9,117 | 1% |
| **Mainline Between NC 55 On and Toll NC 147 Off** | **NB Mainline** | **27,443** | **26,686** | **-3%** |
| Off to Toll NC 147 | NB Ramp | 9,145 | 9,949 | 9% |
| **Mainline Between Toll NC 147 Off and Toll NC 147 On** | **NB Mainline** | **18,298** | **16,736** | **-9%** |
| On from Toll NC 147 | NB Ramp | 4,689 | 4,217 | -10% |
| **Mainline Between Toll NC 147 On and NC 54 Off** | **NB Mainline** | **22,987** | **20,953** | **-9%** |
| Off to NC 54 | NB Ramp | 3,589 | 5,426 | 51% |
| On from NC 54 | NB Ramp | 10,127 | 12,480 | 23% |
| **Mainline North Of NC 54** | **NB Mainline** | **29,525** | **28,007** | **-5%** |
| **Mainline Between NC 540 On and Davis Off** | **NB Mainline** | **13,690** | **13,667** | **0%** |
| Off to Davis Dr | NB Ramp | 3,660 | 3,762 | 3% |
| On from Hopson Rd | NB Ramp | 3,177 | 3,736 | 18% |
| **Mainline Between Hopson and I-40** | **NB Mainline** | **13,207** | **13,642** | **3%** |
| **Mainline Between I-40 and Hopson** | **SB Mainline** | **12,940** | **14,563** | **13%** |
| Off to Hopson Rd | SB Ramp | 3,300 | 3,144 | -5% |
| On from Davis Dr | SB Ramp | 4,217 | 3,545 | -16% |
| **Mainline Between Davis On and NC 540 Off** | **SB Mainline** | **13,857** | **14,964** | **8%** |
| **Mainline North Of NC 54** | **SB Mainline** | **29,294** | **28,662** | **-2%** |
| Off to NC 54 | SB Ramp | 10,165 | 13,239 | 30% |
| On from NC 54 | SB Ramp | 3,679 | 6,936 | 89% |
| **Mainline Between NC 54 On and Toll NC 147 Off** | **SB Mainline** | **22,809** | **22,358** | **-2%** |
| Off to Toll NC 147 | SB Ramp | 4,545 | 3,718 | -18% |
| **Mainline Between Toll NC 147 Off and Toll NC 147 On** | **SB Mainline** | **18,263** | **18,640** | **2%** |
| On from Toll NC 147 | SB Ramp | 9,168 | 10,747 | 17% |
| **Mainline Between Toll NC 147 On and NC 55 Off** | **SB Mainline** | **27,431** | **29,387** | **7%** |
| Off to NC 55 | SB Ramp | 9,118 | 10,982 | 20% |
| On from NC 55 | SB Ramp | 3,194 | 4,175 | 31% |
| **Mainline Between NC 55 On and Green Level W Off** | **SB Mainline** | **21,507** | **22,580** | **5%** |
| Off to Green Level West | SB Ramp | 2,458 | 4,827 | 96% |
| On from Green Level West | SB Ramp | 2,191 | 3,449 | 57% |
| **Mainline Between Green Level W On and U.S. 64 Off** | **SB Mainline** | **21,240** | **21,203** | **0%** |
| Off to U.S. 64 WB | SB Ramp | 6,483 | 9,419 | 45% |
| On from U.S. 64 WB | SB Ramp | 3,109 | 4,967 | 60% |
| **Mainline Between U.S. 64 NB On and S Salem St Off** | **SB Mainline** | **17,866** | **16,751** | **-6%** |
| Off to S Salem St | SB Ramp | 1,892 | 2,014 | 6% |
| On from S Salem St | SB Ramp | 2,141 | 3,907 | 82% |
| **Mainline Between S Salem St On and U.S. 1 Off SB** | **SB Mainline** | **18,116** | **18,644** | **3%** |
| Off to U.S. 1 SB | SB Ramp | 3,634 | 2,899 | -20% |
| On from U.S. 1 SB | SB Ramp | 543 | 1,705 | 214% |
| Off to U.S. 1 NB | SB Ramp | 3,709 | 4,558 | 23% |
| On from U.S. 1 NB | SB Ramp | 438 | 454 | 4% |
| **Mainline Between U.S. 1 NB On and Veridea Off** | **SB Mainline** | **11,753** | **13,345** | **14%** |
| Off to Veridea | SB Ramp | 1,704 | 2,670 | 57% |
| On from Veridea | SB Ramp | 95 | 121 | 27% |
| **Mainline Between Veridea On and NC 55 SB Off** | **SB Mainline** | **10,145** | **10,795** | **6%** |
| Off to NC 55 SB | SB Ramp | 8,625 | 8,725 | 1% |
| Off to NC 55 NB | SB Ramp | 1,521 | 2,070 | 36% |

Source: Observed counts represent fall 2019 traffic counts provided by NCDOT Traffic Survey Group. Triangle Expressway traffic volumes provided by NCTA.

## Table 5.4
## Speed Calibration Results by Roadway and Direction

| Road Name | From | To | Dir. | Length (miles) | Observed Speed (HERE) (1) | | | | | | | | Modeled Speed (1) | | | | | | | | Speed Difference (Modeled - Observed) (1) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Free Flow | AM1 | AM2 | AM3 | MD | PM1 | PM2 | PM3 | Free Flow | AM1 | AM2 | AM3 | MD | PM1 | PM2 | PM3 | Free Flow | AM1 | AM2 | AM3 | MD | PM1 | PM2 | PM3 |
| U.S. 1/U.S. 64 | I-40 | U.S. 64/EXIT 98 | WB | 3.6 | 67 | 67 | 66 | 64 | 65 | 57 | 42 | 59 | 66 | 64 | 62 | 62 | 62 | 55 | 51 | 61 | -1 | -3 | -3 | -2 | -4 | -2 | 8 | 2 |
| U.S. 1/U.S. 64 | U.S. 64/EXIT 98 | I-40 | EB | 3.3 | 66 | 65 | 47 | 47 | 62 | 58 | 46 | 55 | 68 | 58 | 41 | 37 | 62 | 60 | 55 | 61 | 2 | -7 | -6 | -10 | 0 | 2 | 8 | 6 |
| U.S. 64 | U.S. 1/TRYON RD | NC 751/CHAPEL RD | WB | 9.0 | 55 | 52 | 47 | 44 | 47 | 44 | 37 | 44 | 57 | 54 | 46 | 47 | 47 | 38 | 33 | 46 | 2 | 1 | -1 | 3 | 0 | -6 | -4 | 2 |
| U.S. 64 | NC 751/CHAPEL RD | U.S. 1/TRYON RD | EB | 9.0 | 56 | 54 | 47 | 42 | 48 | 43 | 38 | 43 | 58 | 47 | 33 | 42 | 47 | 42 | 42 | 49 | 2 | -7 | -13 | 0 | 0 | -1 | 5 | 6 |
| U.S. 401 | NC 55/NC 42 | I-440/I-40/U.S. 64 | SB | 13.8 | 48 | 44 | 42 | 41 | 40 | 37 | 31 | 37 | 48 | 46 | 41 | 43 | 42 | 29 | 21 | 39 | 0 | 2 | -1 | 2 | 1 | -8 | -10 | 3 |
| U.S. 401 | I-440/I-40/U.S. 64 | NC 55/NC 42 | NB | 13.1 | 48 | 43 | 34 | 35 | 41 | 39 | 39 | 41 | 49 | 42 | 25 | 37 | 42 | 40 | 40 | 43 | 0 | -1 | -9 | 2 | 1 | 0 | 0 | 2 |
| U.S. 1 | U.S. 64/EXIT 98 | NEW HILL/EXIT 89 | SB | 9.5 | 71 | 70 | 69 | 69 | 69 | 62 | 58 | 66 | 71 | 69 | 69 | 68 | 68 | 60 | 51 | 68 | 0 | -1 | -1 | 0 | -1 | -2 | -7 | 2 |
| U.S. 1 | NEW HILL/EXIT 89 | U.S. 64/EXIT 98 | NB | 9.4 | 71 | 70 | 58 | 62 | 68 | 69 | 65 | 68 | 71 | 66 | 52 | 65 | 68 | 67 | 67 | 69 | 1 | -4 | -6 | 3 | 0 | -2 | 2 | 1 |
| TEN TEN RD | NC 50 | U.S. 1 | WB | 16.2 | 43 | 37 | 27 | 29 | 37 | 36 | 35 | 36 | 41 | 33 | 23 | 30 | 36 | 34 | 33 | 35 | -2 | -4 | -5 | 1 | -1 | -2 | -2 | -1 |
| TEN TEN RD | U.S. 1 | NC 50 | EB | 16.2 | 43 | 41 | 37 | 37 | 37 | 31 | 27 | 29 | 41 | 39 | 37 | 38 | 36 | 27 | 21 | 33 | -2 | -2 | 0 | 1 | -1 | -4 | -6 | 4 |
| NC 55 Byp | NC 55/E WILLIAMS ST | NC55/S MAIN ST | SB | 4.4 | 52 | 48 | 44 | 43 | 43 | 35 | 22 | 30 | 51 | 49 | 48 | 48 | 46 | 36 | 26 | 42 | -1 | 2 | 4 | 5 | 3 | 2 | 3 | 12 |
| NC 55 Byp | NC55/S MAIN ST | NC 55/E WILLIAMS ST | NB | 4.4 | 53 | 48 | 34 | 35 | 42 | 41 | 39 | 41 | 52 | 49 | 31 | 38 | 46 | 46 | 46 | 47 | -1 | 1 | -3 | 3 | 4 | 6 | 7 | 5 |
| NC 55 | NC 55/NC 55 Byp | I-40 (DURHAM) | WB | 16.1 | 43 | 40 | 34 | 31 | 34 | 33 | 31 | 33 | 39 | 33 | 26 | 30 | 34 | 32 | 31 | 33 | -4 | -7 | -8 | -1 | 0 | -1 | 0 | 0 |
| NC 55 | I-40 (DURHAM) | NC 55/NC 55 Byp | EB | 16.3 | 43 | 39 | 34 | 32 | 34 | 31 | 28 | 31 | 39 | 36 | 32 | 33 | 34 | 27 | 25 | 32 | -4 | -3 | -3 | 1 | 0 | -3 | -3 | 1 |
| NC 55 | NC 55/NC 55 Byp | U.S. 401 | SB | 4.1 | 40 | 37 | 36 | 35 | 34 | 33 | 33 | 33 | 46 | 44 | 42 | 42 | 40 | 27 | 19 | 37 | 6 | 7 | 6 | 7 | 5 | -7 | -14 | 4 |
| NC 55 | U.S. 401 | NC 55/NC 55 Byp | NB | 4.1 | 39 | 37 | 29 | 31 | 33 | 33 | 33 | 33 | 51 | 37 | 19 | 32 | 43 | 41 | 41 | 43 | 12 | 0 | -10 | 1 | 9 | 8 | 9 | 9 |
| NC 540 | I-40/EXIT 1 | NC 55 BYP | WB | 15.4 | 72 | 70 | 69 | 69 | 70 | 72 | 70 | 72 | 74 | 73 | 73 | 73 | 73 | 70 | 64 | 72 | 1 | 3 | 4 | 4 | 3 | -2 | -6 | 0 |
| NC 540 | NC 55 BYP | I-40/EXIT 1 | EB | 16.6 | 73 | 73 | 73 | 71 | 70 | 70 | 70 | 70 | 73 | 71 | 65 | 71 | 72 | 72 | 72 | 72 | 0 | -2 | -8 | 0 | 3 | 2 | 2 | 2 |
| NC 42 | U.S. 401/N MAIN ST | U.S. 70 | WB | 18.0 | 46 | 41 | 35 | 36 | 39 | 36 | 34 | 36 | 44 | 41 | 37 | 39 | 39 | 35 | 33 | 38 | -3 | -1 | 2 | 2 | 1 | -1 | -1 | 2 |
| NC 42 | U.S. 70 | U.S. 401/N MAIN ST | EB | 18.1 | 47 | 42 | 38 | 38 | 39 | 37 | 35 | 37 | 44 | 39 | 34 | 37 | 40 | 36 | 35 | 39 | -3 | -3 | -4 | -1 | 1 | 0 | 0 | 3 |
| NC 147 | I-40 | NC 540 | SB | 4.9 | 69 | 68 | 64 | 63 | 66 | 64 | 65 | 68 | 66 | 65 | 64 | 64 | 64 | 59 | 54 | 64 | -3 | -3 | 0 | 1 | -2 | -5 | -11 | -4 |
| NC 147 | NC 540 | I-40 | NB | 5.3 | 72 | 72 | 61 | 64 | 69 | 63 | 51 | 61 | 66 | 63 | 53 | 54 | 64 | 62 | 51 | 64 | -5 | -9 | -7 | -10 | -4 | -1 | -1 | 3 |
| NC 751 | U.S. 64 | U.S. 1 | SB | 15.4 | 49 | 49 | 47 | 45 | 46 | 45 | 41 | 44 | 44 | 43 | 43 | 43 | 43 | 41 | 40 | 42 | -5 | -6 | -4 | -2 | -3 | -4 | -1 | -2 |
| NC 751 | U.S. 1 | U.S. 64 | NB | 15.4 | 49 | 49 | 46 | 44 | 45 | 46 | 45 | 45 | 44 | 42 | 39 | 41 | 43 | 43 | 42 | 43 | -5 | -7 | -6 | -3 | -2 | -3 | -3 | -3 |
| I-540 | U.S. 64/U.S. 264 | I-40/EXIT 1 | WB | 26.0 | 72 | 70 | 51 | 50 | 69 | 70 | 70 | 71 | 75 | 69 | 56 | 63 | 71 | 69 | 69 | 72 | 3 | -1 | 5 | 13 | 2 | -1 | -1 | 1 |
| I-540 | I-40/EXIT 1 | U.S. 64/U.S. 264 | EB | 24.9 | 71 | 71 | 70 | 70 | 70 | 53 | 42 | 56 | 74 | 73 | 71 | 72 | 72 | 56 | 47 | 69 | 3 | 2 | 1 | 2 | 2 | 3 | 5 | 14 |
| I-440 | I-40/EXIT 16 | I-40/EXIT 1 | CCW | 16.9 | 64 | 62 | 46 | 48 | 61 | 51 | 43 | 58 | 62 | 56 | 47 | 53 | 57 | 49 | 46 | 57 | -2 | -5 | 1 | 5 | -5 | -1 | 2 | -1 |
| I-440 | I-40/EXIT 1 | I-40/EXIT 16 | CW | 16.7 | 66 | 66 | 59 | 54 | 63 | 55 | 46 | 58 | 62 | 58 | 48 | 55 | 57 | 49 | 44 | 57 | -4 | -8 | -11 | 2 | -5 | -6 | -1 | -1 |
| I-40 | U.S. 70 | NC 55/EXIT 278 | WB | 43.0 | 69 | 58 | 46 | 48 | 66 | 62 | 55 | 61 | 69 | 57 | 41 | 55 | 60 | 53 | 52 | 62 | 0 | -1 | -5 | 7 | -6 | -9 | -3 | 1 |
| I-40 | NC 55/EXIT 278 | U.S. 70 | EB | 36.2 | 69 | 69 | 65 | 63 | 65 | 45 | 39 | 50 | 69 | 64 | 56 | 61 | 59 | 42 | 34 | 58 | 0 | -5 | -9 | -2 | -6 | -3 | -5 | 8 |
| DAVIS DR | E CORNWALLIS RD | U.S. 64 | SB | 11.6 | 44 | 41 | 37 | 34 | 37 | 34 | 29 | 33 | 40 | 38 | 35 | 36 | 37 | 29 | 25 | 34 | -4 | -2 | -1 | 2 | 0 | -6 | -4 | 1 |
| DAVIS DR | U.S. 64 | E CORNWALLIS RD | NB | 11.6 | 43 | 41 | 39 | 34 | 37 | 35 | 34 | 36 | 40 | 36 | 28 | 33 | 37 | 33 | 33 | 36 | -3 | -5 | -11 | -1 | 0 | -2 | -2 | 0 |
| U.S. 64 /U.S. 264 /I-87 | I-540 | I-440 | WB | 3.4 | 73 | 69 | 52 | 61 | 70 | 71 | 71 | 71 | 74 | 65 | 36 | 63 | 71 | 71 | 72 | 72 | 1 | -4 | -16 | 2 | 1 | 1 | 1 | 1 |
| U.S. 64 /U.S. 264 /I-87 | I-440 | I-540 | EB | 3.6 | 71 | 70 | 70 | 70 | 70 | 63 | 49 | 62 | 74 | 73 | 72 | 72 | 70 | 45 | 27 | 66 | 3 | 2 | 2 | 2 | 0 | -19 | -22 | 4 |

(1) Time periods correspond to the following hours:

AM1 = 0600 0700
AM2 = 0700 0800
AM3 = 0800 0900
MD = 0900 1600
PM1 = 1600 1700
PM2 = 1700 1800
PM3 = 1800 1900

>50 mph
40-50 mph
30-40 mph
20-30 mph
10-20 mph
0-10 mph

## 5.6 Travel Pattern Validation

Once the model calibration to speeds and volumes was completed, a final check against the Streetlight travel pattern data was made. Two sample movements from the Streetlight data are shown in Chapter 2 (Figures 2.8 and 2.9). **Table 5.5** shows a comparison of Streetlight data and model results for northbound and southbound movements. The observed share of trips that travel from the southern end of the existing Triangle Expressway to a point just north of Green Level West Road is about 50 percent in the Streetlight data and about 44 percent in the model. The Streetlight data and the model also both show that about 20 percent of the trips from the southern end of the project travel to the northern end of Toll NC 540 (north of the Toll NC 147 interchange). In the southbound direction, from the link at the northern end of the Triangle Expressway, Streetlight data shows about 44 percent of the traffic travels as far as Green Level West Road while the model shows 54 percent. Streetlight data shows about 11 percent of the total traffic from the northern end of the Triangle Expressway travels to the southern end, the entire length of the project, while the model shows 13 percent make this movement.

These, and other comparisons, indicate that the travel patterns within the model for the study area zones reasonably replicate the travel patterns observed from the Streetlight data, and are within the tolerance limits of both the data and the model.

**Table 5.5**
**Through Trip Comparison - Model versus Streetlight**

| Direction | Origin Segment | Destination Segment | Streetlight | Model |
|---|---|---|---|---|
| Northbound | NC 55 Bypass to Veridea Parkway | North of S. Salem St/Old U.S. 1 | 75% | 82% |
| | | North of Green Level West Rd | 50% | 44% |
| | | North of Toll NC 147 | 22% | 20% |
| **Direction** | **Origin Segment** | **Destination Segment** | **Streetlight** | **Model** |
| Southbound | Toll NC 540, North of Toll NC 147 | North of Green Level West Rd | 44% | 54% |
| | | North of S. Salem St/Old U.S. 1 | 24% | 26% |
| | | North of NC 55 Bypass | 11% | 13% |

## 5.7 Network Refinement

Critical elements in any comprehensive traffic and revenue study are assumptions regarding competing and complementary transportation improvements which may be expected to occur during the forecast period. As part of this study, CDM Smith reviewed the planned and proposed roadway improvement programs in the study area from the following sources:

1. The adopted ***2020-2029 NCDOT State Transportation Improvement Program*** (STIP) and amendments through October 2020. These are projects that have an identified funding and construction schedule. Projects in the STIP were all scored and prioritized through the NCDOT's Strategic Prioritization Office (SPOT) program, which is the methodology used to evaluate and score all transportation projects.

2. The ***2045 Metropolitan Transportation Plan*** (MTP). This is the long-range plan for transportation in the Triangle region. It includes roadway, transit, rail, bicycle, and pedestrian projects to be implemented through the year 2045. This plan is coordinated by the two Metropolitan Planning Organizations (MPOs) in the study area; the Capital Area MPO (CAMPO) and the Durham Chapel-Hill Carrboro MPO (DCHC MPO). Roadway improvements in the 2045 MTP include the current STIP projects. Future projects in the MTP, but not included in the STIP, do not have current schedules and are not financially committed but were developed recognizing overall future fiscal sources and constraints.

Roadway improvements in the STIP and the 2045 MTP generally aligned with TRMv6 networks provided in June. The TRMv6 model supports future years 2025, 2035 and 2045, so road improvements were incorporated into the appropriate completion year.

CDM Smith reviewed the STIP, STIP amendments, and MTP transportation projects and compared them to the projects in the TRMv6 for consistency. CDM Smith contacted NCDOT personnel to verify estimated project completion dates for modeling purposes.

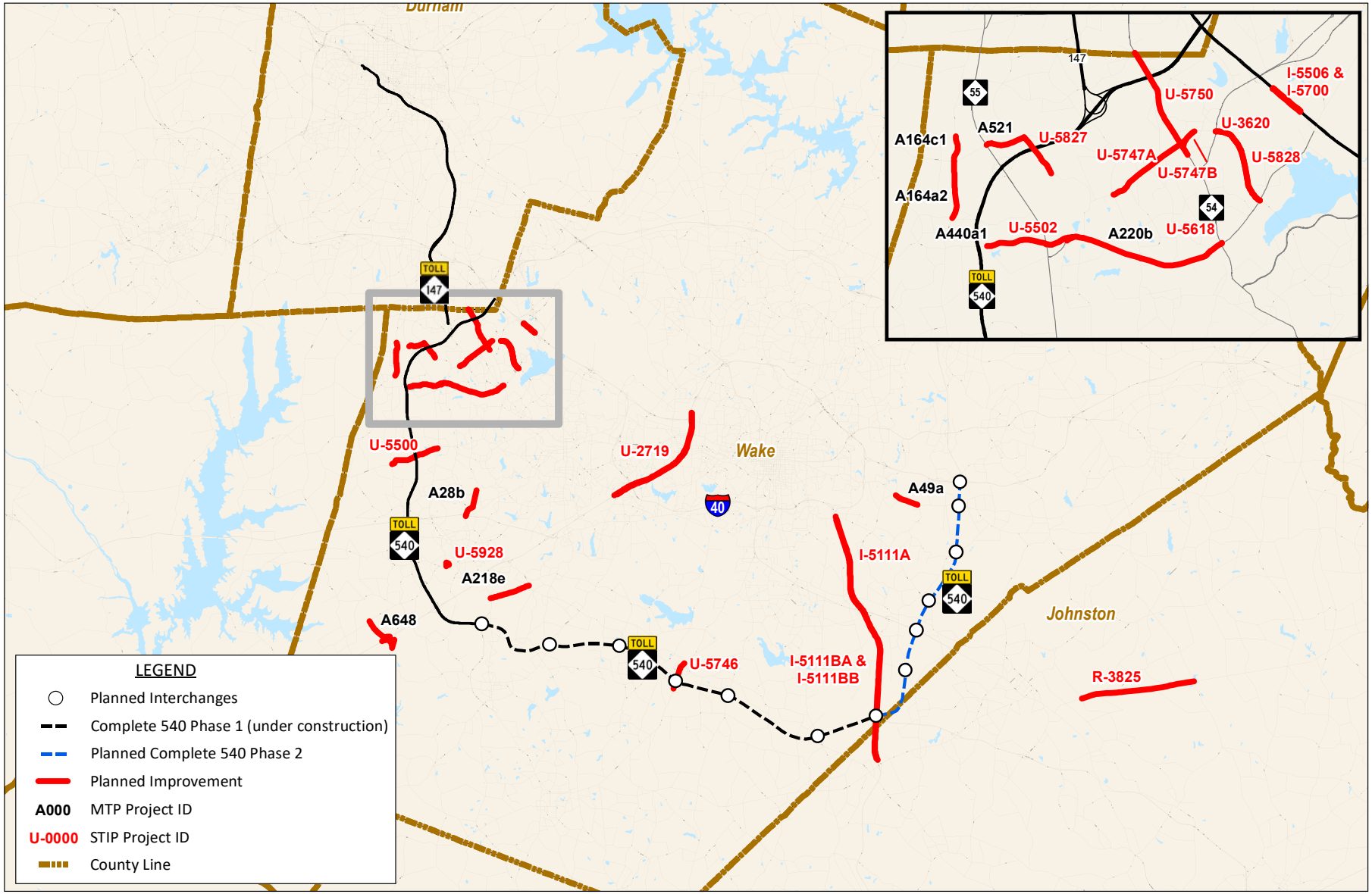
A very large number of highway improvements were assumed in this study, many of which would be competitive to the Triangle Expressway or Complete 540 Phase 1 and Phase 2. While many of these projects are not yet funded, it was considered appropriate and conservative to assume the completion of the projects for developing long-range forecasts for Triangle Expressway, Complete 540 Phase 1, and Complete 540 Phase 2, discussed in Chapter 6. In general, the shorter-term projects identified in the NCDOT STIP were included in the 2025 travel demand model networks. The longer-range improvements covered in the MTP were included in either the 2035 or 2045 TRMv6 networks as received by CDM Smith.

The following subsections describe many of the roadway improvement projects assumed in the TRMv6 roadway networks in the study area (and included in the STIP and MTP). The improvements discussed are limited to planned additional capacity (increased number of through travel lanes) and new interchanges on limited access roadways. There are additional roadway improvements assumed in the TRMv6 that include work such as pavement repair and maintenance, signalization improvements, turning lane additions, and grade separations.

### 5.7.1 Assumed 2025 Roadway Improvements

**Figure 5.2** shows roadway improvements included in the TRMv6 2025 highway networks in the Triangle Expressway and Complete 540 corridors. These improvements were assumed in the modeling and in development of traffic and toll revenue forecasts. All the improvements shown are either road widenings, a new interchange, or, in a few cases, a new road segment. The improvements are generally competitive with the Triangle Expressway and Complete 540, as they improve traffic flow and connectivity through the area on toll-free routes.

**Table 5.6** provides more detail on each of the proposed improvements; the project ID number is shown for each improvement and can be related to the numbers shown in Figure 5.2. Of particular significance with respect to Complete 540 Phase 1 and Phase 2 is the assumed widening of I-40 from six to eight lanes on the north-south segment between I-440 and U.S. 70.




## ASSUMED LONG-RANGE HIGHWAY IMPROVEMENTS - 2025

FIGURE 5.2

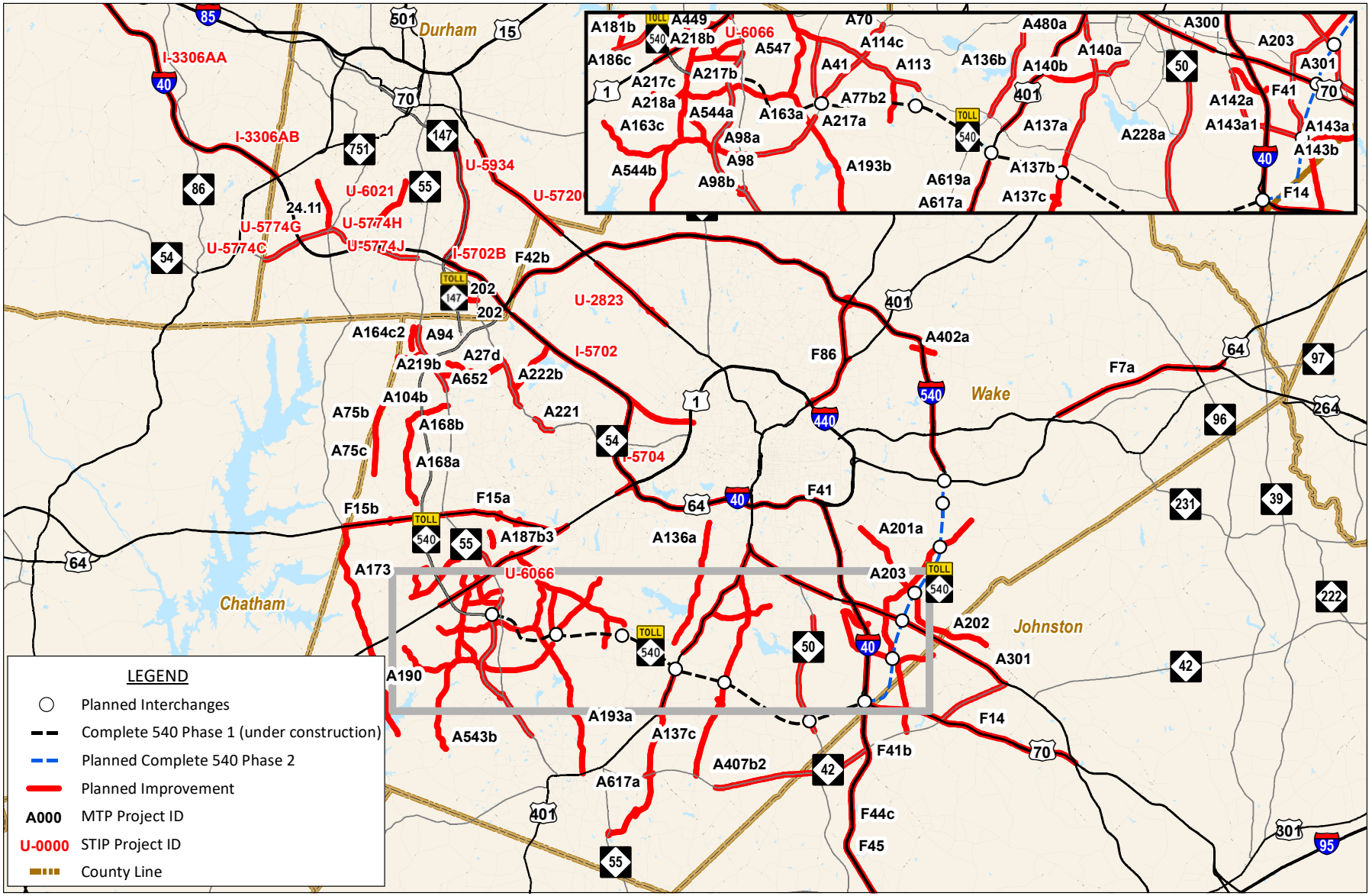
**Table 5.6**
**2025 STIP Roadway Improvements**
**Assumed in the TRMv6**

| Project STIP/MTP ID | Roadway | Location | Description |
|---|---|---|---|
| A164a2 | Green Level Church Rd | O'Kelly Chapel Rd to McCrimmon Parkway | Widen from 2 to 4 lanes |
| A164c1 | Green Level Church Rd | Folklore Way to O'Kelly Chapel Rd | Widen from 2 to 4 lanes |
| A218e | Jessie Dr (part NL) | NC 55 to Ten Ten Rd | Construct 2 lanes on new location |
| A220b | Morrisville Carpenter Rd | Davis Dr to Louis Stephens Dr | Widen from 2 to 4 lanes |
| A220c | Morrisville Carpenter Rd | Louis Stephens Dr to Good Hope Church Rd | Widen from 2 to 4 lanes |
| A28b | Davis Dr | Farm Pond Rd to U.S. 64 | Widen from 2 to 4 lanes |
| A440a1 | Carpenter Fire Station Rd | Cameron Pond Dr to NC 55 | Widen from 2 to 4 lanes |
| A49a | Poole Rd | Maybrook Dr to Barwell Rd | Widen from 2 to 4 lanes |
| A521 | O'Kelley Chapel Rd | Louis Stephens Dr to NC 55 | Construct 4 lanes on new location |
| A648 | U.S. 1/Friendship Interchange | Ols U.S. 1 Highway to Friendship Rd | Interchange |
| I-5111 | I-40 (East) | I-440 to U.S. 70 Buisness | Add 2 general purpose lanes in each direction |
| I-5506 | Aviation Parkway Interchange (Impr) | National Guard Dr to I-40 | Interchange |
| I-5700 | Airport Blvd Interchange (Impr) | I-540 to Aviation Parkway | Construct auxillary lanes |
| R-3825 | NC 42 East Widening | Glen Laurel Rd to Buffaloe Rd | Widen from 2 to 4 lanes |
| U-2719 | I-440 Widening | U.S. 1/64 to Wade Avenue | Widen from 4 to 6 lanes |
| U-5502 | Carpenter Fire Station Ext | NC 55 to Morrisville Carpenter Rd | Construct 4 lanes on new location |
| U-5618 | Morrisville Carpenter Rd | Page St to Davis Dr | Widen from 2 to 4 lanes |
| U-5747A | McCrimmon Parkway Ext | NC 54 to Davis Dr | Widen from 2 to 4 lanes |
| U-5747B | McCrimmon Parkway | Airport Blvd to NC 54 | Widen from 2 to 4 lanes |
| U-5750 | NC 54 | Perimeter Park Dr to Northern Twn Limits | Widen from 2 to 6 lanes |
| U-5827 | Louis Stephens Dr Ext (NL) | Little Drive to Poplar Pike Lane | Construct 4 lanes on new location |
| U-5828 | McCrimmon Parkway | Airport Blvd to Aviation Parkway | Widen from 2 to 4 lanes |
| U-5928 | Apex Peakway/Salem St Interchange | | Interchange |

### 5.7.2 Longer Range Roadway Improvements

**Figure 5.3** and **Table 5.7** present additional roadway improvements assumed to be completed by 2035. Many of the improvements are in the Triangle Expressway and Complete 540 corridors. The improvements are primarily road widenings, generally from two to four lanes.

There are many planned improvements on I-40 comprised primarily of roadway widening to address future anticipated traffic demand. Included in the planned improvements is a capacity increase on I-40 of an additional lane in each direction from the Durham County line, southward to NC 210 in Johnston County. This improvement may be implemented as either a managed lane, or possibly, an additional toll-free lane. The TRMv6 model assumes the additional capacity increase as a tolled, managed lane. This study also assumes the proposed capacity increase will be managed lanes, tolled at a level to preserve free-flow traffic conditions in the managed lanes. Managed lanes are also assumed to be implemented on I-540, north of Raleigh. Overall, a significant amount of increased capacity is assumed to be provided by 2035; a relatively conservative assumption for purposes of projecting future traffic and revenue on Triangle Expressway and Complete 540 Phases 1 and 2.




LEGEND

- Planned Interchanges
- Complete 540 Phase 1 (under construction)
- Planned Complete 540 Phase 2
- Planned Improvement
- A000 MTP Project ID
- U-0000 STIP Project ID
- County Line

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## ASSUMED LONG-RANGE HIGHWAY IMPROVEMENTS - 2035

FIGURE 5.3

**Table 5.7 (Page 1 of 2)**
**Year 2035 Roadway Improvements**
**Assumed in the Complete 540 Forecast Model**

| Project STIP/MTP | Roadway | Location | Description |
|---|---|---|---|
| 24.11 | Garrett Rd | NC 751 to Old Durham Rd | Widen from 2 to 4 lanes |
| 202 | Hopson Rd | Davis Dr to S Miaml-Blvd (NC 54) | Widen from 2 to 4 lanes |
| A104b | Morrisville Parkway | Green Level Church Rd to NC 55 | Widen from 2 to 4 lanes |
| A113 | Ten Ten Rd | Holly Springs Rd to Bells Lake Rd | Widen from 2 to 4 lanes |
| A114c | Ten Ten Rd | Holly Springs Rd and Kildare Farm Rd | Widen from 2 to 4 lanes |
| A136a | Lake Wheeler Rd | Tryon Rd to Penny Rd | Widen from 2 to 4 lanes |
| A136b | Lake Wheeler Rd | Penny Rd to Ten Ten Rd | Widen from 2 to 4 lanes |
| A136c | Lake Wheeler Rd | Ten Ten Rd to Hilltop-Needmore Rd | Widen from 2 to 4 lanes |
| A137a | Old Stage Rd | U.S. 40 to Ten Ten Rd | Widen from 2 to 4 lanes |
| A137b | Old Stage Rd | Ten Ten Rd to Rock Service Station | Widen from 2 to 4 lanes |
| A137c | Old Stage Rd | Rock Service Station to NC 42 | Widen from 2 to 4 lanes |
| A138a | Timber Dr/Jones Sausage Connector | U.S. 70 to Timber Dr Ext | Construct 4 lanes on new location |
| A138b | Timber Dr/Jones Sausage Connector | Jones Sausage Rd to U.S. 70 | Construct 4 lanes on new location |
| A138c | Timber Dr/Jones Sausage Connector | White Oak Rd to I-40 (South) | Widen from 2 to 4 lanes |
| A138d | White Oak-Guy Rd Connector | White Oak Rd to Guy Rd | Construct 4 lanes on new location |
| A140a | Vandora Springs Rd & Extension | Timber Dr to Old Stage Rd | Widen from 2 to 4 lanes |
| A140b | Vandora Springs Rd & Extension | Old Stage Rd to U.S. 401 | Widen from 2 to 4 lanes |
| A142a | Timber Dr East | Waterfiled Rd to White Oak Rd | Construct 4 lanes on new location |
| A143a | White Oak Rd | U.S. 70 to I-540 | Widen from 2 to 4 lanes |
| A143a1 | I-40/White Oak Interchange | | Interchange |
| A143b | White Oak Rd | I-540 to NC 42 (Johnston Co) | Widen from 2 to 4 lanes |
| A163a | Holly Springs Rd | Old Holly Springs Rd to N of NC 540 Interchange | Widen from 2 to 4 lanes |
| A163c | Friendship Rd | Richardson Rd to Old Holly Springs Apex | Widen from 2 to 4 lanes |
| A164c2 | Green Level Church Rd | Kit Creek Rd to Precept Way | Widen from 2 to 4 lanes |
| A165a2 | Airport Blvd Extension | Garden Square Lane to NC 54 | Construct 4 lanes on new location |
| A165b | Airport Blvd Extension | Davis Dr to Louis Stephens Rd | Construct 2 lanes on new location |
| A168a | Green Level Church Rd | Green Level West to Jenks Rd | Widen from 2 to 4 lanes |
| A168b | Green Level Church Rd | Green Level West to Morrisville Parkway | Widen from 2 to 4 lanes |
| A173 | New Hill Olive Chapel Rd | Old U.S. 1 to Chatham Co. | Widen from 2 to 3 lanes |
| A187b2 | Apex Peakway (East) | Laura Duncan to Old Raleigh Rd | Widen from 2 to 4 lanes |
| A187b3 | Apex Peakway (East) | Old Raleigh Rd to Center Street | Widen from 2 to 4 lanes |
| A190 | New Hill Holleman Rd | Old U.S. 1 to Avent Ferry Rd | Widen from 2 to 4 lanes |
| A193a | Sunset Lake Rd | U.S. 401 to Hilltop-Needmore Rd | Widen from 2 to 4 lanes |
| A193b | Sunset Lake Rd | Hilltop-Needmore Rd to Optimist Farm Rd | Widen from 2 to 4 lanes |
| A201a | Rock Quarry Rd | New Hope Rd to Battle Bridge Rd | Widen from 2 to 4 lanes |
| A202 | East Garner Rd | Rock Quarry Rd to Shotwell Rd | Widen from 2 to 4 lanes |
| A203 | Auburn-Knightdale Rd | Grasshopper Rd to Raynor Rd | Widen from 2 to 4 lanes |
| A217a | Sunset Lake Rd | Main St to Optimist Farm Rd | Widen from 2 to 4 lanes |
| A217b | Sunset Lake Rd Extension | Old Holly Springs Apex to Main St | Construct 4 lanes on new location |
| A218a | Old Holly Springs Apex Rd | Holly Springs Rd to Jessie Dr | Widen from 2 to 4 lanes |
| A218b | Jessie Dr (part NL) | Veridea Parkway to NC 55 | Construct 4 lanes on new location |
| A218c | Veridea Parkway | Tingen Rd to Jessie Dr | Widen from 2 to 3 lanes (turn lane) |
| A218d | Tingen Rd | Apex Peakway to Old Holly Springs Apex Rd | Widen from 2 to 3 lanes (turn lane) |
| A219a2 | McCrimmon Parkway Extension | Davis Dr to Louis Stephens Rd | Widen from 2 to 4 lanes |
| A219b | McCrimmon Parkway Extension | Louis Stephens Rd to NC 55 | Construct 4 lanes on new location |
| A221 | NC 54 | N.W. Maynard Rd to Wilson Rd | Widen from 2 to 6 lanes |
| A222b | NC 54 | Weston Parkway to McCrimmon Pkwy | Widen from 2 to 4 lanes |
| A228a | NC 50 | Timber Dr to I-540 | Widen from 2 to 4 lanes |
| A27d | Louis Stephens Dr Ext (part existing) | Poplar Pike Lane to Airport Blvd | Widen from 2 to 4 lanes |
| A300 | U.S. 70 | U.S. 401 to I-40 | Widen from 4 to 6 lanes |
| A301 | U.S. 70 | I-40 to NC 42 | Widen from 4 to 6 lanes |
| A402a | Buffaloe Rd | Spring Forest Rd Ext to Forestville Rd | Widen from 2 to 4 lanes |
| A407b2 | NC 42 | John Adams Rd to NC 50 | Widen from 2 to 4 lanes |
| A41 | Kildare Farm Rd | Ten Ten Rd to Kildare Farm Connector | Widen from 2 to 4 lanes |
| A449 | Perry Rd Extension | Apex Peakway to NC 55 Bypass | Construct 4 lanes on new location |
| A480a | U.S. 401 (South) | U.S. 70 to Ten Ten Rd | Widen from 4 to 6 lanes |
| A543b | Rex Rd Realignment | Avent Ferry Connector to Cass Holt Rd | Construct 4 lanes on new location |

**Table 5.7 (Page 2 of 2)**
**Year 2035 Roadway Improvements**
**Assumed in the Complete 540 Forecast Model**

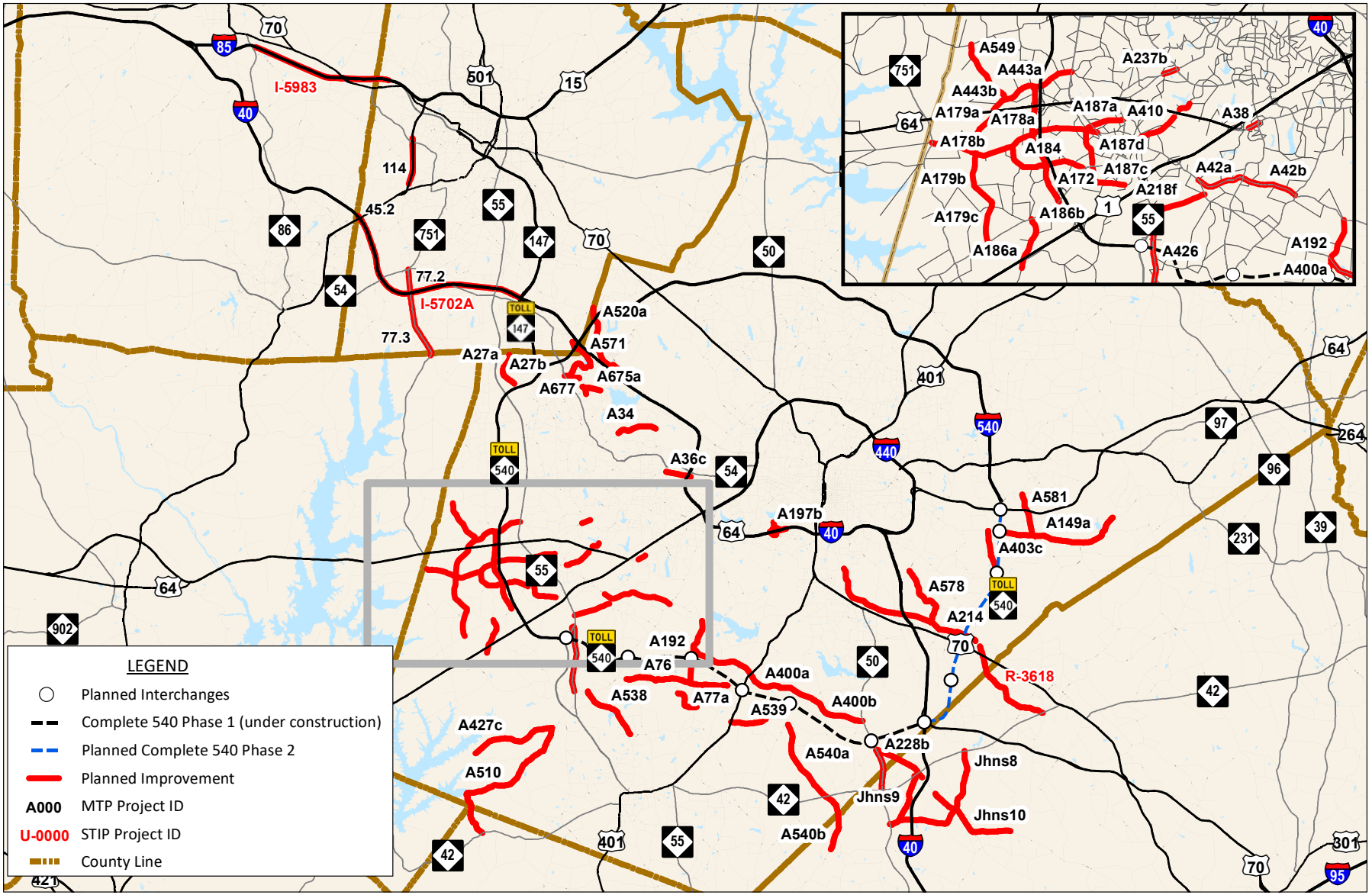
| Project STIP/MTP | Roadway | Location | Description |
|---|---|---|---|
| A544a | Avent Ferry Connector | Old Holly Springs Apex to Holly Springs Rd | Construct 4 lanes on new location |
| A544b | Avent Ferry Connector | Holly Springs Rd to Rex Rd | Construct 4 lanes on new location |
| A547 | Stephenson Rd | Ten Ten Rd to Sunset Lake Rd | Widen from 2 to 4 lanes |
| A617a | U.S. 401 Bypass | U.S. 401 (East of Fuquay-Varina) to NC 55 | Construct 6 lanes on new location |
| A619a | U.S. 401 | NC 540 to U.S. 401 Bypass | Widen from 4 to 6 lanes |
| A619b | U.S. 401 | U.S. 401 Bypass to NC 55/NC 42 | Widen from 4 to 6 lanes |
| A652 | NC 55 | Morrisville Carpenter Rd to NC 540 | Widen from 4 to 6 lanes |
| A66a | O'Kelley Chapel Rd | Alston Avenue to NC 55 | Widen from 2 to 4 lanes |
| A66b | O'Kelley Chapel Rd | Alston Avenue to NC 751 | Widen from 2 to 4 lanes |
| A70 | Holly Springs Rd | Penny Rd to Ten Ten Rd | Widen from 2 to 4 lanes |
| A71 | Holly Springs Rd | Ten Ten Rd to Kildaire Farm Rd Connector | Widen from 2 to 4 lanes |
| A75b | Yates Store Rd | Yates Store Rd to Morrisville Parkway | Construct 4 lanes on new location |
| A75c | Wimberley Rd | Morrisville Parkway to Green Level West Rd | Construct 4 lanes on new location |
| A77b2 | West Lake Rd | Ten Ten Rd and Middle Creek Park Ave | Widen from 2 to 4 lanes |
| A94 | NC 55 | NC 540 to Kit Creek Rd | Widen from 4 to 6 lanes |
| A98 | NC 55 Bypass | North Main St to Honeycutt Connector | Widen from 4 to 6 lanes |
| F14 | Clayton Bypass Widening | I-40 to U.S. 70 | Widen from 4 to 6 lanes |
| F15A | U.S. 64 West conversion to expressway | Laura Duncan Rd to I-540 | Widen from 4 to 6 lanes |
| F15B | U.S. 64 West conversion to expressway | NC 540/TriEx to NC 751 | Widen from 4 to 6 lanes |
| F41 | I-40 Managed Lanes | Wade Avenue to Johnston County | Construct 2 Managed Lanes |
| F41b | I-40 Managed Lanes | Johnston County to Cornwallis Rd | Construct 2 Managed Lanes |
| F42b | I-540 Managed Lanes | I-40 to U.S. 64 Bypass | Construct 2 Managed Lanes |
| F44c | I-40 (East) | NC 42 to NC 210 | Widen from 4 to 6 lanes |
| F44d | I-40 (East) | NC 210 to CAMPO MAB | Widen from 4 to 6 lanes |
| F45 | I-40 Managed Lanes | Cornwallis Rd to NC 210 | Construct 2 Managed Lanes |
| F7a | U.S. 64 East | U.S. 64 Bypass to U.S. 64/U.S. 264 to | Widen from 4 to 6 lanes |
| F86 | Capital Blvd | I-440 to I-540 | Corridor Upgrades on new location |
| I-3306AA | I-40 | NC 86 to I-85 | Widen from 4 to 6 lanes |
| I-3306AB | I-40 | U.S. 15-501 to NC 86 | Widen from 4 to 6 lanes |
| I-5701 | I-40 | U.S. 1/64 to Lake Wheeler Rd | Widen from 6 to 8 lanes |
| I-5702 | I-40 Managed Lanes | Durham County Line to Wade Avenue | Construct 2 Managed Lanes |
| I-5702B | I-40 Managed Lanes | Wake County Line to NC 147 | |
| I-5703 | I-40/U.S. 1/U.S. 64 Interchange | I-40/U.S. 1/U.S. 64 | Interchange |
| I-5704 | I-40 | Wade Avenue to U.S. 1/64 | Widen from 6 to 8 lanes |
| R-3410A | NC 42 West | U.S. 70 BU.S.iness to U.S. 70 Bypass | Widen from 2 to 4 lanes |
| R-3410B | NC 42 | NC 50 to I-40 | Widen from 2 to 4 lanes |
| R-3410B | NC 42 West Widening | U.S. 70 Bypass to I-40 | Widen from 2 to 4 lanes |
| U-2823 | U.S. 70 | Lumley/Westgate Rd to Duraleigh/Millbrook | Widen from 4 to 6 lanes |
| U-2901B | NC 55 | U.S.1 to North of Olive Chapel Rd | Widen from 2 to 4 lanes |
| U-5301A | U.S. 64/Laura Duncan Interchange (New) | U.S. 64 to Laura Duncan Rd | Interchange |
| U-5301B | U.S. 64/Lake Pine Interchange (New) | | Interchange |
| U-5301C | U.S. 64/Lake Pine Interchange (New) | U.S. 1 to Lake Pine Dr | Interchange |
| U-5774C | U.S. 70 (freeway conversion) | S MiamI-Blvd to Northern Durham Parkway | Widen from 4 to 6 lanes |
| U-5774G | NC 54 | I-40 Interchange to NC 751 | Widen from 2 to 4 lanes |
| U-5774H | NC 54 | NC 751 to Highgate Dr | Widen from 2 to 4 lanes |
| U-5774I | NC 54 | Fayetteville to Barbee | Widen from 2 to 4 lanes |
| U-5774J | NC 54 | Barbee to NC 55 | Widen from 2 to 4 lanes |
| U-5811 | Aviation Parkway | NC 54 to I-40 in Morrisville | Widen to multilanes |
| U-5825A | Ten Ten Rd | U.S. 1 | Interchange |
| U-5825B | Ten Ten Rd | Kildare Farm Rd to U.S. 1 | Widen from 2 to 4 lanes |
| U-5934 | NC 147 | East End Connector to I-40 | Widen from 4 to 8 lanes |
| U-5936 | Wade Ave Widening | I-40 to I-440 | Widen from 4 to 6 lanes |
| U-6021 | SR 1118 | Woodcroft Pkwy to Barbee Rd | Widen from 2 to 4 lanes |
| U-6066 | U.S. 1 | U.S. 64 to NC 540 | Widen from 4 to 6 lanes |

**Figure 5.4** and **Table 5.8** provide information on long-range improvements assumed to be in place by 2045. The projects shown are roadway widenings or new roadway, and most are located in the southern Triangle Expressway and Complete 540 corridors. Most notable would be the assumed widening of Ten Ten Road and NC 55 from two to four lanes. These roads provide local alternative routes to Complete 540. Again, improvements shown in Figure 5.4 and Table 5.8 are assumed to be in place by 2045, relatively late in the traffic and revenue projection period.

### 5.7.3 Excluded Improvement in the Base Case

One planned improvement included in the STIP and MTP that was excluded from the traffic and revenue forecast is the planned construction of an approximately 1.6-mile toll-free extension of NC 147, from the southern end of Toll NC 147 to McCrimmon Parkway and Little Road. If constructed, the improvement would include modifications to the existing interchange between Toll NC 540 and Toll NC 147 and associated toll zone and toll schedule modifications. This project is identified as STIP number U-5966.

This improvement, while planned, does not have current committed funding, and the completion of the project is expected to have positive transaction and toll revenue impacts on the Triangle Expressway. For conservative purposes, the forecasts in this report assume that this project does not occur during the forecast period.




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## ASSUMED LONG-RANGE HIGHWAY IMPROVEMENTS - 2045

FIGURE 5.4

**Table 5.8**
**Year 2045 Roadway Improvements**
**Assumed in the Complete 540 Forecast Model**

| Project STIP/MTP ID | Roadway | Location | Description |
|---|---|---|---|
| A149a | Poole Rd | I-540 to Martin Pond Rd | Widen from 2 to 4 lanes |
| A172 | Kelly Rd | Jenks Rd to Old U.S. 1 | Widen from 2 to 4 lanes |
| A178a | Olive Chapel Rd | Kelly Rd to NC 55 | Widen from 2 to 4 lanes |
| A178b | Olive Chapel Rd | Richardson Rd to Kelly Rd | Widen from 2 to 3 lanes (turn lane) |
| A178c | Olive Chapel Rd | New Hill Olive Chapel Rd to Richardson Rd | Widen from 2 to 3 lanes (turn lane) |
| A179a | Richardson Rd | U.S. 64 (West) to Olive Chapel Rd | Construct 4 lanes on new location |
| A179b | Richardson Rd | Olive Chapel Rd to Humie Olive Rd | Widen from 2 to 4 lanes |
| A179c | Richardson Rd | Humie Olive Rd to Old U.S. 1 Highway | Construct 4 lanes on new location |
| A184 | Apex Barbecue Rd | Old U.S. 1 to Olive Chapel Rd | Widen from 2 to 3 lanes (turn lane) |
| A186a | Friendship Rd | Friendship Rd to Winding Way | Widen from 2 to 3 lanes (turn lane) |
| A186b | Friendship Rd | Winding Rd to Old U.S. 1 | Widen from 2 to 3 lanes (turn lane) |
| A187a | Apex Peakway | Olive Chapel Rd to Laura Duncan Rd | Widen from 2 to 4 lanes |
| A187c | Apex Peakway | Broadstone Way to Old U.S. 1 | Widen from 2 to 4 lanes |
| A187d | Apex Peakway | Old U.S. 1 to Olive Chapel Rd | Widen from 2 to 4 lanes |
| A192 | Graham Newton Rd | Penny Rd to Optimist Farm Rd | Widen from 2 to 4 lanes |
| A197b | Center CampU.S. Conn/Interchng | Main CampU.S. Dr Connector to I-40 | Const. 4 lanes on new location |
| A214 | Garner Rd | Tryon Rd to Rock Quarry Rd | Widen from 2 to 3 lanes (turn lane) |
| A218f | Jessie Dr | NC 55 to Ten Ten Rd | Widen from 2 to 4 lanes |
| A228b | NC 50 | I-540 to NC 42 | Widen from 2 to 4 lanes |
| A237b | Old Apex Rd | Cary Parkway to Laura Duncan Rd | Widen from 2 to 4 lanes |
| A27a | Louis Stephens Dr Extension | Wake County Line to Kit Creek Rd | Widen from 2 to 4 lanes |
| A27b | Louis Stephens Dr Extension | Kit Creek Rd to O'Kelly Chapel Rd | Widen from 2 to 4 lanes |
| A34 | Cary Parkway | Evans Rd to Harrison Ave | Widen from 2 to 4 lanes |
| A36c | Chatham St | N.E. Maynard Rd to I-40 Bridge | Widen from 2 to 4 lanes |
| A38 | Tryon Rd | U.S. 64 to Kildare Farm Rd | Widen from 2 to 6 lanes |
| A400a | Ten Ten Rd | Bells Lake Rd to Old Stage Rd | Widen from 2 to 4 lanes |
| A400b | Ten Ten Rd | Old Stage Rd to NC 50 | Widen from 2 to 4 lanes |
| A403c | Hodge Rd | Auburn-Knightdale Rd to Poole Rd | Widen from 2 to 4 lanes |
| A410 | Lake Pine Dr/Old Raleigh Rd | Cary Parkway to Apex Peakway | Widen from 2 to 4 lanes |
| A426 | NC 55 (Main St) | Holly Springs Rd to Technology Dr | Widen from 2 to 4 lanes |
| A427c | Avent Ferry Rd | New Hill Holleman to Cass Holt | Widen from 2 to 4 lanes |
| A42a | Penny Rd | Ten Ten Rd to Kildaire Farm Rd | Widen from 2 to 4 lanes |
| A42b | Penny Rd | Kildaire Farm Rd to Holly Springs Rd | Widen from 2 to 4 lanes |
| A443a | Jenks Rd | NC 55 to Wimberly Rd | Widen from 2 to 3 lanes (turn lane) |
| A443b | Jenks Rd | Wimberly Rd to U.S. 64 | Widen from 2 to 4 lanes |
| A510 | Cass Holt Rd | Avent Ferry Rd to NC 42 | Widen from 2 to 4 lanes |
| A520a | Pleasant Grove Church Rd | Nelson Rd to Airport Blvd | Widen from 2 to 4 lanes |
| A520b | Pleasant Grove Church Rd | Airport Blvd to Aviation Parkway | Construct 2 lanes on new location |
| A538 | Bass Lake Rd | Holly Springs Rd to Hilltop-Needmore Rd | Widen from 2 to 4 lanes |
| A539 | Banks Rd | U.S. 401 to Fanny Brown Rd | Widen from 2 to 3 lanes (turn lane) |
| A540a | Rock Service Station | Old Stage Rd to NC 42 | Widen from 2 to 3 lanes (turn lane) |
| A540b | Rock Service Station | NC 42 to Mt Pleasant Rd | Widen from 2 to 3 lanes (turn lane) |
| A549 | Wimberley Rd | Jenks Rd to Green Level West Rd | Widen from 2 to 3 lanes |
| A571 | Slater Rd | Airport Blvd to West of NC 540 | Widen from 2 to 3 lanes (turn lane) |
| A578 | Auburn Church Rd | Jones SaU.S.age Rd to Garner Rd | Widen from 2 to 3 lanes (turn lane) |
| A581 | Bethlehem Rd | Old Faison Rd to Grasshopper Rd | Widen from 2 to 3 lanes (turn lane) |
| A675a | Morrisville East Connector | Trans Air Dr/Airport Blvd to Int'l Dr/Nova Dr | Construct 2 lanes on new location |
| A677 | Marcom Dr Extension | Watkins Rd to Sorrell Grove Church Rd | Construct 2 lanes on new location |
| A76 | Optimist Farm Rd | Lake Wheeler Rd to Sunset Lake Rd | Widen from 2 to 4 lanes |
| A77a | West Lake Rd | Larboard Rd to Bells Lake Rd | Construct 2 lanes on new location |
| A98c | Technology Drive | Technology Drive and NC 55 Bypass | Interchange |
| R-3618 | Guy Rd | U.S. 70 BU.S. to NC 42 | Widen from 2 to 4 lanes |
| Jhns8 | Cornwallis Rd | NC 42 to Old Drugstore Rd | Widen from 2 to 4 lanes |
| Jhns9 | Old Drugstore Rd | NC 42 to NC 50 | Widen from 2 to 4 lanes |
| Jhns10 | Cleveland Rd | NC 50 to Barber Mill Rd | Widen from 2 to 4 lanes |
| 45 | I-40 Managed Lanes | NC 54 to U.S. 15-501 | Widen from 6 to 8 lanes |
| 45 | I-40 Managed Lanes | NC 147 to NC 54 | Widen from 6 to 10 lanes |
| 48 | I-85 | Sparger Rd to U.S. 70 | Widen from 4 to 6 lanes |
| 48 | I-85 | U.S. 70 to I-40 | Widen from 4 to 6 lanes |
| 77.2 | NC 751 | NC 54 to Renaissance Pkwy | Widen from 2 to 4 lanes |
| 77.3 | NC 751 | Renaissance Pkwy to O'Kelly Chapel Rd | Widen from 2 to 4 lanes |
| 114 | U.S. 15-501 Bypass | MLK Parkway to I-85 | Widen from 4 to 6 lanes |

# 5.8 Other Modeling Assumptions and Inputs

**Table 5.9** provides a concise summary of modeling assumptions and inputs used in each of the assignment years; 2020, 2025, 2035 and 2045.

**Table 5.9**
**Model Inputs (VOT, VOC and CPI)**

| | 2020 | 2025 | 2035 | 2045 |
|---|---|---|---|---|
| **Value Of Time ($/minute)** | | | | |
| Non-Airport | | | | |
| Commute | $0.335 | $0.380 | $0.472 | $0.583 |
| Work-Based Other | 0.432 | 0.489 | 0.608 | 0.750 |
| Other | 0.310 | 0.351 | 0.437 | 0.539 |
| Airport | | | | |
| Commute | $0.372 | $0.422 | $0.524 | $0.647 |
| Work-Based Other | 0.359 | 0.406 | 0.505 | 0.623 |
| Other | 0.363 | 0.411 | 0.511 | 0.630 |
| **Vehicle Operating Cost ($/mile)** | | | | |
| Toll Class 1 | $0.198 | $0.212 | $0.271 | $0.341 |
| Toll Class 2 & 3 | 0.643 | 0.727 | 0.977 | 1.245 |

| | 2020-2025 | 2025-2035 | 2035-2045 |
|---|---|---|---|
| **Annual Inflation (1)** | 2.53% | 2.20% | 2.12% |

(1) Moody's Analytics Raleigh MSA Forecast

A critical parameter in any traffic and revenue analysis relates to value of time (VOT). This is a measure of motorist's willingness to pay for time savings, and the values in Table 5.9 are shown in terms of dollars per minute. VOT information was derived from stated preference (SP) surveys conducted in 2018 by RSG and summarized in Chapter 4 of this report.

It is important to recognize that the VOT information in Table 5.9 reflects weighted regionwide averages. As part of the SP survey, a relationship was established between VOT and estimated household income by Traffic Analysis Zone (TAZ). Hence, VOT in individual traffic zones also varied from the averages shown based on median household income in each TAZ.

The VOT values derived from the SP survey were inflated to 2019 levels and used as a starting point in the model calibration for this study. The resulting VOT was increased across the board by an additional 5 percent during model calibration to improve consistency between modeled and actual 2019 Triangle Expressway traffic volumes. The results of this process are reflected in VOT values shown in Table 5.9. Values shown for subsequent years were adjusted in proportion to inflation assumptions, also shown in the table.

The vehicle operating costs (VOC), in dollars per mile, were developed based on U.S Energy Information Administration (EIA) forecasts of fuel prices, changes in fuel efficiency standards adopted by the U.S. Environmental Protection Agency (EPA) in April 2019, and the 2019 information on average vehicle maintenance costs from the Automobile Association of America. Estimates were derived for toll Class 1 (2-axle vehicles), and toll Classes 2 and 3 combined to represent vehicles with three or more axles. Vehicle operating costs are considerable higher for larger vehicles, primarily due to lower fuel efficiency.

Finally, the bottom of Table 5.9 shows assumptions regarding annual inflation rates in the Raleigh Metropolitan Statistical Area (MSA) as expressed in the consumer price index (CPI). The CPI forecasts were obtained from Moody's Analytics. From 2020 to 2025, inflation is estimated at 2.53 percent per year. CPI is forecast to average 2.20 percent per year from 2025 to 2035, and 2.12 percent per from 2035 to 2045. VOT and VOC projections were increased to reflect changes in CPI. Toll rates on the Triangle Expressway are increased annually through 2035 by a previously adopted toll schedule.

Annual toll rate increases beginning in 2036 are indexed to the forecast CPI. After 2045, toll rates increase by an assumed 2.0 percent per year.

## 5.9 Adjustments to Future Trip Tables

As noted earlier, the updated socioeconomic forecasts developed by Dr. Appold as summarized in Chapter 3 did not take into account any impacts of the ongoing COVID-19 pandemic since there was very limited actual data available on changes at the small area level at the time of his analysis and the situation continues to evolve.

In light of this, COVID-19 related impacts have been applied to the future-year trip tables used in this study in two ways. First, it is assumed that the pandemic will have resulted in a slowdown in growth over the short-term. To reflect this impact in the traffic and revenue forecasts, the total growth previously assumed to take place between 2019 and 2025 has been assumed to be delayed two years to 2027. Assuming that the 2025 trip tables reflecting Dr. Appold's changes will occur by 2027, an adjusted 2025 trip table was developed by interpolation from 2019. The net difference between the 2025 and 2027 trip tables was also subtracted from the baseline 2035 and 2045 trip tables to recognize this delayed growth. Second, as discussed in Chapter 3 (Section 3.4.4), available data on increased rates of telecommuting were used to estimate a 4 percent reduction in future work and business-related trips within the 2025, 2035 and 2045 trip tables used for this study.

# Chapter 6
# Traffic and Revenue Forecast

As described in Chapter 1, this Traffic and Revenue Study develops forecasts for Triangle Expressway and Complete 540 Phase 1 and Phase 2. Complete 540 Phase 1, which is currently under construction, will extend the Triangle Expressway from its southern terminus at the NC 55 Bypass to I-40 and U.S. 70. This study assumes that Complete 540 Phase 1 would open on July 1, 2023. Complete 540 Phase 2 would extend Toll NC 540 from the eastern terminus of Phase 1 at I-40 and U.S. 70 to U.S. 64/U.S. 264/Interstate 87 (I-87). This study assumes that Complete 540 Phase 2 would open on July 1, 2026.

The forecast includes the recently opened Triangle Expressway interchange with Morrisville Parkway and the addition of a mainline toll location north of this interchange. No further additions or expansions to the Triangle Expressway are assumed in the forecast presented in this chapter.

This chapter includes a description of the forecasting approach, the approach to estimating short-term and long-term impacts of COVID-19, important forecast assumptions, and a 40-year traffic and revenue forecast for Triangle Expressway with Complete 540 Phase 1 and Phase 2.

## 6.1 Forecasting Approach

Traffic and revenue projections were developed for calendar years 2020 through 2060, and then converted to state fiscal years (FY), which extend from July 1st through June 30th. The Triangle Regional Model Version 6 (TRMv6) was used to develop long-term forecasts; this model has a long-range horizon year of 2045. Socioeconomic data updated by Dr. Steven Appold (see Chapter 3) were input to the TRMv6 model to generate trip tables representing travel demand for 2019, 2025, 2035 and 2045 model years. Traffic assignments using the 2019 trip tables were validated to 2019 traffic counts, representing pre-pandemic conditions. Similarly, the trip tables generated by the TRMv6 model for future years are considered to be pre-pandemic estimates, since neither the input socioeconomic forecasts nor the TRMv6 model has been altered to reflect events of the past nine months.

CDM Smith has reflected impacts of COVID-19 in two ways: (1) near-term impacts through 2024 were developed through extrapolation of observed monthly traffic impacts and initial recovery patterns; and (2) medium- to longer-term adjustments to trip tables used in the traffic models to reflect impacts on growth and telecommuting. First, actual experience from March through October 2020 on the Triangle Expressway (see Section 2.3.2) was used to estimate monthly impacts due to COVID-19 through the end of 2021 assuming continued restrictions on public and private gatherings into spring 2021 and wider distribution of a vaccine by summer 2021, which would allow the lifting of most restrictions.

Next, the TRMv6 output trip tables for 2025, 2035, and 2045 were adjusted to reflect potential changes to growth and telecommuting as a direct result of the pandemic. It is assumed that the pandemic will have resulted in a slowdown in growth over the short-term that would delay by two years the growth previously assumed to take place between 2019 and 2025. Assuming that the 2025 trip tables reflecting Dr. Appold's changes will instead occur by 2027, an adjusted 2025 trip table was developed by interpolation from 2019. The net adjustments at 2025 levels were applied to the 2035

and 2045 trip tables as well. Then, it is assumed that one of the responses to the pandemic, large-scale working from home, will result in a permanent shift in the share of workers allowed/choosing to work from home more frequently. As discussed in Section 3.4.4, a comparison of estimates of pre-pandemic versus peak rates of telecommuting from spring 2020 by job sectors was used to estimate the boundaries of possible shares of return to work versus continued work from home for each sector. The estimates for each job sector was weighted by the share of jobs in each sector to develop a net average change in rates of trip-making. An average four percent reduction in trip tables representing commute-to-work and non-home based trips (likely business-related trips) was estimated through 2045. These adjusted trip tables were then used for the final traffic assignments that form the basis of this traffic and revenue study.

Traffic and revenue projections for years 2022 through 2024 were developed by interpolating the traffic and revenue estimates between a "no-COVID" 2020 and 2025 based on model results using trip tables adjusted for COVID-19 impacts and applying gradually dampened COVID-19-related impacts. Forecasts between 2025, 2035, and 2045 were developed primarily through interpolation between model year control points. Estimates for years following 2045 were based on assumed nominal growth in traffic, and annual toll rate increases of approximately 2.0 percent.

The forecast period in this study extends beyond the year 2040. With progressive developments in vehicle technology, it is widely anticipated there will likely be modifications in urban mobility patterns in the long term. It is anticipated that there will be a gradual increasing shift toward "shared mobility" travel and, ultimately, fully autonomous driverless vehicles. While it is increasingly accepted that mobility change is coming, there remains considerable uncertainty regarding exactly what will occur and when the transition will happen. Based on research now underway, it is likely that over the long term we may see a reduction in the number of vehicles on the road but an actual increase in vehicle miles of travel, depending on the level of shift to shared mobility services. On balance, the impact on potential traffic and toll revenue may prove to be negligible. It is noted that the forecasts included in this report do not assume any specific change in travel patterns and characteristics, beyond assumed increases in telecommuting. If disruptive technology change does ultimately have a significant impact on urban mobility, it will likely occur after the year 2040, relatively late in the forecast period covered by this study.

## 6.2 Basic Assumptions

Traffic and revenue estimates for the Triangle Expressway and Complete 540 Phases 1 and 2 are predicated on the following basic assumptions, which are considered reasonable for purpose of the base case forecasts:

1. Tolls on the Triangle Expressway and Complete 540 Phases 1 and 2 will be charged for three vehicle classes, using a cashless all-electronic toll collection methodology. Two payment types will continue to be offered; electronic toll collection with transponders (ETC) and Bill by Mail (BBM), utilizing video imaging of license plates for those vehicles not equipped with transponders. Toll rates for each year of the forecast period will be as shown in Tables 6.1 and 6.2, which assumes continued annual increases in toll rates. Any changes in the assumed rates of annual increase, or discontinuation of annual rate increases, will impact traffic and revenue forecasts.

2. Highway and other transportation improvements as set forth in Tables 5.6, 5.7 and 5.8 will be implemented within the time frames assumed in those tables. No other transportation

improvement projects, particularly new roads, additional road capacity or new interchanges will be constructed during the forecast period, other than those shown in Table 5.6, 5.7 and 5.8.

3. The annual rate of inflation will be as shown in Table 5.9 for purposes of the forecast. Any change in inflation rates could affect traffic and revenue even if toll rates continue to be adjusted in accordance with the assumed toll rates shown in Tables 6.1 and 6.2.

4. Estimated method-of-payment market shares among ETC and BBM transactions will be as shown in Table 6.9.

5. Economic growth in the project study area will generally occur as forecasted by the independent economist used in the study, whose work is summarized in Chapter 3, along with the two year growth lag and 4 percent reduction in work-based trips due to long-term COVID-19 impacts discussed in section 5.9.

6. Leakage and fee revenue adjustments are applied to the estimated gross toll revenue forecasts. The adjustments are based on seven years of actual experience on the Triangle Expressway, provided by NCTA. The forecast assumes that toll revenue collection, particularly as related to BBM transactions and processing fee revenue, will continue to be collected at similar rates over the forecast period.

7. The Triangle Expressway will continue to be well maintained, efficiently operated, effectively signed and promoted to encourage maximum usage.

8. Motor fuel will remain in adequate supply throughout the forecast period. Fuel price increases will not significantly exceed the overall rate of inflation. Fuel price forecasts provided by the U.S. Energy Information Administration through 2050 will generally be experienced.

9. No national, state or regional emergency will arise that would abnormally restrict the use of motor vehicles. Future transportation technology changes will not significantly negatively impact traffic and revenue on Triangle Expressway over the projection period.

Any significant departure from these basic assumptions could materially affect traffic and revenue potential on the Triangle Expressway.

## 6.3 Assumed Toll Rates

The current toll schedule for Triangle Expressway was originally adopted by the NCTA Board of Directors on June 20, 2013, and was subsequently amended as new interchanges at Veridea Parkway and Morrisville Parkway were opened. In accordance with NCTA toll rate policy, which states the NCTA Board will adopt toll rates that are expected to generate at least as much revenue as is projected in the traffic and revenue study, each of these changes to Triangle Expressway toll rates were informed by the most current traffic and revenue study at the time of adoption.

The toll rates for Triangle Expressway assumed for this study match the NCTA Board-adopted toll schedule through 2035. Beyond 2035 annual toll rate increases assumed for this study were revised to keep pace with CPI forecasts of approximately 2.1 percent per year as described in Chapter 5 of this report (Table 5.9), which is higher than the approximately 1.4 percent per year increase between

2035 and 2051 in the current NCTA Board-adopted toll schedule. The toll rates assumed in this study for Complete 540 Phase 1 and Phase 2 were designed to have a similar per-mile rate as a through-trip on Triangle Expressway, and are subject to the same annual increases assumed for Triangle Expressway.

Class 1 toll rates by year for each toll zone are shown for Triangle Expressway in **Table 6.1** and for Complete 540 Phase 1 and Phase 2 in **Table 6.2**. Rates are shown separately for ETC and BBM transactions at each location. A location map with each of the Triangle Expressway toll zone IDs presented in Table 6.1 can be seen in Chapter 2 of this report (Figure 2.1).

These tables also show the assumed average annual percent increase in toll rates for each tolling point and payment category. Using the through-trip rate as an overall measure, toll rates will increase by an average of 3.0 percent per year between 2020 and 2035, and about 2.1 percent per year after 2035. Overall, between 2020 and 2060, toll rates will increase by an average annual amount of 2.4 percent.

**Figure 6.1** shows assumed toll rates by toll zone on the Triangle Expressway and Complete 540 Phase 1 and Phase 2 for 2026, the assumed opening year of Phase 2. Toll rates are shown separately for ETC and BBM, for each of the three vehicle classes.

For example, the ETC toll rate for Class 1 vehicles at the eastern-most mainline toll point located just west of I-40 would be $0.62 (shown in red). At the same location, a Class 1 vehicle without an ETC transponder would be charged $0.95. Higher toll rates are shown at the mainline toll point immediately to the west; this is because of a longer distance between interchanges at Old Stage Road and NC 50 as compared with the eastern-most section of the project. As is current practice, it is assumed that the Class 2 toll will be twice the Class 1 toll while the Class 3 toll, which represents vehicles with more than three axles, would be set at four times the Class 1 rate.

Figure 6.1 also shows through-trip rates for ETC vehicles on both the Triangle Expressway and Complete 540 Phase 1 and Phase 2 at 2026 rates. For a Class 1 vehicle, using ETC, a 15.1 mile through trip on the Triangle Expressway portion of the project would be charged $3.71. The through-trip toll for the Complete 540 Phase 1 portion of the project, a distance of 17.1 miles, would be $4.33. The through-trip toll for the Complete 540 Phase 2 portion of the project, a distance of approximately 10.3 miles, would be $2.61. It is important to recognize that the toll rates shown in Figure 6.1 reflect 2026 conditions, after six years of annual rate increases from current toll rates on Triangle Expressway.

**Table 6.1**
**Assumed Class 1 Toll Rates By Year**
**Triangle Expressway Toll Zones**

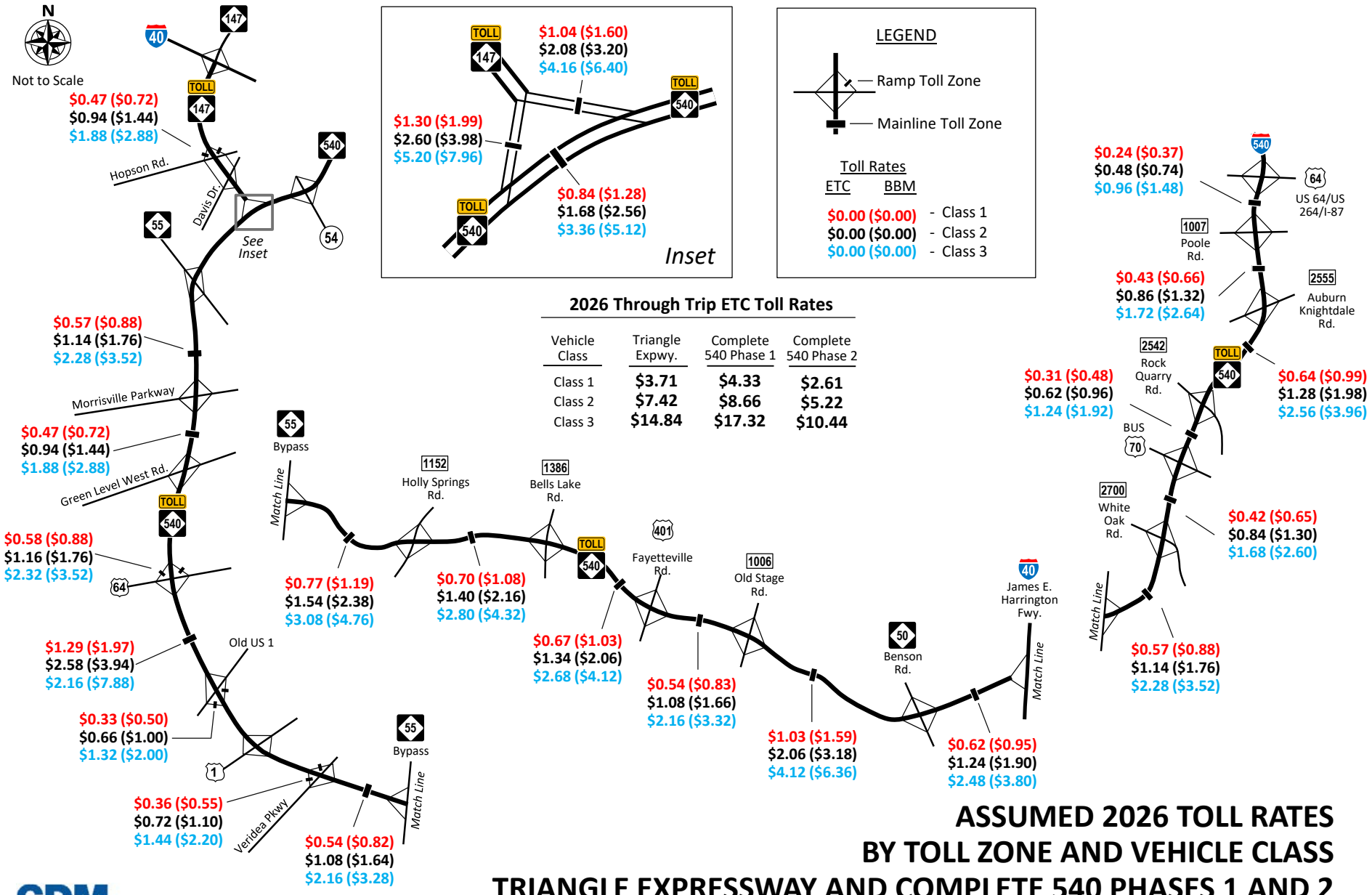
| Calendar | T01/T02 | | T09/T10 | | T05/T06 | | T13/T14 | | T15/T16 | | T17/T18 | | T21/T22 | | T25/T26 | | T29/T30 | | T31/T32 | | T33/T34 | | ETC Through Trip via Toll NC 540 (3) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year (1) | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | Toll Rate | Per-mile Rate |
| 2020 (2) | $0.39 | $0.60 | $0.87 | $1.33 | $1.08 | $1.66 | $0.70 | $1.07 | $0.48 | $0.73 | $0.39 | $0.60 | $0.48 | $0.73 | $1.08 | $1.65 | $0.28 | $0.42 | $0.30 | $0.46 | $0.45 | $0.69 | $3.10 | $0.205 |
| 2021 | 0.41 | 0.62 | 0.90 | 1.38 | 1.12 | 1.72 | 0.72 | 1.10 | 0.49 | 0.76 | 0.41 | 0.63 | 0.50 | 0.76 | 1.11 | 1.70 | 0.28 | 0.43 | 0.31 | 0.47 | 0.47 | 0.71 | 3.20 | 0.212 |
| 2022 | 0.42 | 0.64 | 0.93 | 1.42 | 1.16 | 1.77 | 0.74 | 1.13 | 0.51 | 0.78 | 0.42 | 0.65 | 0.51 | 0.78 | 1.14 | 1.75 | 0.30 | 0.45 | 0.32 | 0.49 | 0.48 | 0.73 | 3.29 | 0.218 |
| 2023 | 0.43 | 0.66 | 0.95 | 1.46 | 1.19 | 1.82 | 0.77 | 1.17 | 0.52 | 0.80 | 0.43 | 0.66 | 0.53 | 0.81 | 1.17 | 1.80 | 0.30 | 0.46 | 0.33 | 0.50 | 0.49 | 0.75 | 3.38 | 0.224 |
| 2024 | 0.45 | 0.68 | 0.99 | 1.51 | 1.23 | 1.88 | 0.79 | 1.20 | 0.54 | 0.83 | 0.45 | 0.69 | 0.54 | 0.83 | 1.21 | 1.86 | 0.31 | 0.47 | 0.34 | 0.52 | 0.51 | 0.78 | 3.50 | 0.232 |
| 2025 | 0.46 | 0.70 | 1.01 | 1.55 | 1.27 | 1.94 | 0.81 | 1.24 | 0.55 | 0.85 | 0.46 | 0.71 | 0.56 | 0.86 | 1.25 | 1.91 | 0.32 | 0.49 | 0.35 | 0.53 | 0.52 | 0.80 | 3.59 | 0.238 |
| 2026 | 0.47 | 0.72 | 1.04 | 1.60 | 1.30 | 1.99 | 0.84 | 1.28 | 0.57 | 0.88 | 0.47 | 0.72 | 0.58 | 0.88 | 1.29 | 1.97 | 0.33 | 0.50 | 0.36 | 0.55 | 0.54 | 0.82 | 3.71 | 0.246 |
| 2027 | 0.49 | 0.74 | 1.08 | 1.65 | 1.34 | 2.05 | 0.86 | 1.31 | 0.59 | 0.90 | 0.49 | 0.75 | 0.60 | 0.91 | 1.32 | 2.03 | 0.34 | 0.52 | 0.37 | 0.57 | 0.56 | 0.85 | 3.82 | 0.253 |
| 2028 | 0.50 | 0.76 | 1.11 | 1.70 | 1.38 | 2.12 | 0.88 | 1.35 | 0.61 | 0.93 | 0.50 | 0.77 | 0.61 | 0.93 | 1.36 | 2.09 | 0.35 | 0.53 | 0.38 | 0.58 | 0.57 | 0.87 | 3.92 | 0.260 |
| 2029 | 0.52 | 0.79 | 1.14 | 1.75 | 1.42 | 2.18 | 0.91 | 1.39 | 0.62 | 0.96 | 0.52 | 0.80 | 0.63 | 0.96 | 1.40 | 2.15 | 0.36 | 0.55 | 0.39 | 0.60 | 0.59 | 0.90 | 4.04 | 0.268 |
| 2030 | 0.53 | 0.81 | 1.17 | 1.80 | 1.46 | 2.24 | 0.94 | 1.44 | 0.64 | 0.99 | 0.53 | 0.82 | 0.65 | 0.99 | 1.45 | 2.22 | 0.37 | 0.57 | 0.40 | 0.62 | 0.61 | 0.93 | 4.17 | 0.276 |
| 2031 | 0.54 | 0.83 | 1.21 | 1.85 | 1.51 | 2.31 | 0.97 | 1.48 | 0.66 | 1.01 | 0.55 | 0.85 | 0.67 | 1.02 | 1.49 | 2.29 | 0.38 | 0.59 | 0.42 | 0.64 | 0.63 | 0.96 | 4.30 | 0.285 |
| 2032 | 0.56 | 0.85 | 1.25 | 1.91 | 1.55 | 2.38 | 0.99 | 1.52 | 0.68 | 1.05 | 0.57 | 0.88 | 0.69 | 1.05 | 1.54 | 2.36 | 0.39 | 0.60 | 0.43 | 0.66 | 0.65 | 0.99 | 4.43 | 0.293 |
| 2033 | 0.58 | 0.88 | 1.28 | 1.96 | 1.60 | 2.45 | 1.03 | 1.57 | 0.70 | 1.07 | 0.58 | 0.89 | 0.71 | 1.08 | 1.58 | 2.43 | 0.40 | 0.62 | 0.44 | 0.68 | 0.67 | 1.02 | 4.56 | 0.302 |
| 2034 | 0.60 | 0.91 | 1.32 | 2.02 | 1.64 | 2.52 | 1.06 | 1.62 | 0.72 | 1.11 | 0.60 | 0.92 | 0.73 | 1.11 | 1.63 | 2.50 | 0.41 | 0.63 | 0.45 | 0.70 | 0.69 | 1.05 | 4.70 | 0.311 |
| 2035 | 0.61 | 0.93 | 1.36 | 2.08 | 1.69 | 2.60 | 1.09 | 1.67 | 0.74 | 1.14 | 0.62 | 0.95 | 0.75 | 1.15 | 1.68 | 2.57 | 0.43 | 0.66 | 0.47 | 0.72 | 0.71 | 1.08 | 4.84 | 0.321 |
| 2036 | 0.62 | 0.95 | 1.39 | 2.14 | 1.73 | 2.66 | 1.11 | 1.71 | 0.76 | 1.17 | 0.63 | 0.97 | 0.77 | 1.19 | 1.72 | 2.65 | 0.44 | 0.68 | 0.48 | 0.74 | 0.72 | 1.11 | 4.94 | 0.327 |
| 2037 | 0.64 | 0.99 | 1.42 | 2.19 | 1.76 | 2.71 | 1.14 | 1.76 | 0.77 | 1.19 | 0.65 | 1.00 | 0.78 | 1.20 | 1.75 | 2.70 | 0.45 | 0.69 | 0.49 | 0.75 | 0.74 | 1.14 | 5.05 | 0.334 |
| 2038 | 0.65 | 1.00 | 1.45 | 2.23 | 1.80 | 2.77 | 1.16 | 1.79 | 0.79 | 1.22 | 0.66 | 1.02 | 0.80 | 1.23 | 1.79 | 2.76 | 0.46 | 0.71 | 0.50 | 0.77 | 0.76 | 1.17 | 5.16 | 0.342 |
| 2039 | 0.66 | 1.02 | 1.48 | 2.28 | 1.84 | 2.83 | 1.18 | 1.82 | 0.80 | 1.23 | 0.68 | 1.05 | 0.82 | 1.26 | 1.83 | 2.82 | 0.47 | 0.72 | 0.51 | 0.79 | 0.77 | 1.19 | 5.26 | 0.348 |
| 2040 | 0.68 | 1.05 | 1.51 | 2.33 | 1.88 | 2.90 | 1.21 | 1.86 | 0.82 | 1.26 | 0.69 | 1.06 | 0.83 | 1.28 | 1.86 | 2.86 | 0.48 | 0.74 | 0.52 | 0.80 | 0.79 | 1.22 | 5.37 | 0.356 |
| 2041 | 0.69 | 1.06 | 1.54 | 2.37 | 1.91 | 2.94 | 1.23 | 1.89 | 0.84 | 1.29 | 0.70 | 1.08 | 0.85 | 1.31 | 1.90 | 2.93 | 0.49 | 0.75 | 0.53 | 0.82 | 0.80 | 1.23 | 5.47 | 0.362 |
| 2042 | 0.71 | 1.09 | 1.57 | 2.42 | 1.95 | 3.00 | 1.26 | 1.94 | 0.86 | 1.32 | 0.71 | 1.09 | 0.87 | 1.34 | 1.94 | 2.99 | 0.50 | 0.77 | 0.54 | 0.83 | 0.82 | 1.26 | 5.59 | 0.370 |
| 2043 | 0.72 | 1.11 | 1.61 | 2.48 | 2.00 | 3.08 | 1.29 | 1.99 | 0.87 | 1.34 | 0.74 | 1.14 | 0.89 | 1.37 | 1.98 | 3.05 | 0.51 | 0.79 | 0.56 | 0.86 | 0.84 | 1.29 | 5.72 | 0.379 |
| 2044 | 0.74 | 1.14 | 1.64 | 2.53 | 2.04 | 3.14 | 1.31 | 2.02 | 0.89 | 1.37 | 0.75 | 1.16 | 0.90 | 1.39 | 2.03 | 3.13 | 0.52 | 0.80 | 0.57 | 0.88 | 0.86 | 1.32 | 5.84 | 0.387 |
| 2045 | 0.75 | 1.16 | 1.67 | 2.57 | 2.08 | 3.20 | 1.34 | 2.06 | 0.91 | 1.40 | 0.76 | 1.17 | 0.92 | 1.42 | 2.07 | 3.19 | 0.53 | 0.82 | 0.58 | 0.89 | 0.87 | 1.34 | 5.95 | 0.394 |
| 2046 | 0.77 | 1.19 | 1.70 | 2.62 | 2.12 | 3.26 | 1.37 | 2.11 | 0.93 | 1.43 | 0.77 | 1.19 | 0.94 | 1.45 | 2.11 | 3.25 | 0.54 | 0.83 | 0.59 | 0.91 | 0.89 | 1.37 | 6.07 | 0.402 |
| 2047 | 0.78 | 1.20 | 1.74 | 2.68 | 2.16 | 3.33 | 1.39 | 2.14 | 0.95 | 1.46 | 0.79 | 1.22 | 0.96 | 1.48 | 2.15 | 3.31 | 0.55 | 0.85 | 0.60 | 0.92 | 0.91 | 1.40 | 6.19 | 0.410 |
| 2048 | 0.80 | 1.23 | 1.77 | 2.73 | 2.21 | 3.40 | 1.42 | 2.19 | 0.97 | 1.49 | 0.80 | 1.23 | 0.98 | 1.51 | 2.20 | 3.39 | 0.56 | 0.86 | 0.62 | 0.95 | 0.92 | 1.42 | 6.31 | 0.418 |
| 2049 | 0.81 | 1.25 | 1.81 | 2.79 | 2.25 | 3.47 | 1.45 | 2.23 | 0.99 | 1.52 | 0.82 | 1.26 | 1.00 | 1.54 | 2.24 | 3.45 | 0.57 | 0.88 | 0.63 | 0.97 | 0.94 | 1.45 | 6.44 | 0.426 |
| 2050 | 0.83 | 1.28 | 1.84 | 2.83 | 2.30 | 3.54 | 1.48 | 2.28 | 1.00 | 1.54 | 0.84 | 1.29 | 1.02 | 1.57 | 2.29 | 3.53 | 0.59 | 0.91 | 0.64 | 0.99 | 0.96 | 1.48 | 6.57 | 0.435 |
| 2051 | 0.85 | 1.31 | 1.88 | 2.90 | 2.35 | 3.62 | 1.51 | 2.33 | 1.02 | 1.57 | 0.86 | 1.32 | 1.04 | 1.60 | 2.34 | 3.60 | 0.60 | 0.92 | 0.65 | 1.00 | 0.98 | 1.51 | 6.71 | 0.444 |
| 2052 | 0.86 | 1.32 | 1.91 | 2.94 | 2.39 | 3.68 | 1.54 | 2.37 | 1.04 | 1.60 | 0.87 | 1.34 | 1.06 | 1.63 | 2.38 | 3.67 | 0.61 | 0.94 | 0.67 | 1.03 | 1.00 | 1.54 | 6.83 | 0.452 |
| 2053 | 0.88 | 1.36 | 1.95 | 3.00 | 2.44 | 3.76 | 1.57 | 2.42 | 1.06 | 1.63 | 0.89 | 1.37 | 1.08 | 1.66 | 2.43 | 3.74 | 0.63 | 0.97 | 0.68 | 1.05 | 1.02 | 1.57 | 6.97 | 0.462 |
| 2054 | 0.90 | 1.39 | 1.99 | 3.06 | 2.49 | 3.83 | 1.60 | 2.46 | 1.08 | 1.66 | 0.91 | 1.40 | 1.10 | 1.69 | 2.48 | 3.82 | 0.64 | 0.99 | 0.69 | 1.06 | 1.04 | 1.60 | 7.11 | 0.471 |
| 2055 | 0.92 | 1.42 | 2.03 | 3.13 | 2.54 | 3.91 | 1.63 | 2.51 | 1.10 | 1.69 | 0.93 | 1.43 | 1.13 | 1.74 | 2.53 | 3.90 | 0.65 | 1.00 | 0.71 | 1.09 | 1.06 | 1.63 | 7.25 | 0.480 |
| 2056 | 0.93 | 1.43 | 2.07 | 3.19 | 2.59 | 3.99 | 1.67 | 2.57 | 1.13 | 1.74 | 0.94 | 1.45 | 1.15 | 1.77 | 2.58 | 3.97 | 0.66 | 1.02 | 0.72 | 1.11 | 1.08 | 1.66 | 7.40 | 0.490 |
| 2057 | 0.95 | 1.46 | 2.11 | 3.25 | 2.64 | 4.07 | 1.70 | 2.62 | 1.15 | 1.77 | 0.96 | 1.48 | 1.17 | 1.80 | 2.63 | 4.05 | 0.68 | 1.05 | 0.74 | 1.14 | 1.10 | 1.69 | 7.54 | 0.499 |
| 2058 | 0.97 | 1.49 | 2.16 | 3.33 | 2.69 | 4.14 | 1.73 | 2.66 | 1.17 | 1.80 | 0.99 | 1.52 | 1.20 | 1.85 | 2.68 | 4.13 | 0.69 | 1.06 | 0.75 | 1.16 | 1.12 | 1.72 | 7.69 | 0.509 |
| 2059 | 0.99 | 1.53 | 2.21 | 3.41 | 2.76 | 4.25 | 1.77 | 2.73 | 1.20 | 1.85 | 1.02 | 1.56 | 1.23 | 1.90 | 2.75 | 4.23 | 0.71 | 1.09 | 0.77 | 1.19 | 1.15 | 1.76 | 7.89 | 0.523 |
| 2060 | 1.02 | 1.57 | 2.27 | 3.50 | 2.83 | 4.36 | 1.81 | 2.80 | 1.23 | 1.90 | 1.05 | 1.60 | 1.26 | 1.95 | 2.82 | 4.34 | 0.73 | 1.12 | 0.79 | 1.22 | 1.18 | 1.80 | 8.09 | 0.536 |
| **Average Annual Percent Change in Toll Rates** | | | | | | | | | | | | | | | | | | | | | | | | |
| 2020-2025 | 3.4 | 3.1 | 3.0 | 3.1 | 3.3 | 3.2 | 3.0 | 3.0 | 2.8 | 3.1 | 3.4 | 3.4 | 3.1 | 3.3 | 3.0 | 3.0 | 2.7 | 3.1 | 3.1 | 2.9 | 2.9 | 3.0 | 3.0 | 3.0 |
| 2025-2035 | 2.9 | 2.9 | 3.0 | 3.0 | 2.9 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 2.9 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.1 | 3.2 | 3.0 | 3.0 | 3.0 |
| 2035-2045 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.1 |
| 2045-2060 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.0 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.2 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.1 |
| **2020-2045** | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.5 | 2.5 | 2.4 | 2.5 | 2.4 | 2.4 | 2.4 | 2.5 | 2.5 | 2.5 | 2.4 | 2.4 | 2.4 | 2.4 |

(1) Annual toll rate increases are assumed to be implemented on January 1st of each year.
(2) Mainline toll zone north of Morrisville Parkway interchange began recording toll transactions August 9, 2020.
(3) Through-trip toll rates and distances, shown in this table, exclude the Toll NC 147 portion of Triangle Expressway.

**Table 6.2**
**Assumed Class 1 Toll Rates by Toll Zone**
**Complete 540 Phases 1 and 2**

| | Complete 540 Phase 1 | | | | | | | | | | | | Complete 540 Phase 2 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Calendar Year (1) | NC 55 Bypass - Holly Springs Rd. | | Holly Springs Rd.- Bells Lake Rd. | | Bells Lake Rd. - U.S. 401 | | U.S. 401 - Old Stage Rd. | | Old Stage Rd. - NC 50 | | NC 50 - I-40 | | I-40 - White Oak Rd. | | White Oak Rd. - Bus. 70 | | Bus. 70 - Rock Quarry Rd. | | Rock Quarry Rd. - Auburn Knightdale Rd. | | Auburn Knightdale Rd. - Poole Rd. | | Poole Rd. - Knightdale Bypass | | ETC Through Trip via Complete 540 Phase 1 | | ETC Through Trip via Complete 540 Phase 2 | |
| | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | ETC | BBM | Toll Rate | Per-mile Rate | Toll Rate | Per-mile Rate |
| 2023 (2) | $0.70 | $1.08 | $0.64 | $0.99 | $0.61 | $0.94 | $0.49 | $0.75 | $0.94 | $1.45 | $0.57 | $0.88 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $3.95 | $0.231 | $ - | $ - |
| 2024 | 0.72 | 1.11 | 0.66 | 1.02 | 0.63 | 0.97 | 0.51 | 0.79 | 0.97 | 1.49 | 0.58 | 0.89 | - | - | - | - | - | - | - | - | - | - | - | - | 4.07 | 0.238 | - | - |
| 2025 | 0.74 | 1.14 | 0.68 | 1.05 | 0.65 | 1.00 | 0.52 | 0.80 | 1.00 | 1.54 | 0.60 | 0.92 | - | - | - | - | - | - | - | - | - | - | - | - | 4.19 | 0.245 | - | - |
| 2026 (3) | 0.77 | 1.19 | 0.70 | 1.08 | 0.67 | 1.03 | 0.54 | 0.83 | 1.03 | 1.59 | 0.62 | 0.95 | 0.57 | 0.88 | 0.42 | 0.65 | 0.31 | 0.48 | 0.64 | 0.99 | 0.43 | 0.66 | 0.24 | 0.37 | 4.33 | 0.253 | 2.61 | 0.253 |
| 2027 | 0.79 | 1.22 | 0.73 | 1.12 | 0.69 | 1.06 | 0.55 | 0.85 | 1.06 | 1.63 | 0.64 | 0.99 | 0.58 | 0.89 | 0.44 | 0.68 | 0.32 | 0.49 | 0.66 | 1.02 | 0.44 | 0.68 | 0.24 | 0.37 | 4.46 | 0.261 | 2.68 | 0.260 |
| 2028 | 0.81 | 1.25 | 0.74 | 1.14 | 0.71 | 1.09 | 0.57 | 0.88 | 1.09 | 1.68 | 0.65 | 1.00 | 0.60 | 0.92 | 0.45 | 0.69 | 0.32 | 0.49 | 0.68 | 1.05 | 0.45 | 0.69 | 0.25 | 0.39 | 4.57 | 0.267 | 2.75 | 0.267 |
| 2029 | 0.84 | 1.29 | 0.77 | 1.19 | 0.73 | 1.12 | 0.59 | 0.91 | 1.12 | 1.72 | 0.67 | 1.03 | 0.62 | 0.95 | 0.46 | 0.71 | 0.33 | 0.51 | 0.70 | 1.08 | 0.47 | 0.72 | 0.26 | 0.40 | 4.72 | 0.276 | 2.84 | 0.276 |
| 2030 | 0.86 | 1.32 | 0.79 | 1.22 | 0.75 | 1.16 | 0.60 | 0.92 | 1.16 | 1.79 | 0.69 | 1.06 | 0.64 | 0.99 | 0.48 | 0.74 | 0.34 | 0.52 | 0.72 | 1.11 | 0.48 | 0.74 | 0.26 | 0.40 | 4.85 | 0.284 | 2.92 | 0.283 |
| 2031 | 0.89 | 1.37 | 0.82 | 1.26 | 0.78 | 1.20 | 0.62 | 0.95 | 1.20 | 1.85 | 0.72 | 1.11 | 0.66 | 1.02 | 0.49 | 0.75 | 0.36 | 0.55 | 0.75 | 1.16 | 0.50 | 0.77 | 0.27 | 0.42 | 5.03 | 0.294 | 3.03 | 0.294 |
| 2032 | 0.92 | 1.42 | 0.84 | 1.29 | 0.80 | 1.23 | 0.64 | 0.99 | 1.23 | 1.89 | 0.74 | 1.14 | 0.68 | 1.05 | 0.51 | 0.79 | 0.37 | 0.57 | 0.77 | 1.19 | 0.51 | 0.79 | 0.28 | 0.43 | 5.17 | 0.302 | 3.12 | 0.303 |
| 2033 | 0.95 | 1.46 | 0.87 | 1.34 | 0.83 | 1.28 | 0.66 | 1.02 | 1.27 | 1.96 | 0.76 | 1.17 | 0.70 | 1.08 | 0.52 | 0.80 | 0.38 | 0.59 | 0.79 | 1.22 | 0.53 | 0.82 | 0.29 | 0.45 | 5.34 | 0.312 | 3.21 | 0.312 |
| 2034 | 0.97 | 1.49 | 0.89 | 1.37 | 0.85 | 1.31 | 0.68 | 1.05 | 1.31 | 2.02 | 0.78 | 1.20 | 0.72 | 1.11 | 0.54 | 0.83 | 0.39 | 0.60 | 0.82 | 1.26 | 0.55 | 0.85 | 0.30 | 0.46 | 5.48 | 0.320 | 3.32 | 0.322 |
| 2035 | 1.00 | 1.54 | 0.92 | 1.42 | 0.88 | 1.36 | 0.70 | 1.08 | 1.34 | 2.06 | 0.81 | 1.25 | 0.74 | 1.14 | 0.55 | 0.85 | 0.40 | 0.62 | 0.84 | 1.29 | 0.56 | 0.86 | 0.31 | 0.48 | 5.65 | 0.330 | 3.40 | 0.330 |
| 2036 | 1.02 | 1.57 | 0.94 | 1.45 | 0.89 | 1.37 | 0.71 | 1.09 | 1.37 | 2.11 | 0.82 | 1.26 | 0.76 | 1.17 | 0.56 | 0.86 | 0.41 | 0.63 | 0.86 | 1.32 | 0.57 | 0.88 | 0.31 | 0.48 | 5.75 | 0.336 | 3.47 | 0.337 |
| 2037 | 1.04 | 1.60 | 0.96 | 1.48 | 0.91 | 1.40 | 0.73 | 1.12 | 1.40 | 2.16 | 0.84 | 1.29 | 0.77 | 1.19 | 0.58 | 0.89 | 0.42 | 0.65 | 0.87 | 1.34 | 0.59 | 0.91 | 0.32 | 0.49 | 5.88 | 0.344 | 3.55 | 0.345 |
| 2038 | 1.07 | 1.65 | 0.98 | 1.51 | 0.93 | 1.43 | 0.75 | 1.16 | 1.43 | 2.20 | 0.86 | 1.32 | 0.79 | 1.22 | 0.59 | 0.91 | 0.43 | 0.66 | 0.89 | 1.37 | 0.60 | 0.92 | 0.33 | 0.51 | 6.02 | 0.352 | 3.63 | 0.352 |
| 2039 | 1.09 | 1.68 | 1.00 | 1.54 | 0.95 | 1.46 | 0.76 | 1.17 | 1.46 | 2.25 | 0.87 | 1.34 | 0.80 | 1.23 | 0.60 | 0.92 | 0.43 | 0.66 | 0.91 | 1.40 | 0.61 | 0.94 | 0.33 | 0.51 | 6.13 | 0.358 | 3.68 | 0.357 |
| 2040 | 1.11 | 1.71 | 1.02 | 1.57 | 0.97 | 1.49 | 0.77 | 1.19 | 1.49 | 2.29 | 0.89 | 1.37 | 0.82 | 1.26 | 0.61 | 0.94 | 0.44 | 0.68 | 0.93 | 1.43 | 0.62 | 0.95 | 0.34 | 0.52 | 6.25 | 0.365 | 3.76 | 0.365 |
| 2041 | 1.13 | 1.74 | 1.03 | 1.59 | 0.99 | 1.52 | 0.79 | 1.22 | 1.51 | 2.33 | 0.91 | 1.40 | 0.83 | 1.28 | 0.62 | 0.95 | 0.45 | 0.69 | 0.95 | 1.46 | 0.63 | 0.97 | 0.35 | 0.54 | 6.36 | 0.372 | 3.83 | 0.372 |
| 2042 | 1.15 | 1.77 | 1.06 | 1.63 | 1.01 | 1.56 | 0.81 | 1.25 | 1.55 | 2.39 | 0.93 | 1.43 | 0.85 | 1.31 | 0.64 | 0.99 | 0.46 | 0.71 | 0.97 | 1.49 | 0.65 | 1.00 | 0.35 | 0.54 | 6.51 | 0.381 | 3.92 | 0.381 |
| 2043 | 1.18 | 1.82 | 1.08 | 1.66 | 1.03 | 1.59 | 0.83 | 1.28 | 1.59 | 2.45 | 0.95 | 1.46 | 0.87 | 1.34 | 0.65 | 1.00 | 0.47 | 0.72 | 0.99 | 1.52 | 0.66 | 1.02 | 0.36 | 0.55 | 6.66 | 0.389 | 4.00 | 0.388 |
| 2044 | 1.20 | 1.85 | 1.10 | 1.69 | 1.05 | 1.62 | 0.84 | 1.29 | 1.62 | 2.49 | 0.97 | 1.49 | 0.89 | 1.37 | 0.66 | 1.02 | 0.48 | 0.74 | 1.01 | 1.56 | 0.68 | 1.05 | 0.37 | 0.57 | 6.78 | 0.396 | 4.09 | 0.397 |
| 2045 | 1.23 | 1.89 | 1.13 | 1.74 | 1.07 | 1.65 | 0.86 | 1.32 | 1.65 | 2.54 | 0.99 | 1.52 | 0.91 | 1.40 | 0.68 | 1.05 | 0.49 | 0.75 | 1.03 | 1.59 | 0.69 | 1.06 | 0.38 | 0.59 | 6.93 | 0.405 | 4.18 | 0.406 |
| 2046 | 1.25 | 1.93 | 1.15 | 1.77 | 1.10 | 1.69 | 0.88 | 1.36 | 1.68 | 2.59 | 1.01 | 1.56 | 0.93 | 1.43 | 0.69 | 1.06 | 0.50 | 0.77 | 1.05 | 1.62 | 0.70 | 1.08 | 0.38 | 0.59 | 7.07 | 0.413 | 4.25 | 0.413 |
| 2047 | 1.28 | 1.97 | 1.17 | 1.80 | 1.12 | 1.72 | 0.90 | 1.39 | 1.72 | 2.65 | 1.03 | 1.59 | 0.95 | 1.46 | 0.71 | 1.09 | 0.51 | 0.79 | 1.07 | 1.65 | 0.72 | 1.11 | 0.39 | 0.60 | 7.22 | 0.422 | 4.35 | 0.422 |
| 2048 | 1.30 | 2.00 | 1.20 | 1.85 | 1.14 | 1.76 | 0.91 | 1.40 | 1.75 | 2.70 | 1.05 | 1.62 | 0.96 | 1.48 | 0.72 | 1.11 | 0.52 | 0.80 | 1.09 | 1.68 | 0.73 | 1.12 | 0.40 | 0.62 | 7.35 | 0.430 | 4.42 | 0.429 |
| 2049 | 1.33 | 2.05 | 1.22 | 1.88 | 1.17 | 1.80 | 0.93 | 1.43 | 1.79 | 2.76 | 1.07 | 1.65 | 0.99 | 1.52 | 0.73 | 1.12 | 0.53 | 0.82 | 1.12 | 1.72 | 0.75 | 1.16 | 0.41 | 0.63 | 7.51 | 0.439 | 4.53 | 0.440 |
| 2050 | 1.36 | 2.09 | 1.25 | 1.93 | 1.19 | 1.83 | 0.95 | 1.46 | 1.82 | 2.80 | 1.09 | 1.68 | 1.00 | 1.54 | 0.75 | 1.16 | 0.54 | 0.83 | 1.14 | 1.76 | 0.76 | 1.17 | 0.42 | 0.65 | 7.66 | 0.448 | 4.61 | 0.448 |
| 2051 | 1.39 | 2.14 | 1.27 | 1.96 | 1.21 | 1.86 | 0.97 | 1.49 | 1.86 | 2.86 | 1.12 | 1.72 | 1.03 | 1.59 | 0.76 | 1.17 | 0.55 | 0.85 | 1.16 | 1.79 | 0.78 | 1.20 | 0.43 | 0.66 | 7.82 | 0.457 | 4.71 | 0.457 |
| 2052 | 1.41 | 2.17 | 1.30 | 2.00 | 1.24 | 1.91 | 0.99 | 1.52 | 1.90 | 2.93 | 1.14 | 1.76 | 1.04 | 1.60 | 0.78 | 1.20 | 0.56 | 0.86 | 1.18 | 1.82 | 0.79 | 1.22 | 0.43 | 0.66 | 7.98 | 0.467 | 4.78 | 0.464 |
| 2053 | 1.44 | 2.22 | 1.32 | 2.03 | 1.26 | 1.94 | 1.01 | 1.56 | 1.94 | 2.99 | 1.16 | 1.79 | 1.07 | 1.65 | 0.79 | 1.22 | 0.58 | 0.89 | 1.21 | 1.86 | 0.81 | 1.25 | 0.44 | 0.68 | 8.13 | 0.475 | 4.90 | 0.476 |
| 2054 | 1.47 | 2.26 | 1.35 | 2.08 | 1.28 | 1.97 | 1.03 | 1.59 | 1.97 | 3.03 | 1.18 | 1.82 | 1.09 | 1.68 | 0.81 | 1.25 | 0.59 | 0.91 | 1.23 | 1.89 | 0.82 | 1.26 | 0.45 | 0.69 | 8.28 | 0.484 | 4.99 | 0.484 |
| 2055 | 1.50 | 2.31 | 1.38 | 2.13 | 1.31 | 2.02 | 1.05 | 1.62 | 2.01 | 3.10 | 1.21 | 1.86 | 1.11 | 1.71 | 0.83 | 1.28 | 0.60 | 0.92 | 1.26 | 1.94 | 0.84 | 1.29 | 0.46 | 0.71 | 8.46 | 0.495 | 5.10 | 0.495 |
| 2056 | 1.53 | 2.36 | 1.40 | 2.16 | 1.34 | 2.06 | 1.07 | 1.65 | 2.05 | 3.16 | 1.23 | 1.89 | 1.13 | 1.74 | 0.84 | 1.29 | 0.61 | 0.94 | 1.28 | 1.97 | 0.86 | 1.32 | 0.47 | 0.72 | 8.62 | 0.504 | 5.19 | 0.504 |
| 2057 | 1.56 | 2.40 | 1.43 | 2.20 | 1.36 | 2.09 | 1.09 | 1.68 | 2.09 | 3.22 | 1.25 | 1.93 | 1.15 | 1.77 | 0.86 | 1.32 | 0.62 | 0.95 | 1.31 | 2.02 | 0.87 | 1.34 | 0.48 | 0.74 | 8.78 | 0.513 | 5.29 | 0.514 |
| 2058 | 1.59 | 2.45 | 1.46 | 2.25 | 1.39 | 2.14 | 1.11 | 1.71 | 2.13 | 3.28 | 1.28 | 1.97 | 1.17 | 1.80 | 0.88 | 1.36 | 0.63 | 0.97 | 1.33 | 2.05 | 0.89 | 1.37 | 0.49 | 0.75 | 8.96 | 0.524 | 5.39 | 0.523 |
| 2059 | 1.63 | 2.51 | 1.50 | 2.31 | 1.43 | 2.19 | 1.14 | 1.75 | 2.18 | 3.36 | 1.31 | 2.02 | 1.20 | 1.85 | 0.90 | 1.39 | 0.65 | 0.99 | 1.36 | 2.10 | 0.91 | 1.40 | 0.50 | 0.77 | 9.19 | 0.537 | 5.52 | 0.536 |
| 2060 | 1.67 | 2.57 | 1.54 | 2.37 | 1.47 | 2.25 | 1.17 | 1.79 | 2.24 | 3.45 | 1.34 | 2.07 | 1.23 | 1.90 | 0.92 | 1.43 | 0.67 | 1.02 | 1.39 | 2.15 | 0.93 | 1.44 | 0.51 | 0.79 | 9.43 | 0.551 | 5.65 | 0.549 |
| **Average Annual Percent Change in Toll Rates** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2026-2035 | 2.9 | 2.9 | 3.1 | 3.1 | 3.1 | 3.1 | 2.9 | 3.0 | 3.0 | 2.9 | 3.0 | 3.1 | 2.9 | 2.9 | 3.0 | 3.0 | 2.9 | 2.9 | 3.1 | 3.0 | 3.0 | 3.0 | 2.9 | 2.9 | 3.0 | 3.0 | 3.0 | 3.0 |
| 2035-2045 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.1 | 2.0 | 2.1 | 2.1 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 1.9 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 |
| 2045-2060 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.1 | 2.0 | 2.1 | 2.0 | 2.1 | 2.0 | 2.1 | 2.1 | 2.1 | 2.0 | 2.0 | 2.0 | 2.1 | 2.0 | 2.0 | 2.1 | 2.1 | 2.0 | 2.0 |
| **2026-2045** | 2.5 | 2.5 | 2.6 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.6 | 2.6 | 2.4 | 2.4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |

(1) Annual toll rate increases are assumed to be implemented on January 1st of each year.
(2) Assumes Complete 540 Phase 1 is opened on July 1, 2023.
(3) Assumes Complete 540 Phase 2 is opened on July 1, 2026.




**2026 Through Trip ETC Toll Rates**

| Vehicle Class | Triangle Expwy. | Complete 540 Phase 1 | Complete 540 Phase 2 |
|---|---|---|---|
| Class 1 | $3.71 | $4.33 | $2.61 |
| Class 2 | $7.42 | $8.66 | $5.22 |
| Class 3 | $14.84 | $17.32 | $10.44 |

# ASSUMED 2026 TOLL RATES BY TOLL ZONE AND VEHICLE CLASS TRIANGLE EXPRESSWAY AND COMPLETE 540 PHASES 1 AND 2

FIGURE 6.1

Finally, **Table 6.3** provides a comparison of through-trip toll rates on Triangle Expressway and Complete 540 Phase 1 and Phase 2, by vehicle class and payment method for each of the four primary modeling years. For example, in 2020, the through trip Class 1 toll for electronic toll collection on the existing Triangle Expressway would be $3.10, or an average of about $0.21 per mile. The through-trip toll for a vehicle without a transponder (BBM) would be $4.74, or $0.31 per mile. Class 1 ETC through trip toll would increase to $3.59 in 2025, and to $4.84 by 2035.

**Table 6.3**
**Through-Trip Toll Rates By Toll Class (1)**
**Triangle Expressway (Toll 540) and Complete 540 Phases 1 and 2**

| Calendar Year | Toll Class | Triangle Expressway | | Complete 540 Phase 1 | | Complete 540 Phase 2 | |
|---|---|---|---|---|---|---|---|
| | | ETC | BBM | ETC | BBM | ETC | BBM |
| 2020 | Class 1 | $ 3.10 | $ 4.74 | $ - | $ - | $ - | $ - |
| | Class 2 | 6.20 | 9.48 | - | - | - | - |
| | Class 3 | 12.40 | 18.96 | - | - | - | - |
| 2025 | Class 1 | $ 3.59 | $ 5.51 | $ 4.19 | $ 6.45 | $ - | $ - |
| | Class 2 | 7.18 | 11.02 | 8.38 | 12.90 | - | - |
| | Class 3 | 14.36 | 22.04 | 16.76 | 25.80 | - | - |
| 2035 | Class 1 | $ 4.84 | $ 7.41 | $ 5.65 | $ 8.71 | $ 3.40 | $ 5.24 |
| | Class 2 | 9.68 | 14.82 | 11.30 | 17.42 | 6.80 | 10.48 |
| | Class 3 | 19.36 | 29.64 | 22.60 | 34.84 | 13.60 | 20.96 |
| 2045 | Class 1 | $ 5.95 | $ 9.16 | $ 6.93 | $ 10.66 | $ 4.18 | $ 6.44 |
| | Class 2 | 11.90 | 18.32 | 13.86 | 21.32 | 8.36 | 12.88 |
| | Class 3 | 23.80 | 36.64 | 27.72 | 42.64 | 16.72 | 25.76 |

(1) The Triangle Expressway through trip is comprised of a through movement on Toll NC 540 and does not include any travel on Toll NC 147.

## 6.4 Toll Sensitivity Assessment

As part of this traffic and revenue study, an updated toll sensitivity analysis was conducted at 2035 levels. Future toll rates and rate increases assumed in this study follow previously established patterns which have been adopted by the NCTA Board through 2035. The updated toll sensitivity analysis included herein is simply to provide an indication of where current and assumed future toll rates fall within the overall rate sensitivity curve; providing an indication of the ability to increase revenue, if ever needed, with future toll rate increases above those already assumed.

**Figure 6.2** shows the toll sensitivity curve at 2035 levels. The horizontal scale shows the per-mile toll rate levels which were tested in the analysis, for ETC and BBM payment methods. The prior relationship between ETC and BBM is assumed to remain constant, with ETC rates priced at 35 percent less than BBM rates. ETC rates tested ranged from $0.229 per mile to $0.572 per mile, at 2035 levels. As shown, maximum revenue potential would be generated at a per mile ETC toll rate of about $0.47 per mile. The forecast assumes the 2035 rates would be approximately $0.327 per mile, well below the revenue maximizing rate. This indicates there is the ability to raise revenues by increasing toll rates above the assumed rates.

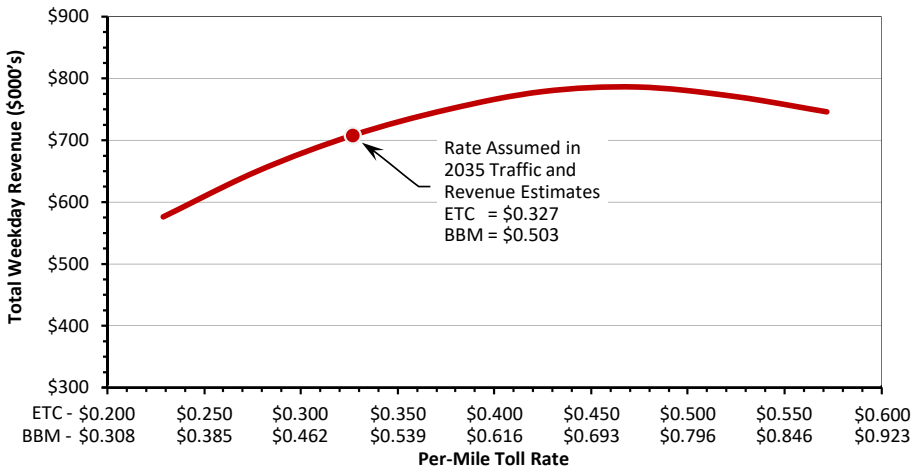



Figure 6.2
**Toll Sensitivity Curve - 2035**

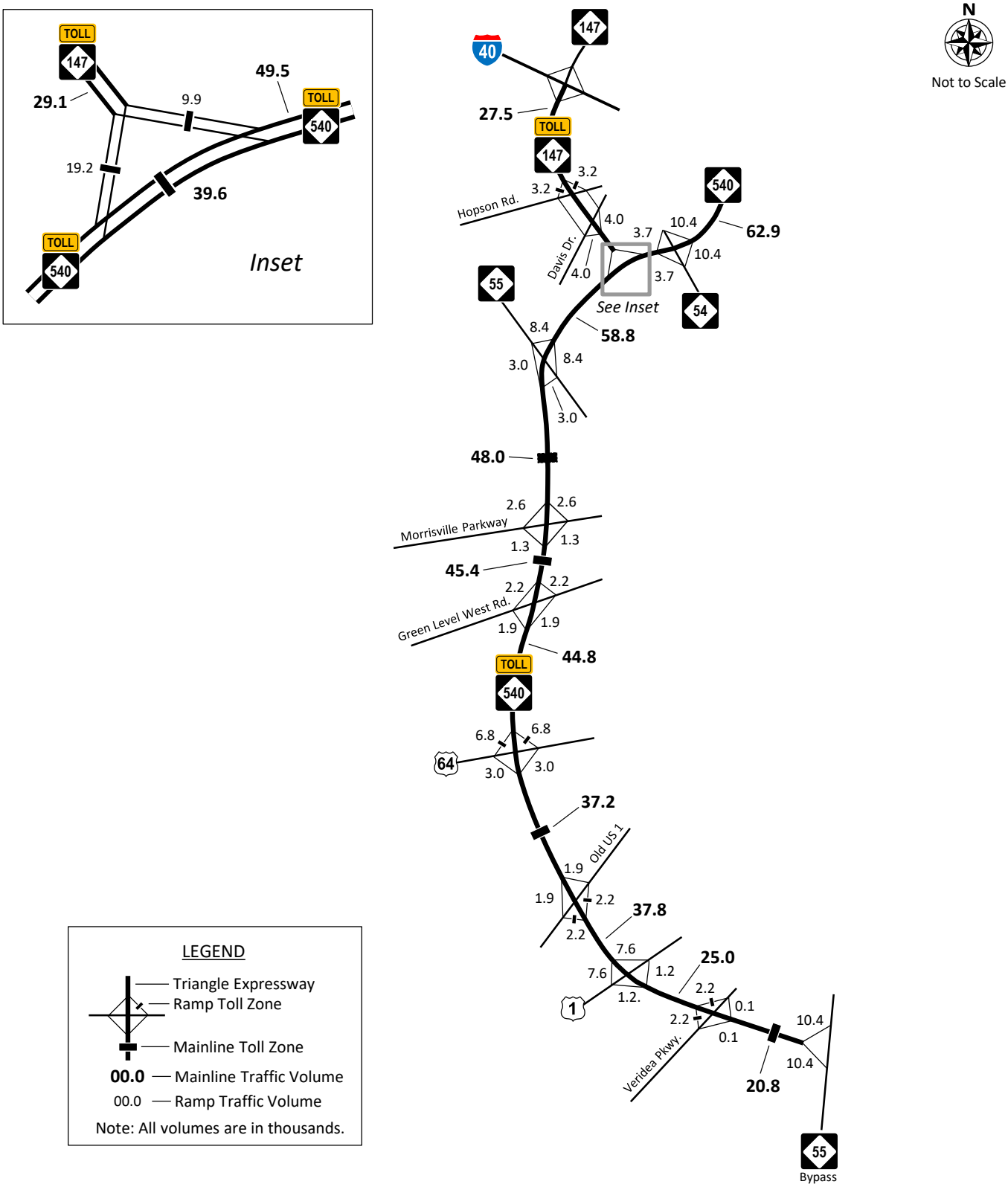
In the curve shown in Figure 6.2, revenue is expressed in average weekday terms, and includes both ETC and BBM revenue elements. On a weekday basis, in 2035, the current assumed toll rate of $0.327 per mile would yield about $708,000 revenue per weekday. At revenue maximizing rates, revenue would be increased to about $786,000 per day, an increase of about 11 percent. However, given the relatively flat shape of the curve, this 11 percent revenue increase would only be achieved through a 45 percent increase in toll rates.

## 6.5 Estimated 2020 "No-COVID" Weekday Traffic and Revenue

This section presents traffic and revenue for a theoretical average weekday in 2020 in the absence of COVID-19. The development of no-COVID 2020 traffic and revenue estimates served as the first step towards generating interpolated annual traffic and revenue streams between 2020 and 2025 to which gradually moderated COVID-19-related impacts were applied in order to reflect the estimated pattern of recovery through 2024. COVID-19-related impacts in 2025 and beyond were reflected in the trip table adjustments described in Section 6.1.

Estimated weekday traffic on Triangle Expressway at 2020 levels assuming the COVID-19 pandemic had not occurred is shown in **Figure 6.3**. The larger bold numbers reflect two-directional traffic on each mainline section. The smaller numbers at each interchange reflect balanced ramp volumes. All values are shown in thousands, and all reflect average weekday conditions. Average daily traffic would be lower than the volumes shown in Figure 6.3, given that weekend day traffic is considerably lower than weekday traffic on the Triangle Expressway.

The Morrisville Parkway interchange is assumed to be in open and the new mainline tolling zone located just north of Morrisville Parkway is also assumed to be in place. Weekday traffic is estimated to be at its highest just north of the NC 55 interchange, estimated at 58,800 vehicles per day. Of this, about 19,200 vehicles would use Toll NC 147 and the remaining 39,600 would continue on Toll NC 540 to NC 54 and beyond. South of NC 55, average weekday mainline traffic on Triangle Expressway would range from between 48,000 and 37,200 as far south as U.S. 1. South of U.S. 1 volumes decrease with average weekday traffic estimated of 20,800 at the southernmost mainline near the NC 55 Bypass.




# TRIANGLE EXPRESSWAY: 2020 NO-COVID AVERAGE WEEKDAY TRAFFIC

FIGURE 6.3

**Table 6.4** shows the calculation of estimated 2020 no-COVID gross toll revenue by toll zone, vehicle class and method-of-payment. The calculated toll revenue is prior to any adjustment for leakage or processing fee revenue associated with BBM toll collection. Traffic volumes in Table 6.4 may not exactly match traffic volumes in Figure 6.3 due to rounding. The right portion of the Table 6.4 summarizes average weekday transactions and revenue by ETC and BBM. The average weighted toll is provided by toll location. It is influenced by the mix of vehicle classes and the distribution of payment modes.

In total, it is estimated that without the impact of COVID-19, there would have been a total of 249,068 transactions on Triangle Expressway on an average weekday in 2020, producing an average weekday revenue estimated at $204,995.

The bottom row of Table 6.4 converts the estimated weekday values at 2020 levels to estimated annual transaction and revenues. In this case, the figures shown are rounded to thousands. Hence, total annual transactions are estimated at about 76.0 million. Of these, an estimated 52.1 million would be ETC and 23.8 million would be BBM. Annual gross revenue is estimated at $62.2 million.

Average weekday traffic and revenue forecasts were expanded to annual levels using annualization factors of 301 days for ETC passenger cars, 319 for BBM passenger cars, 274 for ETC trucks, and 277 for BBM trucks. These annualization factors reflect the relationship between weekday and weekend day transactions from 2019 historical transaction data on Triangle Expressway. The weighted average annualization factor for all classes and payment methods is 304. Since weekend day transactions and revenue are considerably lower than weekdays, the annualization factor, as applied to average weekday conditions, is less than the 365 days per year.

**Table 6.4**
**Estimated 2020 Weekday Transactions and Revenue by Toll Zone**
**Triangle Expressway**

| Toll Zone | | Class 1 Vehicles | | | | | | Class 2 and 3 Vehicles | | | | | | Total Weekday Transactions | | | Total Weekday Revenue | | | Average Weekday Toll per Transaction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ETC | | | BBM | | | ETC | | | BBM | | | | | | | | | |
| Number | Location | Trans. | Toll | Revenue | Trans. | Toll | Revenue | Trans. | Toll | Revenue | Trans. | Toll | Revenue | ETC | BBM | Total | ETC | BBM | Total | (all vehicles and payment types) |
| **Triangle Expressway** | | | | | | | | | | | | | | | | | | | | |
| 01/02 | Ramps North at Hopson Rd. | 4,407 | $0.39 | $1,719 | 1,970 | $0.60 | $1,182 | 69 | $1.34 | $92 | 49 | $2.06 | $102 | 4,476 | 2,020 | 6,495 | $1,811 | $1,284 | $3,094 | $0.476 |
| 05/06 | Toll NC 147/Toll NC 540 Jct. NW Connection | 12,946 | $1.08 | $13,982 | 5,414 | $1.66 | $8,987 | 484 | $3.70 | $1,795 | 308 | $5.69 | $1,755 | 13,431 | 5,722 | 19,153 | $15,777 | $10,742 | $26,519 | $1.385 |
| 09/10 | Toll NC 147/Toll NC 540 Jct. NE Connection | 6,353 | $0.87 | $5,527 | 3,402 | $1.33 | $4,525 | 100 | $2.98 | $298 | 62 | $4.56 | $284 | 6,453 | 3,465 | 9,918 | $5,826 | $4,809 | $10,635 | $1.072 |
| 13/14 | Toll NC 147/Toll NC 540 Jct. 540 Thru Mvt. | 26,667 | $0.70 | $18,667 | 11,282 | $1.07 | $12,072 | 914 | $2.40 | $2,195 | 727 | $3.67 | $2,670 | 27,581 | 12,010 | 39,591 | $20,861 | $14,742 | $35,603 | $0.899 |
| 15/16 | Mainline N of Morrisville Pky | 32,234 | $0.48 | $15,472 | 13,643 | $0.73 | $9,959 | 1,279 | $1.65 | $2,106 | 872 | $2.50 | $2,180 | 33,513 | 14,515 | 48,027 | $17,578 | $12,139 | $29,717 | $0.619 |
| 17/18 | Mainline N. of Green Level Rd | 30,433 | $0.39 | $11,869 | 12,881 | $0.60 | $7,728 | 1,207 | $1.34 | $1,615 | 823 | $2.06 | $1,696 | 31,640 | 13,704 | 45,344 | $13,484 | $9,424 | $22,908 | $0.505 |
| 21/22 | Ramps North at U.S. 64 | 9,367 | $0.48 | $4,496 | 3,636 | $0.73 | $2,654 | 348 | $1.65 | $572 | 254 | $2.50 | $634 | 9,714 | 3,889 | 13,603 | $5,068 | $3,288 | $8,356 | $0.614 |
| 25/26 | Mainline S of U.S. 64 | 24,330 | $1.08 | $26,276 | 10,952 | $1.65 | $18,071 | 1,108 | $3.70 | $4,105 | 790 | $5.66 | $4,472 | 25,438 | 11,742 | 37,180 | $30,381 | $22,543 | $52,923 | $1.423 |
| 29/30 | Ramps South at S. Salem St./Old U.S. 1 | 3,333 | $0.28 | $933 | 1,028 | $0.42 | $432 | 52 | $0.96 | $50 | 51 | $1.44 | $73 | 3,385 | 1,079 | 4,464 | $983 | $505 | $1,488 | $0.333 |
| 31/32 | Ramps North at Veridea Pky | 3,308 | $0.30 | $992 | 906 | $0.46 | $417 | 46 | $1.03 | $48 | 40 | $1.58 | $63 | 3,354 | 946 | 4,300 | $1,040 | $480 | $1,520 | $0.353 |
| 33/34 | Mainline N of NC 55 Bypass | 14,282 | $0.45 | $6,427 | 5,753 | $0.69 | $3,970 | 525 | $1.54 | $810 | 433 | $2.37 | $1,025 | 14,806 | 6,186 | 20,992 | $7,237 | $4,995 | $12,232 | $0.583 |
| **Weekday Total Triangle Expressway** | | **167,659** | | **$106,360** | **70,867** | | **$69,997** | **6,132** | | **$13,685** | **4,409** | | **$14,952** | **173,791** | **75,277** | **249,068** | **$120,045** | **$84,950** | **$204,995** | $0.823 |
| **Annual Total Triangle Expressway** | | **50,465** | | **$32,014** | **22,607** | | **$22,329** | **1,680** | | **$3,750** | **1,221** | | **$4,142** | **52,146** | **23,828** | **75,974** | **$35,764** | **$26,471** | **$62,235** | |

Assumes Annualization Factor of 301 Days (Class 1 ETC), 319 (Class 1 BBM), 274 (Class 2-3 ETC), 277 (Class 2-3 BBM)

Note: Transactions by toll zone in this table may not match transactions shown in Figure 6.3 due to rounding by direction in the figure.

## 6.6 Estimated 2025 Weekday Traffic and Revenue

**Figure 6.4** shows estimated weekday traffic on the Triangle Expressway and Complete 540 Phase 1 at 2025 levels. Weekday traffic at the easternmost mainline segment of Phase 1 is estimated at 17,800, increasing to 37,600 at the southern end of the existing Triangle Expressway, to a peak of 62,400 north of NC 55. Of this, about 24,600 vehicles would use Toll NC 147, while about 37,800 vehicles per weekday would continue on Toll NC 540 to NC 54 and beyond.

In addition to the effects of recovery from COVID-19 and socioeconomic growth, weekday traffic volumes on the existing Triangle Expressway are expected to increase due to the construction of Complete 540 Phase 1.

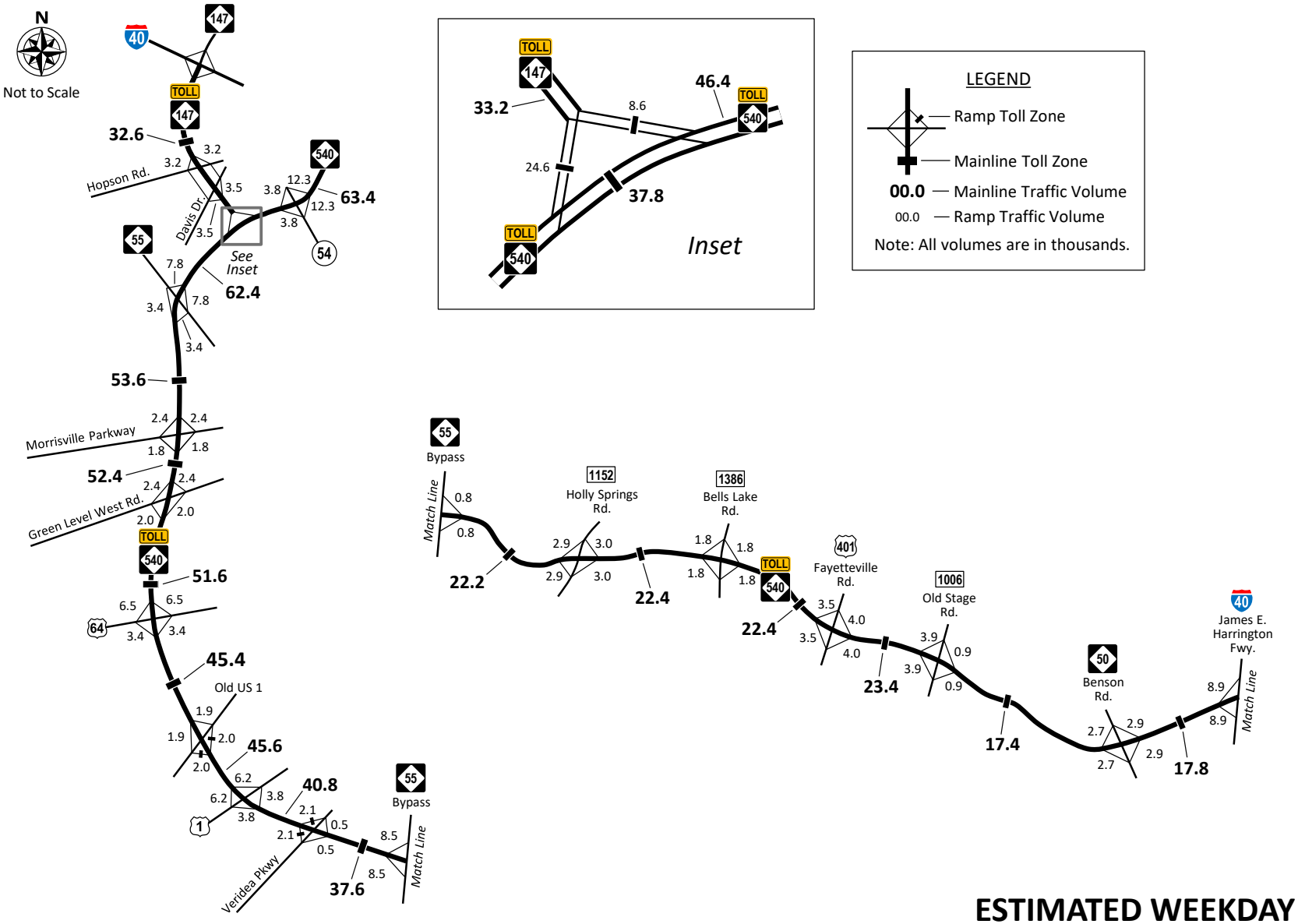
**Table 6.5** shows the calculation of estimated 2025 weekday transactions and gross toll revenue by toll zone. Again, both transactions and revenue are broken out by payment category and overall vehicle class. Weekday revenue is estimated at $278,157 for Triangle Expressway, $115,368 for Complete 540 Phase 1, and $393,525 combined, resulting in estimated annual gross toll revenue of $118.6 million. Of this, about $73.4 million would be attributed to ETC transactions, while the remaining $45.2 million would come from BBM collections. Systemwide, the overall average toll per transaction would be about $0.95, reflecting the overall mix of toll rates by location, payment type and vehicle class.

## 6.7 Estimated 2035 Weekday Traffic and Revenue

**Figure 6.5** shows estimated weekday traffic on the Triangle Expressway, Complete 540 Phase 1, and Complete 540 Phase 2 in 2035. Weekday traffic at the northernmost mainline segment of Phase 2 is estimated at 38,200, decreasing to 22,600 at the easternmost mainline segment of Phase 1, increasing back to 40,000 at the southern end of the existing Triangle Expressway, to a peak of 67,800 north of NC 55. Of this, about 28,500 vehicles would use Toll NC 147, while about 39,300 vehicles per weekday would continue on Toll NC 540 to NC 54 and beyond.

Weekday traffic volumes on the existing Triangle Expressway are expected to decrease slightly and traffic volumes on Complete 540 Phase 1 are expected to increase slightly due to the traffic impacts of the opening of Complete 540 Phase 2. These impacts are discussed in more detail in Section 6.11.2.

Toll revenue calculations for 2035 are shown in **Table 6.6**. In 2035, weekday revenue is estimated at $420,406 for Triangle Expressway, $184,038 for Complete 540 Phase 1, $106,851 for Complete 540 Phase 2, and $711,295 combined, resulting in estimated annual gross toll revenue of $213.7 million. Of this, about $146.3 million would be attributed to ETC transactions, while the remaining $67.4 million would come from BBM collections. Systemwide, the overall average toll per transaction would be about $1.11.




# ESTIMATED WEEKDAY TRAFFIC
# TRIANGLE EXPRESSWAY AND COMPLETE 540 PHASE 1 - 2025

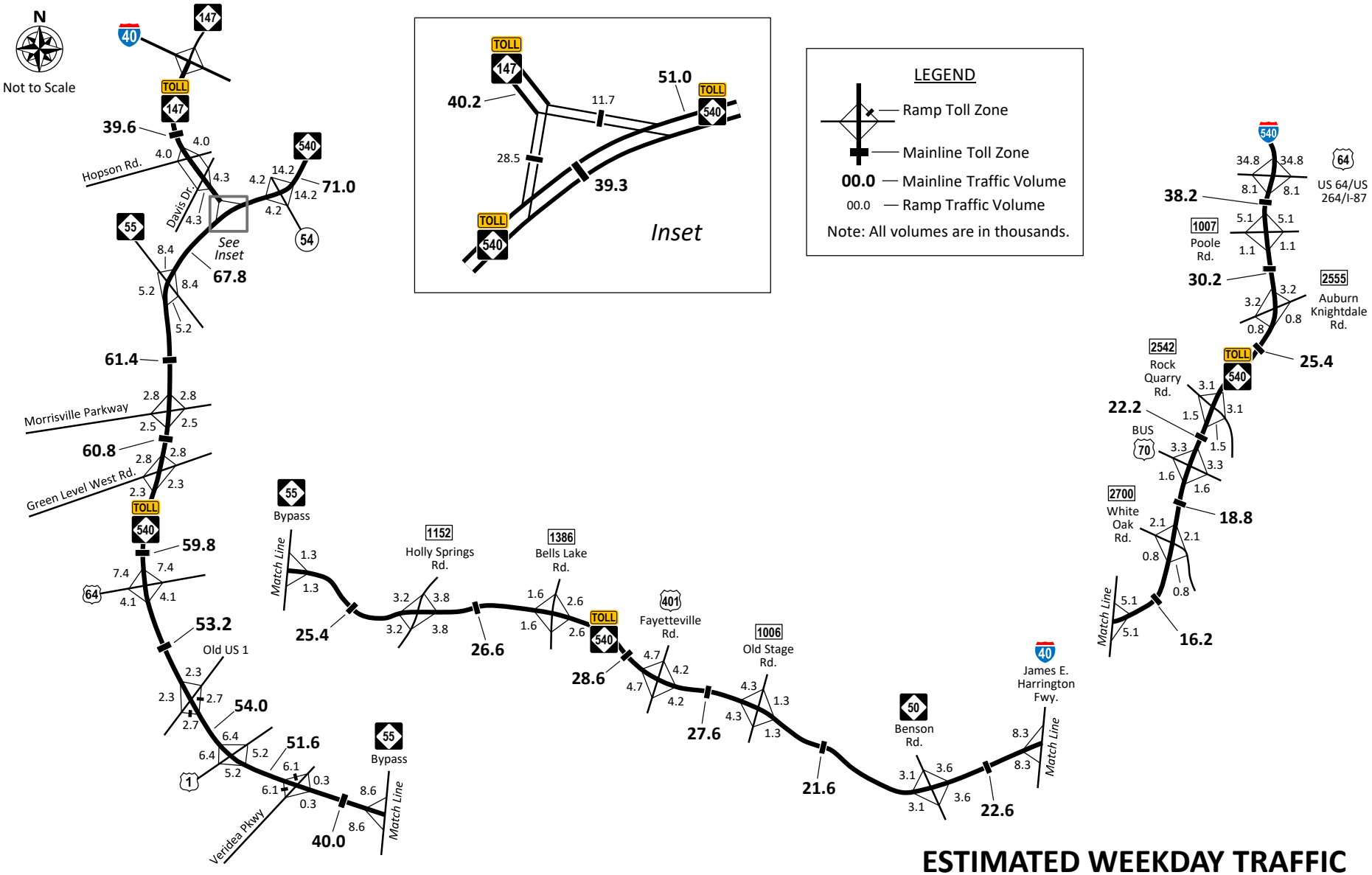
FIGURE 6.4

**Table 6.5**
**Estimated 2025 Weekday Transactions and Revenue by Toll Zone**
**Triangle Expressway and Complete 540 Phase 1**

| Toll Zone | | Class 1 Vehicles | | | | | | Class 2 and 3 Vehicles | | | | | | Total Weekday Transactions | | | Total Weekday Revenue | | | Average Weekday Toll per Transaction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ETC | | | BBM | | | ETC | | | BBM | | | | | | | | | |
| Number | Location | Trans. | Toll | Revenue | Trans. | Toll | Revenue | Trans. | Toll | Revenue | Trans. | Toll | Revenue | ETC | BBM | Total | ETC | BBM | Total | (all vehicles and payment types) |
| **Triangle Expressway** | | | | | | | | | | | | | | | | | | | | |
| 01/02 | Ramps North at Hopson Rd. | 4,472 | $0.46 | $2,057 | 1,734 | $0.70 | $1,213 | 90 | $1.58 | $142 | 55 | $2.40 | $132 | 4,562 | 1,789 | 6,351 | $2,200 | $1,346 | $3,545 | $0.558 |
| 05/06 | Toll NC 147/Toll NC 540 Jct. NW Connection | 17,273 | $1.27 | $21,937 | 5,833 | $1.94 | $11,316 | 1,003 | $4.36 | $4,369 | 581 | $6.65 | $3,862 | 18,276 | 6,414 | 24,690 | $26,306 | $15,178 | $41,484 | $1.680 |
| 09/10 | Toll NC 147/Toll NC 540 Jct. NE Connection | 5,669 | $1.01 | $5,725 | 2,871 | $1.55 | $4,450 | 83 | $3.46 | $287 | 31 | $5.32 | $166 | 5,751 | 2,902 | 8,654 | $6,012 | $4,616 | $10,628 | $1.228 |
| 13/14 | Toll NC 147/Toll NC 540 Jct. 540 Thru Mvt. | 26,495 | $0.81 | $21,461 | 9,660 | $1.24 | $11,979 | 937 | $2.78 | $2,604 | 693 | $4.25 | $2,943 | 27,432 | 10,353 | 37,785 | $24,065 | $14,922 | $38,987 | $1.032 |
| 15/16 | Mainline N of Morrisville Pky | 37,468 | $0.55 | $20,607 | 13,196 | $0.85 | $11,216 | 1,863 | $1.89 | $3,515 | 1,143 | $2.92 | $3,338 | 39,331 | 14,339 | 53,670 | $24,122 | $14,554 | $38,676 | $0.721 |
| 17/18 | Mainline N. of Green Level Rd | 36,736 | $0.46 | $16,899 | 12,881 | $0.71 | $9,146 | 1,806 | $1.58 | $2,849 | 1,105 | $2.44 | $2,695 | 38,542 | 13,986 | 52,528 | $19,748 | $11,841 | $31,588 | $0.601 |
| 21/22 | Ramps North at U.S. 64 | 9,384 | $0.56 | $5,255 | 2,910 | $0.86 | $2,502 | 352 | $1.92 | $676 | 237 | $2.95 | $700 | 9,736 | 3,147 | 12,883 | $5,931 | $3,203 | $9,134 | $0.709 |
| 25/26 | Mainline S of U.S. 64 | 31,204 | $1.25 | $39,005 | 11,442 | $1.91 | $21,855 | 1,748 | $4.29 | $7,495 | 1,103 | $6.55 | $7,223 | 32,952 | 12,545 | 45,497 | $46,500 | $29,077 | $75,577 | $1.661 |
| 29/30 | Ramps South at S. Salem St./Old U.S. 1 | 3,265 | $0.32 | $1,045 | 667 | $0.49 | $327 | 58 | $1.10 | $64 | 44 | $1.68 | $74 | 3,323 | 711 | 4,034 | $1,108 | $401 | $1,509 | $0.374 |
| 31/32 | Ramps North at Veridea Pky | 3,304 | $0.35 | $1,156 | 682 | $0.53 | $362 | 60 | $1.20 | $71 | 44 | $1.82 | $80 | 3,363 | 726 | 4,089 | $1,228 | $441 | $1,669 | $0.408 |
| 33/34 | Mainline N of NC 55 Bypass | 26,938 | $0.52 | $14,008 | 8,571 | $0.80 | $6,857 | 1,246 | $1.78 | $2,222 | 829 | $2.74 | $2,272 | 28,184 | 9,400 | 37,584 | $16,230 | $9,129 | $25,359 | $0.675 |
| **Subtotal Triangle Expressway** | | **202,207** | | **$149,155** | **70,446** | | **$81,222** | **9,245** | | **$24,294** | **5,865** | | **$23,486** | **211,453** | **76,311** | **287,764** | **$173,449** | **$104,708** | **$278,157** | $0.967 |
| **Complete 540 Phase 1 (C540 Phase 1)** | | | | | | | | | | | | | | | | | | | | |
| 35/36 | Mainline East of NC 55 Bypass | 15,952 | $0.74 | $11,804 | 4,743 | $1.14 | $5,407 | 831 | $2.54 | $2,108 | 490 | $3.91 | $1,916 | 16,782 | 5,233 | 22,015 | $13,913 | $7,323 | $21,235 | $0.965 |
| 37/38 | Mainline East of Holly Springs Rd. | 16,104 | $0.68 | $10,951 | 4,952 | $1.05 | $5,199 | 867 | $2.33 | $2,021 | 520 | $3.60 | $1,870 | 16,971 | 5,471 | 22,442 | $12,972 | $7,070 | $20,042 | $0.893 |
| 39/40 | Mainline East of Bells Lake Rd. | 16,014 | $0.65 | $10,409 | 5,069 | $1.00 | $5,069 | 875 | $2.23 | $1,950 | 529 | $3.43 | $1,816 | 16,889 | 5,598 | 22,487 | $12,359 | $6,885 | $19,244 | $0.856 |
| 41/42 | Mainline East U.S. 401 | 16,566 | $0.52 | $8,614 | 5,434 | $0.80 | $4,347 | 911 | $1.78 | $1,625 | 571 | $2.74 | $1,565 | 17,477 | 6,005 | 23,482 | $10,240 | $5,912 | $16,152 | $0.688 |
| 43/44 | Old Stage Rd. | 12,238 | $1.00 | $12,238 | 3,914 | $1.54 | $6,027 | 861 | $3.43 | $2,953 | 537 | $5.28 | $2,838 | 13,099 | 4,451 | 17,550 | $15,191 | $8,865 | $24,056 | $1.371 |
| 45/46 | Mainline East of NC 50 | 12,370 | $0.60 | $7,422 | 4,253 | $0.92 | $3,913 | 806 | $2.06 | $1,658 | 521 | $3.16 | $1,645 | 13,176 | 4,774 | 17,950 | $9,081 | $5,558 | $14,639 | $0.816 |
| **Subtotal Complete 540 Phase 1** | | **89,243** | | **$61,438** | **28,365** | | **$29,963** | **5,150** | | **$12,317** | **3,168** | | **$11,650** | **94,393** | **31,533** | **125,926** | **$73,755** | **$41,612** | **$115,368** | $0.916 |
| **Weekday Total Triangle Exp. Plus C540 Phase 1** | | **291,451** | | **$210,593** | **98,811** | | **$111,185** | **14,396** | | **$36,612** | **9,033** | | **$35,136** | **305,846** | **107,844** | **413,690** | **$247,204** | **$146,321** | **$393,525** | $0.951 |
| **Annual Total Triangle Exp. Plus C540 Phase 1 (000)** | | **87,727** | | **$63,388** | **31,521** | | **$35,468** | **3,944** | | **$10,032** | **2,502** | | **$9,733** | **91,671** | **34,023** | **125,694** | **$73,420** | **$45,201** | **$118,621** | |

Assumes Annualization Factor of 301 Days (Class 1 ETC), 319 (Class 1 BBM), 274 (Class 2-3 ETC), 277 (Class 2-3 BBM)

Note: Transactions by toll zone in this table may not match transactions shown in Figure 6.4 due to rounding by direction in the figure.




# ESTIMATED WEEKDAY TRAFFIC
# TRIANGLE EXPRESSWAY AND COMPLETE 540 PHASES 1 & 2 - 2035

CDM Smith

FIGURE 6.5

**Table 6.6**
**Estimated 2035 Weekday Transactions and Revenue by Toll Zone**
**Triangle Expressway and Complete 540 Phases 1 and 2**

| Toll Zone | | Class 1 Vehicles | | | | | | Class 2 and 3 Vehicles | | | | | | Total Weekday Transactions | | | Total Weekday Revenue | | | Average Weekday Toll per Transaction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ETC | | | BBM | | | ETC | | | BBM | | | | | | | | | |
| Number | Location | Trans. | Toll | Revenue | Trans. | Toll | Revenue | Trans. | Toll | Revenue | Trans. | Toll | Revenue | ETC | BBM | Total | ETC | BBM | Total | (all vehicles and payment types) |
| **Triangle Expressway** | | | | | | | | | | | | | | | | | | | | |
| 01/02 | Ramps North at Hopson Rd. | 5,850 | $0.61 | $3,569 | 1,757 | $0.93 | $1,634 | 241 | $2.09 | $503 | 64 | $3.19 | $203 | 6,091 | 1,821 | 7,912 | $4,072 | $1,837 | $5,909 | $0.747 |
| 05/06 | Toll NC 147/Toll NC 540 Jct. NW Connection | 21,320 | $1.69 | $36,030 | 5,455 | $2.60 | $14,183 | 1,310 | $5.80 | $7,595 | 475 | $8.92 | $4,239 | 22,630 | 5,930 | 28,560 | $43,625 | $18,422 | $62,047 | $2.173 |
| 09/10 | Toll NC 147/Toll NC 540 Jct. NE Connection | 8,131 | $1.36 | $11,058 | 3,217 | $2.08 | $6,691 | 203 | $4.66 | $947 | 15 | $7.13 | $107 | 8,334 | 3,232 | 11,566 | $12,005 | $6,798 | $18,803 | $1.626 |
| 13/14 | Toll NC 147/Toll NC 540 Jct. 540 Thru Mvt. | 29,288 | $1.09 | $31,924 | 8,231 | $1.67 | $13,746 | 1,200 | $3.74 | $4,485 | 610 | $5.73 | $3,498 | 30,488 | 8,842 | 39,330 | $36,409 | $17,244 | $53,653 | $1.364 |
| 15/16 | Mainline N of Morrisville Pky | 45,698 | $0.74 | $33,816 | 12,247 | $1.14 | $13,962 | 2,456 | $2.54 | $6,234 | 987 | $3.91 | $3,859 | 48,154 | 13,234 | 61,388 | $40,050 | $17,821 | $57,871 | $0.943 |
| 17/18 | Mainline N. of Green Level Rd | 45,342 | $0.62 | $28,112 | 12,087 | $0.95 | $11,483 | 2,398 | $2.13 | $5,099 | 954 | $3.26 | $3,112 | 47,739 | 13,041 | 60,781 | $33,211 | $14,594 | $47,805 | $0.787 |
| 21/22 | Ramps North at U.S. 64 | 11,680 | $0.75 | $8,760 | 2,403 | $1.15 | $2,763 | 495 | $2.57 | $1,273 | 208 | $3.94 | $819 | 12,175 | 2,611 | 14,785 | $10,033 | $3,583 | $13,615 | $0.921 |
| 25/26 | Mainline S of U.S. 64 | 38,930 | $1.68 | $65,402 | 11,025 | $2.57 | $28,334 | 2,274 | $5.76 | $13,102 | 963 | $8.82 | $8,492 | 41,204 | 11,988 | 53,192 | $78,505 | $36,826 | $115,331 | $2.168 |
| 29/30 | Ramps South at S. Salem St./Old U.S. 1 | 4,637 | $0.43 | $1,994 | 658 | $0.66 | $434 | 108 | $1.47 | $160 | 40 | $2.26 | $90 | 4,745 | 698 | 5,443 | $2,153 | $525 | $2,678 | $0.492 |
| 31/32 | Ramps North at Veridea Pky | 9,659 | $0.47 | $4,540 | 2,167 | $0.72 | $1,560 | 200 | $1.61 | $322 | 81 | $2.47 | $200 | 9,859 | 2,248 | 12,107 | $4,862 | $1,760 | $6,623 | $0.547 |
| 33/34 | Mainline N of NC 55 Bypass | 30,488 | $0.71 | $21,647 | 7,225 | $1.08 | $7,803 | 1,623 | $2.44 | $3,951 | 722 | $3.70 | $2,670 | 32,111 | 7,946 | 40,057 | $25,598 | $10,473 | $36,071 | $0.900 |
| **Subtotal Triangle Expressway** | | **251,023** | | **$246,852** | **66,472** | | **$102,593** | **12,506** | | **$43,671** | **5,119** | | **$27,290** | **263,529** | **71,591** | **335,120** | **$290,523** | **$129,883** | **$420,406** | $1.254 |
| **Complete 540 Phase 1 (C540 Phase 1)** | | | | | | | | | | | | | | | | | | | | |
| 35/36 | Mainline East of NC 55 Bypass | 19,407 | $1.00 | $19,407 | 4,407 | $1.54 | $6,787 | 1,180 | $3.43 | $4,047 | 426 | $5.28 | $2,252 | 20,587 | 4,834 | 25,421 | $23,454 | $9,039 | $32,493 | $1.278 |
| 37/38 | Mainline East of Holly Springs Rd. | 20,149 | $0.92 | $18,537 | 4,742 | $1.42 | $6,734 | 1,241 | $3.16 | $3,917 | 455 | $4.87 | $2,216 | 21,390 | 5,197 | 26,587 | $22,454 | $8,950 | $31,404 | $1.181 |
| 39/40 | Mainline East of Bells Lake Rd. | 21,617 | $0.88 | $19,023 | 5,295 | $1.36 | $7,201 | 1,266 | $3.02 | $3,820 | 469 | $4.66 | $2,185 | 22,883 | 5,763 | 28,646 | $22,843 | $9,386 | $32,229 | $1.125 |
| 41/42 | Mainline East U.S. 401 | 20,711 | $0.70 | $14,497 | 5,142 | $1.08 | $5,553 | 1,313 | $2.40 | $3,153 | 496 | $3.70 | $1,836 | 22,024 | 5,638 | 27,662 | $17,650 | $7,389 | $25,039 | $0.905 |
| 43/44 | Old Stage Rd. | 16,010 | $1.34 | $21,454 | 3,865 | $2.06 | $7,961 | 1,267 | $4.60 | $5,825 | 477 | $7.07 | $3,370 | 17,277 | 4,341 | 21,619 | $27,278 | $11,331 | $38,609 | $1.786 |
| 45/46 | Mainline East of NC 50 | 16,723 | $0.81 | $13,546 | 4,227 | $1.25 | $5,284 | 1,226 | $2.78 | $3,407 | 473 | $4.29 | $2,027 | 17,949 | 4,700 | 22,649 | $16,953 | $7,311 | $24,264 | $1.071 |
| **Subtotal Complete 540 Phase 1** | | **114,617** | | **$106,464** | **27,678** | | **$39,520** | **7,493** | | **$24,168** | **2,796** | | **$13,886** | **122,111** | **30,473** | **152,584** | **$130,633** | **$53,406** | **$184,038** | $1.206 |
| **Complete 540 Phase 2 (C540 Phase 2)** | | | | | | | | | | | | | | | | | | | | |
| 47/48 | Mainline East of I-40 | 11,888 | $0.74 | $8,797 | 3,121 | $1.14 | $3,558 | 868 | $2.54 | $2,204 | 408 | $3.91 | $1,593 | 12,757 | 3,528 | 16,285 | $11,002 | $5,151 | $16,153 | $0.992 |
| 49/50 | Mainline North of White Oak Rd. | 13,700 | $0.55 | $7,535 | 3,664 | $0.85 | $3,114 | 923 | $1.89 | $1,742 | 437 | $2.92 | $1,275 | 14,623 | 4,100 | 18,723 | $9,277 | $4,389 | $13,665 | $0.730 |
| 51/52 | Mainline North of U.S. 70 Business | 16,170 | $0.40 | $6,468 | 4,366 | $0.62 | $2,707 | 1,058 | $1.37 | $1,451 | 507 | $2.13 | $1,079 | 17,228 | 4,873 | 22,101 | $7,919 | $3,786 | $11,706 | $0.530 |
| 53/54 | Mainline North of Rock Quarry Rd. | 18,501 | $0.84 | $15,541 | 5,062 | $1.29 | $6,531 | 1,213 | $2.88 | $3,494 | 589 | $4.42 | $2,602 | 19,714 | 5,651 | 25,365 | $19,035 | $9,133 | $28,168 | $1.111 |
| 55/56 | Mainline North of Auburn Knightdale Rd. | 22,057 | $0.56 | $12,352 | 6,193 | $0.86 | $5,326 | 1,261 | $1.92 | $2,422 | 618 | $2.95 | $1,824 | 23,318 | 6,812 | 30,130 | $14,774 | $7,150 | $21,924 | $0.728 |
| 57/58 | Mainline North of Poole Rd. | 27,920 | $0.31 | $8,655 | 8,241 | $0.48 | $3,956 | 1,384 | $1.06 | $1,471 | 699 | $1.65 | $1,153 | 29,304 | 8,939 | 38,243 | $10,127 | $5,108 | $15,235 | $0.398 |
| **Subtotal Complete 540 Phase 2** | | **110,236** | | **$59,348** | **30,647** | | **$25,191** | **6,707** | | **$12,784** | **3,257** | | **$9,527** | **116,943** | **33,903** | **150,846** | **$72,133** | **$34,718** | **$106,851** | $0.708 |
| **Weekday Total Triangle Exp. Plus C540 Phases 1 and 2** | | **475,877** | | **$412,665** | **124,796** | | **$167,304** | **26,706** | | **$80,624** | **11,172** | | **$50,703** | **502,583** | **135,968** | **638,551** | **$493,288** | **$218,007** | **$711,295** | $1.114 |
| **Annual Total Triangle Exp. Plus C540 Phases 1 and 2 (000)** | | **143,239** | | **$124,212** | **39,810** | | **$53,370** | **7,318** | | **$22,091** | **3,095** | | **$14,045** | **150,556** | **42,905** | **193,461** | **$146,303** | **$67,415** | **$213,718** | |

Assumes Annualization Factor of 301 Days (Class 1 ETC), 319 (Class 1 BBM), 274 (Class 2-3 ETC), 277 (Class 2-3 BBM)

Note: Transactions by toll zone in this table may not match transactions shown in Figure 6.5 due to rounding by direction in the figure.

### 6.7.1 Time Distance Relationships

**Figure 6.6** provides a comparison of time and distance relationships for selected movements using the tolled Triangle Expressway and Complete 540 Phase 1 and Phase 2 as compared with the best alternative non-tolled routing. Information shown in Figure 6.6 was derived from travel demand modeling performed at 2035 levels.

Five control points were identified for purposes of this comparison:

- A: A location on I-40 west of NC 55 south of Durham
- B: A location within the town of Apex
- C: A location within the town of Holly Springs
- D: A location on I-40 just south of the NC 42 interchange
- E: A location just west of the US 64 Business/I-540 interchange

A total of seven movements were selected for comparison, as shown in the table also shown in Figure 6.6. Some of the movements would use a single section or phase of the toll road system while other movement would use different combinations of Triangle Expressway, Complete 540 Phase 1 and Complete 540 Phase 2. The toll paths used for each of these movements are depicted in darker colors, with a unique color for each of the seven movements. The best alternative non-tolled route for the respective movements is illustrated using a lighter shade of the same color. For about half the movements, the best toll-free route is along an arterial, while the rest of the use portion of I-40.

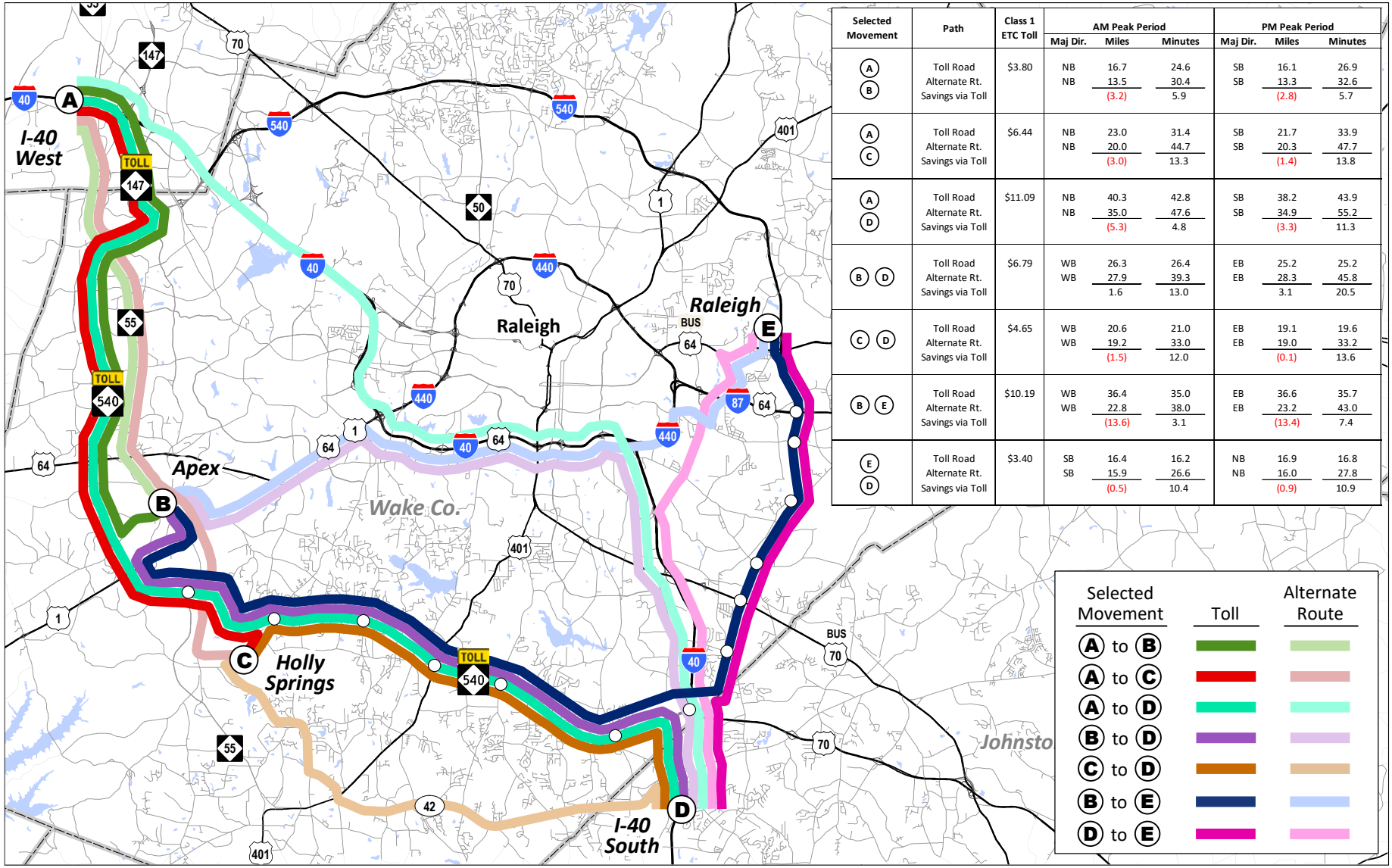
The table in the upper right-hand corner of Figure 6.6 provides a comparison of distance and travel times, for AM peak and PM peak hour conditions. It also shows the Class 1 ETC toll rate for each movement. Since NC 540 is a circumferential road, the total distance on the tolled routing tends to be longer than the toll-free routing for most of the movements selected, although the travel time savings varies from 3 to 13 minutes in the morning peak hour and 6 to 21 minutes in the afternoon peak hour.

## 6.8 Estimated 2045 Weekday Traffic and Revenue

**Figure 6.7** presents estimated weekday traffic for Triangle Expressway, Complete 540 Phase 1, and Complete 540 Phase 2 in year 2045. Weekday traffic at the northernmost mainline on Phase 2 is estimated at 51,800, decreasing to 32,000 at the easternmost mainline on Phase 1, increasing back to 57,800 at the southern end of the existing Triangle Expressway, to a peak of 84,200 north of NC 55. Of this, about 39,000 vehicles would use Toll NC 147, while about 45,200 vehicles per weekday would continue on Toll NC 540 to NC 54 and beyond.

**Table 6.7** provides estimated 2045 weekday transactions and gross toll revenue by toll zone. It is estimated that an average of about 847,000 transactions will be recorded systemwide, each weekday, yielding about $1.15 million. This results in an overall average toll per transaction, systemwide, of about $1.36.

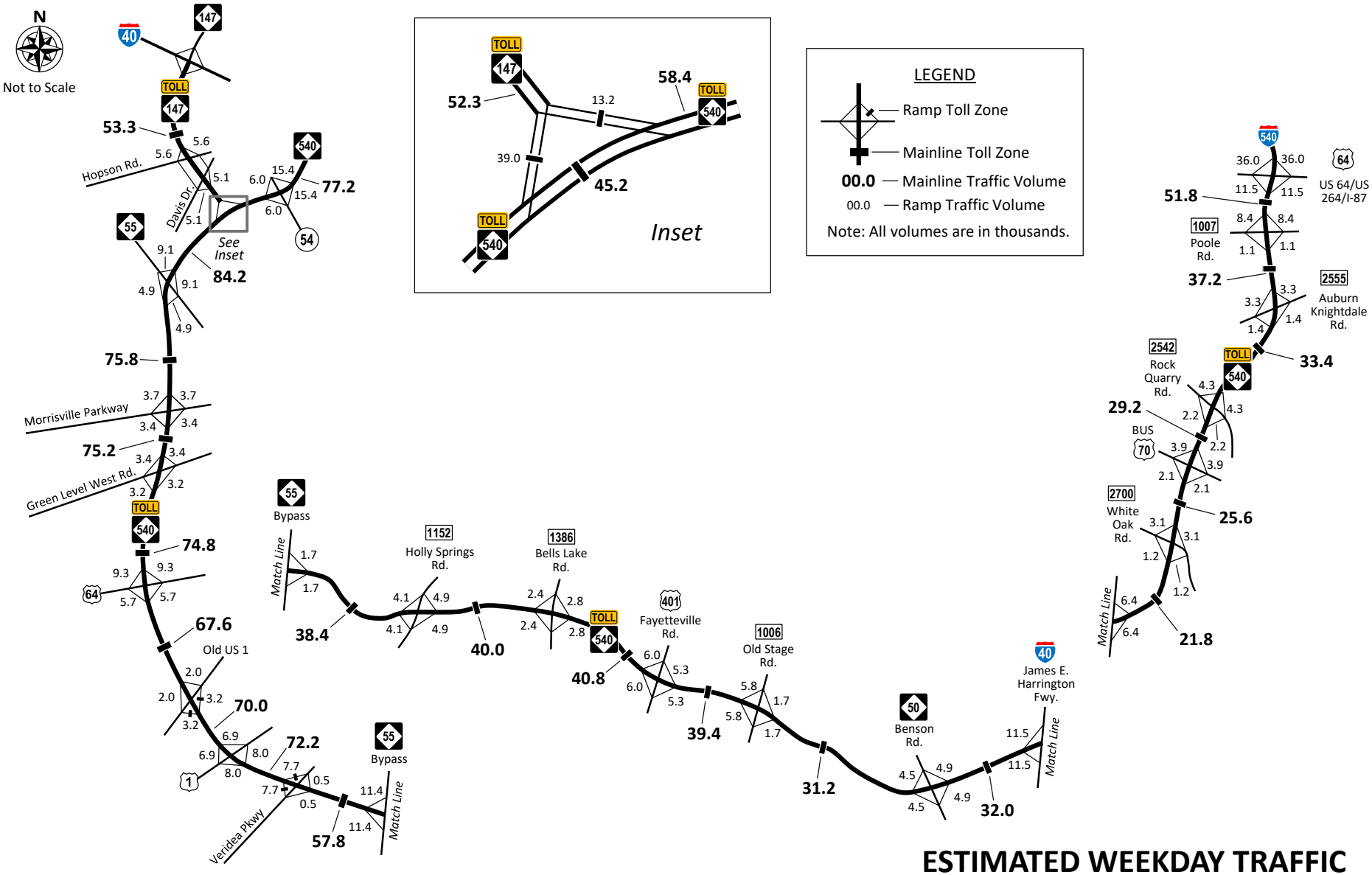
On a systemwide basis, about 256.0 million transactions are estimated by 2045, of which 207.8 million would be ETC and about 48.2 million would be BBM. Total systemwide annual expected revenue, before leakage adjustment, is estimated at about $343.7 million.




| Selected Movement | Path | Class 1 ETC Toll | AM Peak Period | | | PM Peak Period | | |
|---|---|---|---|---|---|---|---|---|
| | | | Maj Dir. | Miles | Minutes | Maj Dir. | Miles | Minutes |
| A B | Toll Road | $3.80 | NB | 16.7 | 24.6 | SB | 16.1 | 26.9 |
| | Alternate Rt. | | NB | 13.5 | 30.4 | SB | 13.3 | 32.6 |
| | Savings via Toll | | | (3.2) | 5.9 | | (2.8) | 5.7 |
| A C | Toll Road | $6.44 | NB | 23.0 | 31.4 | SB | 21.7 | 33.9 |
| | Alternate Rt. | | NB | 20.0 | 44.7 | SB | 20.3 | 47.7 |
| | Savings via Toll | | | (3.0) | 13.3 | | (1.4) | 13.8 |
| A D | Toll Road | $11.09 | NB | 40.3 | 42.8 | SB | 38.2 | 43.9 |
| | Alternate Rt. | | NB | 35.0 | 47.6 | SB | 34.9 | 55.2 |
| | Savings via Toll | | | (5.3) | 4.8 | | (3.3) | 11.3 |
| B D | Toll Road | $6.79 | WB | 26.3 | 26.4 | EB | 25.2 | 25.2 |
| | Alternate Rt. | | WB | 27.9 | 39.3 | EB | 28.3 | 45.8 |
| | Savings via Toll | | | 1.6 | 13.0 | | 3.1 | 20.5 |
| C D | Toll Road | $4.65 | WB | 20.6 | 21.0 | EB | 19.1 | 19.6 |
| | Alternate Rt. | | WB | 19.2 | 33.0 | EB | 19.0 | 33.2 |
| | Savings via Toll | | | (1.5) | 12.0 | | (0.1) | 13.6 |
| B E | Toll Road | $10.19 | WB | 36.4 | 35.0 | EB | 36.6 | 35.7 |
| | Alternate Rt. | | WB | 22.8 | 38.0 | EB | 23.2 | 43.0 |
| | Savings via Toll | | | (13.6) | 3.1 | | (13.4) | 7.4 |
| E D | Toll Road | $3.40 | SB | 16.4 | 16.2 | NB | 16.9 | 16.8 |
| | Alternate Rt. | | SB | 15.9 | 26.6 | NB | 16.0 | 27.8 |
| | Savings via Toll | | | (0.5) | 10.4 | | (0.9) | 10.9 |

# TYPICAL TIME-DISTANCE RELATIONSHIPS SELECTED MOVEMENTS AT 2035 LEVELS

FIGURE 6.6




# ESTIMATED WEEKDAY TRAFFIC
# TRIANGLE EXPRESSWAY AND COMPLETE 540 PHASES 1 & 2 - 2045

FIGURE 6.7

**Table 6.7**
**Estimated 2045 Weekday Transactions and Revenue by Toll Zone**
**Triangle Expressway and Complete 540 Phases 1 and 2**

| Toll Zone | | Class 1 Vehicles | | | | | | Class 2 and 3 Vehicles | | | | | | Total Weekday Transactions | | | Total Weekday Revenue | | | Average Weekday Toll per Transaction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ETC | | | BBM | | | ETC | | | BBM | | | | | | | | | |
| Number | Location | Trans. | Toll | Revenue | Trans. | Toll | Revenue | Trans. | Toll | Revenue | Trans. | Toll | Revenue | ETC | BBM | Total | ETC | BBM | Total | (all vehicles and payment types) |
| **Triangle Expressway** | | | | | | | | | | | | | | | | | | | | |
| 01/02 | Ramps North at Hopson Rd. | 8,516 | $0.75 | $6,387 | 2,126 | $1.16 | $2,466 | 404 | $2.57 | $1,040 | 61 | $3.98 | $243 | 8,920 | 2,187 | 11,107 | $7,427 | $2,709 | $10,137 | $0.913 |
| 05/06 | Toll NC 147/Toll NC 540 Jct. NW Connection | 30,096 | $2.08 | $62,599 | 6,231 | $3.20 | $19,938 | 2,213 | $7.13 | $15,789 | 563 | $10.98 | $6,180 | 32,309 | 6,794 | 39,102 | $78,387 | $26,118 | $104,505 | $2.673 |
| 09/10 | Toll NC 147/Toll NC 540 Jct. NE Connection | 9,573 | $1.67 | $15,987 | 3,234 | $2.57 | $8,310 | 324 | $5.73 | $1,857 | 10 | $8.82 | $88 | 9,898 | 3,244 | 13,141 | $17,845 | $8,398 | $26,243 | $1.997 |
| 13/14 | Toll NC 147/Toll NC 540 Jct. 540 Thru Mvt. | 34,963 | $1.34 | $46,851 | 8,275 | $2.06 | $17,046 | 1,458 | $4.60 | $6,701 | 551 | $7.07 | $3,896 | 36,421 | 8,826 | 45,247 | $53,551 | $20,942 | $74,493 | $1.646 |
| 15/16 | Mainline N of Morrisville Pky | 58,491 | $0.91 | $53,227 | 12,850 | $1.40 | $17,990 | 3,522 | $3.12 | $10,994 | 1,001 | $4.80 | $4,803 | 62,013 | 13,851 | 75,864 | $64,221 | $22,793 | $87,013 | $1.147 |
| 17/18 | Mainline N. of Green Level Rd | 58,141 | $0.76 | $44,187 | 12,739 | $1.17 | $14,905 | 3,451 | $2.61 | $8,997 | 968 | $4.01 | $3,883 | 61,592 | 13,707 | 75,299 | $53,184 | $18,788 | $71,971 | $0.956 |
| 21/22 | Ramps North at U.S. 64 | 15,207 | $0.92 | $13,990 | 2,495 | $1.42 | $3,543 | 635 | $3.16 | $2,005 | 184 | $4.87 | $895 | 15,842 | 2,679 | 18,521 | $15,995 | $4,438 | $20,433 | $1.103 |
| 25/26 | Mainline S of U.S. 64 | 51,415 | $2.07 | $106,429 | 12,019 | $3.19 | $38,341 | 3,298 | $7.10 | $23,417 | 999 | $10.94 | $10,934 | 54,713 | 13,019 | 67,732 | $129,846 | $49,275 | $179,121 | $2.645 |
| 29/30 | Ramps South at S. Salem St./Old U.S. 1 | 5,668 | $0.53 | $3,004 | 586 | $0.82 | $481 | 138 | $1.82 | $251 | 27 | $2.81 | $75 | 5,807 | 613 | 6,420 | $3,255 | $556 | $3,811 | $0.594 |
| 31/32 | Ramps North at Veridea Pky. | 12,585 | $0.58 | $7,299 | 2,360 | $0.89 | $2,100 | 289 | $1.99 | $575 | 74 | $3.05 | $225 | 12,874 | 2,433 | 15,308 | $7,874 | $2,325 | $10,199 | $0.666 |
| 33/34 | Mainline N of NC 55 Bypass | 45,399 | $0.87 | $39,497 | 9,027 | $1.34 | $12,096 | 2,596 | $2.98 | $7,746 | 810 | $4.60 | $3,727 | 47,994 | 9,837 | 57,831 | $47,243 | $15,822 | $63,065 | $1.091 |
| **Subtotal Triangle Expressway** | | **330,054** | | **$399,457** | **71,941** | | **$137,216** | **18,329** | | **$79,371** | **5,247** | | **$34,948** | **348,383** | **77,189** | **425,571** | **$478,828** | **$172,164** | **$650,992** | $1.530 |
| **Complete 540 Phase 1 (C540 Phase 1)** | | | | | | | | | | | | | | | | | | | | |
| 35/36 | Mainline East of NC 55 Bypass | 29,899 | $1.23 | $36,776 | 5,707 | $1.89 | $10,786 | 2,093 | $4.22 | $8,830 | 528 | $6.48 | $3,423 | 31,992 | 6,235 | 38,227 | $45,606 | $14,209 | $59,815 | $1.565 |
| 37/38 | Mainline East of Holly Springs Rd. | 31,093 | $1.13 | $35,135 | 6,106 | $1.74 | $10,624 | 2,190 | $3.88 | $8,489 | 558 | $5.97 | $3,334 | 33,283 | 6,664 | 39,947 | $43,623 | $13,957 | $57,581 | $1.441 |
| 39/40 | Mainline East of Bells Lake Rd. | 31,580 | $1.07 | $33,791 | 6,399 | $1.65 | $10,558 | 2,212 | $3.67 | $8,117 | 567 | $5.66 | $3,212 | 33,792 | 6,967 | 40,758 | $41,907 | $13,770 | $55,678 | $1.366 |
| 41/42 | Mainline East U.S. 401 | 30,376 | $0.86 | $26,123 | 6,247 | $1.32 | $8,246 | 2,285 | $2.95 | $6,742 | 596 | $4.53 | $2,701 | 32,661 | 6,843 | 39,504 | $32,865 | $10,946 | $43,811 | $1.109 |
| 43/44 | Old Stage Rd. | 23,644 | $1.65 | $39,013 | 4,748 | $2.54 | $12,061 | 2,225 | $5.66 | $12,593 | 579 | $8.71 | $5,040 | 25,869 | 5,327 | 31,196 | $51,606 | $17,100 | $68,707 | $2.202 |
| 45/46 | Mainline East of NC 50 | 24,349 | $0.99 | $24,105 | 5,109 | $1.52 | $7,766 | 2,044 | $3.40 | $6,940 | 543 | $5.21 | $2,830 | 26,392 | 5,652 | 32,045 | $31,045 | $10,596 | $41,640 | $1.299 |
| **Subtotal Complete 540 Phase 1** | | **170,940** | | **$194,942** | **34,316** | | **$60,040** | **13,049** | | **$51,710** | **3,372** | | **$20,539** | **183,989** | **37,688** | **221,677** | **$246,652** | **$80,580** | **$327,232** | $1.476 |
| **Complete 540 Phase 2 (C540 Phase 2)** | | | | | | | | | | | | | | | | | | | | |
| 47/48 | Mainline East of I-40 | 16,575 | $0.91 | $15,083 | 3,564 | $1.40 | $4,989 | 1,283 | $3.12 | $4,006 | 406 | $4.80 | $1,949 | 17,858 | 3,970 | 21,828 | $19,089 | $6,939 | $26,028 | $1.192 |
| 49/50 | Mainline North of White Oak Rd. | 19,625 | $0.68 | $13,345 | 4,309 | $1.05 | $4,524 | 1,358 | $2.33 | $3,167 | 432 | $3.60 | $1,557 | 20,983 | 4,741 | 25,724 | $16,512 | $6,081 | $22,593 | $0.878 |
| 51/52 | Mainline North of U.S. 70 Business | 22,305 | $0.49 | $10,929 | 4,933 | $0.75 | $3,700 | 1,497 | $1.68 | $2,516 | 482 | $2.57 | $1,239 | 23,802 | 5,415 | 29,217 | $13,445 | $4,939 | $18,384 | $0.629 |
| 53/54 | Mainline North of Rock Quarry Rd. | 25,575 | $1.03 | $26,342 | 5,728 | $1.59 | $9,107 | 1,701 | $3.53 | $6,010 | 556 | $5.45 | $3,028 | 27,276 | 6,283 | 33,559 | $32,352 | $12,135 | $44,486 | $1.326 |
| 55/56 | Mainline North of Auburn Knightdale Rd. | 28,413 | $0.69 | $19,605 | 6,521 | $1.06 | $6,912 | 1,736 | $2.37 | $4,110 | 573 | $3.64 | $2,086 | 30,150 | 7,094 | 37,244 | $23,715 | $8,998 | $32,713 | $0.878 |
| 57/58 | Mainline North of Poole Rd. | 39,538 | $0.38 | $15,025 | 9,656 | $0.59 | $5,697 | 1,940 | $1.30 | $2,529 | 663 | $2.02 | $1,340 | 41,478 | 10,319 | 51,797 | $17,553 | $7,037 | $24,590 | $0.475 |
| **Subtotal Complete 540 Phase 2** | | **152,031** | | **$100,329** | **34,710** | | **$34,930** | **9,515** | | **$22,336** | **3,113** | | **$11,199** | **161,547** | **37,823** | **199,369** | **$122,665** | **$46,129** | **$168,794** | $0.847 |
| **Weekday Total Triangle Exp. Plus C540 Phases 1 and 2** | | **653,025** | | **$694,729** | **140,967** | | **$232,186** | **40,894** | | **$153,417** | **11,732** | | **$66,686** | **693,918** | **152,699** | **846,618** | **$848,146** | **$298,872** | **$1,147,018** | $1.355 |
| **Annual Total Triangle Exp. Plus C540 Phases 1 and 2 (000)** | | **196,561** | | **$209,113** | **44,969** | | **$74,067** | **11,205** | | **$42,036** | **3,250** | | **$18,472** | **207,765** | **48,218** | **255,984** | **$251,150** | **$92,539** | **$343,689** | |

Assumes Annualization Factor of 301 Days (Class 1 ETC), 319 (Class 1 BBM), 274 (Class 2-3 ETC), 277 (Class 2-3 BBM)

Note: Transactions by toll zone in this table may not match transactions shown in Figure 6.7 due to rounding by direction in the figure.

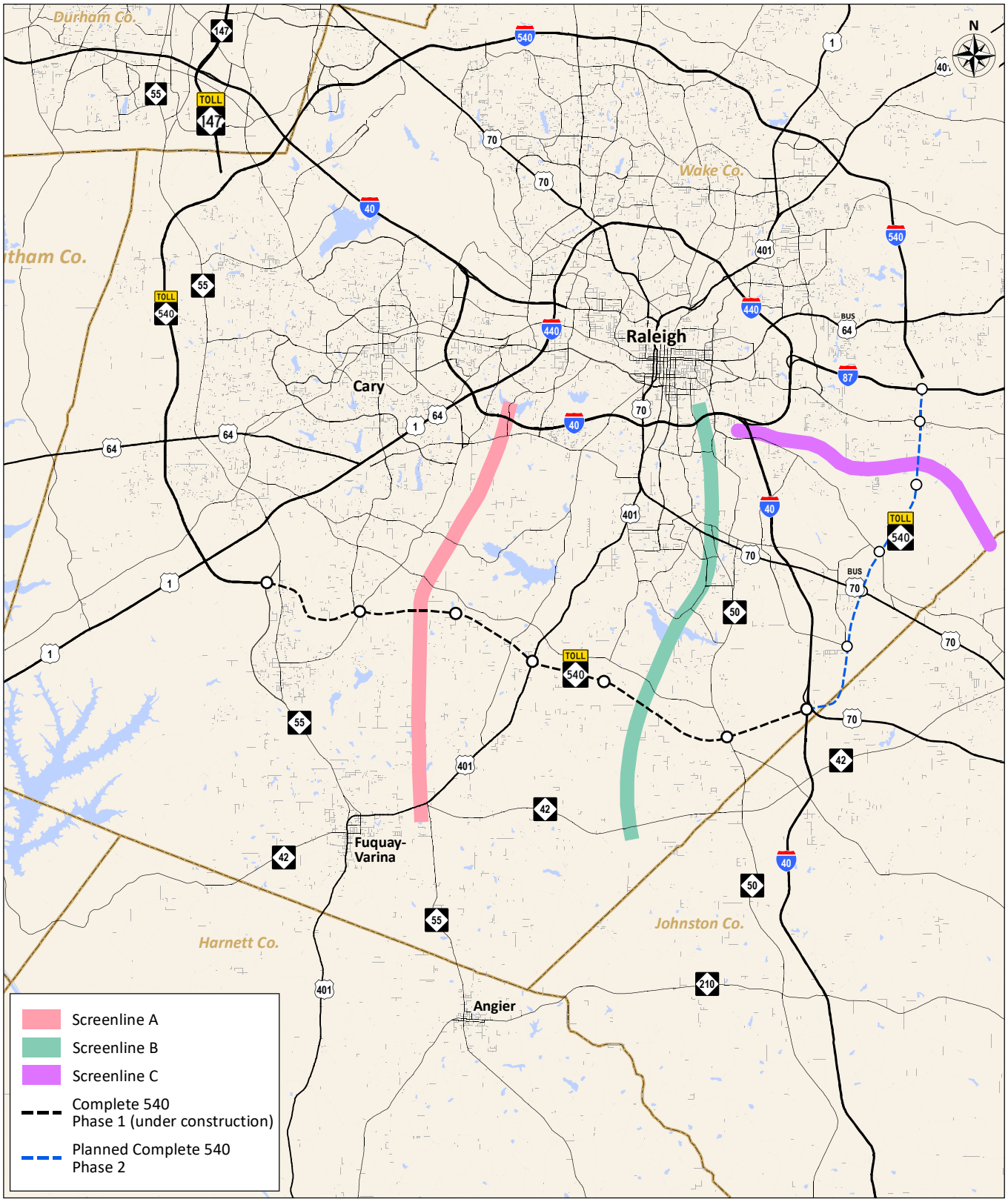
## 6.9 Complete 540 Phase 1 and Phase 2 Corridor Share Comparison

Examining the Complete 540's share of total corridor traffic is useful in reviewing the reasonableness of the traffic forecasts. **Figure 6.8** shows three corridor share screenlines. Screenline A is between the existing Triangle Expressway and U.S. 401, Screenline B is between U.S. 401 and I-40, and Screenline C is between I-40 and U.S. 64/U.S. 264/I-87. Each of the screenlines covers a "travel shed" from which Complete 540 would draw traffic. Screenlines A and B include all significant routes between NC 42 to the south and I-40 to the north. Screenline C includes all significant routes between South New Hope Road to the east and I-40 to the west.

**Table 6.8** provides a corridor-share comparison for model years 2025, 2035 and 2045. In 2025, total traffic crossing Screenline A is estimated at 296,641 on a typical weekday. Of this, about 50 percent would be on I-40. On Complete 540 Phase 1, traffic is estimated at 22,442, or about 7.6 percent of the total screenline. At screenline B, traffic on Complete 540 Phase 1 is estimated at about 17,550 on a typical weekday in 2025. This represents about 6.8 percent of the total model forecasted traffic. On this screenline, I-40 carries about 60.4 percent of the total traffic. Estimated Complete 540 weekday traffic volumes in Table 6.8 do not reflect ramp-up adjustments.

Similar corridor share patterns are shown at 2035 levels. On Screenline A, the Complete 540 Phase 1 screenline share remains at 7.6 percent in 2035, and on Screenline B, the Complete 540 Phase 1 screenline share in 2035 remains very similar to 2025 levels at 6.7 percent. To the northeast, the Complete 540 Phase 2 share of Screenline C, which has a lower overall traffic volume than screenlines A and B, is about 12 percent.

In 2045, Toll NC 540 screenline shares increase to 9.7 percent for Screenline A and 8.1 percent for screenline B, while the share for Screenline C remains similar to 2035 levels at 12.2 percent. Traffic levels on Complete 540 Phase 1 at Screenlines A and B are anticipated to grow at about 4 percent per year between 2035 and 2045, while traffic levels on Complete 540 Phase 2 are expected to grow at a more modest 2 percent per year during that time period.




CDM Smith

## CORRIDOR SHARE SCREENLINES

FIGURE 6.8

**Table 6.8**
**Complete 540 Weekday Corridor-Share Comparison**

| Road Name | 2025 (1) Weekday Traffic | 2025 (1) Screenline Market Share | 2035 (2) Weekday Traffic | 2035 (2) Screenline Market Share | 2045 (2) Weekday Traffic | 2045 (2) Screenline Market Share |
|---|---|---|---|---|---|---|
| **Screenline A** | | | | | | |
| I-40 | 148,182 | 50.0% | 185,451 | 53.2% | 209,151 | 50.6% |
| Tryon Rd | 32,187 | 10.9% | 34,737 | 10.0% | 38,455 | 9.3% |
| Yates Mill Pond Rd | 12,901 | 4.3% | 12,455 | 3.6% | 14,515 | 3.5% |
| Penny Rd | 7,020 | 2.4% | 4,948 | 1.4% | 8,111 | 2.0% |
| Ten Ten Rd | 25,776 | 8.7% | 38,719 | 11.1% | 46,014 | 11.1% |
| **Toll NC 540** | **22,442** | **7.6%** | **26,587** | **7.6%** | **39,947** | **9.7%** |
| Optimist Farm Rd | 7,504 | 2.5% | 8,272 | 2.4% | 10,484 | 2.5% |
| Hilltop Needmore Rd | 8,018 | 2.7% | 9,636 | 2.8% | 15,473 | 3.7% |
| U.S. 401 | 32,611 | 11.0% | 27,605 | 7.9% | 31,132 | 7.5% |
| Total | 296,641 | 100.0% | 348,411 | 100.0% | 413,283 | 100.0% |
| **Screenline B** | | | | | | |
| I-40 | 156,156 | 60.4% | 196,515 | 61.2% | 225,153 | 58.4% |
| Garner Rd | 9,257 | 3.6% | 9,412 | 2.9% | 12,249 | 3.2% |
| U.S. 70 | 27,394 | 10.6% | 32,389 | 10.1% | 38,333 | 9.9% |
| Lakeside Dr | 2,576 | 1.0% | 2,173 | 0.7% | 2,729 | 0.7% |
| Timber Dr. | 18,540 | 7.2% | 26,144 | 8.1% | 29,648 | 7.7% |
| Buffalo Rd. | 1,435 | 0.6% | 1,806 | 0.6% | 2,391 | 0.6% |
| Ten Ten Rd. | 8,703 | 3.4% | 9,976 | 3.1% | 14,611 | 3.8% |
| **Toll NC 540** | **17,550** | **6.8%** | **21,619** | **6.7%** | **31,196** | **8.1%** |
| Pagan Rd | 3,468 | 1.3% | 3,220 | 1.0% | 6,496 | 1.7% |
| Rock Service Station Rd | 3,266 | 1.3% | 4,450 | 1.4% | 5,209 | 1.4% |
| NC 42 | 10,209 | 3.9% | 13,544 | 4.2% | 17,688 | 4.6% |
| Total | 258,552 | 100.0% | 321,246 | 100.0% | 385,702 | 100.0% |
| **Screenline C** | | | | | | |
| S. New Hope Rd | | | 20,520 | 8.2% | 30,981 | 10.1% |
| Barwell Rd | | | 5,154 | 2.1% | 5,142 | 1.7% |
| **Toll NC 540** | | | **30,130** | **12.0%** | **37,244** | **12.2%** |
| Auburn Knightdale Rd | | | 8,503 | 3.4% | 10,191 | 3.3% |
| Mial Plantation Rd | | | 9,273 | 3.7% | 9,002 | 2.9% |
| Hodge Rd (Future) | | | - | 0.0% | 13,343 | 4.4% |
| I-40 | | | 177,535 | 70.7% | 199,929 | 65.4% |
| Total | | | 251,115 | 100.0% | 305,832 | 100.0% |

(1) Complete 540 Phase 2 is not yet assumed to be built in 2025. 2025 traffic estimates are prior to ramp up adjustments on Complete 540 Phase 1.

(2) 2035 and 2045 traffic estimates assume Complete 540 Phases 1 and 2 are open.

## 6.10 Estimated Annual Transactions and Revenue

The weekday transaction and revenue estimates calculated at 2020, 2025, 2035 and 2045 levels, based on travel demand model assignments, were used to develop fiscal year transaction and revenue forecasts over a 40-year projection period.

As noted previously, forecasts for a theoretical 2020 without COVID-19 were developed using model output and recent historical trends. Intermediate years were developed by interpolating between model years 2020 and 2025, 2025 and 2035, and 2035 and 2045. In the case of the years between 2020 and 2025, short-term impacts of COVID-19 as discussed in section 6.1 were applied on top of the interpolation. After the last model year of 2045, traffic growth was assumed to occur at a nominal 0.5 percent per year.

Estimated annual transactions and revenue are presented in **Table 6.9**. This forecast assumes full construction of Complete 540 Phase 1 and Phase 2. Complete 540 Phase 1 is assumed to open on July 1, 2023, and Complete 540 Phase 2 is assumed to open on July 1, 2026. All transaction and revenue figures shown in Table 6.9 reflect annual totals, rounded to thousands. Information is shown on a fiscal year basis, with each fiscal year representing the 12 months ending June 30. Forecasts are provided for FY 2021 through FY 2060. The toll revenue in Table 6.9 represents expected toll revenue based on forecast traffic volumes and does not include adjustments for leakage associated with BBM or anticipated processing fee revenue.

As noted at the bottom of the table, estimates of transactions and revenue on Complete 540 Phase 1 and Phase 2, as well as the net incremental transactions and revenue on the Triangle Expressway, have been adjusted downward to reflect "ramp-up", since this portion of the facility would be newly opened to traffic. Ramp-up adjustments are applied as net reduction factors to the modeled forecasts; generally intended to reflect the transition period where it takes time for motorists to become aware of new toll facilities; to initially try and eventually modify travel habits.

Ramp-up reflects the patterns typically experienced on new toll facilities, in which transaction and revenue growth over the first several years considerably exceeds long-term averages. Significant ramp-up was observed on the Triangle Expressway over its first 3 to 4 years of operation. The weekday estimates provided in Tables 6.5, 6.6 and 6.7 do not include any adjustments for ramp-up. However, the ramp-up adjustments were applied in the annual forecasts shown in Table 6.9, using the following factors over the first 36-months of operation on Complete 540 Phase 1 (FY 2024-2026) and Phase 2 (FY 2027-2029):

- Months 1-12: 0.610
- Months 13-24: 0.813
- Months 25-36: 0.945

Ramp-up adjustments were also made to forecasted transactions and revenue on the existing Triangle Expressway for that incremental portion of demand which would be attributable directly to the implementation of Complete 540 Phase 1 and Phase 2.

**Table 6.9**
**Estimated Annual Transactions and Gross Revenue**
**Triangle Expressway with Complete 540 Phases 1 and 2**

| Fiscal | Estimated Annual Transactions (000) | | | | Estimated Annual Gross Revenue (000) | | | | Average Toll Per Transaction | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | ETC | BBM | Total | % ETC | ETC | BBM | Total | % ETC | ETC | BBM | Overall |
| 2021 (1,2) | 32,586 | 14,674 | 47,260 | 69.0 | $22,678 | $16,568 | $39,246 | 57.8 | $ 0.696 | $ 1.129 | $ 0.830 |
| 2022 (2) | 43,070 | 18,837 | 61,907 | 69.6 | 30,902 | 22,005 | 52,907 | 58.4 | 0.717 | 1.168 | 0.855 |
| 2023 (2) | 50,976 | 21,669 | 72,645 | 70.2 | 37,675 | 26,170 | 63,844 | 59.0 | 0.739 | 1.208 | 0.879 |
| 2024 (2,3) | 74,238 | 29,299 | 103,537 | 71.7 | 56,771 | 36,954 | 93,725 | 60.6 | 0.765 | 1.261 | 0.905 |
| 2025 (2) | 83,834 | 31,813 | 115,647 | 72.5 | 66,083 | 41,557 | 107,640 | 61.4 | 0.788 | 1.306 | 0.931 |
| 2026 (2) | 90,677 | 33,254 | 123,931 | 73.2 | 73,805 | 44,802 | 118,607 | 62.2 | 0.814 | 1.347 | 0.957 |
| 2027 (2,4) | 111,509 | 40,077 | 151,586 | 73.6 | 87,542 | 51,733 | 139,275 | 62.9 | 0.785 | 1.291 | 0.919 |
| 2028 (2) | 119,896 | 42,016 | 161,912 | 74.1 | 94,897 | 54,567 | 149,463 | 63.5 | 0.791 | 1.299 | 0.923 |
| 2029 (2) | 126,627 | 43,219 | 169,845 | 74.6 | 101,890 | 56,982 | 158,872 | 64.1 | 0.805 | 1.318 | 0.935 |
| 2030 | 131,373 | 43,631 | 175,004 | 75.1 | 108,374 | 58,879 | 167,253 | 64.8 | 0.825 | 1.349 | 0.956 |
| 2031 | 134,620 | 43,477 | 178,097 | 75.6 | 114,572 | 60,388 | 174,960 | 65.5 | 0.851 | 1.389 | 0.982 |
| 2032 | 137,969 | 43,331 | 181,300 | 76.1 | 121,169 | 61,988 | 183,157 | 66.2 | 0.878 | 1.431 | 1.010 |
| 2033 | 141,423 | 43,195 | 184,619 | 76.6 | 127,845 | 63,491 | 191,336 | 66.8 | 0.904 | 1.470 | 1.036 |
| 2034 | 144,989 | 43,070 | 188,059 | 77.1 | 134,941 | 65,007 | 199,948 | 67.5 | 0.931 | 1.509 | 1.063 |
| 2035 | 148,609 | 42,921 | 191,529 | 77.6 | 142,415 | 66,568 | 208,983 | 68.1 | 0.958 | 1.551 | 1.091 |
| 2036 | 152,915 | 43,110 | 196,024 | 78.0 | 150,229 | 68,483 | 218,712 | 68.7 | 0.982 | 1.589 | 1.116 |
| 2037 | 157,945 | 43,640 | 201,585 | 78.4 | 158,529 | 70,798 | 229,328 | 69.1 | 1.004 | 1.622 | 1.138 |
| 2038 | 163,084 | 44,144 | 207,228 | 78.7 | 167,575 | 73,194 | 240,769 | 69.6 | 1.028 | 1.658 | 1.162 |
| 2039 | 168,400 | 44,657 | 213,057 | 79.0 | 176,817 | 75,488 | 252,306 | 70.1 | 1.050 | 1.690 | 1.184 |
| 2040 | 173,901 | 45,178 | 219,080 | 79.4 | 186,376 | 77,725 | 264,101 | 70.6 | 1.072 | 1.720 | 1.206 |
| 2041 | 179,593 | 45,709 | 225,302 | 79.7 | 196,439 | 80,083 | 276,522 | 71.0 | 1.094 | 1.752 | 1.227 |
| 2042 | 185,483 | 46,249 | 231,732 | 80.0 | 207,240 | 82,628 | 289,868 | 71.5 | 1.117 | 1.787 | 1.251 |
| 2043 | 191,579 | 46,799 | 238,377 | 80.4 | 219,262 | 85,460 | 304,721 | 72.0 | 1.144 | 1.826 | 1.278 |
| 2044 | 197,887 | 47,358 | 245,245 | 80.7 | 231,698 | 88,341 | 320,040 | 72.4 | 1.171 | 1.865 | 1.305 |
| 2045 | 204,771 | 47,951 | 252,722 | 81.0 | 244,935 | 91,164 | 336,099 | 72.9 | 1.196 | 1.901 | 1.330 |
| 2046 | 208,659 | 48,340 | 256,998 | 81.2 | 254,670 | 93,664 | 348,334 | 73.1 | 1.221 | 1.938 | 1.355 |
| 2047 | 209,385 | 48,518 | 257,903 | 81.2 | 260,709 | 95,905 | 356,614 | 73.1 | 1.245 | 1.977 | 1.383 |
| 2048 | 210,472 | 48,721 | 259,193 | 81.2 | 267,306 | 98,192 | 365,498 | 73.1 | 1.270 | 2.015 | 1.410 |
| 2049 | 211,564 | 48,925 | 260,489 | 81.2 | 274,127 | 100,557 | 374,684 | 73.2 | 1.296 | 2.055 | 1.438 |
| 2050 | 212,662 | 49,129 | 261,791 | 81.2 | 281,258 | 103,030 | 384,288 | 73.2 | 1.323 | 2.097 | 1.468 |
| 2051 | 213,765 | 49,334 | 263,100 | 81.2 | 288,582 | 105,572 | 394,154 | 73.2 | 1.350 | 2.140 | 1.498 |
| 2052 | 214,875 | 49,541 | 264,415 | 81.3 | 295,740 | 108,032 | 403,772 | 73.2 | 1.376 | 2.181 | 1.527 |
| 2053 | 215,990 | 49,748 | 265,738 | 81.3 | 303,005 | 110,580 | 413,585 | 73.3 | 1.403 | 2.223 | 1.556 |
| 2054 | 217,111 | 49,955 | 267,066 | 81.3 | 310,725 | 113,206 | 423,931 | 73.3 | 1.431 | 2.266 | 1.587 |
| 2055 | 218,238 | 50,164 | 268,402 | 81.3 | 318,671 | 115,940 | 434,611 | 73.3 | 1.460 | 2.311 | 1.619 |
| 2056 | 219,370 | 50,373 | 269,744 | 81.3 | 326,839 | 118,791 | 445,630 | 73.3 | 1.490 | 2.358 | 1.652 |
| 2057 | 220,509 | 50,584 | 271,092 | 81.3 | 334,809 | 121,526 | 456,335 | 73.4 | 1.518 | 2.402 | 1.683 |
| 2058 | 221,653 | 50,795 | 272,448 | 81.4 | 343,038 | 124,347 | 467,385 | 73.4 | 1.548 | 2.448 | 1.716 |
| 2059 | 222,803 | 51,007 | 273,810 | 81.4 | 352,759 | 127,634 | 480,393 | 73.4 | 1.583 | 2.502 | 1.754 |
| 2060 | 223,959 | 51,220 | 275,179 | 81.4 | 363,794 | 131,445 | 495,239 | 73.5 | 1.624 | 2.566 | 1.800 |
| **Average Annual Percent Change** | | | | | | | | | | | |
| 2021-25 | 26.6% | 21.3% | 25.1% | | 30.7% | 25.8% | 28.7% | | 3.2% | 3.7% | 2.9% |
| 2025-35 | 5.9% | 3.0% | 5.2% | | 8.0% | 4.8% | 6.9% | | 2.0% | 1.7% | 1.6% |
| 2035-45 | 3.3% | 1.1% | 2.8% | | 5.6% | 3.2% | 4.9% | | 2.2% | 2.1% | 2.0% |
| 2045-60 | 0.6% | 0.4% | 0.6% | | 2.7% | 2.5% | 2.6% | | 2.1% | 2.0% | 2.0% |
| 2030-60 | 1.8% | 0.5% | 1.5% | | 4.1% | 2.7% | 3.7% | | 2.3% | 2.2% | 2.1% |

(1) New mainline toll zone north of Morrisville Pkwy was put into operation August 9, 2020. Morrisville Parkway Interchange opened to traffic February 4, 2020.
(2) Ramp up is applied to the first 36-month period of transaction and revenue impacts associated with new toll zones.
(3) Assumes Complete 540 Phase 1 is opened on July 1, 2023.
(4) Assumes Complete 540 Phase 2 is opened on July 1, 2026.

Annual transactions are expected to increase from 47.3 million in FY 2021 to 115.3 million in FY 2025, an average annual increase of 25.0 percent per year. A significant part of this transaction growth results from recovery from COVID-19 and from the opening of Complete 540 Phase 1 in July 2023. By FY 2030, annual transactions are expected to grow further to 175.0 million, an average annual increase of 8.7 percent per year from FY 2025 to FY 2030, primarily due to the opening of Complete 540 Phase 2 in July 2026 and assumed ramp-up through FY 2029.

After FY 2029, transaction and toll revenue growth are not affected by any additional phases of the project. Annual transactions are expected to increase from 175.0 million in FY 2030 to 252.7 million in FY 2045, an average annual increase of 2.5 percent per year. Gross revenue in that same period is expected to increase by 4.8 percent per year, resulting from increased transactions and annual toll rate increases. The average toll per transaction will have increased by 2.2 percent per year over that time period. ETC average toll rates will increase by 2.5 percent per year, however, the share of BBM versus ETC transactions will decrease between 2030 and 2045. Specifically, ETC transactions will increase by 3.0 percent per year over those 15 years, while BBM transactions will increase by an average of just 0.6 percent per year.

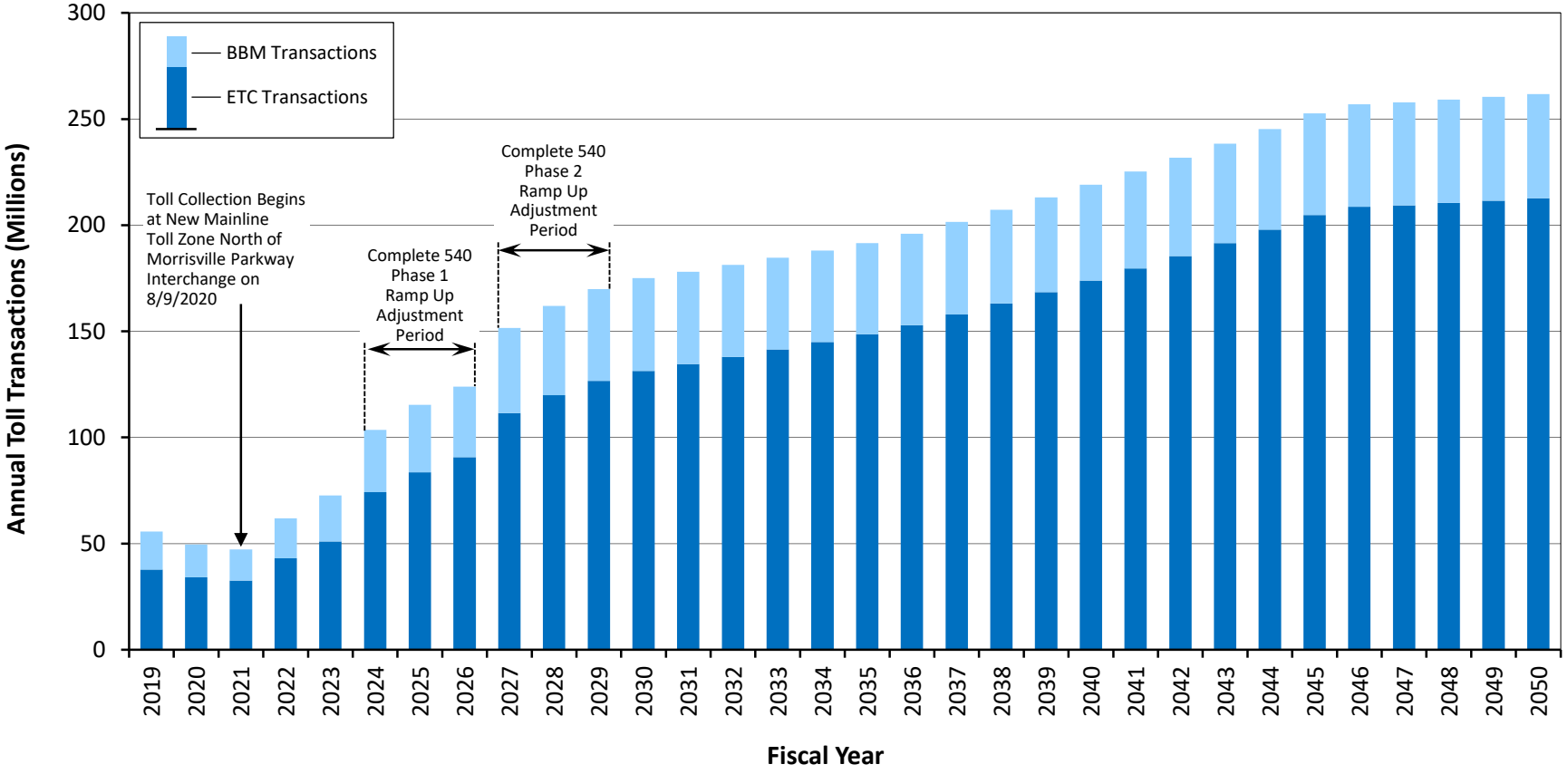
Over the 30-year interval between FY 2030 and FY 2060, in which no toll system changes or new portions of the project are assumed to be added, overall annual transactions are forecast to increase by 1.5 percent per year while expected toll revenue will increase by 3.7 percent per year. Annual gross revenue is expected to reach $495.2 million in FY 2060.

**Figure 6.9** provides a graphic depiction of forecasted systemwide annual transactions, including the distribution of transactions between ETC and BBM. The number of BBM transactions remain fairly constant over time, but they comprise a smaller and smaller proportion of total transactions.

The transactions in Figure 6.9 are actual for FY 2019 and FY 2020. The decrease in transactions in FY 2020 and FY 2021 is due to the impact of COVID-19. Subsequent large increases in transactions seen in FY 2022 and FY 2023 are associated with recovery from COVID-19, in addition to normal growth. Continued recovery and the opening of Complete 540 Phase 1 contribute to a significant increase in FY 2024 through FY 2026. The notable increase in FY 2027 through FY 2029 is due to the opening of Complete 540 Phase 2.

After FY 2029, traffic and toll revenue growth is not impacted by any new interchanges or toll zone relocations. As seen in Figure 6.9, transaction growth levels off after FY 2045. This is because 2045 was the last supported model year, and transactions were assumed to increase at a nominal 0.5 percent per year.

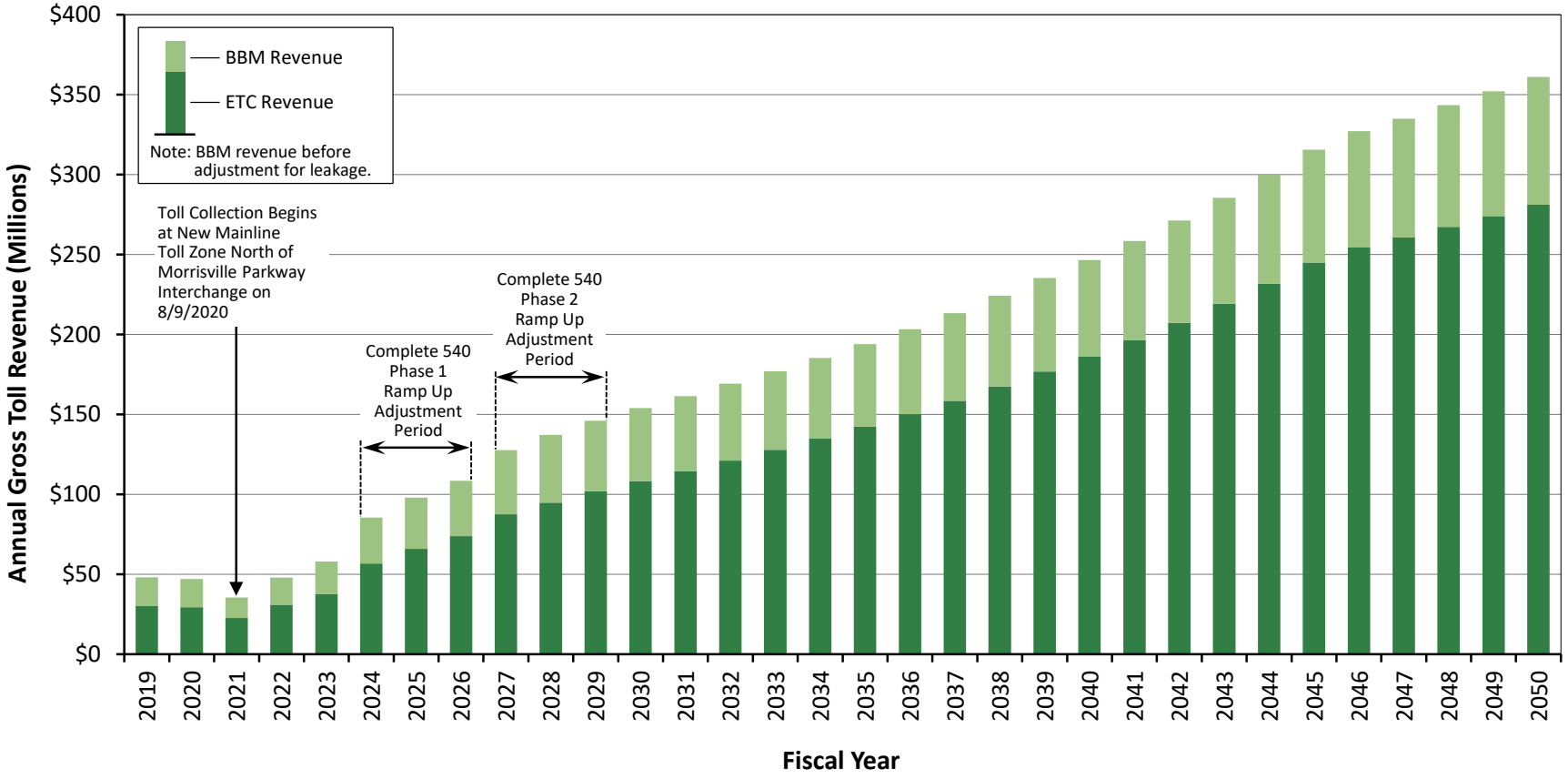
**Figure 6.10** provides a graphic depiction of forecasted collected toll revenue, by ETC and BBM, for FY 2019 through FY 2050. The forecast toll revenue shown in this figure reflects estimated leakage but does not include processing fee revenue. FY 2019 and FY 2020 reflect actual collected toll revenues on Triangle Expressway. Trends in this figure are analogous to those observed in transaction forecasts in Figure 6.9. Figure 6.10 also demonstrates the increasing share of total revenue expected to come from electronic toll collection.




**ESTIMATED ANNUAL TRANSACTIONS BY PAYMENT METHOD**
**TRIANGLE EXPRESSWAY PLUS COMPLETE 540 PHASES 1 AND 2**

CDM Smith

FIGURE 6.9




## ESTIMATED ANNUAL COLLECTED REVENUE BY PAYMENT METHOD
## TRIANGLE EXPRESSWAY PLUS COMPLETE 540 PHASES 1 AND 2

FIGURE 6.10

### 6.10.1 Estimated Adjusted Annual Revenue

The final step in the forecast process was to adjust gross toll revenue estimates for leakage and potential additional processing fee revenue associated with the BBM collections process. Annual forecasts of adjusted total revenue are provided in **Table 6.10**. Estimated gross revenue for FY 2021 is shown at $39.2 million. Of this, $16.6 million is estimated to come from BBM transactions.

As with other all-electronic toll collection facilities in the United States, there is always some portion of BBM revenue which may not be collected. This is generally referred to as "leakage" and is a result of a variety of factors, including:

- Unreadable or obscured license plates at the time of the transaction
- Incomplete, unavailable or inaccurate information about vehicle owner name and address
- Non-payment of billed BBM transactions

Based on actual Triangle Expressway experience, estimates of BBM leakage were applied for each year in Table 6.10. This was applied only to the BBM share of gross revenue. In FY 2021, for example, losses due to BBM leakage were estimated at $3.7 million, or 22.5 percent of expected BBM toll revenue, resulting in adjusted annual revenue of $35.5 million. Leakage adjustments are expected to increase over time in proportion with the increase in computed BBM revenue. Even though the number of BBM transactions were estimated to grow only slightly over the forecast period, the amount of revenue, and hence the BBM leakage estimate, was assumed to increase over time because of assumptions regarding annual increases in toll rates. After adjusting for leakage, adjusted annual revenue would be expected to increase from $35.5 million in FY 2021 to $98.0 million in FY 2025 and $154.0 million in FY 2030.

Also shown in Table 6.10 are estimates of BBM processing fee revenue. This relates to processing fees which are added to BBM invoices which are not paid within the first payment interval. A $6.00 processing fee is assessed for each unpaid BBM invoice up to the fourth unpaid invoice, resulting in a maximum of $24 in assessed processing fees. Processing fees are estimated to generate about $2.2 million in FY 2021, increasing to about $6.3 million in FY 2025 and $8.1 million in FY 2030. Relatively little growth is shown in processing fee revenue after 2030, because BBM transactions are forecast to remain fairly stable and no annual increase in the $6.00 processing fee is assumed in this forecast.

The rightmost column of Table 6.10 shows estimated total collected revenue, which includes the adjusted revenue plus processing fee revenue. Total collected revenue systemwide is expected to grow from $37.7 million in FY 2021 to $324.5 million in FY 2045.

Estimated gross toll revenue and adjusted toll revenue is shown in **Table 6.11** by fiscal year. The gross toll revenue is split into the revenue generated by Triangle Expressway toll zones, Complete 540 Phase 1 toll zones, and Complete 540 Phase 2 toll zones. In FY 2025, gross toll revenue generated on the Triangle Expressway is about 74.5 percent of the total system toll revenue (Triangle Expressway and Complete 540 Phase 1). After the opening of Complete 540 Phase 2, the Triangle Expressway's share of gross toll revenue decreases to about 59.2 percent in 2035 and 57.0 percent in 2045. Also shown is the assumed systemwide leakage, adjusted toll revenue and processing fee revenue for each forecast fiscal year.

**Table 6.10**
**Estimated Adjusted Annual Revenue**
**Triangle Expressway with Complete 540 Phases 1 and 2**

| Fiscal Year | Computed Gross Revenue ETC | Computed Gross Revenue BBM | Computed Gross Revenue Total | BBM Leakage | Adjusted Toll Revenue | Processing Fees | Total Collected Revenue |
|---|---|---|---|---|---|---|---|
| 2021 (1,2) | $ 22,678 | $ 16,568 | $ 39,246 | $ (3,725) | $ 35,522 | $ 2,173 | $ 37,695 |
| 2022 (2) | 30,902 | 22,005 | 52,907 | (4,947) | 47,960 | 4,363 | 52,323 |
| 2023 (2) | 37,675 | 26,170 | 63,844 | (5,883) | 57,961 | 5,019 | 62,980 |
| 2024 (2,3) | 56,771 | 36,954 | 93,725 | (8,307) | 85,418 | 6,071 | 91,489 |
| 2025 (2) | 66,083 | 41,557 | 107,640 | (9,342) | 98,298 | 6,336 | 104,634 |
| 2026 (2) | 73,805 | 44,802 | 118,607 | (10,072) | 108,535 | 6,449 | 114,984 |
| 2027 (2,4) | 87,542 | 51,733 | 139,275 | (11,630) | 127,645 | 7,544 | 135,189 |
| 2028 (2) | 94,897 | 54,567 | 149,463 | (12,267) | 137,197 | 7,860 | 145,056 |
| 2029 (2) | 101,890 | 56,982 | 158,872 | (12,810) | 146,062 | 8,052 | 154,114 |
| 2030 | 108,374 | 58,879 | 167,253 | (13,236) | 154,017 | 8,115 | 162,132 |
| 2031 | 114,572 | 60,388 | 174,960 | (13,575) | 161,385 | 8,086 | 169,471 |
| 2032 | 121,169 | 61,988 | 183,157 | (13,935) | 169,221 | 8,059 | 177,281 |
| 2033 | 127,845 | 63,491 | 191,336 | (14,273) | 177,063 | 8,034 | 185,097 |
| 2034 | 134,941 | 65,007 | 199,948 | (14,614) | 185,334 | 8,011 | 193,345 |
| 2035 | 142,415 | 66,568 | 208,983 | (14,965) | 194,018 | 7,983 | 202,001 |
| 2036 | 150,229 | 68,483 | 218,712 | (15,395) | 203,317 | 8,018 | 211,335 |
| 2037 | 158,529 | 70,798 | 229,328 | (15,916) | 213,412 | 8,117 | 221,529 |
| 2038 | 167,575 | 73,194 | 240,769 | (16,454) | 224,314 | 8,211 | 232,525 |
| 2039 | 176,817 | 75,488 | 252,306 | (16,970) | 235,335 | 8,306 | 243,641 |
| 2040 | 186,376 | 77,725 | 264,101 | (17,473) | 246,628 | 8,403 | 255,031 |
| 2041 | 196,439 | 80,083 | 276,522 | (18,003) | 258,519 | 8,502 | 267,021 |
| 2042 | 207,240 | 82,628 | 289,868 | (18,575) | 271,293 | 8,602 | 279,895 |
| 2043 | 219,262 | 85,460 | 304,721 | (19,212) | 285,510 | 8,704 | 294,214 |
| 2044 | 231,698 | 88,341 | 320,040 | (19,859) | 300,180 | 8,808 | 308,989 |
| 2045 | 244,935 | 91,164 | 336,099 | (20,494) | 315,605 | 8,919 | 324,524 |
| 2046 | 254,670 | 93,664 | 348,334 | (21,056) | 327,278 | 8,991 | 336,269 |
| 2047 | 260,709 | 95,905 | 356,614 | (21,560) | 335,054 | 9,024 | 344,079 |
| 2048 | 267,306 | 98,192 | 365,498 | (22,074) | 343,424 | 9,062 | 352,486 |
| 2049 | 274,127 | 100,557 | 374,684 | (22,606) | 352,078 | 9,100 | 361,178 |
| 2050 | 281,258 | 103,030 | 384,288 | (23,162) | 361,127 | 9,138 | 370,265 |
| 2051 | 288,582 | 105,572 | 394,154 | (23,733) | 370,421 | 9,176 | 379,597 |
| 2052 | 295,740 | 108,032 | 403,772 | (24,286) | 379,486 | 9,214 | 388,700 |
| 2053 | 303,005 | 110,580 | 413,585 | (24,859) | 388,726 | 9,253 | 397,979 |
| 2054 | 310,725 | 113,206 | 423,931 | (25,449) | 398,482 | 9,291 | 407,773 |
| 2055 | 318,671 | 115,940 | 434,611 | (26,064) | 408,547 | 9,330 | 417,878 |
| 2056 | 326,839 | 118,791 | 445,630 | (26,705) | 418,925 | 9,369 | 428,295 |
| 2057 | 334,809 | 121,526 | 456,335 | (27,320) | 429,016 | 9,408 | 438,424 |
| 2058 | 343,038 | 124,347 | 467,385 | (27,954) | 439,431 | 9,448 | 448,879 |
| 2059 | 352,759 | 127,634 | 480,393 | (28,693) | 451,700 | 9,487 | 461,187 |
| 2060 | 363,794 | 131,445 | 495,239 | (29,549) | 465,690 | 9,527 | 475,216 |

(1) New mainline toll zone north of Morrisville Pkwy was put into operation August 9, 2020. Morrisville Parkway Interchange opened to traffic February 4, 2020.
(2) Ramp up is applied to the first 36-month period of transaction and revenue impacts associated with new toll zones.
(3) Assumes Complete 540 Phase 1 is opened on July 1, 2023.
(4) Assumes Complete 540 Phase 2 is opened on July 1, 2026.

**Table 6.11**
**Estimated Adjusted Annual Revenue**
**Triangle Expressway with Complete 540 Phases 1 and 2**

| Fiscal Year | Computed Gross Revenue: Triangle Expressway Toll Zones ETC | Triangle Expressway Toll Zones BBM | Triangle Expressway Toll Zones Total | Complete 540 Phase 1 Toll Zones ETC | Complete 540 Phase 1 Toll Zones BBM | Complete 540 Phase 1 Toll Zones Total | Complete 540 Phase 2 Toll Zones ETC | Complete 540 Phase 2 Toll Zones BBM | Complete 540 Phase 2 Toll Zones Total | Systemwide ETC | Systemwide BBM | Systemwide Total | BBM Leakage | Adjusted Revenue | Processing Fees | Total Collected |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2021 (1,2) | $ 22,678 | $ 16,568 | $ 39,246 | - | - | - | - | - | - | $ 22,678 | $ 16,568 | $ 39,246 | $ (3,725) | $ 35,522 | $ 2,173 | $ 37,695 |
| 2022 (2) | 30,902 | 22,005 | 52,907 | - | - | - | - | - | - | 30,902 | 22,005 | 52,907 | (4,947) | 47,960 | 4,363 | 52,323 |
| 2023 (2) | 37,675 | 26,170 | 63,844 | - | - | - | - | - | - | 37,675 | 26,170 | 63,844 | (5,883) | 57,961 | 5,019 | 62,980 |
| 2024 (2,3) | 44,725 | 29,633 | 74,358 | 12,046 | 7,321 | 19,368 | - | - | - | 56,771 | 36,954 | 93,725 | (8,307) | 85,418 | 6,071 | 91,489 |
| 2025 (2) | 48,835 | 31,336 | 80,170 | 17,249 | 10,221 | 27,470 | - | - | - | 66,083 | 41,557 | 107,640 | (9,342) | 98,298 | 6,336 | 104,634 |
| 2026 (2) | 52,529 | 32,547 | 85,076 | 21,276 | 12,254 | 33,531 | - | - | - | 73,805 | 44,802 | 118,607 | (10,072) | 108,535 | 6,449 | 114,984 |
| 2027 (2,4) | 55,481 | 33,230 | 88,711 | 24,267 | 13,421 | 37,688 | 7,794 | 5,082 | 12,876 | 87,542 | 51,733 | 139,275 | (11,630) | 127,645 | 7,544 | 135,189 |
| 2028 (2) | 58,239 | 33,903 | 92,142 | 25,678 | 13,733 | 39,411 | 10,980 | 6,930 | 17,910 | 94,897 | 54,567 | 149,463 | (12,267) | 137,197 | 7,860 | 145,056 |
| 2029 (2) | 61,161 | 34,641 | 95,802 | 27,170 | 14,053 | 41,223 | 13,559 | 8,288 | 21,847 | 101,890 | 56,982 | 158,872 | (12,810) | 146,062 | 8,052 | 154,114 |
| 2030 | 64,443 | 35,462 | 99,905 | 28,705 | 14,392 | 43,097 | 15,226 | 9,025 | 24,251 | 108,374 | 58,879 | 167,253 | (13,236) | 154,017 | 8,115 | 162,132 |
| 2031 | 68,010 | 36,293 | 104,303 | 30,348 | 14,769 | 45,116 | 16,215 | 9,326 | 25,541 | 114,572 | 60,388 | 174,960 | (13,575) | 161,385 | 8,086 | 169,471 |
| 2032 | 71,765 | 37,178 | 108,943 | 32,097 | 15,151 | 47,249 | 17,306 | 9,659 | 26,965 | 121,169 | 61,988 | 183,157 | (13,935) | 169,221 | 8,059 | 177,281 |
| 2033 | 75,608 | 38,014 | 113,622 | 33,872 | 15,529 | 49,401 | 18,365 | 9,948 | 28,313 | 127,845 | 63,491 | 191,336 | (14,273) | 177,063 | 8,034 | 185,097 |
| 2034 | 79,654 | 38,864 | 118,517 | 35,714 | 15,889 | 51,603 | 19,573 | 10,255 | 29,828 | 134,941 | 65,007 | 199,948 | (14,614) | 185,334 | 8,011 | 193,345 |
| 2035 | 84,014 | 39,798 | 123,812 | 37,599 | 16,226 | 53,826 | 20,802 | 10,543 | 31,345 | 142,415 | 66,568 | 208,983 | (14,965) | 194,018 | 7,983 | 202,001 |
| 2036 | 88,486 | 40,935 | 129,422 | 39,822 | 16,739 | 56,560 | 21,921 | 10,809 | 32,730 | 150,229 | 68,483 | 218,712 | (15,395) | 203,317 | 8,018 | 211,335 |
| 2037 | 92,995 | 42,240 | 135,234 | 42,408 | 17,431 | 59,839 | 23,127 | 11,128 | 34,255 | 158,529 | 70,798 | 229,328 | (15,916) | 213,412 | 8,117 | 221,529 |
| 2038 | 97,786 | 43,467 | 141,253 | 45,322 | 18,235 | 63,557 | 24,467 | 11,491 | 35,958 | 167,575 | 73,194 | 240,769 | (16,454) | 224,314 | 8,211 | 232,525 |
| 2039 | 102,802 | 44,687 | 147,489 | 48,303 | 19,021 | 67,324 | 25,712 | 11,781 | 37,493 | 176,817 | 75,488 | 252,306 | (16,970) | 235,335 | 8,306 | 243,641 |
| 2040 | 107,997 | 45,880 | 153,877 | 51,361 | 19,780 | 71,141 | 27,018 | 12,065 | 39,083 | 186,376 | 77,725 | 264,101 | (17,473) | 246,628 | 8,403 | 255,031 |
| 2041 | 113,350 | 47,086 | 160,435 | 54,593 | 20,577 | 75,170 | 28,497 | 12,420 | 40,917 | 196,439 | 80,083 | 276,522 | (18,003) | 258,519 | 8,502 | 267,021 |
| 2042 | 119,028 | 48,361 | 167,389 | 58,161 | 21,459 | 79,620 | 30,051 | 12,808 | 42,858 | 207,240 | 82,628 | 289,868 | (18,575) | 271,293 | 8,602 | 279,895 |
| 2043 | 125,388 | 49,841 | 175,229 | 62,168 | 22,438 | 84,606 | 31,706 | 13,180 | 44,886 | 219,262 | 85,460 | 304,721 | (19,212) | 285,510 | 8,704 | 294,214 |
| 2044 | 132,025 | 51,390 | 183,414 | 66,205 | 23,357 | 89,562 | 33,468 | 13,595 | 47,063 | 231,698 | 88,341 | 320,040 | (19,859) | 300,180 | 8,808 | 308,989 |
| 2045 | 138,832 | 52,778 | 191,610 | 70,673 | 24,333 | 95,005 | 35,430 | 14,054 | 49,484 | 244,935 | 91,164 | 336,099 | (20,494) | 315,605 | 8,919 | 324,524 |
| 2046 | 143,963 | 54,075 | 198,037 | 73,954 | 25,200 | 99,154 | 36,753 | 14,389 | 51,142 | 254,670 | 93,664 | 348,334 | (21,056) | 327,278 | 8,991 | 336,269 |
| 2047 | 147,387 | 55,370 | 202,757 | 75,712 | 25,813 | 101,524 | 37,611 | 14,723 | 52,334 | 260,709 | 95,905 | 356,614 | (21,560) | 335,054 | 9,024 | 344,079 |
| 2048 | 151,147 | 56,702 | 207,849 | 77,583 | 26,411 | 103,994 | 38,577 | 15,078 | 53,655 | 267,306 | 98,192 | 365,498 | (22,074) | 343,424 | 9,062 | 352,486 |
| 2049 | 154,998 | 58,065 | 213,063 | 79,536 | 27,046 | 106,582 | 39,593 | 15,446 | 55,039 | 274,127 | 100,557 | 374,684 | (22,606) | 352,078 | 9,100 | 361,178 |
| 2050 | 158,945 | 59,474 | 218,418 | 81,646 | 27,700 | 109,346 | 40,667 | 15,857 | 56,524 | 281,258 | 103,030 | 384,288 | (23,162) | 361,127 | 9,138 | 370,265 |
| 2051 | 163,148 | 60,971 | 224,119 | 83,739 | 28,349 | 112,088 | 41,695 | 16,252 | 57,946 | 288,582 | 105,572 | 394,154 | (23,733) | 370,421 | 9,176 | 379,597 |
| 2052 | 167,176 | 62,397 | 229,573 | 85,924 | 29,058 | 114,982 | 42,640 | 16,577 | 59,217 | 295,740 | 108,032 | 403,772 | (24,286) | 379,486 | 9,214 | 388,700 |
| 2053 | 171,236 | 63,835 | 235,071 | 88,069 | 29,775 | 117,844 | 43,700 | 16,971 | 60,670 | 303,005 | 110,580 | 413,585 | (24,859) | 388,726 | 9,253 | 397,979 |
| 2054 | 175,673 | 65,369 | 241,043 | 90,155 | 30,432 | 120,587 | 44,896 | 17,405 | 62,301 | 310,725 | 113,206 | 423,931 | (25,449) | 398,482 | 9,291 | 407,773 |
| 2055 | 180,160 | 66,948 | 247,108 | 92,471 | 31,175 | 123,646 | 46,040 | 17,817 | 63,857 | 318,671 | 115,940 | 434,611 | (26,064) | 408,547 | 9,330 | 417,878 |
| 2056 | 184,746 | 68,593 | 253,340 | 94,866 | 31,950 | 126,816 | 47,227 | 18,247 | 65,474 | 326,839 | 118,791 | 445,630 | (26,705) | 418,925 | 9,369 | 428,295 |
| 2057 | 189,335 | 70,227 | 259,562 | 97,124 | 32,641 | 129,765 | 48,350 | 18,658 | 67,008 | 334,809 | 121,526 | 456,335 | (27,320) | 429,016 | 9,408 | 438,424 |
| 2058 | 194,011 | 71,849 | 265,860 | 99,505 | 33,395 | 132,899 | 49,523 | 19,103 | 68,626 | 343,038 | 124,347 | 467,385 | (27,954) | 439,431 | 9,448 | 448,879 |
| 2059 | 199,555 | 73,758 | 273,313 | 102,355 | 34,289 | 136,644 | 50,849 | 19,588 | 70,437 | 352,759 | 127,634 | 480,393 | (28,693) | 451,700 | 9,487 | 461,187 |
| 2060 | 205,862 | 75,981 | 281,843 | 105,602 | 35,290 | 140,892 | 52,330 | 20,174 | 72,504 | 363,794 | 131,445 | 495,239 | (29,549) | 465,690 | 9,527 | 475,216 |

(1) New mainline toll zone north of Morrisville Pkwy was put into operation August 9, 2020. Morrisville Parkway Interchange opened to traffic February 4, 2020.
(2) Ramp up is applied to the first 36-month period of transaction and revenue impacts associated with new toll zones.
(3) Assumes Complete 540 Phase 1 is opened on July 1, 2023.
(4) Assumes Complete 540 Phase 2 is opened on July 1, 2026.

### 6.10.2 Incremental Transactions and Revenue by Phase

CDM Smith conducted two sets of additional traffic assignments in 2025, 2035 and 2045, including:

1. Triangle Expressway only, assuming neither Complete 540 Phase 1 or Phase 2 would be built, and

2. Triangle Expressway with Complete 540 Phase 1 opening July 1, 2023, assuming Complete 540 Phase 2 would not be built.

These assignments enable the estimation of the impact of each phase of the project on prior phases, including the existing Triangle Expressway.

**Table 6.12** shows these impacts by phase for each model year. In 2025, estimated transactions at Triangle Expressway toll zones increase by 8.3 million (11 percent) as a result new traffic due to the opening of Complete 540 Phase 1. This impact gradually increases to about 15.4 million (14 percent) by 2045. The impact of Phase 1 on revenue generated at Triangle Expressway toll zones similarly increases from $8.9 million (12.5 percent) in 2025 to $28.9 million (17.5 percent) in 2045.

The opening of Complete 540 Phase 2 has a small negative impact on transactions and revenue generated at Triangle Expressway toll zones; a decrease of about 0.9 million transactions and a decrease of more than $1.3 million in revenue in 2035. By 2045 these impacts are estimated to be a decrease of 1.1 million transactions and $2.0 million in revenue. In both model years, these impacts represent a decrease of approximately 1.0 percent to transactions and revenue generated at Triangle Expressway toll zones.

The opening of Complete 540 Phase 2 has a small positive impact on transactions and revenue generated at Complete 540 Phase 2 toll zones; an increase nearly 1.3 million transactions and nearly $1.3 million in toll revenue. This represents a 2.9 percent increase to toll transactions and a 2.5 percent increase in toll revenue generated at Complete 540 Phase 1 toll zones.

**Table 6.12**
**Components of Annual Transactions and Gross Revenue**

| | Incremental Impact of Complete 540 Phase 1 | | | | Incremental Impact of Complete 540 Phase 2 | | | |
|---|---|---|---|---|---|---|---|---|
| **Fiscal Year** | Triangle Expressway Only | Impact to Triangle Expressway | Complete 540 Phase 1 | Systemwide Total | Additional Impact to Triangle Expressway | Impact to Complete 540 Phase 1 | Complete 540 Phase 2 | Systemwide Total |
| | Annual Transactions (000) | | | | | | | |
| 2025 | 76,665 | 8,273 | 30,709 | 115,647 | - | - | - | 115,647 |
| 2035 | 90,943 | 10,663 | 44,430 | 146,035 | (939) | 1,287 | 45,145 | 191,529 |
| 2045 | 113,085 | 15,387 | 64,240 | 192,712 | (1,100) | 1,563 | 59,547 | 252,722 |
| | Annual Gross Revenue ($000) | | | | | | | |
| 2025 | $71,295 | $8,876 | $27,470 | $107,640 | - | - | - | $107,640 |
| 2035 | 109,562 | 15,605 | 52,530 | 177,697 | (1,355) | 1,296 | 31,345 | 208,983 |
| 2045 | 164,740 | 28,902 | 92,975 | 286,617 | (2,032) | 2,030 | 49,484 | 336,099 |

## 6.11 Disclaimer

CDM Smith used currently-accepted professional practices and procedures in the development of the traffic and revenue estimates in this report. However, as with any forecast, it should be understood that differences between forecasted and actual results may occur, as caused by events and circumstances beyond the control of the forecasters. In formulating the estimates, CDM Smith reasonably relied upon the accuracy and completeness of information provided (both written and oral) by NCTA. CDM Smith also relied upon the reasonable assurances of independent parties and is not aware of any material facts that would make such information misleading.

CDM Smith made qualitative judgments related to several key variables in the development and analysis of the traffic and revenue estimates that must be considered as a whole; therefore, selecting portions of any individual result without consideration of the intent of the whole may create a misleading or incomplete view of the results and the underlying methodologies used to obtain the results. CDM Smith gives no opinion as to the value or merit of partial information extracted from this report.

All estimates and projections reported herein are based on CDM Smith's experience and judgment and on a review of information obtained from multiple agencies, including NCTA. These estimates and projections may not be indicative of actual or future values and are therefore subject to substantial uncertainty. Certain variables such as future developments, economic cycles, global pandemics and impacts related to advances in automotive technology etc. cannot be predicted with certainty and may affect the estimates or projections expressed in this report, such that CDM Smith does not specifically guarantee or warrant any estimate or projection contained within this report.

While CDM Smith believes that the projections and other forward-looking statements contained within the report are based on reasonable assumptions as of the date of the report, such forward-looking statements involve risks and uncertainties that may cause actual results to differ materially from the results predicted. Therefore, following the date of this report, CDM Smith will take no responsibility or assume any obligation to advise of changes that may affect its assumptions contained within the report, as they pertain to socioeconomic and demographic forecasts, proposed residential or commercial land use development projects and/or potential improvements to the regional transportation network.

The report and its contents are intended solely for use by the NCTA and designated parties approved by NCTA and CDM Smith. Any use by third-parties, other than as noted above, is expressly prohibited. In addition, any publication of the report without the express written consent of CDM Smith is prohibited.

CDM Smith is not, and has not been, a municipal advisor as defined in Federal law (the Dodd Frank Bill) to NCTA and does not owe a fiduciary duty pursuant to Section 15B of the Exchange Act to NCTA with respect to the information and material contained in this report. CDM Smith is not recommending and has not recommended any action to NCTA. NCTA should discuss the information and material contained in this report with any and all internal and external advisors that it deems appropriate before acting on this information.

# Chapter 7
# Sensitivity Tests

Five hypothetical tests were conducted to determine the sensitivity of the Base Case annual transaction and toll revenue forecasts detailed in Chapter 6 to changes in key study assumptions. The sensitivity tests were conducted at model years 2025, 2035 and 2045 for the full build including Complete 540 Phases 1 and 2. The results were interpolated, converted to fiscal years, and are reported for FY 2030 and FY 2045. The following describes the five sensitivity tests:

1. **Reduced Economic Growth** – trip table growth was reduced by 30 percent.

2. **Reduced Value of Time** - passenger car (Class 1) and truck (Classes 2 and 3) values of time were reduced by 25 percent.

3. **Increased Motor Fuel Prices** – motor fuel prices were increased by 50 percent.

4. **Increased ETC Market Share** – the percentage of ETC transactions was increased by 10 percent. Total toll transactions remained unchanged.

5. **Toll NC 540 / Toll NC 147 Interchange Expansion** – Corresponding to project number U-5966 in the ***2020-2029 NC State Transportation Improvement Program (STIP)***, this scenario tests the addition of a new multilane roadway connecting SR 1613 (McCrimmon Parkway) to Toll NC 540 and Toll NC 147 in Morrisville. The project, shown in **Figure 7.1** below, would include the expansion of the existing Toll NC 540/Toll NC 147 interchange, permitting movements from both Toll NC 540 and Toll NC 147 to continue southward along the new roadway, providing access to McCrimmon Parkway and Little Drive.

**Figure 7.1**
**Toll NC 540 / Toll NC 147 Interchange Expansion**

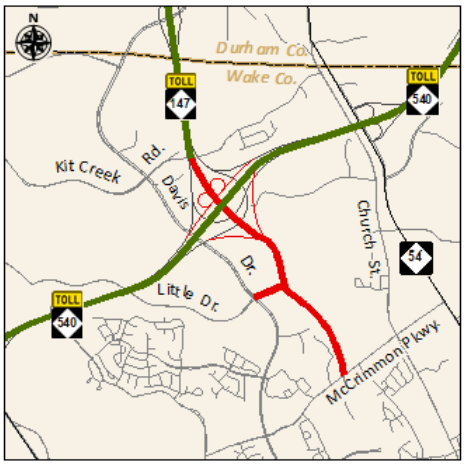



**Table 7.1** presents the estimated impacts on Base Case transactions and revenue associated with the five sensitivity tests described above. Base Case forecasts of toll transactions, gross toll revenue, and total collected revenue for fiscal years 2030 (three years after the opening of Complete 540 Phase 2,

when it is first assumed to be past the initial "ramp-up" period) and 2045 are shown across the top of the table. The results of tests 1 through 5 are also shown for FY 2030 and FY 2045, including the difference and percent impact between the sensitivity test forecast and the Base Case forecast. The percent impact on total collected revenue for each of these sensitivity tests compared to the Base Case is shown graphically in **Figure 7.2.**

**Table 7.1**
**Summary of Sensitivity Test Impacts on Fiscal Year Transaction and Toll Revenue Estimates for Triangle Expressway and Complete 540 Phases 1 and 2 (in thousands)**

| | Base Case and Sensitivity Scenarios | Annual Toll Transactions 2030 | Annual Toll Transactions 2045 | Annual Gross Toll Revenue (5) 2030 | Annual Gross Toll Revenue (5) 2045 | Annual Total Collected Revenue (6) 2030 | Annual Total Collected Revenue (6) 2045 |
|---|---|---|---|---|---|---|---|
| | Base Case | 175,004 | 252,722 | $167,253 | $336,099 | $162,132 | $324,524 |
| | **Sensitivity Scenarios** | | | | | | |
| 1 | Overall Economic Growth Reduced by 30% (1) | 160,700 | 203,907 | $153,589 | $270,936 | $148,890 | $261,596 |
| | Difference | (14,304) | (48,815) | (13,665) | (65,163) | (13,243) | (62,928) |
| | Percent Difference | -8.2% | -19.3% | -8.2% | -19.4% | -8.2% | -19.4% |
| 2 | Value of Time Reduced by 25% (2) | 152,833 | 223,700 | $144,153 | $294,144 | $140,018 | $284,652 |
| | Difference | (22,171) | (29,021) | (23,100) | (41,955) | (22,114) | (39,872) |
| | Percent Difference | -12.7% | -11.5% | -13.8% | -12.5% | -13.6% | -12.3% |
| 3 | Fuel Price Increased by 50% (3) | 160,840 | 232,080 | $154,611 | $311,047 | $149,738 | $300,033 |
| | Difference | (14,164) | (20,642) | (12,642) | (25,052) | (12,394) | (24,490) |
| | Percent Difference | -8.1% | -8.2% | -7.6% | -7.5% | -7.6% | -7.5% |
| 4 | ETC Market Share Increased by 10% (4) | 175,004 | 252,722 | $161,434 | $322,871 | $158,165 | $316,854 |
| | Difference | 0 | 0 | (5,820) | (13,228) | (3,968) | (7,670) |
| | Percent Difference | 0.0% | 0.0% | -3.5% | -3.9% | -2.4% | -2.4% |
| 5 | Extension of Toll NC-147 | 178,079 | 256,276 | $171,772 | $343,897 | $166,448 | $331,988 |
| | Difference | 3,075 | 3,555 | 4,519 | 7,798 | 4,315 | 7,465 |
| | Percent Difference | 1.8% | 1.4% | 2.7% | 2.3% | 2.7% | 2.3% |

(1) 30 percent global reduction in TRM trip table growth from base year 2020 through 2045.
(2) Value of time is reduced by 25 percent for cars and trucks.
(3) Fuel price is increased by 50 percent.
(4) ETC transactions forecast for Triangle Expressway and Complete 540 Phases 1 and 2 are increased by 10 percent. The change in ETC transactions is deducted from bill by mail transactions. Total transactions remain unchanged.
(5) Total expected toll revenue for all toll transactions, prior to accounting for leakage or fee revenue.
(6) Total collected toll revenue and processing fee revenue.

## 7.1 Reduced Economic Growth

The rate of trip table growth was reduced by 30 percent between 2020 and the future years to simulate slower economic growth than assumed in the trip tables used for the Base Case. Because of the slower assumed regional growth, toll transactions would be lower by 8.2 percent in FY 2030 and 19.3 percent in FY 2045. Similarly, total collected revenue decreased by 8.2 percent in FY 2030 and 19.4 percent in FY 2045. The percent impacts in 2045 are larger compared to those estimated for 2030 because of the compounding nature of the reduced annual growth rates.

## 7.2 Reduced Value of Time

Motorist value of time (VOT) is an important factor in the modeling process, as it influences a driver's willingness to pay a toll to achieve a time savings by using the toll road. The VOT is based in part on the median household income in each traffic analysis zone in the TRMv6 model. Base Condition VOTs were reduced by 25 percent, resulting in an estimated 12.7 percent and 11.5 percent decrease in transactions in FY 2030 and FY 2045, respectively. Annual total collected revenue estimates were reduced by 13.6 and 12.3 percent in FY 2030 and FY 2045, respectively.

## 7.3 Increased Motor Fuel Prices

Motor fuel prices can be volatile over a long-term forecast, and this test assumes that Base Case motor fuel prices increase by 50 percent. This change would result in higher operating costs for the motorist and likely result in reduced travel demand. To reflect the reduced travel demand, the trip tables were reduced by five percent representing an elasticity of -0.10. The motor vehicle operating cost used in the tolling assignment was also increased to reflect the increase in motor fuel prices. Under this test, annual toll transactions decreased by 8.1 percent in FY 2030 and by 8.2 percent in FY 2045. Total collected revenue decreased by 7.6 percent and by 7.5 percent for FY 2030 and FY 2045, respectively.

## 7.4 Increased ETC Market Share

For this sensitivity test, the percentage of transactions paying by ETC (for which tolls are 35 percent lower than BBM) was increased by 10 percent. This was a 10 percent increase *to the percentage* – for example, a 60 percent ETC market share would increase to 66 percent, 70 percent would increase to 77 percent. The total number of transactions remain unchanged from the Base Case. Annual total collected revenue decreased by 2.4 percent for both fiscal years 2030 and 2045.

## 7.5 Toll NC 540 / Toll NC 147 Interchange Expansion

In this test, as described above, NC 147 is extended south of NC 540 and terminates at McCrimmon Parkway, with a connection to Little Drive to the west. Drivers using the extension would pay an additional toll at the same per mile rate charged on the rest of the Triangle Expressway. Annual total transactions increased by 1.8 percent and by 1.4 percent for fiscal years 2030 and 2045, respectively. Annual total collected revenue increased by 2.7 percent and by 2.3 percent for fiscal years 2030 and 2045, respectively.

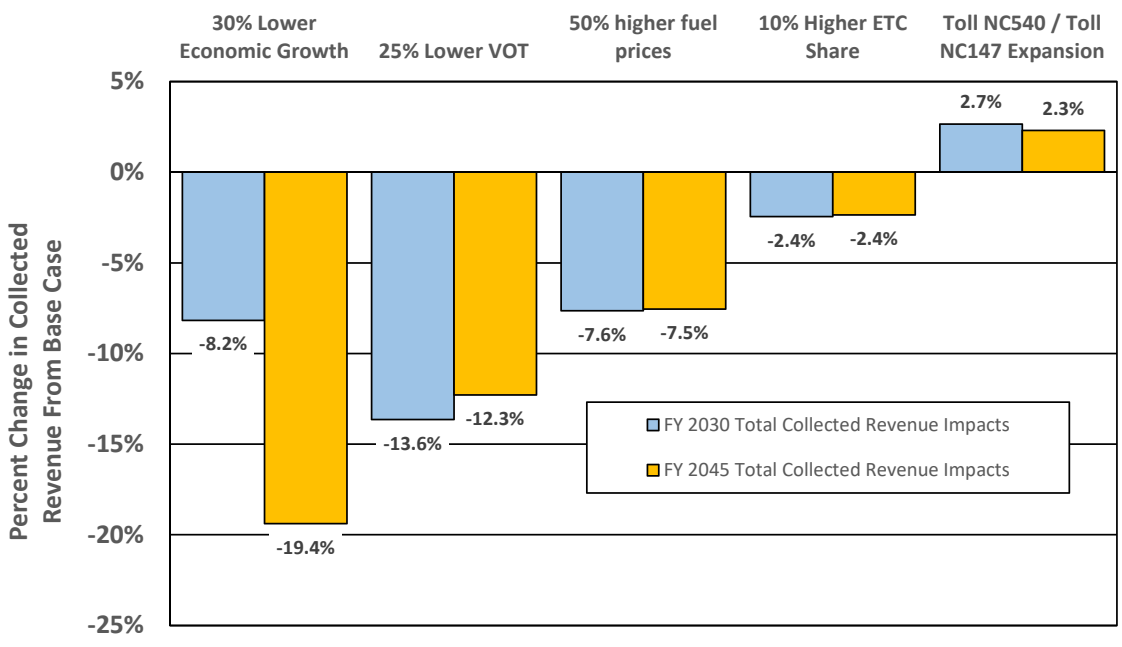



Figure 7.2

**Sensitivity Tests Impacts on Systemwide Collected Revenue for Triangle Expressway with Complete 540 Phases 1 and 2**

# Appendix A

# Employer Survey Questionnaire and Anonymized Response Matrix

**Employer Survey Questions**

1. How many employees and contractors were regularly working on-site pre-COVID?

2. Describe your Pre-COVID work from home participation. What percent of the work force regularly worked from home and how often?

3. How many employees and contractors are now regularly on-site under current COVID restrictions?

4. Please describe your company's current policy regarding working from home.

5. Do you have a current plan for employees to return to office (for example, a phased return plan)

    a. Where are you in that plan at this point?

6. What are the conditions or thresholds that must be met for employees to return to the office?

    a. What are those conditions or thresholds based on?

7. Has there been any outreach efforts to employees to gauge willingness to return to the office and under what conditions? (such as internal surveys or discussions)

    a. What were the results of the outreach?

8. Have any benefits or negative impacts to business been observed that may influence future work-from-home policies? What and how?

    a. Will greater levels of remote work (as compared to before the current pandemic) be allowed once state/county level restrictions have been lifted?

9. Do you anticipate any reduction of office size or number of locations going forward?

| Describe your Pre-COVID work from home participation. What percent of the work force regularly worked from home and how often? | How many employees and contractors are now regularly on-site under current COVID restrictions? |
|---|---|
| Roughly 10%, of those most are flexible work schedule with 4 days in office and one at home. To participate, you must work with your manager on the details. | Roughly 20-25% of our total employees. Non-essential employees are not permitted to go to work. Research positions and essential staff are the ones coming into work. |
| Company does have a flexible work arrangement policy. Not a large percentage, but there is one group that works from home. Around 10% work from home and 75% of that was from the customer service group. | Averages 20% of employees, 10% of contractors. Now at 30% of typical occupancy. |
| Work at Home % = 42%; 10% Work at Home Adjustment for (PTO, Travel) = 32% | 2% of employees |
| It has been permitted and facilitated, but not strongly encouraged. Typically, would be 4 days at work and 1 day at home. Less than 10% of the workforce in total are participating in this agreement. | All of the employees that are essential are on-site, which is roughly 30% of the total. Admin and faculty are all off site. |
| Yes, 40% are not in the office during a given day. | Averaging around 6-8% employees on site. |
| Yes, varies from day to day- about 10-30% work from home based on the day. | Over 90% are working from home now |
| Not sure. Always had a flexible work from home plan. They had assigned occupancy to the site, but company doesn't have a number on how many worked from home. | Approximately 8% of employees. |
| Up to 30% telework. Most are working from home 1 or 2 days a week. | 1/3 of the total employees on site now. |
| Pre-Covid we had 9% of the local staff. Per the telecommuter policy, telecommuters work from home at least 60% of the work week. However, we have a very flexible "work from home" policy that allows virtually all employees to work from home with manager approval. | Under the COVID-19 restrictions, only essential employees are allowed onsite, approximately 10%. |
| Employees are able to work from home one day a week. (Have to be on site 4 days a week) | About 10% of employees are on site at this time. |
| 10-15% of work force worked from home, between 50% and 90% of the time. | Between 32-38% of workforce is in the office. |
| An estimate of between 1% to 2% worked from home regularly. | Under the COVID-19 restrictions, only essential employees are allowed onsite, approximately 10%. In March 2020, at the beginning of COVID, we implemented an Alternate Work Site Policy requiring anyone that could work remotely to do so. That policy remains in place. 38% of workforce is considered essential. Of the rest: 35% are working on-site or in the field, 35% are working partially remote (rotating on- and off-site), 30% are working entirely remotely. Any sites that are open are required to properly socially distance. |
| We never had a formal tele-work policy or guideline. Zero percent | Employees were all sent home, site was closed for 3 months. Just now starting to get some employees back on site. Planning to reopen in Spring 2021. |
| 5-10% of employees | Everyone has been working from home since March 2020. |

| Please describe your company's current policy regarding working from home. | Do you have a current plan for employees to return to office (for example, a phased return plan)? |
|---|---|
| Roughly 80 percent of total employees are working from home with a flexible, five day a week schedule. Communication is occurring through managers of each section. | The playbook, as they call it, was developed in April. It called for, in July 2020, 30% of the office would return to work from each department as pilot groups. This did not occur after failing to meet the 3 factors being evaluated: local and federal guidance, site plan and readiness, medical criteria. |
| It is evolving if you can do it safely and if business can support it. | Return to work site plan started in June. Ramped up another 10% of employee population. Going to stay flat for a while. |
| Unless an employee has been notified that they're included in our current Return to Office Phase (Phase 0 or our next Phase; Phase 1) they are expected to work from home. If they have a specific business-critical need to be onsite, they need to contact their manager. Business-critical is defined as essential to the company for maintaining the viability of internet and IT infrastructure. | "Return to office decisions will be made on a phased basis: Phase 0 \| 3% of employees; Phase 1 \| 25-30 % of employees; Phase 2 \| 50% of Employees; Phase 3 \| Remaining employee base. Phase 0 workers are those performing duties that are deemed as Critical Infrastructure or Mission Critical prioritized according to business need and taking into account necessary individual accommodations. |
| Policy is that it is facilitated. | Units and Offices have been asked to continue to work from home until June 2021, but new evaluation are continuing to be done. |
| No current policy about it. Lots of flexibility for the employees and company giving supplies to make life at home accommodating. | Yes, we have a plan that outlines Phase 1 to phase 4. |
| Work from home is flexible and allows for various hours based on home life. Employees are to complete the same number of hours as a normal work week before COVID. | Leadership is evaluating all the circumstances for all of our offices to return. |
| Don't have a formal policy in place. They have a general flexibility option. | Yes |
| All employees need to work with supervisor to determine if they can work from home. Case by case basis. Telework agreement for each employee if they want to work from home. | Group A – still working on site, Group B-- work that is difficult to do remotely, Group C- People that telework, but more effective at work, Group D-- everyone else. |
| All non-essential staff are required to work from home until June 2021. If they need to come to the office to gather work materials or for on-time requests, they must get approval from their business unit and executive team prior to the visit. | No. Our executives are continuing to evaluate the COVID-19 related data. We will only permit staff to return to the office when it is safe for staff to do so. |
| They're working from home full time. People are not prohibited but are encouraged to not come to the office. Flexible schedule is currently going on. | Following governmental return to work guidance. |
| Encourage work from home. Central personnel supporting critical projects tend to come to work routinely or working in shifts. Have people who come in in the evenings | Following NC guidelines – ahead of the curve with number of employees at one of the sites |
| We have never ceased operations during the pandemic. We quickly adapted to effectively deliver services through Alternate Work Sites. Currently, we will continue to work in this manner indefinitely and continue to monitor community conditions related to COVID. | Each department was required to submit a "Reopening Plan" by the end of May 2020. The plans identified measures that would need to be in place before offices could "reopened" to a pre-COVID state |
| HR has a tele-working agreement all the employees had to sign. | Yes |
| We will continue the work from home policy until February 1st, 2021. We may consider reopening at a 20% capacity at the point. This has not yet been confirmed. | Yes, we are considering phase 1 at a reduced capacity. Even after the mandatory work from home policy has been lifted, the decision about whether to return to the office at that time will be up to each individual. |

| Where are you in that plan at this point? | What are the conditions or thresholds that must be met for 100% of employees to return to the office? |
|---|---|
| At this point, working from home has been extended into end of first quarter 2021. | Currently, awaiting guidance from national experts and corporate medical group. Still going by the 3 factors: local and federal guidance, site plan and readiness, medical criteria. |
| Essential people only, other employees stay where they are now at home until pandemic changes. | If they can bring more people back, not on a request basis, they will stay the same as they are. With more controls around if you have the virus or not. |
| We are currently in Phase 0 (work from home phase) of the return to office plan where only Business Critical workers will be allowed per their manager approval (as stated above). June and July 2021 timeframe for phase 2 of the employees | At this time, the mandatory work from home strategy remains in place for all sites that have not entered the return to office phase. If you have not been notified that you are eligible to return to the office, please continue to work from home until further notice unless you have business critical reasons to be on site. |
| Work from home until June 2021 at this point. | Not sure we will ever get back to 100%. |
| Phase 2 is occurring right now. Allowing 35% of employees to return to work in phase 2 but at most are getting 15-18% of workforce coming into the office. | Phase 4 needs to be in place. |
| All employees have been told to continue working from home at this point. | Federal and state guidelines need to be met, majority of employees feel safe, and corporate health policies. |
| On the cusp of phase 1, essential workers are on site right now. Phase 1 is for people who are volunteering to come back. Opening dates have been pushed back. | Nothing definitive, phased return, nobody is forced to come back to the office. |
| Currently on Group B. Will bring employees onsite up to 40%. | Current rates in area, what is happening politically also. |
| See previous answer. | We will be guided by national, state, and local COVID-19 data. |
| Currently in Phase 2 | Is currently still being evaluated. |
| Phase 2 and Phase 3. Administrative staff are all working from home. | Non-essential employees working from home will not return to work until it is safe. Corporate guidelines, local guidelines, and NC guidelines. State has certain guidelines and local guidelines may be more restrictive. |
| See the following question for a response. | Before employees return to the office, the following items must be in place. Individual departmental needs were identified in the Reopening Plans and leadership is in the process of addressing the various requirements. |
| Employees back on site in December. | The hard date is the driver. |
| We are still under a mandatory work from home until February 1st, 2021. | I do not have the answer to this question at this time. |

| What are those conditions or thresholds based on? | Has there been any outreach efforts to employees to gauge willingness to return to the office and under what conditions? (such as internal surveys or discussions) |
|---|---|
| See previous answer. | Managers from different groups have reported that at least 50% of their staff would like to continue working from home. Survey has been sent out, but do not know the individual results yet. |
| Combination of state, CDC, corporate, and local data. | Yes. Regular town hall meetings, Q&As, and company has put an inbox in place to receive requests or questions. |
| The company's priority is the health and safety of all people on our sites. Condition for Return to Office has four areas of consideration: legal, medical, employee concerns, and government regulations.<br>From a regional basis, positive case numbers for COVID-19 need to be under 5% for two weeks and a minimum of 14-day continuous decrease in hospital cases - 5-10% cumulative decline is also required for leadership to consider going into Phase 1. | The Workplace Resources team has conducted discussions with various business units within the company to gauge comfort and willingness to return to the office. In addition, in conjunction with Workplace Resources, site leaders have offered virtual office updates and Q&A sessions providing the opportunity for employees to engage in a conversation with Site Leaders. Our Change Management teams will also conduct virtual town hall sessions for each phase of the Return to Office as they are announced. |
| Some business functions will return back to 100% in person, while others will be evaluated. | Ongoing communications with managers, some units have done surveys. |
| CDC guidelines, hospital populations and employee feedback. | Yes, there has been surveys. Trying to understand what would make them feel safe to return to work. |
| Read previous answer. | Yes |
| Hospitalizations, local guidelines, etc. Possibly could open in first quarter 2021. | Sent communication that reviewed the current state and measure put in place. They mentioned they were open to people returning and wanted to ask who would like to return when they can. Also conducted a survey on willingness to return. |
| Infection rates | Had internal survey with supervisors in June 2020. Survey included what did they expect to do with Covid continuing and working from home conditions. Also, virtual suggestion box has been used for internal feedback. |
| See previous answer. | Yes. We have had several staff surveys and many discussions with our executive team. |
| Local numbers, medical risks and federal government guidance. | Not quite, leadership did a survey about what working conditions you are under now during COVID and what challenges employees are facing. |
| Information they refer to is from the NC Department of Health and Human services – by county. Cases, hospitalizations, death rate, etc. More informative than used as guidance. Considering impacts of people at home, children at home, etc. Take it all into consideration. | Informal discussions. Great sensitivity to understanding the morale of the people coming in. |
| Most current CDC, OSHA and other guidelines and best practices continuing to evolve throughout the pandemic. | See Next question. |
| Dates. If the Governor closed the state, onsite activity would have to close. | Constant engagement with staff. Plenty of opportunities with staff gauging willingness to return to the office. Schedules may change based on willingness to work. |
| We will watch the local conditions carefully. | Yes. |

| What were the results of the outreach? | Have any benefits or negative impacts to business been observed that may influence future work-from-home policies? What and how? |
|---|---|
| The company is continuing to look at the results and are deciding how to handle the situation. | Have not noticed any loss in productivity. Leadership fears that even though employees are saying they are more productive, are they using the gained hours on personal use or to get more work finished. |
| Received input, ideas and suggestions from employees. Received about 150-200 requests to come into the office for things. | Expected an impact on work, haven't noticed any negative work impacts though. Finding that their employees can work just as effectively remotely. |
| These forms of outreach have been very welcomed and received by our employees | Most businesses look to the future with optimism. Despite the challenges, they expect to emerge stronger. Employee well-being, work-life balance, and engagement are top of mind for leaders. Processes and daily coordination of staff activities have been the most significant challenges. But they've led to best practices, like setting up social chat channels and video conferencing meetups. Businesses are adopting technology that brings together security, networking, and collaboration — an agile workforce needs to be protected anywhere, on any device. Half of the survey respondents felt that increased remote and flexible work would lead to a more inclusive and extended talent pool. |
| A very diverse workforce so this is difficult. Many in the labs want to return to labs, but the ones that work from the office have said they would like to continue working from home. They are evaluating space allocation. | Some believe this is a wonderful situation with more time, flexibility, and productivity. A lot of other factors have been in to play like children at home and caring for elderly. |
| Still being evaluated at this time, variety of opinions. | Lack of options to provide accommodations at home has been a negative impact. Positive impacts have been employees have enjoyed the flexibility at home, significant increase in productivity. |
| Mix of reviews, some would like to work from home more and others would like to return. | Proven that our internal systems work well, and people can work from home. Interpersonal connections are being missed. |
| Between 12-17% of employees who have volunteered to return in some compacity based off survey results. | Most likely. Not sure of any more detail than that. It's a different world now and evaluating for the vaccine and we can then assess the situation. |
| Survey in June 2020– some wanted to return to work after trying it at home. Some also want to see work being done. How much are you and your team working? 72% said 100% of the time the team is working. 62% of supervisors were reconsidering how telework was going to be used going forward for their staff. | Some work has to continue on site no matter what. Need to have trainees working on site with supervisors. |
| The safety of our staff is the most important goal for our company and staff and a return to the office will only be considered once it is safe to do so. | Staff have greatly appreciated our flexibility and commitment to keeping staff safe. Many staff who rarely if ever worked from home pre-Covid-19, are now doing so efficiently and effectively. We have always been very flexible regarding teleworking and this will likely increase over time. |
| Positive results from employees about how the company is handling the situation and allowing flexibility. | No negative impacts so far other than research groups have not been able to continue studies with some of their samples that have timeframes. They have been able to hire more people, but we do have physical office space. |
| Moral is high with employees. Everyone onsite is screened (temp). Social distancing, masks, café with box lunches, etc. | Likely for administrative roles. Give more breathing room in existing sites. |
| Survey results showed that some employees can work remotely full time. Other employees would like to work remote until schools are fully open and no longer a rapid spread of COVID. | Our employees quickly pivoted to determine how to provide services safely in the new COVID world. We continued full services without missing a beat and, in some cases, have seen higher productivity. Employees are spending less time commuting, which can give them time back in their day. We fully implemented Microsoft Teams for all meetings. Teams is creating efficiencies in time and dollars. I do not see us returning to in-person meetings, where participants are coming from all over the triangle. |
| Extensive conversations. Still opening, working around staff challenges to complete work. Those who didn't want to return in person were encouraged to switch to online. | Probably not. 100% will return in person. |
| A survey was sent to the employees. The results are still being evaluated. | I am not allowed to answer this question. |

| Will greater levels of remote work (as compared to before the current pandemic) be allowed once state/county level restrictions have been lifted? | Do you anticipate any reduction of office size or number of locations going forward? |
|---|---|
| Still in the process of evaluating. | No, at this point not due to COVID. Potential to let one of the small (100 person) leased site to be consolidated into the larger locations. |
| My gut feeling is yes, especially if groups can work effectively. Survey results have shown that 1/3 of workforce would like to return to work, 1/3 would like to do part time in office, 1/3 would like to do fully remote. | Still too early to tell. |
| A survey to employees showed that the increase from working-from-home has grown approx. five-fold. Greater levels of remote work after restrictions have been lifted have yet to be determined but most Business Units are evaluating those options. | In the triangle, at this time we do not anticipate any reductions in office space. |
| Yes | Evaluation of space is occurring, and they will be looking at different ways to allocate it. Most certainly yes, but to be determined in the future. |
| Still evaluating this at this time. | We are always trying to reduce our size but also include a seamless work experience. |
| Yes, more flexibility in the schedules. More will be decided in the future. | No |
| Most likely. It is an individual basis but would probably say most likely. | They could reduce office size but it's still too early to tell. Lots of things to look at before they can make that decision. Could depend on nature of the job. If they can work from home, then they will most likely allow that to occur. |
| Yes. I think we'll see more telework, not to the levels they currently have, but somewhere close. | Will be in the same location for at least another 3 to 4 years before re-evaluating. |
| We're already very flexible with remote work, but we suspect more staff will decide to work remotely once state/county level restrictions are lifted and we believe it's safe for staff to return to the office. | We are continuing to evaluate, but I expect that we may be able to reduce our office footprint. |
| Minimum 3 days in the office per week. | No, we do not at this point. More people have been hired, probably about 60-70 people. December and January are the biggest retirement months though. |
| It may be slight | Might see some consolidation of lease space into other sites. May be a slight reduction. |
| Absolutely. | Absolutely. Before COVID, we were already implementing "hoteling" for primarily field positions. We are already having discussions about future space planning and increased remote working to achieve several objectives: Happier and more productive employees for those who prefer working from home; we will continue to grow, but will we be able to continue to meet service demands in less space; The office of the future – will there be fewer cubicles because of the need for social distance? What about collaboration space? Will collaboration now be done via Teams even if people are nearby? Lots of questions to be addressed given how we've adapted to working in the COVID world. |
| N/A | None. |
| I do not have the answer to this question at this time. | Currently, I do not have the answer to this question. |

# Appendix B

# Volume Calibration Results by Time Period and Direction on Screenlines

**Appendix B**
**Volume Calibration Results by Time Period and Direction on Screenlines**

| | | | AM | | | MD | | | PM | | | NT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Screen-line | Roadname | Dir. | Observed Count | Modeled Volume | Percent Difference | Observed Count | Modeled Volume | Percent Difference | Observed Count | Modeled Volume | Percent Difference | Observed Count | Modeled Volume | Percent Difference |
| 1 | SR 2697 (S New Hope Rd) | NB | 2,323 | 2,329 | 0% | 2,170 | 2,225 | 3% | 2,430 | 2,036 | -16% | 1,663 | 1,211 | -27% |
| 1 | SR 2697 (S New Hope Rd) | SB | 1,643 | 1,856 | 13% | 2,133 | 2,495 | 17% | 3,315 | 2,803 | -15% | 1,861 | 1,848 | -1% |
| 1 | SR 2551 (Barwell Rd) | NB | 821 | 522 | -36% | 831 | 763 | -8% | 1,135 | 1,249 | 10% | 917 | 457 | -50% |
| 1 | SR 2551 (Barwell Rd) | SB | 884 | 1,176 | 33% | 885 | 870 | -2% | 1,226 | 866 | -29% | 888 | 499 | -44% |
| 1 | SR 2555 (Auburn Knightdale Rd) | NB | 551 | 676 | 23% | 660 | 646 | -2% | 826 | 1,000 | 21% | 444 | 305 | -31% |
| 1 | SR 2555 (Auburn Knightdale Rd) | SB | 543 | 701 | 29% | 631 | 693 | 10% | 888 | 894 | 1% | 359 | 330 | -8% |
| 1 | SR 2509 (Mial Plantation Rd) | NB | 998 | 950 | -5% | 751 | 836 | 11% | 941 | 1,032 | 10% | 555 | 416 | -25% |
| 1 | SR 2509 (Mial Plantation Rd) | SB | 785 | 846 | 8% | 800 | 830 | 4% | 1,356 | 1,168 | -14% | 553 | 496 | -10% |
| 2 | SR 2547 (White Oak Rd) | NB | 3,955 | 2,832 | -28% | 2,626 | 2,319 | -12% | 1,931 | 1,726 | -11% | 857 | 1,027 | 20% |
| 2 | SR 2547 (White Oak Rd) | SB | 1,255 | 1,078 | -14% | 2,666 | 2,190 | -18% | 3,715 | 3,166 | -15% | 1,389 | 1,368 | -2% |
| 2 | I-40 | NB | 8,154 | 8,173 | 0% | 14,655 | 15,935 | 9% | 16,182 | 15,536 | -4% | 10,177 | 8,918 | -12% |
| 2 | I-40 | SB | 14,083 | 14,882 | 6% | 15,604 | 16,136 | 3% | 11,695 | 10,642 | -9% | 7,998 | 7,090 | -11% |
| 2 | SR 2555 (Raynor Rd) | NB | 1,710 | 1,428 | -16% | 651 | 1,240 | 91% | 454 | 1,231 | 171% | 358 | 670 | 87% |
| 2 | SR 2555 (Raynor Rd) | SB | 304 | 950 | 213% | 708 | 1,168 | 65% | 1,239 | 1,640 | 32% | 413 | 697 | 69% |
| 2 | SR 1551 (Guy Rd) | NB | 1,649 | 1,784 | 8% | 1,139 | 1,114 | -2% | 699 | 922 | 32% | 460 | 423 | -8% |
| 2 | SR 1551 (Guy Rd) | SB | 383 | 439 | 15% | 1,202 | 1,023 | -15% | 2,048 | 2,084 | 2% | 765 | 761 | -1% |
| 3 | SR 2812 (Timber Dr) | EB | 993 | 1,460 | 47% | 2,471 | 2,834 | 15% | 4,547 | 3,359 | -26% | 1,923 | 1,345 | -30% |
| 3 | SR 2812 (Timber Dr) | WB | 2,790 | 3,837 | 37% | 2,571 | 4,083 | 59% | 2,131 | 3,093 | 45% | 1,292 | 1,803 | 40% |
| 3 | SR 2711 (Buffaloe Rd) | EB | 311 | 128 | -59% | 609 | 124 | -80% | 648 | 387 | -40% | 372 | 91 | -76% |
| 3 | SR 2711 (Buffaloe Rd) | WB | 355 | 392 | 10% | 535 | 151 | -72% | 522 | 238 | -54% | 236 | 98 | -58% |
| 3 | SR 1010 (Ten Ten Rd) | EB | 1,190 | 914 | -23% | 2,383 | 1,545 | -35% | 2,920 | 1,761 | -40% | 1,518 | 998 | -34% |
| 3 | SR 1010 (Ten Ten Rd) | WB | 2,109 | 1,760 | -17% | 2,248 | 1,760 | -22% | 1,909 | 1,626 | -15% | 1,290 | 823 | -36% |
| 3 | Pagan Rd | EB | 233 | 169 | -27% | 213 | 229 | 7% | 297 | 402 | 35% | 101 | 142 | 41% |
| 3 | Pagan Rd | WB | 293 | 278 | -5% | 247 | 214 | -13% | 234 | 232 | -1% | 102 | 136 | 33% |
| 3 | SR 2736 (Rock Service Station Rd) | NB | 780 | 687 | -12% | 472 | 486 | 3% | 396 | 430 | 9% | 288 | 199 | -31% |
| 3 | SR 2736 (Rock Service Station Rd) | SB | 316 | 204 | -35% | 561 | 467 | -17% | 980 | 675 | -31% | 430 | 329 | -23% |
| 3 | NC 42 | EB | 1,085 | 1,120 | 3% | 1,425 | 1,323 | -7% | 1,685 | 1,600 | -5% | 822 | 768 | -7% |
| 3 | NC 42 | WB | 1,352 | 1,351 | 0% | 1,388 | 1,366 | -2% | 1,441 | 1,442 | 0% | 894 | 750 | -16% |
| 4 | U.S. 401 | NB | 5,864 | 6,930 | 18% | 5,870 | 6,373 | 9% | 4,552 | 4,263 | -6% | 2,582 | 2,988 | 16% |
| 4 | U.S. 401 | SB | 3,091 | 2,713 | -12% | 5,151 | 6,379 | 24% | 7,115 | 7,578 | 7% | 3,482 | 4,056 | 16% |
| 4 | Ten Ten Rd | EB | 1,161 | 1,063 | -8% | 2,933 | 2,795 | -5% | 3,630 | 3,535 | -3% | 1,536 | 1,840 | 20% |
| 4 | Ten Ten Rd | WB | 3,181 | 3,882 | 22% | 2,589 | 3,271 | 26% | 1,953 | 2,476 | 27% | 944 | 1,341 | 42% |
| 4 | Banks Rd | EB | 455 | 375 | -18% | 752 | 572 | -24% | 1,367 | 800 | -41% | 423 | 236 | -44% |
| 4 | Banks Rd | WB | 1,682 | 709 | -58% | 783 | 357 | -54% | 774 | 487 | -37% | 335 | 199 | -41% |
| 5 | SR 1379 (Penny Rd) | EB | 650 | 251 | -61% | 1,337 | 871 | -35% | 2,707 | 1,924 | -29% | 721 | 256 | -64% |
| 5 | SR 1379 (Penny Rd) | WB | 2,150 | 1,501 | -30% | 1,436 | 938 | -35% | 1,103 | 953 | -14% | 380 | 171 | -55% |
| 5 | SR 1010 (Ten Ten Rd) | EB | 1,674 | 1,370 | -18% | 3,218 | 3,988 | 24% | 3,498 | 4,332 | 24% | 1,971 | 3,006 | 53% |
| 5 | SR 1010 (Ten Ten Rd) | WB | 2,386 | 3,982 | 67% | 3,427 | 4,083 | 19% | 2,548 | 3,311 | 30% | 1,568 | 2,080 | 33% |
| 5 | SR 1390 (Optimist Farm Rd) | EB | 979 | 1,313 | 34% | 1,330 | 1,249 | -6% | 2,035 | 1,220 | -40% | 932 | 646 | -31% |
| 5 | SR 1390 (Optimist Farm Rd) | WB | 1,596 | 1,020 | -36% | 1,609 | 1,461 | -9% | 1,540 | 1,912 | 24% | 907 | 819 | -10% |
| 5 | SR 1393 (Hilltop Needmore Rd) | EB | 1,202 | 781 | -35% | 1,592 | 1,141 | -28% | 1,665 | 1,341 | -19% | 864 | 615 | -29% |
| 5 | SR 1393 (Hilltop Needmore Rd) | WB | 960 | 1,014 | 6% | 1,570 | 1,181 | -25% | 1,728 | 1,506 | -13% | 1,023 | 675 | -34% |
| 6 | SR 1613 (Davis Dr) | NB | 1,900 | 3,574 | 88% | 3,746 | 2,772 | -26% | 5,441 | 3,697 | -32% | 2,691 | 2,360 | -12% |
| 6 | SR 1613 (Davis Dr) | SB | 3,705 | 2,874 | -22% | 4,208 | 4,433 | 5% | 3,648 | 4,530 | 24% | 2,665 | 2,834 | 6% |
| 6 | SR 1635 (Louis Stephens Dr) | NB | 344 | 992 | 189% | 443 | 455 | 3% | 646 | 1,112 | 72% | 352 | 226 | -36% |
| 6 | SR 1635 (Louis Stephens Dr) | SB | 268 | 820 | 206% | 406 | 735 | 81% | 701 | 1,433 | 104% | 419 | 298 | -29% |
| 6 | NC 55 | NB | 3,350 | 3,375 | 1% | 3,516 | 2,037 | -42% | 3,405 | 3,592 | 6% | 2,465 | 1,401 | -43% |
| 6 | NC 55 | SB | 1,932 | 2,835 | 47% | 3,549 | 3,311 | -7% | 5,003 | 4,504 | -10% | 2,553 | 1,772 | -31% |
| **6** | **NC 540 / Triangle Expressway** | **NB** | **12,240** | **11,129** | **-9%** | **4,354** | **4,530** | **4%** | **3,205** | **3,501** | **9%** | **1,554** | **1,726** | **11%** |
| **6** | **NC 540 / Triangle Expressway** | **SB** | **2,619** | **2,602** | **-1%** | **4,732** | **5,155** | **9%** | **12,031** | **12,461** | **4%** | **2,126** | **2,362** | **11%** |
| 6 | Green Level Church Rd | NB | 981 | 1,988 | 103% | 1,138 | 1,837 | 61% | 1,586 | 2,058 | 30% | 581 | 989 | 70% |
| 6 | Green Level Church Rd | SB | 1,202 | 1,616 | 34% | 1,238 | 1,815 | 47% | 1,718 | 2,214 | 29% | 429 | 1,138 | 165% |
| 6 | White Oak Church Rd | NB | 103 | 195 | 89% | 90 | 221 | 146% | 152 | 334 | 120% | 30 | 133 | 342% |
| 6 | White Oak Church Rd | SB | 135 | 252 | 86% | 101 | 201 | 99% | 114 | 210 | 84% | 18 | 139 | 674% |
| 6 | SR 1605 (Green Level West Rd) | EB | 285 | 325 | 14% | 318 | 309 | -3% | 411 | 411 | 0% | 179 | 183 | 2% |
| 6 | SR 1605 (Green Level West Rd) | WB | 317 | 331 | 4% | 325 | 334 | 3% | 483 | 604 | 25% | 140 | 127 | -9% |
| 6 | NC 751 | NB | 1,706 | 1,895 | 11% | 1,034 | 1,499 | 45% | 1,063 | 1,252 | 18% | 346 | 500 | 45% |
| 6 | NC 751 | SB | 896 | 829 | -7% | 1,198 | 1,434 | 20% | 2,022 | 1,813 | -10% | 429 | 780 | 82% |
| 6 | NC 540 (TriEx) | NB | 12,240 | 11,129 | -9% | 4,354 | 4,530 | 4% | 3,205 | 3,501 | 9% | 1,554 | 1,726 | 11% |
| 6 | NC 540 (TriEx) | SB | 2,619 | 2,602 | -1% | 4,732 | 5,155 | 9% | 12,031 | 12,461 | 4% | 2,126 | 2,362 | 11% |
| 7 | NC 55 | NB | 1,728 | 4,236 | 145% | 2,980 | 3,325 | 12% | 4,954 | 3,414 | -31% | 2,095 | 1,221 | -42% |
| 7 | NC 55 | SB | 5,620 | 1,736 | -69% | 4,405 | 3,308 | -25% | 3,188 | 4,638 | 45% | 2,194 | 1,650 | -25% |
| 7 | SR 2153 (Louis Stephens Dr) | NB | 250 | 724 | 189% | 553 | 143 | -74% | 871 | 213 | -76% | 260 | 78 | -70% |
| 7 | SR 2153 (Louis Stephens Dr) | SB | 573 | 105 | -82% | 549 | 148 | -73% | 371 | 955 | 157% | 188 | 97 | -48% |
| 7 | SR (1613) Davis Dr | NB | 4,057 | 4,811 | 19% | 3,176 | 4,037 | 27% | 2,892 | 5,275 | 82% | 1,139 | 1,711 | 50% |
| 7 | SR (1613) Davis Dr | SB | 2,011 | 3,525 | 75% | 2,764 | 4,172 | 51% | 4,511 | 5,298 | 17% | 1,300 | 2,486 | 91% |
| **7** | **NC 147/Triangle Expressway** | **NB** | **7,185** | **7,286** | **1%** | **2,469** | **2,682** | **9%** | **3,347** | **2,452** | **-27%** | **690** | **1,248** | **81%** |
| **7** | **NC 147/Triangle Expressway** | **SB** | **1,539** | **1,470** | **-4%** | **2,906** | **3,368** | **16%** | **8,407** | **8,493** | **1%** | **1,005** | **1,633** | **62%** |
| 7 | NC 54 (S Miaml-Blvd) | NB | 3,586 | 2,905 | -19% | 3,997 | 3,049 | -24% | 2,665 | 2,605 | -2% | 1,832 | 1,428 | -22% |
| 7 | NC 54 (S Miaml-Blvd) | SB | 1,277 | 1,961 | 54% | 2,631 | 2,915 | 11% | 3,568 | 3,707 | 4% | 1,263 | 1,552 | 23% |
| 7 | NC 147 (TriEx) | NB | 6,685 | 7,286 | 9% | 2,369 | 2,682 | 13% | 2,947 | 2,452 | -17% | 690 | 1,248 | 81% |
| 7 | NC 147 (TriEx) | SB | 1,039 | 1,470 | 42% | 2,806 | 3,368 | 20% | 8,007 | 8,493 | 6% | 1,005 | 1,633 | 62% |
| 8 | SR 1978 (Hopson Rd) | EB | 1,768 | 1,701 | -4% | 2,214 | 1,109 | -50% | 1,950 | 1,071 | -45% | 913 | 547 | -40% |
| 8 | SR 1978 (Hopson Rd) | WB | 1,721 | 702 | -59% | 2,220 | 1,454 | -35% | 3,097 | 1,957 | -37% | 1,196 | 767 | -36% |
| 8 | SR 1999 (Davis Dr) | NB | 3,145 | 3,011 | -4% | 3,022 | 1,630 | -46% | 2,943 | 2,460 | -16% | 1,165 | 862 | -26% |
| 8 | SR 1999 (Davis Dr) | SB | 2,395 | 1,358 | -43% | 2,557 | 1,895 | -26% | 3,610 | 3,208 | -11% | 1,241 | 989 | -20% |
| 8 | NC 54 | EB | 1,045 | 756 | -28% | 2,180 | 796 | -63% | 2,620 | 809 | -69% | 802 | 215 | -73% |
| 8 | NC 54 | WB | 1,600 | 464 | -71% | 2,188 | 715 | -67% | 1,990 | 1,216 | -39% | 751 | 236 | -69% |
| 8 | NC 55 | NB | 7,934 | 5,259 | -34% | 5,058 | 3,429 | -32% | 4,408 | 2,968 | -33% | 2,007 | 1,764 | -12% |
| 8 | NC 55 | SB | 3,235 | 1,592 | -51% | 4,587 | 3,669 | -20% | 7,437 | 5,857 | -21% | 2,440 | 1,815 | -26% |
| 8 | SR 1621 (Green Hope School Rd) | EB | 733 | 771 | 5% | 745 | 633 | -15% | 1,041 | 785 | -25% | 312 | 321 | 3% |
| 8 | SR 1621 (Green Hope School Rd) | WB | 640 | 488 | -24% | 739 | 470 | -36% | 1,170 | 938 | -20% | 357 | 352 | -1% |
| 8 | SR 1605 (Green Level West Rd) | EB | 778 | 802 | 3% | 1,347 | 1,065 | -21% | 1,823 | 1,864 | 2% | 1,108 | 594 | -46% |
| 8 | SR 1605 (Green Level West Rd) | WB | 1,294 | 1,337 | 3% | 1,410 | 976 | -31% | 1,732 | 742 | -57% | 740 | 493 | -33% |
| 8 | SR 1615 (Green Level West Rd) | EB | 1,617 | 2,497 | 54% | 1,948 | 2,251 | 16% | 2,496 | 2,932 | 17% | 976 | 1,049 | 8% |
| 8 | SR 1615 (Green Level West Rd) | WB | 1,240 | 2,307 | 86% | 1,833 | 2,229 | 22% | 2,359 | 2,641 | 12% | 1,256 | 1,167 | -7% |

**Appendix B (continued)**
**Volume Calibration Results by Time Period and Direction on Screenlines**

| Screen-line | Roadname | Dir. | AM Observed Count | AM Modeled Volume | AM Percent Difference | PM Observed Count | PM Modeled Volume | PM Percent Difference | MD Observed Count | MD Modeled Volume | MD Percent Difference | NT Observed Count | NT Modeled Volume | NT Percent Difference |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | U.S. 64 | EB | 5,198 | 4,407 | -15% | 6,344 | 5,080 | -20% | 6,585 | 5,725 | -13% | 2,871 | 2,548 | -11% |
| 8 | U.S. 64 | WB | 4,121 | 4,753 | 15% | 5,739 | 5,152 | -10% | 6,295 | 4,652 | -26% | 3,304 | 2,618 | -21% |
| 8 | U.S. 64 | EB | 5,822 | 6,341 | 9% | 7,973 | 7,617 | -4% | 7,535 | 6,096 | -19% | 3,453 | 3,747 | 9% |
| 8 | U.S. 64 | WB | 4,559 | 5,077 | 11% | 7,544 | 7,602 | 1% | 8,368 | 6,641 | -21% | 4,319 | 4,016 | -7% |
| 8 | SR 1011 (S Salem St) | NB | 914 | 1,154 | 26% | 1,065 | 1,023 | -4% | 1,546 | 1,162 | -25% | 556 | 344 | -38% |
| 8 | SR 1011 (S Salem St) | SB | 1,000 | 1,265 | 26% | 1,050 | 1,009 | -4% | 1,350 | 1,385 | 3% | 687 | 451 | -34% |
| 8 | NC 55 Byp | NB | 3,354 | 4,409 | 31% | 4,639 | 5,742 | 24% | 5,124 | 4,806 | -6% | 3,805 | 3,311 | -13% |
| 8 | NC 55 Byp | SB | 3,915 | 3,529 | -10% | 4,777 | 4,993 | 5% | 4,441 | 3,789 | -15% | 2,472 | 4,425 | 79% |
| 8 | SR 1152 (Holly Springs Rd) | NB | 4,608 | 2,953 | -36% | 3,367 | 3,195 | -5% | 2,619 | 2,336 | -11% | 1,085 | 1,277 | 18% |
| 8 | SR 1152 (Holly Springs Rd) | SB | 1,731 | 1,501 | -13% | 3,771 | 3,240 | -14% | 4,534 | 3,095 | -32% | 1,659 | 2,261 | 36% |
| 8 | SR 1386 (Bells Lake Rd) | NB | 1,325 | 1,744 | 32% | 915 | 1,346 | 47% | 635 | 1,129 | 78% | 363 | 509 | 40% |
| 8 | SR 1386 (Bells Lake Rd) | SB | 440 | 393 | -11% | 967 | 1,329 | 37% | 1,564 | 1,866 | 19% | 661 | 925 | 40% |
| 8 | Johnson Pond Rd | NB | 206 | 1,133 | 449% | 481 | 590 | 23% | 1,206 | 528 | -56% | 310 | 193 | -38% |
| 8 | Johnson Pond Rd | SB | 1,113 | 169 | -85% | 514 | 618 | 20% | 367 | 1,362 | 271% | 192 | 310 | 61% |
| 8 | SR 1375 (Lake Wheeler Rd) | NB | 1,382 | 1,923 | 39% | 980 | 1,188 | 21% | 718 | 755 | 5% | 544 | 588 | 8% |
| 8 | SR 1375 (Lake Wheeler Rd) | SB | 641 | 344 | -46% | 1,114 | 1,192 | 7% | 2,096 | 2,213 | 6% | 734 | 837 | 14% |
| 8 | U.S. 401 | NB | 4,695 | 5,123 | 9% | 5,923 | 5,310 | -10% | 4,394 | 3,998 | -9% | 2,282 | 2,409 | 6% |
| 8 | U.S. 401 | SB | 3,181 | 2,600 | -18% | 5,381 | 5,304 | -1% | 5,738 | 5,934 | 3% | 2,874 | 3,285 | 14% |
| 8 | Fanny Brown Rd | NB | 1,010 | 1,869 | 85% | 667 | 1,513 | 127% | 491 | 1,171 | 139% | 283 | 576 | 104% |
| 8 | Fanny Brown Rd | SB | 235 | 486 | 107% | 794 | 1,397 | 76% | 1,130 | 1,926 | 70% | 565 | 898 | 59% |
| 8 | Sauls Rd | NB | 1,088 | 400 | -63% | 632 | 403 | -36% | 537 | 361 | -33% | 233 | 179 | -23% |
| 8 | Sauls Rd | SB | 333 | 236 | -29% | 663 | 368 | -45% | 971 | 473 | -51% | 411 | 218 | -47% |
| 8 | Jordan Rd | NB | 496 | 585 | 18% | 269 | 445 | 65% | 231 | 399 | 73% | 112 | 189 | 69% |
| 8 | Jordan Rd | SB | 137 | 186 | 35% | 301 | 424 | 41% | 492 | 670 | 36% | 199 | 284 | 42% |
| 8 | NC 50 (Benson Rd) | NB | 2,718 | 2,392 | -12% | 2,694 | 2,622 | -3% | 2,272 | 2,237 | -2% | 1,605 | 959 | -40% |
| 8 | NC 50 (Benson Rd) | SB | 1,186 | 1,296 | 9% | 3,021 | 2,186 | -28% | 3,834 | 2,473 | -35% | 2,125 | 1,234 | -42% |
| 8 | White Oak Rd | NB | 4,125 | 2,280 | -45% | 1,523 | 1,494 | -2% | 1,220 | 1,246 | 2% | 665 | 492 | -26% |
| 8 | White Oak Rd | SB | 561 | 625 | 12% | 1,742 | 1,308 | -25% | 3,129 | 2,638 | -16% | 1,008 | 705 | -30% |
| 8 | SR 2542 (Rock Quarry Rd) | EB | 531 | 794 | 49% | 671 | 1,354 | 102% | 1,523 | 2,246 | 47% | 578 | 830 | 43% |
| 8 | SR 2542 (Rock Quarry Rd) | WB | 1,238 | 1,846 | 49% | 643 | 1,288 | 100% | 800 | 1,203 | 50% | 481 | 510 | 6% |
| 8 | SR 1007 (Poole Rd) | EB | 898 | 595 | -34% | 1,561 | 1,357 | -13% | 3,018 | 2,887 | -4% | 1,388 | 815 | -41% |
| 8 | SR 1007 (Poole Rd) | WB | 2,502 | 2,650 | 6% | 1,449 | 1,421 | -2% | 1,294 | 1,317 | 2% | 982 | 522 | -47% |
| 8 | I 40 | EB | 14,207 | 14,920 | 5% | 20,392 | 24,173 | 19% | 21,105 | 24,665 | 17% | 10,892 | 12,540 | 15% |
| 8 | I 40 | WB | 22,255 | 22,595 | 2% | 17,195 | 22,986 | 34% | 15,837 | 17,556 | 11% | 10,811 | 10,070 | -7% |
| 8 | I 40 | EB | 23,678 | 20,698 | -13% | 29,049 | 28,695 | -1% | 30,909 | 27,249 | -12% | 16,354 | 15,844 | -3% |
| 8 | I 40 | WB | 28,547 | 25,795 | -10% | 30,471 | 29,491 | -3% | 24,414 | 25,447 | 4% | 16,314 | 14,337 | -12% |
| 9 | SR 1127 (New Hill Holleman Rd) | EB | 2,040 | 2,407 | 18% | 719 | 787 | 10% | 596 | 546 | -8% | 355 | 179 | -49% |
| 9 | SR 1127 (New Hill Holleman Rd) | WB | 421 | 280 | -34% | 796 | 765 | -4% | 2,290 | 2,639 | 15% | 326 | 308 | -6% |
| 9 | Old Holly Springs Apex Rd | NB | 1,187 | 2,380 | 101% | 444 | 1,883 | 324% | 444 | 1,321 | 198% | 131 | 435 | 232% |
| 9 | Old Holly Springs Apex Rd | SB | 245 | 837 | 242% | 448 | 1,785 | 298% | 1,305 | 2,153 | 65% | 185 | 591 | 219% |
| **9** | **NC 540 / Triangle Expressway** | **NB** | **5,541** | **5,670** | **2%** | **2,150** | **2,462** | **14%** | **1,737** | **1,705** | **-2%** | **735** | **717** | **-2%** |
| **9** | **NC 540 / Triangle Expressway** | **SB** | **1,645** | **1,192** | **-28%** | **2,689** | **3,156** | **17%** | **4,723** | **5,147** | **9%** | **1,088** | **1,301** | **20%** |
| 9 | NC 55 | NB | 6,824 | 6,809 | 0% | 7,726 | 8,435 | 9% | 5,946 | 5,992 | 1% | 4,038 | 4,861 | 20% |
| 9 | NC 55 | SB | 3,486 | 3,610 | 4% | 6,766 | 7,747 | 15% | 8,230 | 6,306 | -23% | 6,050 | 7,171 | 19% |
| 9 | SR 1010 (Ten Ten Rd) | NB | 3,628 | 3,395 | -6% | 5,245 | 3,317 | -37% | 3,981 | 2,516 | -37% | 2,174 | 1,657 | -24% |
| 9 | SR 1010 (Ten Ten Rd) | SB | 2,448 | 1,034 | -58% | 4,419 | 2,761 | -38% | 4,502 | 3,387 | -25% | 2,940 | 2,213 | -25% |
| 9 | NC 540 (TriEx) | NB | 5,541 | 5,670 | 2% | 2,150 | 2,462 | 14% | 1,737 | 1,705 | -2% | 735 | 717 | -2% |
| 9 | NC 540 (TriEx) | SB | 1,645 | 1,192 | -28% | 2,689 | 3,156 | 17% | 4,723 | 5,147 | 9% | 1,088 | 1,301 | 20% |
| 10 | NC 55 | NB | 2,888 | 3,917 | 36% | 4,574 | 5,362 | 17% | 3,750 | 4,690 | 25% | 2,933 | 3,832 | 31% |
| 10 | NC 55 | SB | 1,891 | 4,168 | 120% | 3,709 | 5,289 | 43% | 3,627 | 4,320 | 19% | 2,608 | 4,095 | 57% |
| 10 | NC 55 | NB | 3,570 | 3,384 | -5% | 5,128 | 3,556 | -31% | 4,682 | 4,083 | -13% | 2,947 | 1,951 | -34% |
| 10 | NC 55 | SB | 2,491 | 2,988 | 20% | 5,397 | 3,657 | -32% | 5,312 | 3,888 | -27% | 2,910 | 1,949 | -33% |
| 10 | SR 1613 (Davis Dr) | NB | 1,777 | 2,602 | 46% | 2,232 | 2,962 | 33% | 2,044 | 2,479 | 21% | 1,440 | 2,128 | 48% |
| 10 | SR 1613 (Davis Dr) | SB | 1,308 | 2,106 | 61% | 2,557 | 3,137 | 23% | 2,859 | 2,826 | -1% | 1,412 | 2,416 | 71% |
| 10 | NC 55 | NB | 2,156 | 1,830 | -15% | 2,352 | 2,526 | 7% | 2,110 | 1,965 | -7% | 1,538 | 1,344 | -13% |
| 10 | NC 55 | SB | 1,213 | 1,383 | 14% | 2,254 | 2,484 | 10% | 3,414 | 2,045 | -40% | 1,734 | 1,952 | 13% |
| 10 | SR 1613 (Davis Dr) | NB | 4,895 | 4,317 | -12% | 4,149 | 2,820 | -32% | 2,539 | 2,893 | 14% | 1,715 | 1,221 | -29% |
| 10 | SR 1613 (Davis Dr) | SB | 1,445 | 1,681 | 16% | 3,518 | 3,100 | -12% | 6,338 | 4,947 | -22% | 2,304 | 1,832 | -20% |
| 10 | Church St | NB | 866 | 615 | -29% | 1,088 | 946 | -13% | 1,475 | 1,212 | -18% | 804 | 755 | -6% |
| 10 | Church St | SB | 1,258 | 1,031 | -18% | 1,187 | 944 | -20% | 2,088 | 992 | -53% | 485 | 601 | 24% |
| 10 | NC 54 (Chapel Hill Rd) | NB | 1,918 | 2,966 | 55% | 4,162 | 5,594 | 34% | 5,524 | 6,774 | 23% | 2,100 | 2,778 | 32% |
| 10 | NC 54 (Chapel Hill Rd) | SB | 4,273 | 5,362 | 25% | 4,677 | 5,501 | 18% | 3,154 | 4,044 | 28% | 1,934 | 2,206 | 14% |
| 10 | I 440 | EB | 11,270 | 10,433 | -7% | 19,724 | 19,407 | -2% | 21,440 | 23,669 | 10% | 10,253 | 12,571 | 23% |
| 10 | I 440 | WB | 21,430 | 22,417 | 5% | 20,086 | 19,397 | -3% | 14,226 | 14,699 | 3% | 10,900 | 10,366 | -5% |
| 10 | I 440 | EB | 2,888 | 3,917 | 36% | 4,574 | 5,362 | 17% | 3,750 | 4,690 | 25% | 2,933 | 3,832 | 31% |
| 10 | I 440 | WB | 1,891 | 4,168 | 120% | 3,709 | 5,289 | 43% | 3,627 | 4,320 | 19% | 2,608 | 4,095 | 57% |
| 10 | I 40 | EB | 11,304 | 10,345 | -8% | 18,445 | 20,932 | 13% | 15,861 | 22,208 | 40% | 8,918 | 11,871 | 33% |
| 10 | I 40 | WB | 21,144 | 21,992 | 4% | 17,764 | 21,889 | 23% | 13,867 | 14,479 | 4% | 10,319 | 9,686 | -6% |
| 10 | I 540 | EB | 11,711 | 9,579 | -18% | 16,215 | 14,572 | -10% | 20,569 | 18,702 | -9% | 9,483 | 10,437 | 10% |
| 10 | I 540 | WB | 17,865 | 16,523 | -8% | 15,478 | 15,794 | 2% | 13,402 | 12,855 | -4% | 9,140 | 10,725 | 17% |
| 10 | I 540 | EB | 7,345 | 6,668 | -9% | 11,183 | 11,844 | 6% | 15,626 | 15,987 | 2% | 6,678 | 6,129 | -8% |
| 10 | I 540 | WB | 15,165 | 14,242 | -6% | 11,351 | 13,324 | 17% | 9,105 | 11,082 | 22% | 6,965 | 5,610 | -19% |
| 10 | U.S. 64 BU.S. | EB | 2,021 | 2,072 | 2% | 4,513 | 3,400 | -25% | 5,656 | 3,451 | -39% | 3,032 | 1,975 | -35% |
| 10 | U.S. 64 BU.S. | WB | 4,236 | 3,293 | -22% | 4,844 | 4,304 | -11% | 3,984 | 3,460 | -13% | 2,909 | 1,868 | -36% |
| 10 | U.S. 64 BU.S. | EB | 1,650 | 869 | -47% | 4,162 | 2,133 | -49% | 4,762 | 2,803 | -41% | 3,133 | 1,261 | -60% |
| 10 | U.S. 64 BU.S. | WB | 3,191 | 2,205 | -31% | 4,135 | 2,291 | -45% | 3,282 | 1,895 | -42% | 2,071 | 844 | -59% |
| 10 | I 87 | EB | 7,571 | 7,118 | -6% | 12,978 | 14,403 | 11% | 17,391 | 19,717 | 13% | 7,720 | 6,473 | -16% |
| 10 | I 87 | WB | 16,407 | 18,202 | 11% | 11,880 | 14,604 | 23% | 9,292 | 9,812 | 6% | 6,343 | 5,024 | -21% |
| 10 | U.S. 70 | NB | 3,570 | 3,384 | -5% | 5,128 | 3,556 | -31% | 4,682 | 4,083 | -13% | 2,947 | 1,951 | -34% |
| 10 | U.S. 70 | SB | 2,491 | 2,988 | 20% | 5,397 | 3,657 | -32% | 5,312 | 3,888 | -27% | 2,910 | 1,949 | -33% |
| 10 | U.S. 70 | EB | 8,321 | 2,887 | -65% | 7,587 | 6,430 | -15% | 5,629 | 7,711 | 37% | 3,327 | 4,246 | 28% |
| 10 | U.S. 70 | WB | 3,377 | 7,439 | 120% | 6,723 | 6,911 | 3% | 8,649 | 4,776 | -45% | 5,382 | 3,227 | -40% |
| 10 | U.S. 70 | EB | 5,208 | 2,114 | -59% | 5,124 | 4,707 | -8% | 3,804 | 5,329 | 40% | 2,249 | 2,791 | 24% |
| 10 | U.S. 70 | WB | 2,311 | 4,952 | 114% | 4,588 | 4,897 | 7% | 5,663 | 3,361 | -41% | 3,661 | 2,069 | -43% |
| 10 | U.S. 70 | EB | 4,513 | 3,198 | -29% | 5,202 | 5,735 | 10% | 4,102 | 6,000 | 46% | 2,834 | 3,261 | 15% |
| 10 | U.S. 70 | WB | 2,974 | 5,589 | 88% | 4,711 | 5,075 | 8% | 4,648 | 3,955 | -15% | 3,705 | 2,405 | -35% |
| 10 | I 40 | NB | 9,267 | 10,512 | 13% | 10,743 | 12,013 | 12% | 8,063 | 8,507 | 6% | 5,703 | 5,070 | -11% |
| 10 | I 40 | SB | 5,593 | 6,193 | 11% | 10,515 | 11,153 | 6% | 11,988 | 11,356 | -5% | 7,352 | 6,041 | -18% |

# APPENDIX D

# GEC REPORT

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NORTH CAROLINA
Turnpike Authority

# Complete 540
# Phase 2
# Engineering Report




1 · 2 · 2024

January 2, 2024

Prepared by:

HNTB

# North Carolina Turnpike Authority

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# North Carolina Turnpike Authority
# Complete 540 – Phase 2
# Engineering Report

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# North Carolina Turnpike Authority
# Complete 540 – Phase 2 Engineering Report

## EXECUTIVE SUMMARY

### Introduction

This report documents and describes the location, preliminary engineering design features, total project cost estimate, projected operation and maintenance expenses, projected renewal and replacement expenses, and the Design-Build procurement schedule for Phase 2 of the proposed Complete 540 project (the "Project"). The project is a new location All-Electronic Toll (AET) facility that will be funded, constructed, operated and maintained by the North Carolina Turnpike Authority (NCTA), within the North Carolina Department of Transportation (NCDOT).

NCTA was created from a need to implement alternative financing to provide for key transportation projects during a time of rapid growth, dwindling resources and escalating construction costs. In October 2002, North Carolina Session Law 2002-133 created NCTA. Since then, legislation has been enacted to further define the powers of NCTA. NCTA is currently authorized to study, plan, develop, and undertake preliminary design work on Turnpike Projects. At the conclusion of these activities, NCTA is authorized to design, establish, finance, purchase, construct, operate and maintain up to eleven projects.

Functional design plans have been developed and Complete 540 - Phase 2 has been scheduled for construction by NCTA. The first project, which was substantially completed and opened to traffic in December 2012, is the Triangle Expressway located in Wake and Durham Counties. The second project, which opened in November 2018, is the Monroe Expressway located in Mecklenburg and Union Counties. Complete 540 - Phase 1, which is currently under construction and scheduled to open to traffic in 2024 and Complete 540 - Phase 2 are extensions of the Triangle Expressway.

The funding sources identified to finance the design and construction of the Complete 540 project are: toll revenue bonds, GARVEEs, State Transportation Improvement Program (STIP) funds and TIFIA loans. The "Draft North Carolina Triangle Expressway and Complete 540 Segments 1 and 2 Traffic and Revenue Study" and the Forecast Bringdown Letter, completed by CDM Smith has been used to quantify the forecasted toll revenue of the Project.

Design and highway construction of the Project will be accomplished through new Design-Build contracts specific for the Project. There are two separate Design-Build contracts for highway construction (including highway, Intelligent Transportation Systems (ITS) and toll gantry infrastructure). Landscaping and toll integration will be accomplished via separate contracts. The Design-Build project delivery method enhances innovation, improves constructability of the project and further expedites delivery.

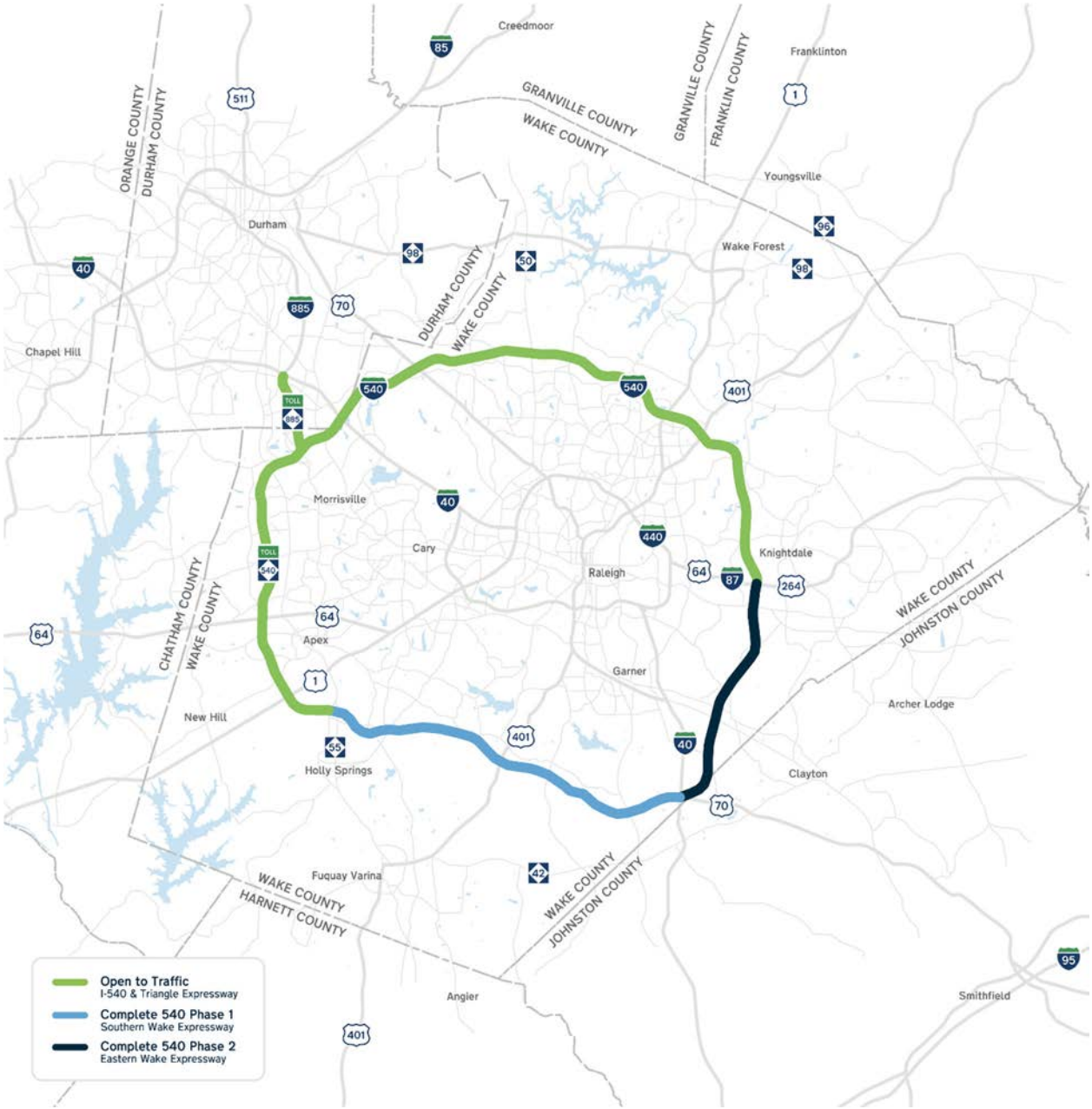
### Project Description

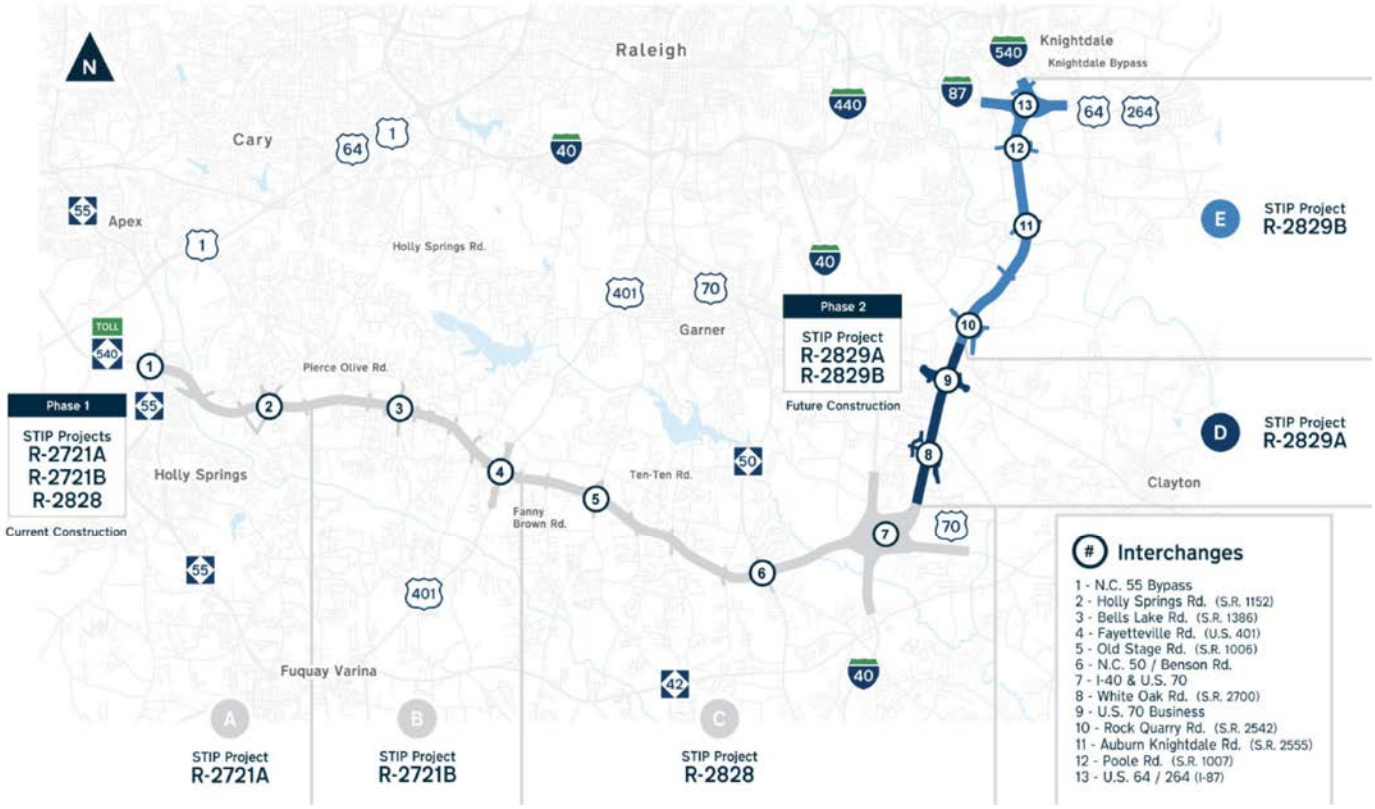
Complete 540 is a greenfield project in the greater Raleigh area in North Carolina, that would link the towns of Apex, Cary, Clayton, Garner, Fuquay-Varina, Holly Springs, Knightdale and Raleigh. In addition to connecting these towns and cities, the project is anticipated to ease congestion on area roadways, including I-440, I-40, I-42 (US 70), NC 42, NC 55 and Ten-Ten Road. The Complete 540 project is the extension of the existing Triangle Expressway (Toll 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-87/US 64/US 264 interchange in Knightdale. Phase 2 of proposed Complete 540 is being implemented now (the "Project"). Complete 540, like the Triangle Expressway, will be constructed as a six-lane controlled-access toll facility. Tolls will be collected by an AET collection system and there will be no cash toll booths.

The Project is comprised of two separate projects as stated in the NCDOT's State Transportation Improvement Program (STIP):

- STIP project R-2829A: from I-40 to south of Rock Quarry Road; and
- STIP Project R-2829B: from south of Rock Quarry Road to I-87/US 64/US 264






## Project Cost Estimate

The projected capital costs of the Project are listed below. The table includes Design-Build Contract values, other project cost categories, as well as reasonable project contingencies. The costs have been updated following the results of the price proposal opening for both Highway Design-Build contracts.

**Complete 540 - Phase 2 Capital Cost Breakdown**

| Project Element | R-2829A Cost ($M) | R-2829B Cost ($M) | Total Cost ($M) |
|---|---|---|---|
| Highway Design-Build Contract | $ 266.80 | $ 417.92 | $ 684.72 |
| Change Order Contingency | $ 17.56 | $ 27.46 | $ 45.02 |
| Construction Engr. & Inspection | $ 27.00 | $ 26.00 | $ 53.00 |
| Stipends | $ 0.83 | $ 1.20 | $ 2.03 |
| Landscaping | $ 4.05 | $ 6.34 | $ 10.39 |
| Right of Way | $ 75.26 | $ 76.88 | $ 152.14 |
| Utilities | $ 9.24 | $ 5.95 | $ 15.19 |
| Toll Integration Vendors | $ 13.05 | $ 12.69 | $ 25.74 |
| Agency Labor and Administration | $ 7.32 | $ 11.44 | $ 18.76 |
| Surcharges | $ 15.13 | $ 20.68 | $ 35.81 |
| Environmental Mitigation | $ 22.94 | $ - | $ 22.94 |
| Public Education & Outreach | $ 0.20 | $ - | $ 0.20 |
| Agency & Engineering Contingency | $ 12.55 | $ 17.54 | $ 30.09 |
| Diesel/AC/Steel Price Adj. Reserve Fund | $ 4.50 | $ 4.50 | $ 9.00 |
| **Total Cost ($M)** | **$ 476.43** | **$ 628.59** | **$ 1,105.02** |

# North Carolina Turnpike Authority
# Complete 540 - Phase 2 Engineering Report

## INTRODUCTION

By statute, the North Carolina Turnpike Authority (NCTA) is authorized to study, plan, finance, develop and undertake design work on toll facilities in the State of North Carolina. The state's first modern toll road, the Triangle Expressway in Wake and Durham Counties, was substantially completed in 2012. The Monroe Expressway was the second turnpike project to be constructed in North Carolina; the road was substantially completed and opened to traffic in November 2018. The proposed Complete 540 project is an extension of the Triangle Expressway.

The Complete 540 project is a proposed greenfield project in the greater Raleigh area in North Carolina, 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, I-42 (US 70), NC 42, NC 55 and Ten-Ten Road. Complete 540 is the extension of the existing Triangle Expressway (Toll 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-87/US 64/US 264 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 miles per hour. Tolls will be collected by an All-Electronic Toll (AET) system and there will be no cash toll booths. The Complete 540 project, sometimes referred to as the Triangle Expressway Southeast Extension, is comprised of five separate segments as stated in the NCDOT State Transportation Improvement Program (STIP) and as shown in **Exhibit 1**. Complete 540 is scheduled to be constructed in two phases. Phase 1 contains three segments (R-2721A, R-2721B, and R-2828) that are currently under construction as Design-Build projects; Phase 2 contains two segments (R-2829A and R-2829B) and is in the procurement process. Projects R-2829A and R-2829B will be delivered as Design-Build projects as well. Both Phase 2 segments are heretofore collectively referred to as the "Project."

The Complete 540 segments are described more fully as follows:

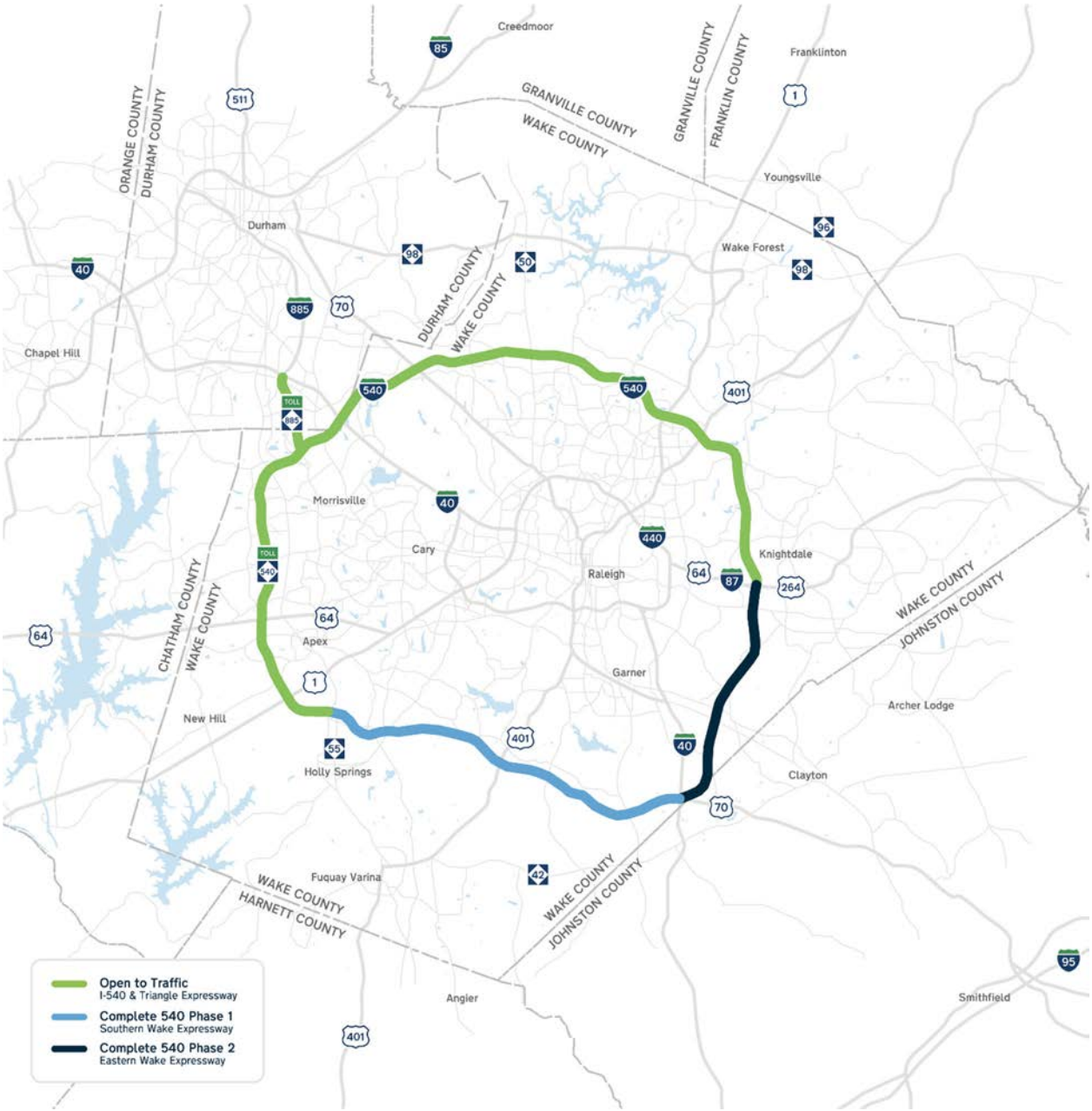
**Phase 1 (Construction as described in a prior Engineering Report):**

- 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; and
- STIP Project R-2828: from east of US 401 to I-40.

**Phase 2 (Construction as described in this Engineering Report):**

- STIP project R-2829A: from I-40 to south of Rock Quarry Road; and
- STIP project R-2829B: from south of Rock Quarry Road to I-540/I-87/US 64/US 264.

## Exhibit 1: Complete 540 Project Location Maps






## NORTH CAROLINA TURNPIKE AUTHORITY ORGANIZATION

In October 2002, legislation was passed authorizing the creation of the North Carolina Turnpike Authority (NCTA, or Authority) with the purpose to study, design, plan, construct, own, finance and operate a system of toll roads, bridges, and/or tunnels supplementing the traditional non-toll transportation system serving the citizens of North Carolina (NC General Statute [GS] §136-89.182). By action of the North Carolina General Assembly, effective July 27, 2009, the Authority became a part of the North Carolina Department of Transportation (NCDOT, or Department), a public agency of the State of North Carolina.

NCTA is governed by a nine-member Authority Board. The General Assembly appoints four representatives: two based upon the recommendation of the President Pro Tempore of the Senate, and two based upon the recommendation of the Speaker of the House of Representatives. The remaining members consist of the Secretary of Transportation, and four members appointed by the Governor. The following powers have been delegated by the Secretary to the Authority Board (see **Appendix A**):

- Fix, revise, charge, and collect tolls and fees for Turnpike Projects pursuant to NCGS §136-89.183 (a)(5);
- Issue bonds or notes of NCTA pursuant to NCGS §136-89.183(a)(6);
- Invest the proceeds of bonds or notes of NCTA that are pending disbursement or other idle funds of the Authority in any investment authorized by NCGS §159-30 pursuant to NCGS §136-89.183 (6a); and,
- Exercise such additional powers as shall be necessary for the financing of Turnpike Projects through compliance with the associated bond documentation, including complying with any arbitrage, rebate or other federal tax filings and providing for secondary market disclosure;

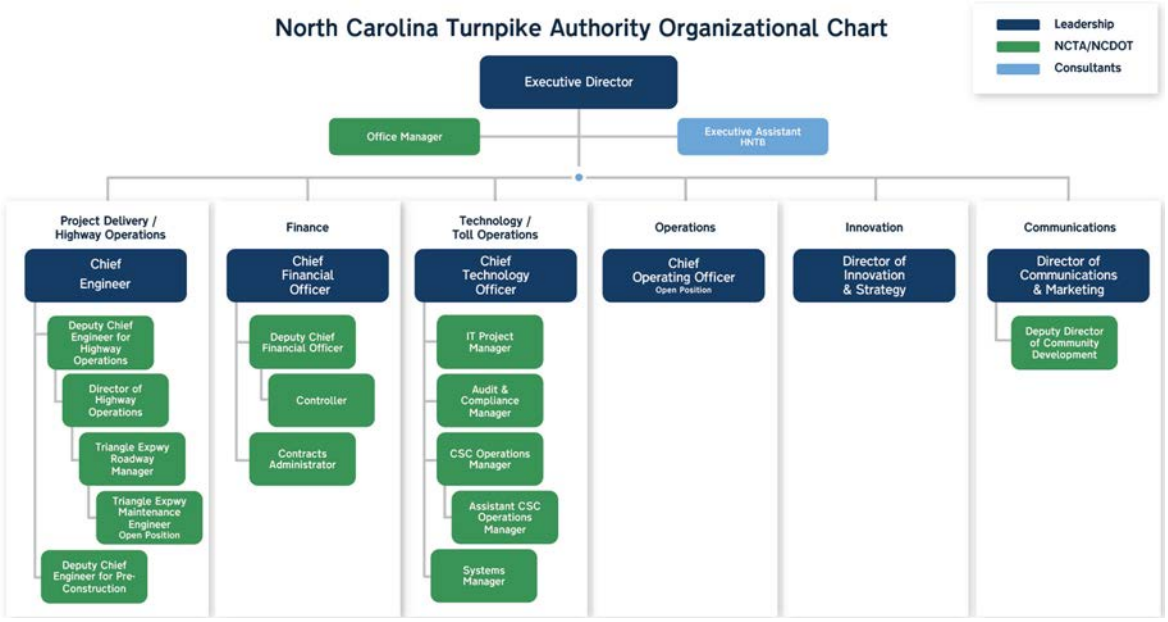
provided any such additional power may be subjected to conditions, including the involvement and participation of other portions of the North Carolina Department of Transportation, which are stated within the bond documentation and executed by the Secretary acting as the Secretary.

The following describes the key leadership roles and responsibilities of the NCTA organization.

- The NCTA Executive Director reports directly to the NCDOT Secretary of Transportation and is charged with the overall operations of the North Carolina Turnpike Authority.
- The NCTA Chief Engineer reports to NCTA Executive Director and is responsible for the oversight of all project delivery, and operations and maintenance (O&M) of turnpike projects.
- The NCTA Chief Financial Officer is responsible for all NCTA financial activities.
- The NCTA Chief Technology Officer oversees the day-to-day operations of the roadside toll collection system and the back-office system.
- The NCTA Chief Operating Officer oversees daily operations, establishes policies that promote the vision of the North Carolina Turnpike Authority and sets comprehensive goals for the agency.
- The NCTA Director of Innovation & Strategy is responsible for understanding emerging technology in the industry and ensuring that the Authority is strategically positioned to maximize innovation in its day-to-day operations.
- The NCTA Director of Communication and Marketing manages community outreach efforts in concert with the NCDOT Communications office.

The following exhibit displays the organizational structure for the Project team, including both NCTA and NCDOT staff.

**Exhibit 2: Organizational Chart**



## Management and Administration

Management and administrative policies and procedures have been established to ensure that NCTA operations are carried out in accordance with State law and the requirements of the trust indenture securing the bond financings. NCTA staff is ultimately responsible for the operation of all NCTA facilities, including Complete 540. Each aspect of operations, including administration, finance, auditing and accounting, purchasing, toll collection, enforcement, safety and security, and maintenance will have its own policies and procedures.

In order for a project to be considered for development as a toll facility, the legislation requires that the project be included in a locally adopted comprehensive transportation plan and be shown in the current NCDOT STIP (NCGS §136-89.183[a][2]). Any toll road developed in the state must have a free alternate route (NCGS §136-89.197). All revenues from tolls are to be used to cover the cost of financing, operating and maintaining the road. Current legislation requires that when the toll revenue backed debt is retired, and financial obligations of the road are met, then tolls will be removed (NCGS §136-89.196).

The rapid growth in the greater Raleigh area and the State of North Carolina has led to challenges in the funding allocation, development and implementation of transportation projects due to the many needs and competing priorities. Enacted in 2013, the Strategic Transportation Investments (STI) law (NCGS §136-189.10) allows NCDOT to use its funding more efficiently and effectively to improve the state's infrastructure. STI establishes a Strategic Mobility Formula, which allocates available revenues based on data-driven scoring and local input. It is used to develop NCDOT's State Transportation Improvement Program, which identifies the transportation projects, including NCTA projects, that will receive funding during a specified 10-year period. For more information on Strategic Transportation Investments and the Strategic Mobility Formula, refer to NCDOT's STI webpage at:

HTTPS://WWW.NCDOT.GOV/INITIATIVES-POLICIES/TRANSPORTATION/STIP/PAGES/STRATEGIC-TRANSPORTATION-INVESTMENTS.ASPX

# PROJECT HISTORY

## Complete 540

A summary of the history of the Complete 540 project planning efforts is located in **Exhibit 3.**

**Exhibit 3: Project History**

| Date | Milestone |
|---|---|
| June 2018 | NCTA received the Record of Decision from the Federal Highway Administration (FHWA), signifying final federal approval of the Complete 540 route. |
| February 2018 | NCTA and the NCDOT held a series of public meetings to provide information on Complete 540, share the preliminary design and gather feedback from the public. |

| | |
|---|---|
| December 2017 | FHWA approved the Final Environmental Impact Statement that was prepared for the Complete 540 project. |
| April 2016 | NCDOT selected Detailed Study Alternative 2 (orange-green-mint-green route) as the Preferred Alternative for the Complete 540 project. |
| February 2016 | NCDOT recommended Detailed Study Alternative 2 as the Preferred Alternative for the Complete 540 project. |
| December 2015 | NCDOT held public meetings and a public hearing regarding the Draft Environmental Statement. |
| November 2015 | The Complete 540 Draft Environmental Impact Statement was published and followed by a public comment period (November 9, 2015 until January 8, 2016). |
| 2014 | Various engineering, planning and environmental studies were completed for the Detailed Study Alternatives. |
| December 2013 | NCDOT announced the alternatives that it would study in detail in the Draft Environmental Impact Statement. These alternatives are known as the Detailed Study Alternatives. |
| October 2013 | NCDOT presented all alternatives to the public to review and comment on during a series of public meetings. Based on the comments received from the public, state and federal agencies as well as the Capital Area Metropolitan Planning Organization, NCDOT decided to study all of the recommended alternatives in detail. These alternatives are known as the Detailed Study Alternatives and are shown on the Detailed Study Alternatives Map. |
| September 2013 | NCDOT published the Draft Alternatives Development and Analysis Report, which included a list of recommended Detailed Study Alternatives. |
| July 2013 | NCDOT resumed all environmental study activities for the Complete 540 project. |
| June 2013 | North Carolina General Assembly enacted House Bill 10 (Session Law 2013-94) and House Bill 817 (Session Law 2013-183) to remove previous restrictions on studying the Red Corridor. These bills were signed into law, allowing NCDOT to resume the environmental study. |

| | |
|---|---|
| December 2012 | FHWA and The US Army Corps of Engineers (USACE) issued a letter requiring full evaluation of the Red Corridor to remain eligible for federal funds and to meet the requirements of the National Environmental Policy Act and Section 404 of the Clean Water Act. The Complete 540 project could not be built without meeting these requirements. |
| March 2011 | North Carolina Session Law 2011-7 restricted NCDOT's ability to evaluate the Red Corridor. |
| Late 2009 | Environmental study began. |
| 1996-1997 | In accordance with the North Carolina Transportation Corridor Official Map Act, NCDOT established a protected corridor for the portion of 540 between N.C. 55 Bypass in Apex and I-40 near the Johnston-Wake County line. A protected corridor preserves the location of a new road from encroaching development. |

### Complete 540 Studies

A Draft Environmental Impact Statement (EIS) was prepared and approved in November 2015. The document was circulated for review and comment by environmental resource and regulatory agencies and the public. In addition, Corridor/Design Public Hearings were held in December 2015. Comments on the Draft EIS and public hearings were accepted through January 2016. The majority of public comments received during the comment period supported the Complete 540 project.

Based on public support, and with the concurrence of the environmental agencies, NCTA selected the Preferred Alternative for the Complete 540 project in April 2016. A Final EIS was prepared for the Preferred Alternative and approved in December 2017, followed by FHWA's issuance of the Record of Decision in June 2018.

## PROJECT DESCRIPTION

The Complete 540 Triangle Southeast Extension, in the greater Raleigh area in North Carolina, is a 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, I-42 (US 70), I-42, NC 42, NC 55, and Ten-Ten Road. Complete 540 is the extension of the existing Triangle Expressway project (Toll 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-87/US 64/US 264 interchange in Knightdale.

Complete 540, like the Triangle Expressway, will be constructed as a six-lane controlled-access toll facility. Tolls will be collected by an AET collection system and there will be no cash toll booths.

The Complete 540 - Phase 2 Project is comprised of two separate projects as stated in the NCDOT's State Transportation Improvement Program (STIP):

- STIP project R-2829A: from I-40 to south of Rock Quarry Road; and
- STIP project R-2829B: from south of Rock Quarry Road to I-540/I-87/US 64/US 264.

The proposed cross section on new alignment will consist of six mainline travel lanes with inside and outside shoulders divided by a depressed grass median. Mainline travel lanes will be 12' in width, with 14' inside and outside shoulders (12' of which will be full depth paved). The median is 70' in width and will be capable of accommodating one additional lane in each direction if deemed prudent at some later date.

Complete 540 – Phase 2 will have controlled access interchanges with the following roads:

- White Oak Road
- US 70 Business
- Rock Quarry Road
- Auburn Knightdale Road
- Poole Road
- I-540/I-87/US 64/US 264

Grade separations will be provided between the toll road and several local roads and streams, as well as an existing mainline crossing of Norfolk Southern Railway and North Carolina Railroad. The construction of the Project is expected to be typical for the area with structures limited to normal grade separations and flyovers.

Complete 540 – Phase 2 will contain five mainline toll collection zones:

- Between the Turbine Interchange (R-2828) and White Oak Road interchange (R-2829A),
- Between White Oak Road interchange and US 70 Business interchange (R-2829A),
- Between US 70 Business interchange and Rock Quarry Road interchange (R-2829B),
- Between Rock Quarry Road interchange and Auburn-Knightdale Road interchange (R-2829B), and
- Between Auburn-Knightdale Road interchange and I-540/I-87/US 64/US 264 (R-2829B).

## PROJECT IMPLEMENTATION

The construction of Complete 540 - Phase 2 will be completed using the Design-Build method of contracting. A summary of the procurement timeline is listed in **Exhibit 4**.

### Exhibit 4: Procurement Schedule

| | R-2829A | R-2829B |
|---|---|---|
| **RFQ Advertisement** | February 1, 2023 | November 15, 2022 |
| **Short-Listed Teams Announced** | March 16, 2023 | January 18, 2023 |
| **Price Proposals Opened** | October 17, 2023 | August 29, 2023 |

A summary of the price proposals and technical scores is shown in **Exhibit 5**. The results of the best value procurements resulted in the following joint ventures being awarded the contracts.

- R-2829A: Branch Civil – S.T. Wooten JV, A Joint Venture with the lead design firm of RK&K, LLP
- R-2829B: Flatiron – Fred Smith Company, A Joint Venture with the lead design firm of Infrastructure Consulting & Engineering (ICE)

### Exhibit 5: Quality Adjusted Price Rankings for Highway Design-Build Contracts

**R-2829A**

| Vendor | Technical Score | Quality Credit (%) | Price Proposal ($) | Quality Value ($) | Adjusted Price ($) |
|---|---|---|---|---|---|
| Branch Civil - S.T. Wooten JV | 93.6 | 15.73 | $ 287,285,000.00 | $ 45,199,506.67 | $ 242,085,493.33 |
| Flatiron - Fred Smith Company JV | 93.4 | 15.60 | $ 317,341,000.00 | $ 49,505,196.00 | $ 267,835,804.00 |
| The Lane - Blythe Construction JV | 89.6 | 13.07 | $ 337,180,000.00 | $ 44,058,186.67 | $ 293,121,813.33 |
| ENGINEER'S ESTIMATE | | | $ 314,513,000.00 | | |

**R-2829B**

| Vendor | Technical Score | Quality Credit (%) | Price Proposal ($) | Quality Value ($) | Adjusted Price ($) |
|---|---|---|---|---|---|
| Branch Civil - S.T. Wooten JV | 89.7 | 13.14 | $ 443,585,000.00 | $ 58,287,069.00 | $ 385,297,931.00 |
| Flatiron - Fred Smith Company JV | 93.4 | 15.60 | $ 449,946,000.00 | $ 70,191,576.00 | $ 379,754,424.00 |
| The Lane - Blythe Construction JV | 86.4 | 10.94 | $ 551,460,800.00 | $ 60,329,811.52 | $ 491,130,988.48 |

The following project substantial completion dates were proposed:

- June 21, 2028 was proposed by Branch Civil – S.T. Wooten JV for the R-2829A project;
- May 26, 2028 was proposed by Flatiron/Fred Smith Company JV for the R-2829B project.

Functional design plans were provided to the Design-Build team for the R-2829A and R-2829B projects. The contractors are responsible for all final designs of the Project that meet the project criteria and specifications.

NCTA is implementing a comprehensive and proactive Project Management and Compliance Monitoring Plan for the Project, designed to ensure that planning, design, right-of-way acquisition, construction, operation and maintenance of the Project meet all applicable federal, state and local laws and regulations (including the requirements generated by the NEPA process, as well as the design and construction standards and specifications). NCTA will continue to implement and maintain this comprehensive and proactive Project Management and Compliance Monitoring Plan using several procedures, policies and oversight measures. The Plan includes the following concepts:

- <u>Planning</u>

  The initial planning completed for the Project was conducted by NCTA with support from units of NCDOT. The regional FHWA office has been heavily involved in these efforts. Representatives from the regional FHWA office have attended all formal project public meetings and hearings. Frequent discussions have also been held with FHWA to ensure project planning and environmental documents are in compliance with applicable federal statutes and regulations.

- <u>Preliminary/Right-of-Way Design</u>

  For R-2829A, the preliminary designs and right-of-way plans will be prepared by the Design-Build team's lead engineering firm, RK&K LLP. For R-2829B, the preliminary designs and right-of-way plans will be prepared by the Design-Build team's lead

engineering firm, ICE. Enhancements to the overall design, full definition of the right-of-way requirements, utility designs, and coordination with the Design-Build teams will continue throughout the development of right-of-way plans and construction. NCTA is coordinating closely with NCDOT's division personnel and design groups.

- Final Design

  Final design will be completed by RK&K, LLP for R- 2829A, and ICE for R-2829B as part of the design scope of each Design-Build contract. As part of the management process, NCTA will conduct frequent "over-the-shoulder" design reviews and audits of the Project with FHWA and other units of NCDOT to ensure that the Project is in compliance with applicable design criteria from the earliest stages of design. NCTA will utilize units of NCDOT and external consultants as necessary to provide direct oversight of the Design-Build team's design activities. The Design-Build teams will be required to complete and document an extensive design review program. NCTA will be responsible for ensuring proper interagency coordination and oversight of these functions.

- Right-of-Way Acquisition

  Preliminary right-of-way limits have been established based on construction limits from functional roadway design plans for the R-2829A and R-2829B projects. These limits are subject to change based on the final design plans prepared by the Design-Build teams; however, the teams have been encouraged to minimize the right of way and easements required for construction.

  Approximately $58 million of advanced STIP funding is currently available for early right-of-way acquisition activities prior to financial close. NCDOT/NCTA is acquiring parcels that are clearly impacted by the Project to the extent that the entire parcels will be required regardless of the status of final design plans.

  The remainder of the right of way will be acquired during the Design-Build phase. NCDOT has the statutory authority to acquire land, real estate easements, and other interests in real estate by negotiated purchase and by eminent domain for construction, operation, and maintenance of the facility.

  The Design-Build teams for R-2829A and R-2829B are responsible for right-of-way acquisition. The R-2829A team has selected American Acquisitions Group, LLC and the R-2829B team has selected THC, Inc. and Right of Way Consultants, LLC as their right-of-way firms.

  Each of the firms have extensive experience in the field of right-of-way acquisition, relocations, and related services and will adhere to the provisions of the Uniform Relocation and Real Property Acquisition Act of 1970, as well as all appropriate state and federal guidelines.

- Construction Oversight and QA/QC Testing

  NCTA will be directly responsible for construction management/construction oversight of the Project which includes overseeing the Construction Engineering and Inspection (CEI) firm. WSP was hired as the CEI firm. The activities of the CEI firm will include inspection, erosion control inspection, materials sampling and testing, surveying grade verification,

documentation of pay quantities, and claims avoidance. The NCTA Director of Highway Operations will be responsible for construction oversight and overseeing the CEI contract.

- Environmental and Permit Monitoring

  NCTA will require the selected Design-Build teams to procure an independent consultant to provide impartial environmental and permit monitoring services in conjunction with the Project. This will include the monitoring of items during each phase of the construction, including construction runoff water quality device inspections, hazardous material spill reporting and response, compliance with US Army Corps of Engineers Section 404 permit requirements and NC Department of Environmental Quality (NCDEQ) - Division of Water Resources (DWR) 401 permit requirements, and notification of archaeological discoveries. NCTA will designate an internal environmental coordinator to review and supervise this monitoring program. NCDOT and NCTA will assist with erosion and sedimentation compliance during design reviews and during construction.

- Toll Integration

  In order to implement tolling of Complete 540 - Phase 2, NCTA anticipates using the Statewide Roadside Toll Collection System (SRTCS) to issue a Task Order for the Toll Collection Technology and will amend existing contracts for the Back-Office System (BOS), Electronic Toll Collection System (ETCS), and Customer Service Center Operations (OPS).

  Since opening the Triangle Expressway, NCTA has recently procured new and additional toll integration and toll collection services to adapt to changes in technology and to prepare for program expansion (including the extension of the Triangle Expressway). Complete 540 - Phase 2 will continue to use new toll collection technology based on data collected from current programs.

  In late 2023, NCTA awarded a competitively bid contract for the SRTCS to multiple vendors. A task order will be issued 18-24 months prior to the anticipated go-live date for Complete 540 - Phase 2 that will be responsible for the design, development, installation, and maintenance of a fully automated toll collection system.

- Customer Service and Public Outreach

  NCTA has customer service and public outreach staff responsible for supporting the NC Quick Pass transponder-based program and for usage of the state's toll road system. The customer service and public outreach initiatives for Complete 540 - Phase 2 will mirror that of the Triangle Expressway, Complete 540 - Phase 1, and the Monroe Expressway. These initiatives consist of outreach programs to local businesses, creative services, advertising, branding, as well as transponder sales and other promotional activities. The outreach has and will continue to include meetings with municipalities, neighborhood and community groups, and other stakeholders.

- Other

  To date, NCTA has had frequent internal and external coordination meetings with key project stakeholders and team members to ensure that all potential problem areas are identified and resolved as early as possible.

  The Design-Build teams will be required to hold periodic progress meetings and submit monthly progress/status reports to NCTA. These efforts will be maintained throughout

the duration of the Project to ensure advanced notice of potential issues and early identification of related solutions.

NCTA will encourage local FHWA participation throughout development of the Project. This intention to work closely with local and national FHWA personnel is consistent with project development to date, which has benefited significantly by local FHWA input. To affect the desired FHWA involvement, NCTA plans to develop a regular meeting schedule with the local FHWA officials, as well as establish the reporting process in a format acceptable to FHWA.

## DESIGN DETAILS

### Roadway

The design criteria for the Complete 540 - Phase 2 project are consistent with the current practices and standards of NCDOT and the American Association of State Highway and Transportation Officials (AASHTO). Design criteria and typical sections were established for the preliminary engineering designs based on existing and projected (2045) traffic forecasts and the long-range vision for the NC 540 corridor as defined by the NC Strategic Highway Corridor program and the NC Intrastate Corridor System. Future traffic projections for the facility are based on a design year of 2045 and assume the facility is tolled. Design guidelines were based on desirable roadway standards from latest version of AASHTO's *A Policy on Geometric Design of Highways and Streets*, the *NCDOT Roadway Design Manual* and the *NCDOT Roadway Standard Drawings*.

The typical roadway section for NC 540 will be three 12' lanes in each direction with a 70' median including 14' inside and outside shoulders (12' of which will be full depth paved). In areas where ramps are present, auxiliary lanes are added where necessary to provide adequate distance to allow vehicles to merge into traffic. The minimum mainline right of way width will be 350 feet and will be larger at interchange locations. The typical section is depicted in **Appendix B**.

The design speed for the tolled highway is 75 miles per hour, which will accommodate a posted speed limit of 70 miles per hour.

The design and construction of all local cross streets (-Y- Lines), ramps, service roads and cul-de-sacs, widening and improvements will be of sufficient length to tie to existing facilities based upon the current guidelines and standards. The -Y- Lines will be designed for the appropriate speed based upon the functional classification and for a speed consistent with the currently posted speed limits.

### Intelligent Transportation Systems

The Intelligent Transportation Systems (ITS) design elements proposed by the two highway Design-Build teams will be reviewed by NCTA, the toll integrator, NCDOT ITS Design, and local NCDOT ITS Operations staff to ensure that the design approach accommodates the overall tolls operational scheme and the ITS operational plan for the Raleigh metro area.

It is crucial that ITS video feeds and data are transmitted seamlessly to NCTA, both to the NCTA office in the NCDOT Highway Building, and to the State Transportation Operations Center (STOC) in west Raleigh.

It is also crucial to establish a reliable and secure connection to transmit tolls transaction data to the NC Quick Pass customer service center in Morrisville.

The Project will include ITS infrastructure and operational systems to support overall management of traffic flow to assist with timely response to incidents. ITS deployment will complement similar NCDOT activities on interstate highways in the region, the deployment on the existing Triangle Expressway, and will meet or exceed the State's ITS performance requirements. ITS will be constructed by the respective highway Design-Build contractors for each of the three Design-Build projects. The project elements comprising the ITS include:

- A fiber-optic (backbone) network (FON), (approximately 12 miles in length), to provide a redundant communication network for the toll systems and the ITS. The communication network will be configured to connect toll zones, ITS devices and NCTA and NCDOT traffic management centers (TMCs).
- Approximately 42 Microwave Vehicle Detector (MVD) locations with four locations on each mainline segment and one on each ramp directly connecting other facilities to the Triangle Expressway.
- Approximately 17 closed-circuit television (CCTV) camera locations with approximately one-mile spacing sufficient to provide full viewing of the Complete 540 mainline and of the crossing roads at interchanges.
- Five full-color Dynamic Message Sign (DMS) locations in advance of key decision points relative to major cross routes or alternative routes. Four DMS's will be located on toll gantries and one will be on a crossing route.
- Infrastructure on interchange ramps and at toll sites to support the deployment of a wrong-way detection and notification system, with the technology provided by others.

## Toll Infrastructure

Toll infrastructure is included in the Design-Build lump sum prices of each of the Design-Build contracts, and is comprised of mainline gantry frames, AET space frame foundations and dynamic messaging sign structures. Toll gantries will be designed for six-lane mainline space frames.

## Pavement

For each of the two segments that make up Complete 540 – Phase 2, the NCDOT Pavement Management Unit has prepared four 30-year designs to allow maximum flexibility in pavement type selection for the Design-Build teams. These design options include the following pavement types:

- Concrete Pavement with Tied Concrete Shoulders
- Concrete Pavement with Roller Compacted Concrete Shoulders
- Asphalt Pavement, Full Depth Asphalt
- Asphalt Pavement with Aggregate Base Course

## Bridge and Wall Structures

Bridge design, construction criteria, construction and materials shall be in accordance with the latest publication of the following, including all revisions, errata, addenda, etc., effective on the Technical Proposal submittal date unless noted otherwise in the Design-Build contract:

- AASHTO *Load and Resistance Factor Design (LRFD) Bridge Design Specification* (with exceptions noted in the NCDOT *Structures Management Unit Manual*)
- NCDOT *Structures Management Unit Manual* (including Policy Memos)
- NCDOT *LRFD Driven Pile Foundation Design Policy*
- NCDOT *Roadway Design Manual, Chapter 5*
- NCDOT *Structures Management Unit Standard Drawings*
- NCDOT *Structures Management Unit Project Special Provisions*
- 2018 NCDOT *Standard Specifications for Roads and Structures*
- Any special provisions included in the project requirements

Bridge materials will be non-prestressed cast-in-place concrete, prestressed precast concrete, or steel, based on the Design-Build team's design and subject to NCTA approval. The Design-Build teams shall submit structure recommendations and design criteria for NCTA, NCDOT and FHWA review and acceptance prior to submittal of the preliminary plans.

## Hydraulics

All work shall be in accordance with the information on the following website, the version of the following references, including all revisions, errata, addenda, memos etc., effective on the Technical Proposal submittal date, and the contract requirements:

- NCDOT Hydraulics Unit website: ***https://connect.ncdot.gov/resources/hydro/pages/default.aspx***
- NCDOT *Best Management Practices for Construction and Maintenance Activities*
- NCTA *Design-Build Submittal Guidelines*
- NCDOT *Guidelines for Drainage Studies and Hydraulics Design*, excepted as may be amended in the contract
- NCDOT *Post-Construction Stormwater Program*
- NCDOT *Stormwater Best Management Practices Toolbox*

In case of conflicting design parameters, and/or ranges, in the various resources, the proposed design shall adhere to the most conservative values, unless noted otherwise elsewhere in the Design-Build contract.

NCTA will provide the following:

- US Army Corps of Engineers (USACE) Individual Section 404 Permit – ***corridor permit obtained.***
- NC Department of Environmental Quality (NCDEQ) - Division of Water Resources (DWR) Section 401 Water Quality Certification – ***corridor permit obtained.***

Each Design-Build teams shall be required to obtain the following:

- USACE Individual Section 404 Permit Modification
- NCDEQ-DWR Section 401 Water Quality Certification Modification

The Design-Build teams shall be required to prepare the following:

- Provide any necessary permit modification drawings and calculations
- Hold a pre-design meeting with NCTA and NCDOT Hydraulic Review Engineer upon acceptance of the Preliminary Roadway Plans

- Design and install all storm drainage systems within the project limits
- Provide Stormwater Management Plan using Best Management Practices
- Provide Culvert or Bridge Survey Reports for structures
- Ensure all County ordinances are observed
- Analyze existing culverts and cross pipes adjacent to the Project and within existing right of way. Replace any deficient (structurally and/or hydraulically) pipes and/or culverts
- Prepare a Conditional Letter of Map Revision (CLOMR) or Memorandum of Agreement (MOA) package for any Federal Emergency Management Agency (FEMA) regulated stream impacted by the design

## Lighting

The design criteria for all illumination systems will conform to the latest edition of the AASHTO "*Roadway Lighting Design Guide"* and amended by NCTA's specific requirements. The Design-Build team shall provide and install roadway lighting equipment and materials, in accordance with the Final Lighting Plans provided by the Department.

On the R-2829A project, complete interchange lighting will be installed at the I-40, White Oak Road, and US 70 Business interchanges.

On the R-2829B project, complete interchange lighting will be installed at the Rock Quarry Road, Auburn Knightdale Road, Poole Road, and the I-540/I-87/US 64/US 264 interchanges.

Standard design documents have been developed by NCTA and will be utilized for the Project. The Design-Build team will design the systems for economy of installation and maintenance. High mast lighting will be used wherever possible. Pole top lighting standards will be used where required to keep light levels from spilling outside of the right of way. At a minimum, pole lighting will be utilized where right of way does not allow for standard installation of high mast lighting, and where high mast lighting standards are not found to be the most economical option.

## Signing

Distinctive and adequate signing is a necessity for major highway facilities. Signs will provide a means by which the user can readily be guided throughout the Complete 540 corridor. Large, legible, directional signage, as well as regulatory and warning signs, will be provided. Signs along existing intersecting highways and thoroughfares will be modified as necessary to provide clear directions to Complete 540. Special signing in advance of the toll zones will be used to inform drivers of the various payment options.

The Signing Plans shall be prepared by the Design-Build teams in accordance with the latest editions of the *Manual on Uniform Traffic Control Devices (MUTCD)*, the *NC Supplement to the MUTCD*, *NCDOT Standard Specifications for Roads and Structures*, the *NCDOT Roadway Standard Drawings,* AASHTO *LRFD Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals*, *Guidelines for Preparation of Signing Plans for Design-Build Projects*, *NCTA Toll Road Signing Typical Layouts* and *NCTA Toll Signing Details*. NCTA toll collection signing standards have been developed and will be utilized by the Design-Build teams for these specific signs. All electrical installations and coordination are the responsibility of the Design-Build teams and must meet NEC, State and local codes. All electrical/electronic equipment and devices must be Underwriters Laboratory (UL) approved and

listed. NCTA has provided the Design-Build teams with a Signing Schematic of the toll road corridor for use in developing the signing plans.

In addition to the required signage, the Design-Build teams will install enhanced reference location signs (mile markers) at two-tenth (0.2) mile intervals along both sides of the mainline. Each mile marker location shall have two mile-marker identifiers mounted back to back on one u-post to permit easy visual identification and promote safety.

All overhead sign assemblies shall be designed, fabricated, and installed by the Design-Build teams and shall meet all NCDOT and NCTA requirements. The wind speed for the overhead sign structure and foundation design is 100 miles per hour.

The Design-Build teams shall use Grade A retro-reflective sheeting for sign legends (text), borders and all Interstate, US and NC route shields and arrows. The Design-Build team shall design and fabricate all overhead signs with Grade C retro-reflective sheeting for the background. No overhead sign lighting is required for advance guide, toll related signing or exit directional overhead signs.

## Signals

The Design-Build teams shall design and prepare plans for the traffic signal installations. This work shall include, but not be limited to, the preparation of Traffic Signal Plans, Metal Pole Loading Diagrams, Electrical and Programming Details, Utility Make-Ready Plans, Signal Communication Plans, Wireless Communication Plans (for temporary signals), and Project Special Provisions. These plans shall be prepared in accordance with the NCTA *Design-Build Submittal Guidelines* and the *Guidelines for the Preparation of ITS & Signal Plans by Private Engineering Firms*.

The Design-Build team shall be responsible for ensuring that all plans and designs conform to the current design standards of the NCDOT Intelligent Transportation Systems & Signals Management Unit and NCTA. All plans and associated design material and specifications must be reviewed and approved by NCTA before installation.

On the R-2829A project, the Design-Build team shall provide five new traffic signals and modify one existing traffic signal. The modification will occur to the existing signal at US 70 at Garner Business Park and TV Tower Road. The new signals will be installed on White Oak Road at the Toll NC 540 eastbound and westbound ramps, on White Oak Road at Raynor Road and Tiffany Creek Drive and on US 70 at the Toll NC 540 eastbound and westbound ramps.

On the R-2829B project, the Design-Build team shall provide six new traffic signals and modify two existing traffic signals. The modifications will occur to the existing signal on Rock Quarry Road at Auburn-Knightdale Road, and the existing signal on Poole Road at Hodge Road. New signals will be installed on Rock Quarry Road at the Toll NC 540 eastbound and westbound ramps, on Auburn-Knightdale Road at the Toll NC 540 eastbound and westbound ramps and on Poole Road at the Toll NC 540 eastbound and westbound ramps.

## Landscape and Aesthetics

Pursuant to NCTA standards, landscaping and special aesthetics treatments will be provided along Complete 540 and are budgeted to account for a combined total of approximately 3-4% of the total construction cost. The aesthetics theme for the corridor was provided via an aesthetic design guide issued to the Design-Build proposers. The historical and natural features of the area (including building patterns, style, colors, native stone and native plants) have been identified to support a design image that reflects the surrounding natural environment.

The Triangle Expressway has a distinctive aesthetic character, making it a distinguishable road within North Carolina. NCTA's purposes in setting a high aesthetic standard for the facility are to:

- Encourage the attraction of initial users, by giving the road a distinguishable "brand";
- Provide an enhanced travel experience to users that will be paying to use the road; and
- Create a community amenity with the potential to attract public support and possibly some financial contribution for landscape, amenities, maintenance and public art.

The *Complete 540 Phase 2 Aesthetic Design Guide* includes architectural guidelines and was developed by Atkins, a member of the SNC Lavalin Group, in close coordination with NCTA staff. The *Complete 540 Phase 2 Aesthetic Design Guide* follows the aesthetic scheme developed and implemented on the existing Triangle Expressway.

For the Triangle Expressway, an architectural review committee of community representatives was consulted to assure that the design was appropriate for the context in which the Triangle Expressway is located. The style and detailing of the aesthetic themes were inspired by regional architectural themes. The selected theme used primarily brick, supported by concrete formwork, and was incorporated into bridge walls, end bents, center piers, retaining walls, sound walls, toll gantries and overhead sign structures.

Green space planning is included in the Aesthetic Design Guide to demonstrate the anticipated landscape approach to the Design-Build team. NCTA intends to award a separate landscape installation contract in the future, the completion of which will coincide with the opening of the Project to traffic. The Design-Build team will need to protect existing vegetation as shown in the prototypical locations, and to allow for the types of planting schemes shown in the guideline examples.

## Utility Adjustments

The Design-Build team will be responsible for all utility coordination for the R-2829A and R-2829B projects from contract award to the completion of the project.

The Design-Build teams will follow the guidelines as listed below:

- *NCDOT Utilities Accommodation Manual*
- *Federal Aid Policy Guide*- Subchapter G, Part 645, Subparts A & B
- *Federal Highway Administration's Program Guide, Utility Adjustments & Accommodations on Federal Aid Highway Projects*
- *NCDOT Construction Manual* Section 105-8
- *NCDOT Right of way Manual* - Chapter 16 Utility Relocations
- *NCDEQ Public Water Supply* - Rules governing public water supply
- *NCDEQ Division of Water Resources* - Title 15A - Environment and Natural Resources

The NCDOT will be responsible for utility relocation costs when the utility owner has prior rights of way/compensable interest. The Design-Build team shall be responsible for all costs associated with utility relocations due to haul roads and/or any other temporary conditions resulting from the Design-Build team's methods of operation or sequence of work. The Design-Build team shall also be responsible for all

costs associated with relocating or adjusting utilities, due to the Design-Build team's construction methods or their design change, that have already been relocated once, or have been authorized to be relocated, to accommodate the design shown on the right-of-way plans provided by the NCTA.

## TOLL COLLECTION OPERATIONS

Toll collection operations include the collection of the correct toll amounts from patrons in accordance with the established toll rate schedule, accounting of the toll revenue, transfer of the funds into the appropriate toll revenue accounts held with the Trustee and among interoperable agencies, and documentation of the toll collection activities.

As it is an integral part of NCTA's Triangle Expressway, the Project will be exclusively operated as an AET system. AET is the collection of toll revenue through the use of electronic toll collection (ETC) devices, otherwise referred to as transponders, and/or through the capture of license plate images. The proposed AET system will collect tolls as vehicles pass through tolling zones at highway speeds. A toll zone is defined as the area on the roadway under the toll site gantry where the toll collection system equipment is located and performs tolling functions such as transponder reads, license plate image capture and automatic vehicle classification (AVC).

The basic components for any AET toll collection program are the Roadside Toll Collection System (RTCS), Back Office System (BOS), the operations centers, and overall operations and maintenance. For NCTA, the primary operations center is the NC Quick Pass Customer Service Center (CSC), currently located in Morrisville; however, traffic operations are managed from a different facility, the STOC.

Toll collection will utilize pre-paid and post-paid payment methods. For the former, patrons have the option of establishing pre-paid toll accounts and purchasing transponders, which are mounted within the vehicle for automatic deduction of tolls when passing through a toll zone. For customers who do not pre-pay, video tolling camera equipment will process license plate captures and they will be subsequently billed for the tolls in accordance with established NCTA policies pertaining to video toll invoicing or post-paid tolls.

Session Law 2008-225 was ratified by the North Carolina General Assembly on July 18, 2008 and requires payment of outstanding turnpike tolls and applicable fees or fines prior to vehicle registration renewal. This bill was revised in July 2010 as Session Law 2010-133 as it pertains to the video toll collection process.

### Roadside Toll Collection System (RTCS), Electronic Toll Collection System (ETCS) and Back Office System (BOS)

The RTCS, ETCS and BOS includes toll-related hardware and software located on the roadway and offsite at the operations center, such as ETCS readers and antennas, optical character recognition and automated license plate recognition and processing software, the main toll collection system computer server and database, and the hardware and software necessary to support the customer service center and interoperability with out-of-state toll agencies.

The Complete 540 - Phase 2 RTCS will be procured under the Statewide Roadside Toll Collection System (SRTCS) contract. The SRCTS contract provides NCTA with a bench of vendors that provide RTCS services.

BOS services for the Triangle Expressway are currently provided by TransCore. In early 2023, the BOS was successfully updated from a legacy system. The contractor's responsibilities include the design, development, installation, and implementation of hardware, software, and telecommunication networks for customer account processing, billing processing, necessary system interfaces, and maintenance.

The function of the RTCS is to detect vehicles at the toll zones, build the proper transaction, and transmit a fully formed transaction with supporting data to the toll facility host located in the NC Quick Pass CSC. The RTCS being developed for the Project is a state-of-the-art fully automated toll zone, plaza, toll facility host and database. It includes ETC and video systems, through the capture of transponders using ETC readers and antennas or license plate images utilizing front and rear cameras and multiple levels of optical character recognition/automated license plate recognition software. Upon detection of a vehicle, the RTCS begins to build a transaction by detecting and classifying the vehicle; reading a transponder if present; and capturing the front and rear images of the vehicle to begin the image process.

If a transponder is detected, the transaction information is sent to the BOS for validation of account status and debiting of the account for the correct toll amount. The video collection system will capture an image of the license plate of every vehicle. In the event that a vehicle does not have a transponder, the images will be handled via the video processing center (VPC), which is a part of the RTCS. License plate numbers not associated with any prepaid accounts will be sent to the appropriate state DMV to obtain their demographic information through the BOS. All transactions for a given billing period will be billed to the registered owner of the vehicle through an invoicing process. Additionally, each toll zone will be equipped with CCTV cameras for roadway overview, traffic and system audit and site security.

NCTA is part of the EZ-Pass Next Generation ETC Equipment and Services Contract to provide the ETC subsystems and transponders for the entire NC Quick Pass program. The ETC system is a multi-protocol solution that has capability to read all three protocols being considered for national interoperability. NCTA is able to read NCTA-issued transponders, transponders interoperable with the E-Z Pass Group, and transponders from Florida SunPass and Georgia Peach Pass. This system is a statewide system and NCTA-issued transponders will be used on all projects.

The BOS is made up of the system host, databases, and the customer service center (CSC) module, which includes the necessary interfaces to payment systems and commercial establishments. The BOS developed for the Project is a state-of-the-art toll system management and toll account management system based on ETC and video identification of vehicles that has been configured and sized to support the Project as well as other current and future NCTA toll projects. The BOS is located at the NC Quick Pass CSC. The system's overriding functions include acceptance of transactions and roadway data, managing prepaid toll accounts, collecting revenue through these accounts, reporting revenue collection activities, and interfacing with external contacts (retail, interoperable agencies, financial institutions, and DMVs).

## Operations Centers

The NC Quick Pass CSC, located at 200 Sorrell Grove Church Road in Morrisville, NC, houses the BOS and NCTA customer service functions for statewide tolling operations. The primary CSC is supplemented by smaller regional CSC's located around the state.

NCTA has contracted with InteLogix (formerly GC Services) to provide staffing for the CSC's statewide and managing all functions for the statewide ETC and video billing programs. These functions

include customer service at walk-in centers, the call center, mail and email responses, ETC account opening, transponder sales and inventory management, account management, video billing, interoperability/reciprocity with out-of-state toll facilities, and collection efforts. Additionally, a traffic management station is located within the Morrisville CSC and is staffed by InteLogix (formerly GC Services) for the Triangle Expressway.

The State Traffic Operations Center (STOC), which is housed at the Joint Forces Headquarters, or JFHQ, is located at 1636 Gold Star Drive in Raleigh and monitors all traffic activities on NC toll facilities, as well as non-toll routes. Traffic management operators verify roadway incidents, dispatch Incident Management Assistance Patrol (IMAP) and other emergency resources, and monitor, control and disseminate data to and from roadside cameras, traffic detectors and dynamic messages signs.

NCTA operations personnel are co-located with traffic management staff within the STOC and will oversee the various toll operation contracts, monitor performance requirements, and provide audit and accounting for these operations.

## Operations, Maintenance, Renewal and Replacement

The Project is part of the overall Triangle Expressway system, as such operations, maintenance, renewal, and replacement will be incorporated into the overall maintenance plan for the corridor.

### Toll Collection System Operation and Maintenance (O&M)

Operations and maintenance of the Toll Collection System will be provided by the RTCS and BOS integrators with oversight by NCTA personnel. The operations and maintenance of the system includes all preventive, predictive and corrective maintenance and will ensure the highest level of accuracy and availability as required through established performance measures. The up-front and ongoing costs for customer service and sales of transponders are included in the O&M estimate.

In addition to normal maintenance, the requirements also include 24-hour, seven days per week on-call maintenance services. Minimum response times, depending on time of day and on priority of the malfunction, will be specified. The toll collection system will be required to generate its own system malfunction and maintenance messages, which will be used in conjunction with toll collection staff reports, to alert maintenance staff of problems. The mandate of this program is to maintain the capability of the system to collect tolls 24 hours per day, 365 days per year.

### Intelligent Transportation System and Traffic Management Operations

NCTA will monitor video and data feeds from the Complete 540 corridor for traffic management, maintenance, and security concerns. Staff will work closely with local NCDOT personnel, the maintenance contractors, and the toll integrators to proactively address any needs detected. IMAP will also be included as part of the ITS and Operations program. Dedicated IMAP vehicles are currently assigned to the Triangle Expressway corridor to aid stranded motorists, provide temporary traffic control, and assist in incident clearance of disabled vehicles and debris. These services will extend to cover the Complete 540 extension upon opening to traffic. IMAP operations are closely coordinated with local IMAP patrol routes and procedures. IMAP drivers are involved in spotting and reporting maintenance and security concerns. Dedicated North Carolina State Highway Patrol (NCSHP) officers are assigned to patrol the corridor. IMAP

and NCSHP communications hardware and procedures will be consistent with current NCDOT/NCSHP practices.

## Routine Roadway Maintenance

Routine roadway maintenance costs include recurring and routine maintenance activities associated with the highway, such as annual bridge inspections, snow and litter removal, and regular repairs to the pavement structure.

NCTA has developed an in-house model for estimating operations and maintenance costs by utilizing the actual contract values procured for the Triangle Expressway wherever possible, available cost data for certain administrative costs, as well as data available to NCTA for contracted maintenance services for similar roadway facilities. The operations and maintenance model uses intervals developed from existing NCTA roadway maintenance to estimate annual costs for maintenance. In addition, the cost projections are based on NCTA's Business Policies and Procedures Manual and have been adjusted to reflect anticipated organizational changes. HNTB assisted in the development and review of the operations and maintenance model. Sound management practices and an effective program of inspection and maintenance will be essential in maintaining the facilities in good repair and working condition. These baseline costs have been projected to the year 2064 and are presented in **Exhibit 7**.

The plan of finance assumes that operations and maintenance costs will be funded by toll revenues. If, at any time toll revenue fails to cover operations and maintenance expenses, the NCDOT Board of Transportation has agreed to cover these costs through other funding sources. For more information on the contingent guarantees of NCDOT as to initial construction, operations and maintenance, and renewal and replacement expenses, see **Appendix C**.

NCTA is mandated by State law and the terms of the Trust Agreement to maintain a safe highway facility in sound condition. An effective maintenance policy will contribute significantly to ensure a safe highway for system users, as well as preserving the investment. Routine maintenance for the new facilities is anticipated to include, but not be limited to, maintenance of the following items:

- Concrete and asphalt pavement surfaces
- Bridge deck, superstructure, and substructure
- Pavement markings and signage
- Mowing and landscaping
- Snow and ice removal
- Drainage, stormwater systems and slopes
- Roadside protection (guardrail, barrier, attenuation)
- Lighting appurtenances
- Tolling and ITS equipment
- Litter and obstruction removal
- Building infrastructure
- Traffic control
- Emergency maintenance services

NCTA has developed maintenance performance standards to which maintenance contractors are required to adhere. NCTA will be responsible for preparing an annual operations and maintenance plan and budget along with routine maintenance assessments. The maintenance contractors will be required to perform maintenance activities in a safe and efficient manner with a minimum effect on traffic operations.

## Renewal and Replacement (R&R)

During the initial years of operation, the new facility should require relatively minor renewal and replacement activities. However, as the many elements of the facility are subjected to aging and wear, increasing amounts of maintenance and rehabilitation will be required. In addition to being responsible for building Complete 540 – Phase 2, operating and maintaining the facility, paying off its bond indebtedness, and operating with a positive cash flow, NCTA is also required to protect, preserve and maintain the properties it constructs. In order to protect the investments in its properties, revenues are to be allocated annually to a Renewal and Replacement Account established in connection with the issuance of bonds to finance the Project. Amounts in the Renewal and Replacement Account can be disbursed only for the purpose of paying for the cost of:

- Unusual or extraordinary maintenance or repairs, maintenance or repairs not recurring annually, and renewals and replacements, including major items of equipment. Examples include asphalt overlays, pavement marking and toll equipment upgrades.
- Repairs or replacements resulting from an emergency caused by some extraordinary occurrence, so characterized by a certificate signed by an Authorized Representative of NCTA and filed with the Trustee stating that the moneys in the Revenue Fund and insurance proceeds, if any, available therefore are insufficient to meet such emergency.
- Paying any part or all of the cost of any capital improvement to the facility.

The assumed inflation rates of 2.5% for O&M and 2.5% for R&R costs reflect historical averages within the toll road and highway construction industries, respectively. It is what can reasonably be anticipated in view of the natural aging and wear of the Project subject to the traffic and climatic conditions of the region. It is our opinion that the costs projected for the operation and maintenance of the Project are reasonable estimations of future costs assuming that the Project facility is operated and maintained under procedures and practices typical for the toll road industry. Sound management practices and an effective program of inspection and maintenance will be essential in maintaining the facilities in good repair and working condition.

In light of the fact that the Project will be an entirely new facility, covered in part by warranties for the initial operations under terms of the Design-Build contracts, deposit amounts shall be appropriate to meet the projected needs listed in **Exhibit 5**. The amounts in **Exhibit 5** reflect an asphalt pavement design for R-2829A and R-2829B, as selected by the Design-Build team. The projected amounts will be reviewed on an annual basis by NCTA in conjunction with the annual inspections and updated as appropriate to meet the needs of the preservation of the facility. In addition, the NCDOT is also approved through a resolution to provide contingent funding support for construction, operations and maintenance, and renewal and replacement expenses. Such guarantees of support are contained in the Trust Agreement.

**Exhibit 6: Projected O&M and R&R Expenses (2029 – 2064)**

| O&M and R&R Summary<br>Exisiting Triangle Expressway & Complete 540 Phase 1 & 2 | | | | |
|---|---|---|---|---|
| FY | Operations | Maintenance | R&R | Total |
| 2029 | $ 37,077,000 | $ 7,025,000 | $ 13,677,341 | $ 57,779,341 |
| 2030 | $ 42,169,000 | $ 7,603,000 | $ 16,085,602 | $ 65,857,602 |
| 2031 | $ 44,412,000 | $ 7,955,000 | $ 2,767,295 | $ 55,134,295 |
| 2032 | $ 46,078,000 | $ 8,319,000 | $ 22,727,903 | $ 77,124,903 |
| 2033 | $ 46,808,000 | $ 8,697,000 | $ 18,141,975 | $ 73,646,975 |
| 2034 | $ 47,430,000 | $ 9,090,000 | $ 20,604,511 | $ 77,124,511 |
| 2035 | $ 48,061,000 | $ 9,318,000 | $ 2,083,558 | $ 59,462,558 |
| 2036 | $ 48,899,000 | $ 9,550,000 | $ 13,044,880 | $ 71,493,880 |
| 2037 | $ 49,945,000 | $ 9,788,000 | $ 54,215,410 | $ 113,948,410 |
| 2038 | $ 51,000,000 | $ 10,034,000 | $ 22,903,655 | $ 83,937,655 |
| 2039 | $ 52,088,000 | $ 10,284,000 | $ 25,521,187 | $ 87,893,187 |
| 2040 | $ 53,207,000 | $ 10,541,000 | $ 4,538,786 | $ 68,286,786 |
| 2041 | $ 54,359,000 | $ 10,805,000 | $ 8,137,867 | $ 73,301,867 |
| 2042 | $ 55,546,000 | $ 11,073,000 | $ 35,663,096 | $ 102,282,096 |
| 2043 | $ 56,767,000 | $ 11,351,000 | $ 28,088,418 | $ 96,206,418 |
| 2044 | $ 58,026,000 | $ 11,634,000 | $ 23,334,428 | $ 92,994,428 |
| 2045 | $ 59,381,000 | $ 11,926,000 | $ 38,742,660 | $ 110,049,660 |
| 2046 | $ 60,237,000 | $ 12,224,000 | $ 35,397,899 | $ 107,858,899 |
| 2047 | $ 60,567,000 | $ 12,530,000 | $ 34,628,602 | $ 107,725,602 |
| 2048 | $ 60,958,000 | $ 12,843,000 | $ 47,877,960 | $ 121,678,960 |
| 2049 | $ 61,353,000 | $ 13,163,000 | $ 45,298,271 | $ 119,814,271 |
| 2050 | $ 61,752,000 | $ 13,492,000 | $ 5,978,840 | $ 81,222,840 |
| 2051 | $ 62,153,000 | $ 13,829,000 | $ 4,235,511 | $ 80,217,511 |
| 2052 | $ 62,557,000 | $ 14,175,000 | $ 58,077,689 | $ 134,809,689 |
| 2053 | $ 62,964,000 | $ 14,530,000 | $ 81,418,161 | $ 158,912,161 |
| 2054 | $ 63,375,000 | $ 14,892,000 | $ 61,497,282 | $ 139,764,282 |
| 2055 | $ 63,789,000 | $ 15,265,000 | $ 2,556,176 | $ 81,610,176 |
| 2056 | $ 64,206,000 | $ 15,647,000 | $ 7,905,625 | $ 87,758,625 |
| 2057 | $ 64,626,000 | $ 16,038,000 | $ 22,556,751 | $ 103,220,751 |
| 2058 | $ 65,050,000 | $ 16,439,000 | $ 4,649,815 | $ 86,138,815 |
| 2059 | $ 65,477,000 | $ 16,850,000 | $ 23,860,403 | $ 106,187,403 |
| 2060 | $ 65,908,000 | $ 17,271,000 | $ 40,543,817 | $ 123,722,817 |
| 2061 | $ 66,341,000 | $ 17,702,000 | $ 34,504,264 | $ 118,547,264 |
| 2062 | $ 66,779,000 | $ 18,145,000 | $ 4,938,513 | $ 89,862,513 |
| 2063 | $ 67,220,000 | $ 18,599,000 | $ 3,447,169 | $ 89,266,169 |
| 2064 | $ 69,227,000 | $ 19,063,000 | $ 7,051,701 | $ 95,341,701 |

## ENVIRONMENTAL CONSIDERATIONS

The Project will provide several benefits to the Raleigh region. While a project of this magnitude cannot be developed without some impacts to the environment, steps are being taken to avoid, minimize and mitigate those impacts to the greatest extent possible. Some of the steps being implemented to protect the environment are listed below.

Stormwater: Stormwater drainage systems for the Project will be designed in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) program. The Project will also utilize NCDOT's Best Management Practices for the protection of surface waters during construction. Other design features such as vegetated berms and swales will be considered and incorporated into the roadway design where appropriate to mitigate any potential transfer of toxins or other nutrients into surface waters. In lieu of concrete pipes, grass-lined ditches will be used, where possible, to maximize nutrient and particulate removal. Detention and retention facilities will be utilized, as required, to maintain appropriate water discharge rates into existing tributaries. These measures will assist in the preservation of the existing ecosystem.

Wetlands and Streams: A rigorous evaluation was undertaken to avoid and minimize the Project's impacts on wetlands and streams. Mitigation will be required for all unavoidable impacts to jurisdictional wetlands and streams. Mitigation needs for the Project will be provided through the North Carolina Ecosystem Enhancement Program's (NCEEP) In-Lieu Fee Program, through private mitigation banks or through a combination of both. Bridges will be utilized where practical and feasible to span wetlands and streams.

Protected Species: Formal Section 7 Consultation with the US Fish and Wildlife Service was completed to determine the effect of the Project on federally-protected species in the project area, in accordance with the Endangered Species Act of 1973. The US Fish and Wildlife Service issued a Biological Opinion/letter of concurrence with NCTA's Biological Assessment and associated biological conclusions.

Air: The project study area is located within the Raleigh air quality region. The projects are located almost entirely in Wake County, which is a maintenance area for carbon monoxide. Compliance of an individual project with the ozone and carbon monoxide National Ambient Air Quality Standards (NAAQS) is demonstrated if the project is included in a conforming transportation plan, which considers the urban area as a whole.

Noise: Traffic noise studies have been conducted as part of the environmental study process to identify impacted receptors and how best to mitigate potential traffic noise from the Project. Noise walls will be constructed where feasible and reasonable. There were 6 locations identified where preliminary noise barriers were determined to be potentially reasonable and feasible on the R-2829B project and no locations on the R-2829A project. The determination of feasibility and reasonableness is preliminary and subject to change based upon final design, building permits issued as of the Date of Public Knowledge, and the completion of the public involvement process. A Design Noise Study will be prepared during final design of the Preferred Alternative using updated traffic forecasts and more refined engineering. NCTA is requiring the Design-Build teams to construct the noise walls using real brick.

Hazardous Materials: NCTA is ensuring that all state and federal laws will be strictly adhered to in the abatement of hazardous materials located on the Project's right of way, if encountered. The identification and remediation of these sites that would otherwise remain unidentified is of incalculable benefit to the environment.

Hazardous Spills: These facilities would be designed to help capture the spill of a tanker truck to prevent contamination from entering the stream, river or aquifer recharge system. All hazardous spill basins will be designed according to the requirements stipulated in the NCDOT document entitled *Best Management Practices for Protection of Surface Waters* and *Guidelines for the Location and Design of Hazardous Spill Basins*.

Permitting: The R-2829A and R-2829B Design-Build team are responsible for obtaining the permit modifications from the USACE and NCDEQ-DWR. Any required coordination with the environmental agencies, approvals from the environmental agencies, public involvement and/or permit modifications resulting from a variation from NCTA's proposed design and/or construction method, or utility relocation/construction will be the sole responsibility of the Design-Build teams and will be coordinated with NCTA.

Extensive coordination was conducted between FHWA, NCTA, NCDOT, and other governmental entities to develop environmental documents for Complete 540. The formal approvals of the required documents are based on the planned construction limits associated with the Preferred Alternative as presented in the documents. Environmental documents have been prepared by NCTA, or its representatives, during the planning phase of Complete 540 to identify human and natural environmental impacts and to obtain environmental approvals, which specify mitigation requirements and recommendations.

The Design-Build teams, with the support and oversight of NCTA, shall be responsible for all coordination with governmental entities. The Design-Build teams shall ensure compliance with the conditions and schedules set forth in approved environmental documents and permits.

## PUBLIC INVOLVEMENT

Public involvement and input has been encouraged throughout the development of the Project. Local government officials, civic organizations, neighborhood groups, and interested citizens were informed of the progress of the Project through a series of public workshops and a substantial number of small group meetings. Other outreach efforts and opportunities for the public to review project information and provide input included project mailings, a project website, a dedicated project email address and a toll-free project telephone number (i.e., project hotline).

In addition, NCTA has continued to use the well-established CSC to provide interested citizens with educational materials. NCTA and the CSC have continued to run public outreach campaigns for toll roads, transponders, and other NCTA related topics.

During the design and construction phases of the Project, the public involvement program will maintain a high level of communication by informing and educating local government agencies, special interest groups, businesses, and the general public about the status of the Project. The Design-Build teams will develop a Public Information Plan for the Project that will provide the public with an opportunity for input, notify the public in advance of construction and potential impacts.

## PROJECT COSTS

A breakdown of the project cost estimate for implementation of the Project is presented in **Exhibit 8.**

NCTA has reduced contractor project cost risk by performing several tasks associated with higher risks prior to and during the Design-Build procurement process. For example, corridor environmental permits have been obtained. Geotechnical investigations were conducted to identify unsuitable soils and the presence of rock. NCDOT also conducted detailed geo-environmental site assessments, including soil and groundwater testing, at locations with potentially hazardous waste; e.g., gas stations, junkyards, industrial sites, etc. The results of these investigations were provided to the shortlisted Design-Build teams. The Design-Build contracts also include liquidated damages for schedule variations from the expected substantial completion dates. Contingencies have been incorporated in the project budget to cover uncertainties.

### Exhibit 7: Cost Estimate Summary

| Project Element | R-2829A Cost ($M) | R-2829B Cost ($M) | Total Cost ($M) |
|---|---|---|---|
| Highway Design-Build Contract | $ 266.80 | $ 417.92 | $ 684.72 |
| Change Order Contingency | $ 17.56 | $ 27.46 | $ 45.02 |
| Construction Engr. & Inspection | $ 27.00 | $ 26.00 | $ 53.00 |
| Stipends | $ 0.83 | $ 1.20 | $ 2.03 |
| Landscaping | $ 4.05 | $ 6.34 | $ 10.39 |
| Right of Way | $ 75.26 | $ 76.88 | $ 152.14 |
| Utilities | $ 9.24 | $ 5.95 | $ 15.19 |
| Toll Integration Vendors | $ 13.05 | $ 12.69 | $ 25.74 |
| Agency Labor and Administration | $ 7.32 | $ 11.44 | $ 18.76 |
| Surcharges | $ 15.13 | $ 20.68 | $ 35.81 |
| Environmental Mitigation | $ 22.94 | $ - | $ 22.94 |
| Public Education & Outreach | $ 0.20 | $ - | $ 0.20 |
| Agency & Engineering Contingency | $ 12.55 | $ 17.54 | $ 30.09 |
| Diesel/AC/Steel Price Adj. Reserve Fund | $ 4.50 | $ 4.50 | $ 9.00 |
| **Total Cost ($M)** | **$ 476.43** | **$ 628.59** | **$ 1,105.02** |

## CASH FLOW PROJECTIONS

Quarterly projections of cash flow required to construct the Project are shown in **Exhibit 9**. Quarterly cash flows are based upon the anticipated schedule of Design-Build construction, right-of-way acquisition and other activities. The highway Design-Build contracts will utilize a monthly payment based upon verified progress of work. Each Design-Build team will submit a construction schedule and cash flow projection prior to start of work. If construction progress is slower than scheduled, payment will be made only for work accomplished in a given month.

## Exhibit 8: Cash Flow Summary

| | DESCRIPTION/YEAR | Cost Estimate ($M) | Prior Expenditures | Actual Oct-Dec 22 Q2 FY23 | Actual Jan-Mar 23 Q3 FY23 | Actual Apr-Jun 23 Q4 FY23 | Actual Jul-Sept 23 Q1 FY24 | Oct-Dec 23 Q2 FY24 | Jan-Mar 24 Q3 FY24 | Apr-Jun 24 Q4 FY24 | Jul-Sept 24 Q1 FY25 | Oct-Dec 24 Q2 FY25 | Jan-Mar 25 Q3 FY25 | Apr-Jun 25 Q4 FY25 | Jul-Sept 25 Q1 FY26 | Oct-Dec 25 Q2 FY26 | Jan-Mar 26 Q3 FY26 | Apr-Jun 26 Q4 FY26 | Jul-Sept 26 Q1 FY27 | Oct-Dec 26 Q2 FY27 | Jan-Mar 27 Q3 FY27 | Apr-Jun 27 Q4 FY27 | Jul-Sept 27 Q1 FY28 | Oct-Dec 27 Q2 FY28 | Jan-Mar 28 Q3 FY28 | Apr-Jun 28 Q4 FY28 | Jul-Sept 28 Q1 FY29 | Oct-Dec 28 Q2 FY29 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-2829A | Construction | $ 266.80 | $ - | $ - | $ - | $ - | $ - | $ 5.34 | $ 5.34 | $ 5.34 | $ 16.01 | $ 13.34 | $ 13.34 | $ 16.01 | $ 16.01 | $ 13.34 | $ 13.34 | $ 16.01 | $ 16.01 | $ 13.34 | $ 13.34 | $ 16.01 | $ 16.01 | $ 13.34 | $ 13.34 | $ 16.01 | $ 10.67 | $ 5.34 |
| | Toll Integration | $ 13.05 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.26 | $ 0.26 | $ 0.26 | $ 0.26 | $ 1.31 | $ 1.57 | $ 3.26 | $ 3.26 | $ 2.61 |
| | Landscaping | $ 4.05 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 4.05 |
| | Right of Way | $ 75.26 | $ - | $ 0.048332 | $ 4.871880 | $ 8.772087 | $ 0.006384 | $ 7.53 | $ 7.53 | $ 7.53 | $ 7.53 | $ 5.27 | $ 5.27 | $ 5.27 | $ 5.27 | $ 5.27 | $ 5.12 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | Utilities | $ 9.24 | $ - | $ - | $ - | $ - | $ - | $ 0.65 | $ 0.65 | $ 0.74 | $ 0.92 | $ 1.11 | $ 0.74 | $ 0.74 | $ 0.74 | $ 0.74 | $ 0.74 | $ 0.74 | $ 0.74 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | *Agency Costs:* | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NCDOT Labor and Expenses | $ 7.32 | $ - | $ 0.000863 | $ 0.000729 | $ 0.001296 | $ 0.000523 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.36 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.37 | $ 0.29 | $ 0.29 | $ 0.29 | $ 0.29 | $ 0.29 |
| | Change Order Allowance | $ 17.56 | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.70 | $ 1.05 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 | $ 0.88 |
| | Public Education / Outreach | $ 0.20 | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 | $ 0.01 |
| | CEI and Materials Testing | $ 27.00 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.54 | $ 1.35 | $ 1.35 | $ 1.35 | $ 1.35 | $ 1.62 | $ 1.62 | $ 1.62 | $ 1.62 | $ 1.62 | $ 1.62 | $ 1.62 | $ 1.62 | $ 1.62 | $ 1.62 | $ 1.35 | $ 1.35 | $ 1.08 | $ 1.08 |
| | Stipends / Incentives | $ 0.83 | $ - | $ - | $ - | $ - | $ - | $ 0.83 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | Engineering Reserve Fund | $ 3.96 | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 | $ 0.20 |
| | Agency Reserve Fund | $ 8.59 | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 | $ 0.43 |
| | Surcharges | $ 15.13 | $ - | $ 0.000023 | $ 0.000019 | $ 0.000034 | $ 0.000003 | $ 0.30 | $ 0.30 | $ 0.30 | $ 0.91 | $ 0.76 | $ 0.76 | $ 0.91 | $ 0.91 | $ 0.76 | $ 0.76 | $ 0.91 | $ 0.91 | $ 0.76 | $ 0.76 | $ 0.91 | $ 0.76 | $ 0.76 | $ 0.76 | $ 0.61 | $ 0.61 | $ 0.76 |
| | Environmental Mitigation (A&B) | $ 22.94 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 22.94 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | Diesel Fuel Reserve Fund | $ 2.00 | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.02 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.18 |
| | Asphalt Binder Reserve Fund | $ 1.50 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.23 |
| | Steel Price Reserve Fund | $ 1.00 | $ - | $ - | $ - | $ - | $ - | $ 0.02 | $ 0.02 | $ 0.02 | $ 0.06 | $ 0.05 | $ 0.05 | $ 0.06 | $ 0.06 | $ 0.05 | $ 0.05 | $ 0.06 | $ 0.06 | $ 0.05 | $ 0.05 | $ 0.06 | $ 0.06 | $ 0.06 | $ 0.06 | $ 0.04 | $ 0.05 | $ 0.02 |
| | PROJECT SUB-TOTAL | $ 476.43 | $ - | $ 0.05 | $ 4.87 | $ 8.77 | $ 0.01 | $ 15.03 | $ 15.56 | $ 39.56 | $ 28.83 | $ 23.93 | $ 23.56 | $ 26.39 | $ 26.66 | $ 23.83 | $ 23.68 | $ 21.39 | $ 21.39 | $ 18.08 | $ 18.08 | $ 20.91 | $ 20.76 | $ 19.07 | $ 19.04 | $ 23.26 | $ 17.65 | $ 16.06 |
| R-2829B | Construction | $ 417.92 | $ - | $ - | $ - | $ - | $ - | $ 8.36 | $ 8.36 | $ 8.36 | $ 25.08 | $ 20.90 | $ 20.90 | $ 25.08 | $ 25.08 | $ 20.90 | $ 20.90 | $ 25.08 | $ 25.08 | $ 20.90 | $ 20.90 | $ 25.08 | $ 25.08 | $ 25.08 | $ 16.72 | $ 20.90 | $ 20.90 | $ 8.36 |
| | Toll Integration | $ 12.69 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.25 | $ 0.25 | $ 0.25 | $ 0.25 | $ 1.27 | $ 1.52 | $ 3.17 | $ 3.17 | $ 2.54 |
| | Landscaping | $ 6.34 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 6.34 |
| | Right of Way | $ 76.88 | $ - | $ - | $ 0.257446 | $ 2.054200 | $ 0.01 | $ 7.69 | $ 7.69 | $ 9.23 | $ 7.69 | $ 7.69 | $ 6.15 | $ 6.15 | $ 6.15 | $ 6.14 | $ 5.38 | $ 4.61 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | Utilities | $ 5.95 | $ - | $ - | $ - | $ - | $ - | $ 0.48 | $ 0.48 | $ 0.48 | $ 0.59 | $ 0.59 | $ 0.54 | $ 0.54 | $ 0.54 | $ 0.48 | $ 0.48 | $ 0.42 | $ 0.36 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | *Agency Costs:* | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NCDOT Labor and Expenses | $ 11.44 | $ - | $ 0.004078 | $ 0.004600 | $ 0.000860 | $ 0.00 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.46 | $ 0.46 | $ 0.57 | $ 0.57 | $ 0.46 | $ 0.46 | $ 0.57 | $ 0.45 |
| | Change Order Allowance | $ 27.46 | $ - | $ - | $ - | $ - | $ - | $ - | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 | $ 1.37 |
| | Public Education / Outreach | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | CEI and Materials Testing | $ 26.00 | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.52 | $ 1.30 | $ 1.30 | $ 1.30 | $ 1.30 | $ 1.30 | $ 1.30 | $ 1.30 | $ 1.30 | $ 1.30 | $ 1.30 | $ 1.56 | $ 1.56 | $ 1.56 | $ 1.56 | $ 1.56 | $ 1.56 | $ 1.30 | $ 1.30 | $ 1.04 | $ 1.04 |
| | Stipends / Incentives | $ 1.20 | $ - | $ - | $ - | $ - | $ - | $ 1.20 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | Engineering Reserve Fund | $ 6.16 | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 | $ 0.31 |
| | Agency Reserve Fund | $ 11.38 | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 | $ 0.57 |
| | Surcharges | $ 20.68 | $ - | $ 0.000106 | $ 0.000120 | $ 0.000022 | $ 0.00 | $ 0.41 | $ 0.41 | $ 0.62 | $ 1.24 | $ 1.03 | $ 1.03 | $ 1.24 | $ 1.24 | $ 1.03 | $ 1.03 | $ 1.24 | $ 1.24 | $ 1.03 | $ 1.03 | $ 1.24 | $ 1.03 | $ 1.03 | $ 1.03 | $ 0.83 | $ 0.83 | $ 0.83 |
| | Diesel Fuel Reserve Fund | $ 2.00 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.02 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.28 |
| | Asphalt Binder Reserve Fund | $ 1.50 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.08 | $ 0.30 |
| | Steel Price Reserve Fund | $ 1.00 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.05 | $ 0.20 |
| | PROJECT SUB-TOTAL | $ 628.59 | $ - | $ 0.0042 | $ 0.26 | $ 2.06 | $ 0.01 | $ 18.71 | $ 20.28 | $ 22.82 | $ 38.82 | $ 34.56 | $ 32.96 | $ 37.35 | $ 37.35 | $ 32.90 | $ 32.13 | $ 35.69 | $ 31.02 | $ 26.79 | $ 26.68 | $ 31.06 | $ 30.97 | $ 31.98 | $ 23.51 | $ 29.13 | $ 28.98 | $ 22.58 |
| | **PROJECT COST FOR FINANCING** | **$ 1,105.02** | **$ -** | **$ 0.05** | **$ 5.13** | **$ 10.83** | **$ 0.02** | **$ 33.73** | **$ 35.83** | **$ 62.38** | **$ 67.65** | **$ 58.49** | **$ 56.52** | **$ 63.74** | **$ 64.01** | **$ 56.73** | **$ 55.81** | **$ 57.07** | **$ 52.41** | **$ 44.87** | **$ 44.76** | **$ 51.98** | **$ 51.73** | **$ 51.05** | **$ 42.54** | **$ 52.39** | **$ 46.64** | **$ 38.64** |
| P/E | Additional P/E | $ 4.80 | $ - | $ 0.76 | $ 0.94 | $ 1.21 | $ 0.83 | $ 0.10 | $ 0.05 | $ 0.05 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.10 | $ 0.11 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | R-2829A DB Engineering | $ 20.49 | $ - | $ - | $ - | $ - | $ - | $ 2.46 | $ 2.05 | $ 2.05 | $ 2.05 | $ 2.05 | $ 2.05 | $ 1.43 | $ 1.64 | $ 1.23 | $ 1.23 | $ 1.23 | $ 0.61 | $ 0.41 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | R-2829B DB Engineering | $ 32.02 | $ - | $ - | $ - | $ - | $ - | $ 3.84 | $ 3.20 | $ 3.20 | $ 3.20 | $ 3.20 | $ 3.20 | $ 2.24 | $ 2.56 | $ 1.92 | $ 1.92 | $ 1.92 | $ 0.96 | $ 0.64 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | Prior Expenditures (thru 10/04/22) | $ 23.14 | $ 23.14 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | **PROJECT TOTAL (TIFIA ELIGIBLE)** | **$ 1,185.47** | **$ 23.14** | **$ 0.81** | **$ 6.07** | **$ 12.04** | **$ 0.84** | **$ 40.13** | **$ 41.13** | **$ 67.68** | **$ 73.00** | **$ 63.84** | **$ 61.87** | **$ 67.51** | **$ 68.31** | **$ 59.97** | **$ 59.06** | **$ 60.32** | **$ 54.09** | **$ 45.92** | **$ 44.76** | **$ 51.98** | **$ 51.73** | **$ 51.05** | **$ 42.54** | **$ 52.39** | **$ 46.64** | **$ 38.64** |

## IMPLEMENTATION SCHEDULE

The implementation schedule for Complete 540 - Phase 2 is shown below in **Exhibit 10**.

### Exhibit 9: Implementation Schedule

| Event | Date |
|---|---|
| **R-2829A:** | |
| Design-Build Advertisement | February 1, 2023 |
| Price Proposal Opening | October 17, 2023 |
| Limited Notice to Proceed | Early November, 2023 |
| Substantial Completion | June 21, 2028 |
| Project Final Completion | September 1, 2028 |
| **R-2829B:** | |
| Design-Build Advertisement | November 15, 2022 |
| Price Proposal Opening | August 29, 2023 |
| Limited Notice to Proceed | September 21, 2023 |
| Substantial Completion | May 26, 2028 |
| Project Final Completion | September 20, 2028 |

# APPENDIX A: NCTA BOARD DELEGATION OF DUTIES

**DELEGATION OF DUTIES**

**TO**

**THE NORTH CAROLINA TURNPIKE AUTHORITY BOARD**

**BY**

**THE NORTH CAROLINA SECRETARY OF TRANSPORTATION**

This Delegation of Duties by the North Carolina Secretary of Transportation to the Board of the North Carolina Turnpike Authority is issued this 23 day of July, 2010, effective upon execution, under the authority and powers granted to the North Carolina Secretary of Transportation, including NCGS §143B-10 and §143B-349;

WHEREAS, the North Carolina General Assembly adopted legislation effective July 27, 2009 that transferred all powers and duties of the North Carolina Turnpike Authority (NCTA) to the Secretary of Transportation (Secretary) as recorded in Session Law 2009-343 and as codified in NCGS §136-89.182(b);

WHEREAS, the NCTA has the requisite expertise to establish the toll rates for the various toll projects under development by the NCTA (Turnpike Projects as defined in NCGS §136-89.181, said expertise being based upon solid business models and planning and, in addition, the NCTA has the financial background to assess feasibility and risk for financing the various toll projects under development by the NCTA;

WHEREAS, it is in the best interest of the State of North Carolina that certain powers assumed by the Secretary under the transfer be hereby delegated to the NCTA Board:

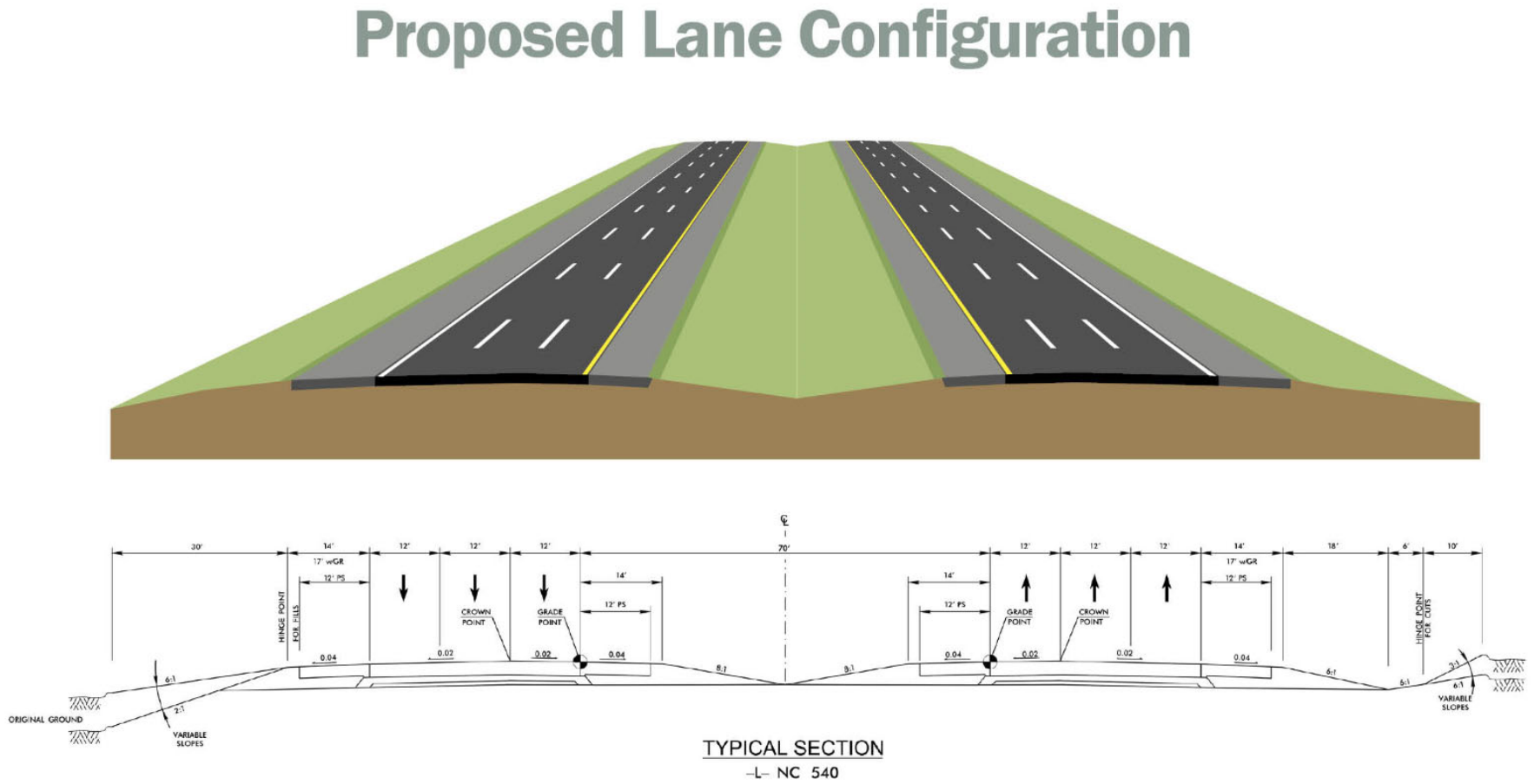
> The power to fix, revise, charge, and collect tolls and fees for the use of the Turnpike Projects pursuant to NCGS §136-89.183 (a) (5);
>
> To issue bonds or notes of the NCTA pursuant to NCGS §136-89.183(a)(6);
>
> To invest the proceeds of bonds or notes of the NCTA that are pending disbursement or other idle funds of the Authority in any investment authorized by NCGS §159-30 pursuant to NCGS §136-89.183 (6a); and
>
> To exercise such additional powers as shall be necessary for the financing of Turnpike Projects through compliance with the associated bond documentation, including complying with any arbitrage, rebate or other federal tax filings and providing for secondary market disclosure; provided any such additional power may be subjected to conditions, including the involvement and participation of other portions of the North Carolina Department of Transportation, which are stated within the bond documentation and executed by the Secretary acting as the Secretary;

THEREFORE, This Delegation shall be binding upon the North Carolina Department of Transportation, its successors and assigns.



(SEAL)

## APPENDIX B: TYPICAL SECTIONS



## APPENDIX C: CONTINGENT GUARANTEES

**RESOLUTION APPROVING A SUPPORT GUARANTEE FOR CERTAIN STIP PROJECTS INVOLVING THE NORTH CAROLINA TURNPIKE AUTHORITY AND AUTHORIZING THE SECRETARY TO TAKE ALL NECESSARY STEPS IN CONNECTION THEREWITH**

**WHEREAS**, the General Assembly of North Carolina created the North Carolina Turnpike Authority (the *"Authority"*) to study, plan, develop, design, establish, purchase, construct, operate and maintain turnpike and toll projects in the State of North Carolina;

**WHEREAS**, the General Assembly of North Carolina transferred the Authority into the North Carolina Department of Transportation (the *"NCDOT"*) pursuant to Session Law 2009-343 and the North Carolina Secretary of Transportation, pursuant to NCGS 143B-10 and 143B-349, has delegated to the Authority certain powers with respect to, among other things, turnpike and toll projects;

**WHEREAS,** there are various projects in the State Transportation Improvement Plan, including but not limited to:

- No. R-2828 (Southern Wake Freeway/Triangle Expressway Southeast Extension (Raleigh Outer Loop) US 401 to I-40);
- No. R-2829 (Eastern Wake Freeway/Triangle Expressway Southeast Extension (Raleigh Outer Loop) I-40 to US 64/US 264 Bypass);
- No. R-2721A (Southern Wake Freeway/Triangle Expressway Southeast Extension (Raleigh Outer Loop) NC 55 Bypass to East of SR 1152 (Holly Springs Road)); and
- No. R-2712B (Southern Wake Freeway/Triangle Expressway Southeast Extension (Raleigh Outer Loop) East of SR 1152 (Holly Springs Road)) to East of US 401.

all of which are expected to be tolled and in which the Authority will be involved;

**WHEREAS,** while the total funding of such projects is still being considered, it is clear that regardless of the amounts and sources of funds for such projects, various parties will need assurance that sufficient funds will be available (a) to complete construction costs for the identified project work, (b) to provide operating and maintenance funds in the event toll and related revenues are not adequate therefor, and (c) to provide funds for renewal and replacement of the various components of the project in the event toll and related revenues are not adequate therefor;

**WHEREAS,** for this purpose it is requested that this Board agree to provide, upon the issuance of the respective record of decision, a guarantee of funding support for unanticipated construction costs, operating and maintenance costs and renewal and replacement costs (the *"Guarantee"*) as evidenced by this resolution and future supplemental resolutions which may add additional projects for such support;

**WHEREAS,** any payments made on the Guarantee for a specified project will be repaid to NCDOT from revenues of such project, with simple statutory interest, in priority after debt service on any financing for the project, debt service reserves,

operating and maintenance and reserves therefor and renewal and replacement costs and reserves therefor with respect to the specified project, but ahead of other Authority uses;

**NOW THEREFORE**, be it resolved by the North Carolina State Board of Transportation, as follows:

**Section 1.** The Board hereby approves and establishes the Guarantee on the terms set forth in Section 2 hereof. The Guarantee initially shall apply to the following STIP Projects (each a *"Specified Project"*):

- No. R-2828 (Southern Wake Freeway/Triangle Expressway Southeast Extension (Raleigh Outer Loop) US 401 to I-40);
- No. R-2829 (Eastern Wake Freeway/Triangle Expressway Southeast Extension (Raleigh Outer Loop) I-40 to US 64/US 264 Bypass);
- No. R-2721A (Southern Wake Freeway/Triangle Expressway Southeast Extension (Raleigh Outer Loop) NC 55 Bypass to East of SR 1152 (Holly Springs Road)); and
- No. R-2712B (Southern Wake Freeway/Triangle Expressway Southeast Extension (Raleigh Outer Loop) East of SR 1152 (Holly Springs Road)) to East of US 401.

Any other STIP Project may be added to the Guarantee as a Specified Project by the adoption of a supplemental resolution hereto and Acknowledgement by the Secretary.

**Section 2.** The Guarantee is made on the following basis:

a) The toll and other revenues of each Specified Project shall be separately held and accounted for by the Authority or an agent thereof in one or more separate accounts (a *"Revenue Account"*).

b) Such toll and other revenues shall be used only to pay debt service on any financing for the Specified Project, to fund or replenish a debt service reserve, to pay all or a portion of the cost of previously unanticipated construction costs, to pay operating and maintenance expenses and fund or replenish a reserve therefor with respect to the Specified Project and to pay reasonable renewal and replacement costs and fund or replenish a reserve therefor as determined by the Authority, unless and until any amounts transferred under c) hereof have been repaid.

c) Subject to the provisions of d) hereafter, NCDOT will pay to the Authority, upon its request for deposit in accounts as designated by the Authority or its agent, 1) for unanticipated construction costs of a Specified Project, the amount of such costs, 2) to an account for operating and maintenance expenses, an amount such that, taking into account the amount of anticipated revenues of such Specified Project during such period, there will be within such account an amount equal to the sum of the expected total of operating and maintenance expenses (including scheduled deposits to a reserve therefor or replenishments of draws on such reserve) for the following 12 month period, and 3) to an account for renewal and replacement costs, an amount such that, taking into account the amount of anticipated revenues of such Specified Project during such period, there will be within such account an amount equal to the expected

total of renewal and replacement costs (including scheduled deposits to a reserve therefor or replenishments of draws on such reserve) for the following 12 month period.

d) The obligation of NCDOT hereunder to the extent payments relate to the operating and maintenance expenses (including for a scheduled deposit to a reserve therefor or replenishment of a draw on such reserve) is to be funded from amounts in the State Highway Fund. The obligation of NCDOT to the extent of other payments hereunder is to be funded from amounts in either the State Highway Fund or the State Highway Trust Fund. Each such payment is subject to appropriation by the State and the availability of amounts in such fund. In the event of an overpayment, NCDOT may withhold or decrease future payments to recoup such overpayment.

e) Amounts in the Revenue Account for a Specified Project at the beginning of a State fiscal year, in excess of the sum of 1) amounts needed for anticipated debt service payments during such year on any financing for the Specified Project (including a scheduled deposit to a reserve therefor or replenishment of a draw on such reserve), and 2) 125% of i) the expected total of operating and maintenance expenses during such year (including for a scheduled deposit to a reserve therefor or replenishment of a draw on such reserve) and ii) the expected total of renewal and replacement costs during such year (including for a scheduled deposit to a reserve therefor or replenishment of a draw on such reserve), reduced by anticipated revenues of such Specified Project during such year, shall be repaid with interest to NCDOT to the extent funds have previously been transferred under c) hereof.

f) Simple interest on amounts transferred under c) hereof shall be calculated at the rate determined pursuant to Section 136-176(b) of the NCGS. Any partial repayments made pursuant to e) shall be credited to principal and interest in proportion to the total of principal and interest owed on the date of repayment.

**Section 3.** The Secretary of Transportation is hereby authorized and directed to permit and agree to the resources of the Department, including employees and agents, being used as required for the appropriate implementation of the Guarantee.

**Section 4.** It is acknowledged that should a Specified Project be the subject of public bond financing or debt with similar security provisions, it may be necessary for the portion of the Guarantee relating to that Specified Project to be stated in a separate agreement or contained within the financing documents if requested by the Authority and such changes as so necessary are hereby authorized and approved.

**Section 5.** It is further acknowledged that one or more Specified Projects may be combined and/or added to other projects which have previously received comparable guarantees and, notwithstanding the terms in Section 2 hereof, the particular terms and provisions of the Guarantee for such Specified Projects, including identification of the

accounts or funds to which the guaranteed amounts will be deposited, how such amounts will be calculated and when repayments thereof will be made and in what amounts, may be conformed to the documentation for such comparable guarantees.

Adopted MAY 3, 2018

**Acknowledgement by Secretary of Transportation**

The undersigned Secretary of Transportation of the State of North Carolina is executing this Acknowledgement to evidence the agreement of the North Carolina Department of Transportation to the Guarantee contained in the attached Resolution.



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# APPENDIX E

# AUDITED FINANCIAL STATEMENTS OF THE AUTHORITY FOR FISCAL YEARS ENDED JUNE 30, 2023 AND 2022

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# NORTH CAROLINA TURNPIKE AUTHORITY

## FINANCIAL STATEMENTS AND SUPPLEMENTARY INFORMATION

***As of and for the Years Ended June 30, 2023 and 2022***

***And Reports of Independent Auditor***

Cherry Bekaert LLP

*Your Guide Forward*

**NORTH CAROLINA TURNPIKE AUTHORITY**
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Your Guide Forward

# Report of Independent Auditor

To the Board of Directors
North Carolina Turnpike Authority
Raleigh, North Carolina

## Report on the Audit of the Financial Statements

### *Opinion*

We have audited the accompanying financial statements of the North Carolina Turnpike Authority ("NCTA"), a major enterprise fund of the State of North Carolina, and a business unit of the North Carolina Department of Transportation ("NCDOT"), as of June 30, 2023 and 2022, and the related statements of revenues, expenses, and changes in net position and cash flows for the years then ended, and the related notes to the financial statements, which collectively comprise the NCTA's basic financial statements, as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the NCTA as of June 30, 2023 and 2022, and the changes in financial position and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP").

### *Basis for Opinion*

We conducted our audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of our report. We are required to be independent of the Authority, and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audits. We believe the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### *Emphasis of Matter*

As discussed in Note 1, the financial statements present only NCTA and do not purport to and do not present fairly the financial position of the State of North Carolina or NCDOT, as of June 30, 2023 and 2022, the changes in their financial position, or, where applicable, their cash flows for the years then ended in accordance with U.S. GAAP. Our opinion is not modified with respect to this matter.

### *Responsibilities of Management for the Financial Statements*

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about NCTA's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

### *Auditor's Responsibilities for the Audit of the Financial Statements*

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and, therefore, is not a guarantee that an audit conducted in accordance with generally accepted auditing standards and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with generally accepted auditing standards and *Government Auditing Standards*, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of NCTA's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about NCTA's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control related matters that we identified during the audits.

### *Required Supplementary Information*

Accounting principles generally accepted in the United States of America require that the Management's Discussion and Analysis and the Required Supplementary Information as listed in the table of contents be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a required part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

### *Supplementary and Other Information*

Our audits were conducted for the purpose of forming an opinion on the financial statements that collectively comprise the financial statements of the NCTA. The Schedule of Revenues and Expenditures – Modified Cash Basis – Non-GAAP, is presented for purposes of additional analysis and are not required part of the financial statement. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the financial statements. The information has been subjected to the auditing procedures applied in the audits of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the Schedule of Revenues and Expenditures – Modified Cash Basis – Non GAAP is fairly stated, in all material respects, in relation to the financial statements as a whole.

### *Other Reporting Required by Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated October 3, 2023, on our consideration of NCTA's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grants agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of NCTA's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering NCTA's internal control over financial reporting and compliance.

Cherry Bekaert LLP

Raleigh, North Carolina
October 3, 2023

# Management's Discussion & Analysis

Management's Discussion and Analysis ("MD&A") provides an overview of the North Carolina Turnpike Authority's ("NCTA" or "Turnpike Authority") activities during the fiscal years ("FY") ended June 30, 2023, 2022, and 2021. The MD&A also includes condensed financial information comparing the current year to the prior years.

## Overview of the Financial Statements

The Turnpike Authority is a public agency of the State of North Carolina located within the Department of Transportation ("NCDOT" or "Department") and is a major enterprise fund of the State. As such, NCTA is included in the State of North Carolina's Annual Comprehensive Financial Report (ACFR). The accompanying statements were prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP") to represent NCTA's financial position separate from the State of North Carolina.

Included in this report are the statements of net position as of June 30, 2023 and 2022, the statements of revenues, expenses, and changes in net position for the years ended June 30, 2023 and 2022, and the statements of cash flows for the years ended June 30, 2023 and 2022. These statements represent all financial activity of the Turnpike Authority at the fund level, therefore they are not an accurate representation of the financial position of individual Turnpike Authority projects (project specific statements of revenues and expenses are on in the **Schedule of Revenues & Expenditures**). These statements use the accrual basis of accounting, which is similar to the accounting used by most private-sector businesses. All of the current year's revenues and expenses are taken into account regardless of when cash is received or paid. The statements of net position present assets and deferred outflows of resources less liabilities and deferred inflows of resources, thus presenting NCTA's financial position at the end of the fiscal year, while the statements of revenues, expenses, and changes in net position present information showing how NCTA's net position changed during the fiscal year.

## The North Carolina Turnpike Authority

### History

In October 2002, legislation was passed authorizing the creation of the Turnpike Authority with the purpose to study, design, plan, construct, promote, own, finance and operate a system of toll roads, bridges, and/or tunnels supplementing the traditional non-toll transportation system serving the citizens of North Carolina (N.C.G.S.

§136-89.182). Financial activity for the Turnpike Authority started in late Fiscal Year 2004. By action of the North Carolina General Assembly, effective July 27, 2009, the Turnpike Authority became a part of NCDOT.

Legislation was passed in 2013 creating the Strategic Mobility Formula, a new way to fund and prioritize transportation projects to ensure they provide the maximum benefit to the State of North Carolina (House Bill 817). This law also included changes to the annual appropriations ("GAP funds") dedicated to Turnpike Authority projects; the annual appropriation of $49 million remains for the Triangle Expressway ($25 million) and Monroe Expressway ($24 million) projects.

The Turnpike Authority operates with a project-level financial structure. NCTA projects are financed as individual systems, and revenues are subject to N.C.G.S. §136-89.188(a) which states, "Revenues derived from a Turnpike Project authorized under this Article shall be used only for the following costs associated with the project from which the revenue was derived or a contiguous toll facility:

1. Authority administration costs.
2. Development, right-of-way acquisition, design, construction, expansion, operation, maintenance, reconstruction, rehabilitation, and replacement costs.
3. Debt service on the Authority's revenue bonds or related purposes such as the establishment of debt service reserve funds.
4. Debt service, debt service reserve funds, and other financing costs related to any of the following:
5. A financing undertaken by a private entity under a partnership agreement with the entity for the Project.
6. Private activity bonds issued under law related to the Project.
7. Any federal or State loan, line of credit, or loan guarantee relating to the Project.
8. A return on investment of any private entity under a partnership agreement with the entity for the Project.
9. Any other uses granted to a private entity under a partnership agreement with the entity for the Project."

To maintain the mandated project-level financial structure, the Turnpike Authority must have separate operating and capital budgets for each Turnpike Project.

## Toll Rate Policy

On September 17, 2008, the Turnpike Authority Board of Directors adopted a toll rate policy (the "Toll Rate Policy"), which provides guidelines pursuant to which the Turnpike Authority shall establish and adjust toll rate schedules for its projects. Pursuant to the Toll Rate Policy, the Turnpike Authority is required to hire a Traffic Consultant to prepare a Traffic and Revenue Study for each of its projects and forecast the projected traffic and toll revenue to be generated. After receipt of such Traffic and Revenue Study, the Toll Rate Policy directs the Turnpike Authority Board of Directors to adopt a toll rate schedule that forecasts revenues on the project that are at least the same level as the revenue set forth in the Traffic and Revenue report.

Under the Toll Rate Policy, an increase in the toll rates is required each year unless the Turnpike Authority provides to the Trustee (1) a resolution of the Turnpike Authority's Board directing that the toll rates will not be increased or will be increased in a lesser amount than assumed in the Traffic and Revenue Study; (2) a certificate of an officer of the Turnpike Authority to the effect that NCTA is in compliance with all applicable rate covenants in the Trust Agreement and all other documents for the Bonds issued to finance its projects; and (3) a report of the Traffic Consultant showing that for each succeeding fiscal year through the final maturity date for all indebtedness issued to finance the project, the forecasted revenues in each such fiscal year would be such that one dollar of additional senior lien indebtedness could be issued by the Turnpike Authority in compliance with the requirements of the additional debt limitations set forth in the documents related to all bonds issued to finance the project.

The Turnpike Authority Board of Directors has adopted toll rate schedules for both the Triangle Expressway and Monroe Expressway projects based on their respective Traffic and Revenue Studies. The toll rate schedules for each facility provide the toll rates for every year through the final maturity date for all indebtedness issued to finance each project. Toll rates on both facilities increase each January 1 based

on the approved toll rate schedules. In Calendar Years (CY) 2022 and 2023, the average cost per mile for customers on the Triangle Expressway in a Class 1 (two- axle) vehicle paying with a transponder was $0.20. In CY 2022 and 2023, the average cost per mile for customers on the Monroe Expressway in a Class 1 (two- axle) vehicle paying with a transponder was $0.15.

# Financial Highlights & Analysis

## Turnpike Authority Fund

Budgeted Administrative Activities for fiscal years 2023 and 2022 were limited to salaries, personnel, Board members' per-diem, travel, and other general operating expenditures, while project-related costs were funded by state-appropriated, Federal Highway Administration ("FHWA"), or project-specific financings. Funding for administrative expenses is reviewed and advanced as needed from the Highway Trust Fund. Interest began to accrue on the advance on January 1, 2014.

- The Turnpike Authority's total assets increased $91.4 million to $3.3 billion.
- The Turnpike Authority's total capital assets increased $217.3 million to $2.8 billion.

## Triangle Expressway

The Triangle Expressway is North Carolina's first modern toll road, and is approximately 18.8 miles of new highway construction, extending from the interchange of I-40 and N.C. 885 on the north end, to N.C. 55 Bypass in the south, to partially complete the "Outer Loop" around the greater Raleigh area. The final phase opened to toll traffic on January 2, 2013. In April 2017, the Veridea Parkway interchange, previously named Old Holly Springs-Apex Road, opened to traffic. The Veridea Parkway Interchange is located between the U.S. 1 interchange and the N.C. 55 Bypass interchange on the southern end of the Triangle Expressway and provides a direct local link between the Triangle Expressway and Veridea Parkway/Old Holly Springs-Apex Road. The Veridea Parkway Interchange was paid for in part with proceeds of the 2009 toll revenue bonds. A second interchange, the Morrisville Parkway Interchange, opened to traffic in February 2020. Toll revenues from both the Veridea Parkway Interchange and Morrisville Parkway Interchange are included in Receipts and Revenues of the Triangle Expressway System.

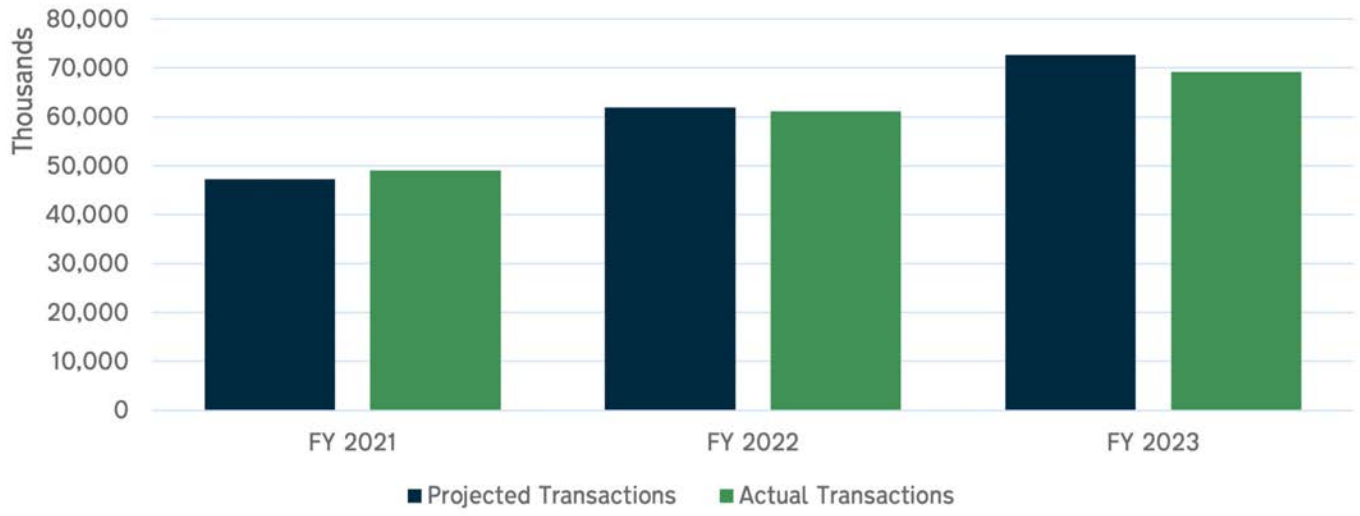
### Fiscal Year 2023 Highlights

- Transactions increased 13.1% to 69.2 million in FY 2023 from FY 2022. Actual transactions were 4.8% below T&R projections.
- Actual revenue increased 13.1% to $61.1 million in FY 2023 from FY 2022. Actual revenue was 3.0% below T&R projections.
- Operating expenses for the Triangle Expressway totaled $18.8 million in FY 2023 which was 33.0% under budget.

## Transactions & Revenue

The Triangle Expressway serves as a commuter facility in the Raleigh area. Transaction and revenue projections were updated by CDM Smith in FY 2021 to include impacts from the COVID-19 pandemic. Total traffic on the facility increased year-over-year since FY 2021. The table below show the number of toll transactions on the Triangle Expressway in fiscal years 2021, 2022 and 2023.

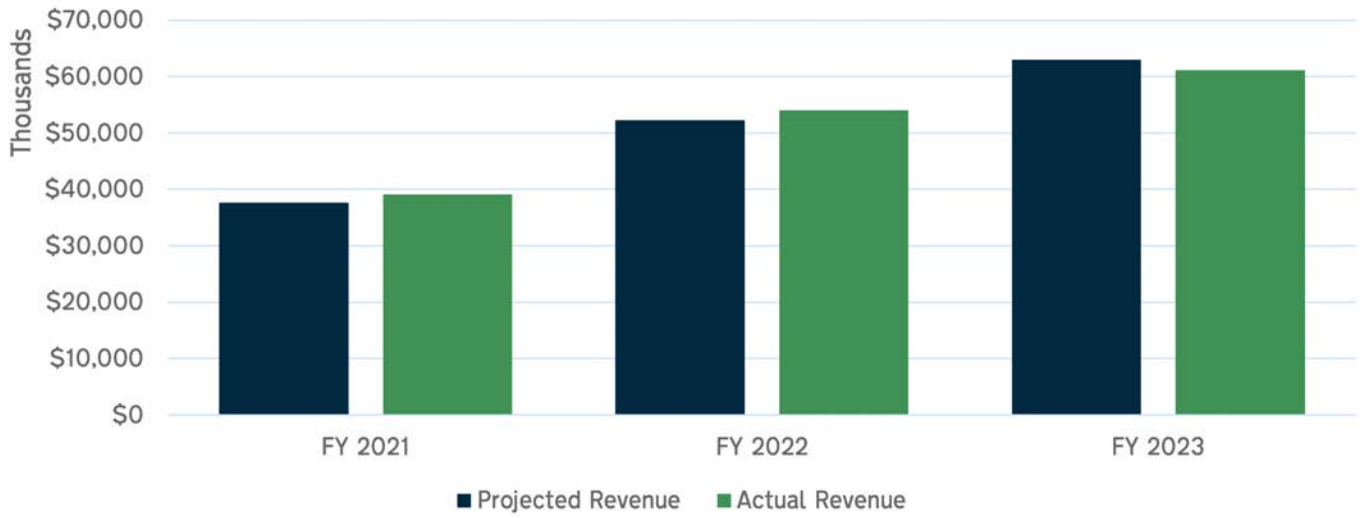
| | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| Projected Transactions | 47,260,000 | 61,907,000 | 72,645,000 |
| Actual Transactions | 49,068,668 | 61,137,704 | 69,170,232 |
| Actual to Projected (%) | 104% | 99% | 95% |
| Actual Transactions YOY Increase (Decrease) (%) | -0.9% | 24.6% | 13.1% |



The table below shows the amount of actual revenue earned on the Triangle Expressway in fiscal years 2021, 2022 and 2023. FY 2023 actual revenue on the Triangle Expressway totaled $61.1 million. Actual revenue is on a cash basis and is inclusive of toll revenue as well as revenue from the following:

- Processing Fees
- Credit Card Equity Fees
- Interest Earnings
- Non-Sufficient Funds Fees
- Actual Damages

| | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| Projected Revenue | $37,695,000 | $52,323,000 | $62,980,000 |
| Actual Revenue | $39,078,585 | $54,042,716 | $61,134,301 |
| Actual to Projected (%) | 104% | 103% | 97% |
| Actual Revenue YOY Increase (Decrease) (%) | -26.0% | 38.3% | 13.1% |




| | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| Toll Revenue as a % of Total Actual Revenue | 92.7% | 88.9% | 89.6% |

Toll Revenue as a percent of Total Actual Revenue is Calculated by dividing the total toll revenue by actual revenue for each fiscal year.

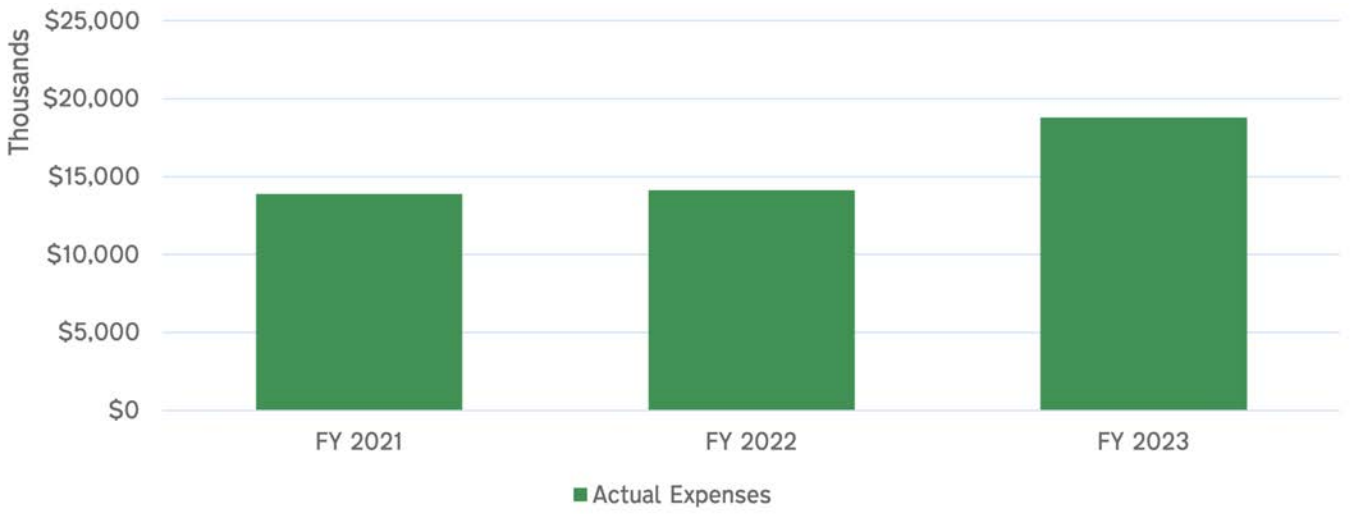
## Operating Expenses

Operating Expenses for the Triangle Expressway are shown on a cash basis and are broken down by the following groups:

- Finance
- Toll Operations
- Highway Operations
- Customer Service
- Service & Safety Patrols
- Communications
- Administrative

Below is a breakdown of the actual operating expenses for the Triangle Expressway for fiscal years 2021, 2022 and 2023.

| | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| Actual Expenses | $13,899,836 | $14,136,679 | $18,788,924 |



## Monroe Expressway

The Monroe Expressway is an All-Electronic Toll (AET) facility that is 19.8-miles of new highway construction that extends from U.S. 74 at I-485 in eastern Mecklenburg County to U.S. 74 between the towns of Wingate and Marshville in Union County. The expressway improves mobility and capacity within the project study area by providing a highway for the U.S. 74 corridor that allows for high-speed regional travel. The Monroe Expressway opened to traffic on November 27, 2018.

### Fiscal Year 2023 Highlights

- Transactions increased 10.3% to 46.4 million in FY 2023 from FY 2022. Actual transactions were 3.1% below T&R projections.
- Actual revenue increased 7.4% to $29.0 million in FY 2023 from FY 2022 and exceeded T&R projections by 2.4%.
- Operating expenses for the Monroe Expressway totaled $14.7 million in FY 2023 which was 10.0% under budget.

### Transactions & Revenue

The Monroe Expressway serves as a commuter facility in the Charlotte area. Transaction and revenue projections were updated by CDM Smith in FY 2021 to include impacts from the COVID-19 pandemic. Total traffic on the facility increased year-over-year since FY 2021. The table below show the number of toll transactions on the Triangle Expressway in fiscal years 2021, 2022 and 2023.

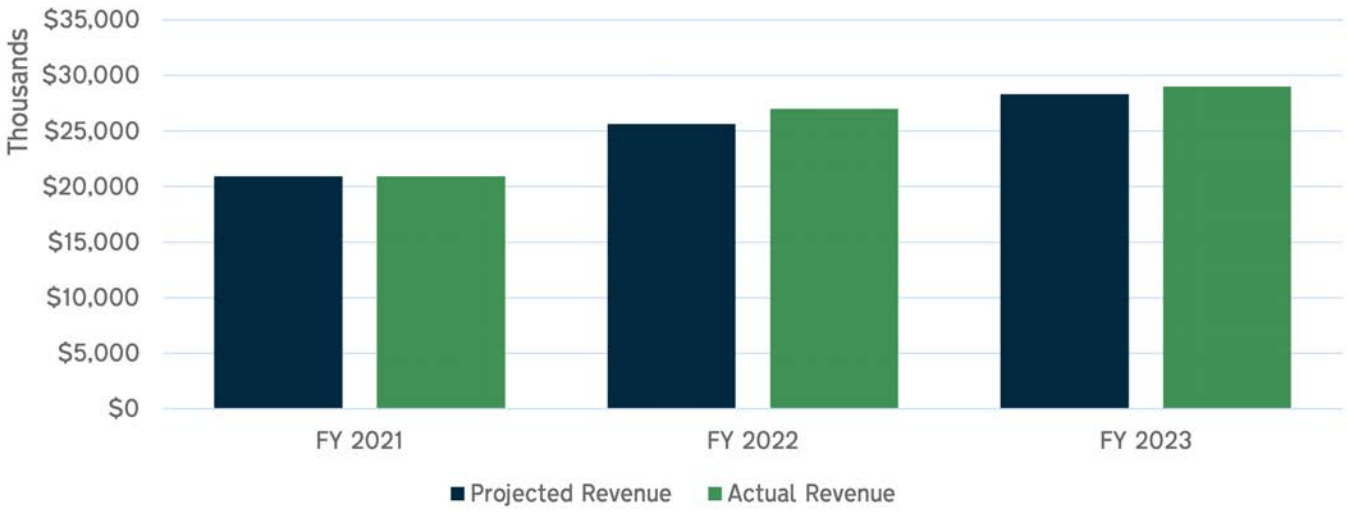
| | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| Projected Transactions | 36,830,000 | 43,255,000 | 47,935,000 |
| Actual Transactions | 37,661,856 | 42,104,433 | 46,435,301 |
| Actual to Projected (%) | 102% | 97% | 97% |
| Actual Transactions YOY Increase (Decrease) (%) | 6.9% | 11.8% | 10.3% |



The table below shows the actual revenue received on the Monroe Expressway in fiscal years 2021, 2022 and 2023. FY 2023 actual revenue on the Monroe Expressway totaled $29.0 million. Actual revenue is on a cash basis and is inclusive of toll revenue as well as revenue from the following:

- Processing Fees
- Credit Card Equity Fees
- Interest Earnings
- Non-Sufficient Funds Fees
- Actual Damages

| | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| Projected Revenue | $20,940,000 | $25,633,000 | $28,342,000 |
| Actual Revenue | $20,950,428 | $27,023,684 | $29,024,768 |
| Actual to Projected (%) | 100% | 105% | 102% |
| Actual Revenue YOY Increase (Decrease) (%) | -1.8% | 29.0% | 7.4% |




| | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| Toll Revenue as a % of Total Actual Revenue | 92.4% | 88.4% | 88.6% |

Toll Revenue as a percent of Total Actual Revenue is calculated by dividing the total toll revenue by actual revenue for each fiscal year.

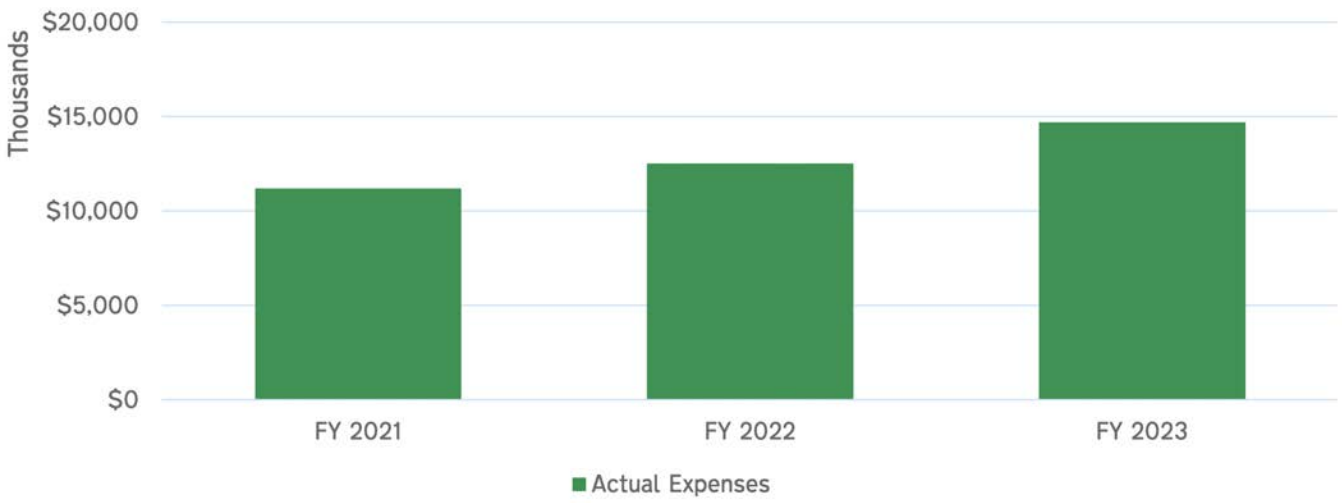
### Operating Expenses

Operating Expenses for the Monroe Expressway are shown on a cash basis and are broken down by the following groups:

- Finance
- Toll Operations
- Highway Operations
- Customer Service
- Service & Safety Patrols
- Communications
- Administrative

Below is a breakdown of the actual operating expenses for the Monroe Expressway for fiscal years 2021, 2022 and 2023.

| | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|
| Actual Expenses | $11,204,940 | $12,532,450 | $14,716,742 |




## New Debt Issuances

### Triangle Expressway

There were no new debt issuances for the Triangle Expressway System in FY 2023.

### Monroe Expressway

There were no new debt issuances for the Monroe Expressway in FY 2023.

# Debt Outstanding as of June 30, 2023

## Triangle Expressway

| Series | Outstanding Par | Final Maturity |
|---|---|---|
| Appropriation Revenue Refunding Bonds, Series 2018A | $150,125,000 | 1/1/39 |
| Appropriation Revenue Refunding Bonds, Series 2018B | $134,593,000 | 1/1/32 |
| Appropriation Revenue Bonds, Series 2019 | $127,582,250 | 1/1/49 |
| Senior Lien Revenue Bonds, Series 2009B | $88,966,835 | 1/1/38 |
| Senior Lien Revenue Refunding Bonds, Series 2017 | $160,020,000 | 1/1/39 |
| Senior Lien Revenue Refunding Bonds, Series 2018 | $393,920,000 | 1/1/41 |
| Senior Lien Revenue Bonds, Series 2019 | $370,975,000 | 1/1/55 |
| TIFIA Loan, 2021 | $499,461,980 | 1/1/58 |

## Monroe Expressway

| Series | Outstanding Par | Final Maturity |
|---|---|---|
| Appropriation Revenue Bonds, Series 2010A | $216,930,000 | 1/1/39 |
| Appropriation Revenue Refunding Bonds, Series 2021 (forward delivery) | $72,595,000 | 1/1/32 |
| Senior Lien Revenue Bonds, Series 2016A | $119,455,000 | 1/1/38 |
| Senior Lien Revenue Bonds, Series 2016C | $23,180,998 | 1/1/39 |
| TIFIA Loan, 2017 | $180,234,152 | 1/1/58 |

# Fund Balances as of June 30, 2023

## Triangle Expressway

| Fund | Balance |
|---|---|
| State Appropriation Revenue | - |
| Revenue | - |
| Operations & Maintenance Expense Fund | 4,608,655 |
| Operating Reserve Fund | 7,784,626 |
| Renewal & Replacement Fund | 15,329,724 |
| Project Fund | - |
| Restricted General Reserve | 1,314,267 |
| Unrestricted General Reserve | 74,336,852 |

## Monroe Expressway

| Fund | Balance |
|---|---|
| State Appropriation Revenue | - |
| State Appropriation Reserve | 3,879,747 |
| Revenue | 2,480 |
| Senior Lien Debt Service Reserve Fund | 12,360,151 |
| Operations & Maintenance Expense Fund | 2,792,653 |
| Operating Reserve Fund | 4,221,660 |
| Renewal & Replacement Fund | 16,492,528 |
| TIFIA Debt Service Reserve Fund | 11,945,443 |
| Ramp-up Reserve Fund | 54,163,093 |
| Unpledge Reserve | 22,639,579 |

# Net Position

Net position represents the residual interest in the Turnpike Authority's assets after all liabilities are deducted. For reporting purposes, they are divided into three categories: net investment in capital assets; restricted; and unrestricted.

**Condensed Statements of Net Position**

| | 2023 | 2022 | 2021 |
|---|---|---|---|
| Current Assets | $ 85,801,706 | $ 51,936,083 | $ 25,166,160 |
| Restricted Assets, Prepaid Insurance Costs, and Net OPEB Asset | 368,597,384 | 528,352,985 | 838,438,968 |
| Capital Assets | 2,800,516,047 | 2,583,207,797 | 2,344,984,535 |
| Total Assets | 3,254,915,137 | 3,163,496,865 | 3,208,589,663 |
| Deferred Outflows of Resources | 21,018,744 | 23,562,733 | 26,012,892 |
| Current Liabilities | 257,800,304 | 225,049,027 | 175,066,624 |
| Noncurrent Liabilities | 2,671,741,301 | 2,718,837,473 | 2,769,481,262 |
| Total Liabilities | 2,929,541,605 | 2,943,886,500 | 2,944,547,886 |
| Deferred Inflows of Resources | 20,955,385 | 7,542,181 | 7,522,839 |
| Net Investment in Capital Assets | 531,138,700 | 422,923,974 | 432,495,273 |
| Restricted: | | | |
| Debt service | 142,613,215 | 197,962,415 | 234,520,949 |
| Transportation | 19,475,299 | 17,470,046 | 16,343,650 |
| Unrestricted | (367,790,323) | (402,725,518) | (400,828,042) |
| Net Position | $ 325,436,891 | $ 235,630,917 | $ 282,531,830 |

# Current Assets

Current assets increased in fiscal year 2023 primarily due to an increase of $17.1 million in accounts receivable for bill by mail toll revenue and an increase of $20.8 million in intergovernmental receivables from the National Highway Performance Program (NHPP) for the Triangle Expressway's Complete 540 project. Current assets increased in fiscal year 2022 primarily due to an increase in accounts receivable for bill by mail toll revenue. For additional information regarding NCTA's current assets, please see Note 1 in the financial statements.

# Non-Current Assets

Non-current assets decreased in fiscal year 2023 primarily due to decrease in restricted investments of $171.3 million for the continued construction of the Triangle Expressway's Complete 540 project using bond proceeds. Non-current assets decreased in fiscal year 2022 primarily due to a decrease in restricted investments of $313.8 million for the continued construction of the Triangle Expressway's Complete 540 project using bond proceeds. For additional information regarding NCTA's restricted assets, please see Note 1, Note 2, and Note 3 in the financial statements.

# Capital Assets

## Capital Assets, Non-Depreciable

The increases in fiscal years 2023 and 2022 were due to the continued progress on the Complete 540 project with an increase for right-of-way (ROW) acquisition of $34.7 million and $19.1 million, respectively; and an increase for construction in progress of $212.3 million and $248.8 million, respectively. For additional information regarding NCTA's capital assets, please see Note 1 and Note 4 in the financial statements.

## Capital Assets, Depreciable, Net

The decrease of $29.7 million in each fiscal year of 2023 and 2022 was due to the current year depreciation expense on the Triangle Expressway and Monroe Expressway projects. For additional information regarding NCTA's capital assets, please see Note 1 and Note 4 in the financial statements.

# Current Liabilities

Current liabilities include accounts payable, current portion of interest payable, obligations under securities lending, current portion of revenue bonds payable, and other current liabilities. Current liabilities increased in fiscal year 2023 primarily due to a $16.7 million increase in Due to Other Funds for ROW acquisition expenditures for the Complete 540 project and an increase of $13.5 million in Accounts Payable. Current liabilities increased in fiscal year 2022 primarily due to a $25.7 million reclassification of the Civil Penalty Fund from Due to Fiduciary Funds to Due to Other Funds and $25 million due to the State Treasurer for funds disbursed to NCTA for project expenditures, but not yet deducted from the NCTA STIF accounts. For additional information regarding NCTA's current liabilities, please see Note 1 and Note 5 of the financial statements.

# Non-Current Liabilities

Non-current liabilities include revenue bonds payable, notes payable, funds advanced to the Turnpike

Authority from the Highway Trust Fund to cover the Turnpike Authority's administrative expenditures, and the non-current portion of accrued vacation and interest payable. Non-current liabilities decreased in fiscal year 2023 primarily due to utilizing the TIFIA line of credit to refund the Triangle Expressway Senior Lien Revenue Bond Anticipation Notes, Series 2020 for the Complete 540 project. Non-current liabilities decreased in fiscal year 2022 primarily due to revenue bond principal payments of $37 million and amortization of premium on bonds payable of $23.8 million. For additional information regarding NCTA's non-current liabilities, please see Note 1, Note 7, Note 10 and Note 11 and in the financial statements.

## Net Position and Revenues, Expenses, and Changes in Net Position

For fiscal years 2023, 2022, and 2021, the Turnpike Authority ended with positive net position.

**Condensed Statements of Revenues, Expenses, and Changes in Net Position**

| | 2023 | 2022 | 2021 |
|---|---|---|---|
| Operating Revenues: | | | |
| Charges for Services | $ 94,172,843 | $ 89,667,045 | $ 49,792,367 |
| Other Operating Revenues | 17,598,892 | 17,604,543 | 7,392,967 |
| Total Operating Revenues | 111,771,735 | 107,271,588 | 57,185,334 |
| Operating Expenses: | | | |
| Personnel Services | 3,189,566 | 3,024,259 | 3,386,775 |
| Supplies and Materials | 1,643,019 | 613,815 | 240,546 |
| Contracted Personnel Services | 12,733,449 | 8,595,600 | 8,476,261 |
| Travel | 84,194 | 72,971 | 3,685 |
| Advertising | 718,950 | 159,027 | 95,823 |
| Utilities | 553,651 | 330,178 | 269,838 |
| Dues and Subscription Fees | 10,216 | 43,887 | 39,063 |
| Other Services | 17,837,082 | 29,013,342 | 18,835,990 |
| Cost of Goods Sold | 608,213 | 933,468 | 701,395 |
| Capital Outlay | 42,286,501 | 35,794,768 | 40,356,587 |
| Rental Expense | 113,913 | 199,973 | 168,893 |
| Depreciation | 29,683,523 | 29,683,523 | 29,683,523 |
| Total Operating Expenses | 109,462,277 | 108,464,811 | 102,258,379 |
| Operating Income (Loss) | 2,309,458 | (1,193,223) | (45,073,045) |
| Nonoperating Revenue (Expenses) and Capital Grants | (25,486,063) | (102,730,936) | (60,825,193) |
| Transfers In | 112,982,579 | 57,023,246 | 49,921,668 |
| Transfers Out | - | - | (13,891,002) |
| Change in Net Position | 89,805,974 | (46,900,913) | (69,867,572) |
| Net Position Beginning, July 1 | 235,630,917 | 282,531,830 | 352,399,402 |
| Net Position Ending, June 30 | 325,436,891 | 235,630,917 | 282,531,830 |

## Operating Revenues

Operating revenues are revenues derived from the business operations of the Turnpike Authority. These include toll revenues, fees, and sales revenue from the sale of transponders. Operating revenues increased in fiscal year 2023 primarily due to an increase of $4.5 million in toll revenues from increased traffic levels. Operating revenues increased in fiscal year 2022 primarily due to an increase of $30.0 million in toll revenues from increased traffic levels. For additional information regarding NCTA's operating revenues, please Note 1 and Note 9 in the financial statements.

## Operating Expenses

Operating expenses are expenses used to acquire or produce goods and services to carry out the mission of the Turnpike Authority. In fiscal years 2023 and 2022, operating expenses increased insignificantly at $1.0 million each year. For additional information regarding NCTA's operating expenses, please Note 1, Note 6, Note 10, and Note 11 in the financial statements.

## Non-operating and Other Revenue/Expenses

Non-operating revenues/expenses are revenues received or expenses incurred for which goods and services are not provided or received. They include capital grants, investment income, and debt service expense. In fiscal year 2023, non-operating revenues and expenses decreased an insignificant amount of $1.9 million. In fiscal year 2022, non-operating expenses increased $20.6 million primarily due to increased debt service. Capital grants are the funds received from the Federal Highway Administration (“FHWA”) and NCDOT for their participation in the initial construction of toll highways and in preliminary studies to determine the feasibility of a toll facility. Capital grants increased $75.4 million in fiscal year 2023 primarily due to funding from the National Highway Performance Program (NHPP) for the Triangle Expressway's Complete 540 project. Capital grants decreased $21.3 million in fiscal year 2022 primarily due to a shift from federal funding to bond funding for the Complete 540 project. For additional information regarding NCTA's non-operating and other revenue/expenses, please see Note 1 in the financial statements.

## Transfers In

Transfers in include funds received from NCDOT for gap funding of debt service and funds for the FHWA State match. The amount of funds received for gap funding of debt service remained unchanged at $49.0 million in fiscal years 2023 and 2022. For additional information regarding NCTA's transfers in, please see Note 1 in the financial statements.

## Transfers Out

Transfers out include funds disbursed to reimburse NCDOT for project participation incurred with proceeds from the sale of bonds for the Complete 540 project. There were no transfers out in fiscal year 2023. The reimbursement decreased $13.9 million in fiscal year 2022 due to no new debt issuances for the Complete 540 project. For additional information regarding NCTA's transfers out, please see Note 1 in the financial statements.

## Requests for Information

Additional information may be found on the Turnpike Authority's Investor Information website. Any request for information about this report should be sent to the Controller at the North Carolina Turnpike Authority, 1 South Wilmington Street, Raleigh, NC 27601.

**NORTH CAROLINA TURNPIKE AUTHORITY**
STATEMENTS OF NET POSITION

*JUNE 30, 2023 AND 2022*

| | 2023 | 2022 |
|---|---|---|
| **ASSETS** | | |
| Current Assets: | | |
| Securities Lending Collateral | $ 1,020,321 | $ 5,191,326 |
| Accounts Receivable, Net | 58,125,209 | 41,025,407 |
| Inventory | 1,074,528 | 914,869 |
| Intergovernmental Receivable | 25,581,648 | 4,804,481 |
| Total Current Assets | 85,801,706 | 51,936,083 |
| Noncurrent Assets: | | |
| Restricted Assets: | | |
| Cash and Cash Equivalents | 50,195,497 | 38,348,158 |
| Investments | 314,123,402 | 485,466,861 |
| Total Restricted Assets | 364,318,899 | 523,815,019 |
| Net OPEB Asset | - | 1,530 |
| Prepaid Insurance Costs | 4,278,485 | 4,536,436 |
| Capital Assets, Nondepreciable: | | |
| Land and Permanent Easements | 590,424,120 | 555,710,391 |
| Construction in Progress | 910,822,653 | 698,544,609 |
| Capital Assets, Depreciable, Net of Depreciation: | | |
| Highway network | 1,299,269,274 | 1,328,952,797 |
| Total Capital Assets, Net of Depreciation | 2,800,516,047 | 2,583,207,797 |
| Total Noncurrent Assets | 3,169,113,431 | 3,111,560,782 |
| **Total Assets** | 3,254,915,137 | 3,163,496,865 |
| Deferred Outflows of Resources: | | |
| Pension | 1,250,417 | 807,640 |
| Other Postemployment Benefits | 1,597,382 | 1,816,021 |
| Unamortized Bond Refunding Charges | 18,170,945 | 20,939,072 |
| **Total Deferred Outflows of Resources** | $ 21,018,744 | $ 23,562,733 |

The accompanying notes to the financial statements are an integral part of these statements.

**NORTH CAROLINA TURNPIKE AUTHORITY**
STATEMENTS OF NET POSITION (CONTINUED)

*JUNE 30, 2023 AND 2022*

| | 2023 | 2022 |
|---|---|---|
| **LIABILITIES** | | |
| Current Liabilities: | | |
| Accounts Payable | $ 30,346,258 | $ 16,865,850 |
| Accrued Interest Payable | 56,476,044 | 58,312,344 |
| Accrued Vacation | 36,553 | 31,902 |
| Obligations Under Securities Lending | 1,020,321 | 5,191,326 |
| Due to the State (NCDOT) | 111,590,293 | 94,881,342 |
| Bonds Payable, Net | 42,002,000 | 36,994,000 |
| Intergovernmental Payables | 2,006,851 | 1,860,914 |
| Funds Held for Others | 14,321,984 | 10,911,349 |
| Total Current Liabilities | 257,800,304 | 225,049,027 |
| Noncurrent Liabilities: | | |
| Bonds Payable, Net | 1,875,536,769 | 2,442,256,684 |
| Note Payable | 665,961,980 | 166,500,000 |
| Advances from Other Funds | 32,839,728 | 30,423,541 |
| Accrued Interest Payable | 92,892,599 | 75,899,324 |
| Accrued Vacation | 347,808 | 294,967 |
| Net OPEB Liability | 2,450,532 | 2,951,039 |
| Net Pension Liability | 1,711,885 | 511,918 |
| Total Noncurrent Liabilities | 2,671,741,301 | 2,718,837,473 |
| **Total Liabilities** | 2,929,541,605 | 2,943,886,500 |
| Deferred Inflows of Resources: | | |
| Pension | 40,391 | 669,612 |
| Deferred Gain on Refunding | 19,578,829 | 5,779,074 |
| Other Postemployment Benefits | 1,336,165 | 1,093,495 |
| **Total Deferred Inflows of Resources** | 20,955,385 | 7,542,181 |
| **NET POSITION** | | |
| Net Investment in Capital Assets | 531,138,700 | 422,923,974 |
| Restricted: | | |
| Debt Service | 142,613,215 | 197,962,415 |
| Transportation | 19,475,299 | 17,470,046 |
| Unrestricted | (367,790,323) | (402,725,518) |
| **Total Net Position** | $ 325,436,891 | $ 235,630,917 |

The accompanying notes to the financial statements are an integral part of these statements.

**NORTH CAROLINA TURNPIKE AUTHORITY**
STATEMENTS OF REVENUES, EXPENSES, AND CHANGES IN NET POSITION

*YEARS ENDED JUNE 30, 2023 AND 2022*

| | 2023 | 2022 |
|---|---|---|
| Revenues: | | |
| Operating Revenues: | | |
| Charges for Services | $ 94,172,843 | $ 89,667,045 |
| Other Operating Revenues | 17,598,892 | 17,604,543 |
| Total Revenues | 111,771,735 | 107,271,588 |
| Expenses: | | |
| Operating Expenses: | | |
| Personnel Services | 3,189,566 | 3,024,259 |
| Supplies and Materials | 1,643,019 | 613,815 |
| Contracted Personnel Services | 12,733,449 | 8,595,600 |
| Travel | 84,194 | 72,971 |
| Advertising | 718,950 | 159,027 |
| Utilities | 553,651 | 330,178 |
| Dues and Subscription Fees | 10,216 | 43,887 |
| Other Services | 17,837,082 | 29,013,342 |
| Cost of Goods Sold | 608,213 | 933,468 |
| Capital Outlay | 42,286,501 | 35,794,768 |
| Rental Expense | 113,913 | 199,973 |
| Depreciation | 29,683,523 | 29,683,523 |
| Total Operating Expenses | 109,462,277 | 108,464,811 |
| Operating Gain (Loss) | 2,309,458 | (1,193,223) |
| Nonoperating Revenues (Expenses): | | |
| Investment Earnings (Loss) | 10,407,076 | (5,463,060) |
| Federal Interest Subsidy on Debt | 3,877,885 | 4,015,963 |
| Interest and Fees | (115,267,249) | (101,687,900) |
| Miscellaneous | 41,988 | 306,094 |
| Total Nonoperating Expenses | (100,940,300) | (102,828,903) |
| Loss Before Transfers and Capital Grants | (98,630,842) | (104,022,126) |
| Capital Grants | 75,454,237 | 97,967 |
| Transfers In | 112,982,579 | 57,023,246 |
| Change in Net Position | 89,805,974 | (46,900,913) |
| Net Position, Beginning | 235,630,917 | 282,531,830 |
| Net Position, Ending | $ 325,436,891 | $ 235,630,917 |

The accompanying notes to the financial statements are an integral part of these statements.

**NORTH CAROLINA TURNPIKE AUTHORITY**
STATEMENTS OF CASH FLOWS

*YEARS ENDED JUNE 30, 2023 AND 2022*

| | 2023 | 2022 |
|---|---|---|
| **Cash Flows from Operating Activities:** | | |
| Receipts from Customers | $ 78,460,180 | $ 69,340,659 |
| Payments to Employees and Fringe Benefits | (3,021,508) | (3,104,615) |
| Payments to Vendors and Suppliers | (57,215,971) | (35,088,263) |
| Other Receipts | 18,131,275 | 16,427,845 |
| Other Payments | (53,197) | (12,718) |
| Net Cash Flows from Operating Activities | 36,300,779 | 47,562,908 |
| **Cash Flows from Noncapital Financing Activities:** | | |
| Advances from Other Funds | 2,416,187 | 68,916 |
| Net Cash Flows from Noncapital Financing Activities | 2,416,187 | 68,916 |
| **Cash Flows from Capital and Related Financing Activities:** | | |
| Acquisition and Construction of Capital Assets | (246,040,714) | (266,047,342) |
| Transfers from Other Funds | 112,982,580 | 57,023,246 |
| Federal Interest Subsidy on Debt | 3,877,885 | 4,015,963 |
| Capital Grants | - | 2,133,495 |
| Capital Contributions | 56,039,975 | - |
| Capital Gifts | - | (7,317) |
| Principal Payments | (536,454,000) | (42,122,000) |
| Interest Payments | (98,387,212) | (107,132,495) |
| Proceeds from Capital Debt | 499,461,980 | - |
| Bond Issuance Costs | (71,250) | (98,700) |
| Insurance Recoveries | 23,382 | 288,246 |
| Net Cash Flows from Capital and Related Financing Activities | (208,567,374) | (351,946,904) |
| **Cash Flows from Investing Activities:** | | |
| Proceeds from Sale and Maturities of Investments | 576,823,684 | 926,164,212 |
| Purchase of Investments | (403,573,647) | (619,319,393) |
| Investment Earnings | 8,447,710 | 1,450,275 |
| Net Cash Flows from Investing Activities | 181,697,747 | 308,295,094 |
| Net Change in Cash and Cash Equivalents | 11,847,339 | 3,980,014 |
| Cash and Cash Equivalents, Beginning of Year | 38,348,158 | 34,368,144 |
| Cash and Cash Equivalents, End of Year | $ 50,195,497 | $ 38,348,158 |

The accompanying notes to the financial statements are an integral part of these statements.

**NORTH CAROLINA TURNPIKE AUTHORITY**
STATEMENTS OF CASH FLOWS (CONTINUED)

*YEARS ENDED JUNE 30, 2023 AND 2022*

| | 2023 | 2022 |
|---|---|---|
| **Reconciliation of Operating Gain (Loss) to Net Cash Flows From Operating Activities:** | | |
| Operating Gain (Loss) | $ 2,309,458 | $ (1,193,223) |
| Adjustments to Reconcile Operating Gain (Loss) to Net Cash Flows from Operating Activities: | | |
| Operating Activities: | | |
| Depreciation Expense | 29,683,523 | 29,683,523 |
| Nonoperating Miscellaneous and Other Expense | (124,447) | (111,418) |
| Management Fees | (53,197) | (12,718) |
| Changes in Assets and Deferred Outflows: | | |
| Accounts Receivable | (17,100,212) | (21,255,009) |
| Intergovernmental Receivables | (2,491,540) | (988,435) |
| Due from Other Funds | 1,128,636 | (865,689) |
| Inventory | (159,659) | (512,643) |
| Net OPEB Asset | 1,530 | 2,876 |
| Deferred Outflows for Pensions | (442,777) | (21,906) |
| Deferred Outflows for OPEB | 218,639 | (128,222) |
| Changes in Liabilities and Deferred Inflows: | | |
| Accounts Payable | 2,822,234 | 369,692 |
| Due to Other Funds | 16,708,950 | 50,681,466 |
| Funds Held for Others | 3,560,635 | 1,476,580 |
| Due to Fiduciary | - | (9,876,488) |
| Unearned Revenue | (150,000) | 240,889 |
| Compensated Absences | 57,492 | (56,689) |
| Net OPEB Liability | (481,902) | 447,262 |
| Deferred Infows for OPEB | 242,670 | (228,375) |
| Net Pension Liability | 1,199,967 | (758,177) |
| Deferred Inflows for Pensions | (629,221) | 669,612 |
| Net Cash Flows from Operating Activities | $ 36,300,779 | $ 47,562,908 |
| **Noncash Investing, Capital, and Financing Activities:** | | |
| Change in Fair Value of Investments | (4,289,423) | 3,779,778 |
| Change in Construction in Progress as a Result of Accrued Liabilities | 22,916,373 | 11,973,677 |
| Change in Net OPEB Liability related to Noncapital Contributions | (18,605) | (17,850) |
| Change in Securities Lending Collateral | (4,171,005) | 5,183,267 |
| Increase in Receivables Related to Nonoperating Income | 19,414,263 | 407 |
| Assets Acquired through Assumption of a Liability | 148,784 | 287,368 |

The accompanying notes to the financial statements are an integral part of these statements.

## Note 1—Nature of operations and summary of significant accounting policies

*Organization and Purpose* – The North Carolina Turnpike Authority ("NCTA") was established by G.S. 136 Article 6H on October 3, 2002. Effective July 27, 2009, the North Carolina General Assembly adopted Session Law 2009-343, transferring the NCTA to the North Carolina Department of Transportation ("NCDOT") to conserve expenditures and improve efficiency. The NCTA is a business unit of NCDOT and is subject to and under the direct supervision of the Secretary of Transportation. NCTA is presented as a major enterprise fund in the State of North Carolina. Currently, NCTA is authorized to construct, operate, and maintain up to 11 turnpike projects in the state.

*Financial Reporting Entity* – The concept underlying the definition of the financial reporting entity is that elected officials are accountable to their constituents for their actions. As required by accounting principles generally accepted in the United States of America ("U.S. GAAP"), the financial reporting entity includes both the primary government and all of its component units. An organization other than a primary government serves as a nucleus for a reporting entity when it issues separate financial statements. NCTA is a business unit of NCDOT. NCTA is an integral part of the State of North Carolina's *Annual Comprehensive Financial Report* ("ACFR"). These financial statements for the NCTA are separate and apart from those of the State of North Carolina and NCDOT and do not present the financial position of the state or NCDOT, or changes in their financial position and cash flows. The NCTA is governed by a nine-member Board of Directors; two members are appointed by the Senate Pro Tempore and two by the Speaker of the House. The remaining five are appointed by the Governor and include the Secretary of Transportation.

*Basis of Presentation* – The accompanying financial statements are presented in accordance with U.S. GAAP as prescribed by the Governmental Accounting Standards Board ("GASB"). The full scope of NCTA's activities is considered to be a single business-type activity and, accordingly, is reported within a single column in the basic financial statements.

*Basis of Accounting* – The financial statements of NCTA have been prepared using the "economic resources" measurement focus and the accrual basis of accounting. Under the accrual basis, revenues are recognized when earned, and expenses are recorded when an obligation has been incurred. Grants and similar items are recognized as revenue as soon as all eligibility requirements imposed by the provider have been met.

*State Treasurer's Securities Lending Collateral* – While NCTA does not directly engage in securities lending transactions, it deposits certain funds with the State Treasurer ("Treasurer") in the short-term investment fund ("NC STIF"), which participates in securities lending activities. Based on the Treasurer's allocation of these transactions, NCTA recognizes its allocable share of the assets and liabilities related to these transactions on the accompanying financial statements as "Securities Lending Collateral" and "Obligations under Securities Lending". NCTA's allocable share of these assets and liabilities is based on NCTA's year-end deposit balance per the State Treasurer's records.

Based on the authority provided in General Statute 147-69.3(e), the Treasurer lends securities from its investment pools to broker-dealers and other entities (borrowers) for collateral that will be returned for the same securities in the future. The Treasurer's securities custodian manages the securities lending program. The Treasurer's custodian lent U.S. government and agency securities, Federal Nation Mortgage Association Securities, corporate bonds, and notes for collateral. The Treasurer's custodian is permitted to receive cash, U.S. government and agency securities, or irrevocable letters of credit as collateral for the securities lent.

The collateral is initially pledged at 102% of the fair value of the securities lent and additional collateral is required if its value falls to less than 100% of the fair value of the securities lent. There are no restrictions on the amount of loans that can be made. Substantially, all security loans can be terminated on demand by either the Treasurer or the borrower.

## Note 1—Nature of operations and summary of significant accounting policies (continued)

Additional details on the Treasurer's securities lending program are included in the State of North Carolina ACFR. An electronic version of this report is available by accessing the North Carolina Office of the State Controller's ("NC OSC") Internet home page http://www.ncosc.net/ and clicking on "Public Information" or by calling the State Controller's Financial Reporting Section at (919) 707-0500.

*Receivables* – Accounts receivable consist of uncollected toll revenues and intergovernmental receivables consist of amounts due from the Federal Highway Administration ("FHWA") and other local governmental agencies in connection with reimbursement of allowable expenditures made pursuant to contracts and grants that are verifiable, measurable, and expected to be collected and available for expenditures for which the resource provider's conditions have been satisfied.

*Allowance for Doubtful Accounts* – NCTA determines the allowance for doubtful accounts for the uncollectible portion of toll revenues based on historical collections. As of June 30, 2023 and 2022, NCTA's allowance for doubtful accounts totaled $34,512,607 and $22,299,811, respectively.

*Inventory* – Inventory is valued at the lower of cost (first-in, first-out) or net realizable value and consists of transponders held for resale.

*Restricted Cash and Cash Equivalents* – This classification includes funds received through toll revenue collections. The proceeds are to be used for debt service payment. The funds are held in the NC STIF. Ownership interest of the NC STIF is determined on a fair market valuation basis as of June 30, 2023 and 2022, in accordance with the NC STIF operating procedures.

*Restricted Investments* – This classification includes revenue and funds received from the State of North Carolina to be used solely for the construction of the Triangle Expressway and the Monroe Expressway. See Note 3 for further information on restricted investments.

*Prepaid Insurance Costs* – Prepaid insurance costs consist of guaranty bond insurance related to the issuance of the 2009 Triangle Expressway bonds, the 2017 and 2018 Triangle Expressway Revenue Refunding bonds, and the Triangle Expressway Senior Lien Series 2019 Revenue bonds. These amounts are capitalized and will be amortized over the maturity of the bonds.

*Capital Assets, Nondepreciable* – Capital assets, non-depreciable include land and permanent easements purchased for specific projects. These costs will never be depreciated. Construction in progress includes consultant contract expenditures and contracted personnel service expenditures that are charged to specific projects. These costs will be transferred to depreciable asset categories when projects are complete.

*Capital Assets, Depreciable* – Capital assets, depreciable are stated at cost at the date of acquisition or fair value at date of donation in the case of gifts. Assets that have a value or cost in excess of $5,000 at the date of acquisition and have an expected useful life of two or more years are capitalized. This definition conforms to the policy of the North Carolina Office of State Controller.

*Subscription-Based Information Technology Arrangement* – Subscription-Based Information Technology Arrangements are right-to-use subscription assets. Subscription assets that have a value or cost in excess of $400,000 at the date of the agreement are capitalized. This definition conforms to the policy of the North Carolina Office of State Controller.

Depreciation is calculated using the straight-line method over the estimated useful life of 50 years for the highway network. Capital assets are carried at cost less accumulated depreciation.

## Note 1—Nature of operations and summary of significant accounting policies (continued)

*Noncurrent Liabilities* – Noncurrent liabilities include the advances from the state (NCDOT), bonds payable, a note payable, accrued interest, accrued vacation, net pension liability, and net OPEB liability that will not be paid within the next fiscal year.

*Accrued Vacation* – NCTA's policy is to record the cost of vacation leave when earned. The policy provides for a maximum accumulation of unused vacation leave of 30 days which can be carried forward each January 1 or for which an employee can be paid upon termination of employment. Also, any accumulated vacation leave in excess of 30 days at year-end is converted to sick leave. Under this policy, the accumulated vacation leave for each employee as of June 30 equals the leave carried forward at the previous December 31 plus the leave earned less the leave taken between January 1 and June 30.

In addition to the vacation leave described above, accrued vacation includes the accumulated unused portion of the special annual leave bonuses awarded by the North Carolina General Assembly. The bonus leave balance on December 31 is retained by employees and transferred into the next calendar year. It is not subject to conversion to sick leave. When classifying accrued vacation into current and noncurrent, leave is considered taken using a last-in, first-out method.

*Net Position* – NCTA's net position is classified as follows:

*Net Investment in Capital Assets* – This represents NCTA's total investment in capital assets, net of the corresponding related debt.

*Restricted* – This represents funds received through toll revenue collections and other deposits that are to be used for debt service payments and reserves. These funds are held in the NC STIF and other investments (see Notes 2 and 3).

*Unrestricted* – Since NCTA has historically operated with expenditures in excess of revenues collected, NCTA has a deficit in the unrestricted balance.

*Deferred Outflows/Inflows of Resources* – In addition to assets, the statement of net position reports a separate section for deferred outflows of resources. This separate financial statement element, deferred outflows of resources, represents a consumption of net assets that applies to a future period and so will not be recognized until then. NCTA has items that meet this criterion which include pension related deferrals, other postemployment benefits ("OPEB") related deferrals, and deferrals related to debt refunding that took place in prior years. The statements of net position also report a separate section for deferred inflows of resources. This separate financial statement element, deferred inflows of resources, represents an acquisition of net assets that applies to a future period and so will not be recognized until then. The NCTA has three items that meets this criterion which include pension and OPEB related deferrals and deferrals related to debt refunding that took place in prior years.

*Revenue and Expense Recognition* – NCTA classifies its revenue and expenses as operating and nonoperating in the accompanying statements of revenues, expenses, and changes in net position. Operating expenses generally result from providing services and producing and delivering goods in connection with NCTA's principal ongoing operations. Operating expenses are all expense transactions incurred other than those related to capital and non-capital financing or investing activities as defined by GASB 9, *Reporting Cash Flows of Proprietary and Nonexpendable Trust Funds and Governmental Entities That Use Proprietary Fund Accounting.* Nonoperating expenses mainly relate to interest expense and the amortization of premiums and discounts of long-term debt.

Operating revenues include activity from the toll roads that were open for operations during the fiscal years ended June 30, 2023 and 2022. These revenues include toll revenues, processing fees, and other charges arising from the toll roads.

## Note 1—Nature of operations and summary of significant accounting policies (continued)

Nonoperating revenues include activities that have the characteristics of nonexchange transactions. Revenue from nonexchange transactions represents funds received from the FHWA and NCDOT. Revenues from FHWA are classified as Capital Grants and are considered nonoperating, along with investment income and transfers in from NCDOT, since these are related to investing, capital, or non-capital financing activities.

*Transfers In/Out* – House Bill 817 [Session Law 2013-183] amends the law that created the Highway Trust Fund. The amendment directs that funds are to be transferred to NCTA to pay debt service or related financing expenses on revenue bonds or notes issued for the following toll road construction projects: Triangle Expressway and Monroe Connector/Bypass. Debt has been issued for the Triangle Expressway/Complete 540 and the Monroe Connector/Bypass, and approximately $91,000,000 and $53,000,000 was transferred to NCTA during the years ended June 30, 2023 and 2022, respectively. Transfers totaling approximately $22,000,000 and $4,100,000 were made from the Highway Trust Fund to NCTA as a result of state match for expenditures that were initially covered by the Highway Fund for continued construction related expenditures during the years ended June 30, 2023 and 2022, respectively.

*Use of Estimates* – The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities as of the dates of the financial statements and the reported amounts of revenues and expenses during the reporting periods. Actual results could differ from those estimates.

*Retirement Plans* – For purposes of measuring the net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the fiduciary net position of the Teachers' and State Employees' Retirement System ("TSERS") and additions to/deductions from TSERS' fiduciary net position have been determined on the same basis as they are reported by TSERS. For this purpose, plan member contributions are recognized in the period in which the contributions are due. The NCTA's employer contributions are recognized when due and NCTA has a legal requirement to provide the contributions. Benefits and refunds are recognized when due and payable in accordance with the terms of TSERS. Investments are reported at fair value.

*Other Post Employment Benefit Plans* – For purposes of measuring the net OPEB asset and liability, deferred outflows of resources and deferred inflows of resources related to OPEB, and OPEB expense, information about the fiduciary net positions of the Retiree Health Benefit Fund ("RHBF") and the Disability Income Plan of North Carolina ("DIPNC"), and additions to/deductions from RHBF and DIPNC's fiduciary net positions have been determined on the same basis as they are reported by RHBF and DIPNC. For this purpose, plan member contributions are recognized in the period in which the contributions are due. NCTA's employer contributions are recognized when due and NCTA has a legal requirement to provide the contributions. Benefits and refunds are recognized when due and payable in accordance with the terms of RHBF and DIPNC. Investments are reported at fair value.

*New Accounting Pronouncement* – As of July 1, 2022, NCTA adopted the provisions of GASB 96, Subscription-based Information Technology Arrangements, which provides guidance and addresses how the costs and investments for subscription-based information technology arrangements ("SBITA") are accounted for and disclosed by governmental entities. A SBITA is a contract that conveys control of the right to use IT software alone or in combination with tangible underlying IT assets for a period of time in an exchange or exchange-like transaction. Following the adoption of the standard, NCTA determined that were no material SBITAs that would be subject to the standard and, therefore, no SBITAs have been recorded.

## Note 2—Deposits

As of June 30, 2023 and 2022, respectively, $50,195,497 and $38,348,158 shown on the statements of net position as restricted cash and cash equivalents represent the NCTA's equity position in the State Treasurer's NC Short-Term Investment Fund ("NC STIF"). The NC STIF (a portfolio within the State Treasurer's Investment Pool, an external investment pool that is not registered with the Securities and Exchange Commission and does not have a credit rating) had a weighted average maturity 1.3 years as of June 30, 2023 and 2022.

Ownership interest of the NC STIF is determined on a fair market valuation basis as of June 30, 2023 and 2022, in accordance with the NC STIF operating procedures. Valuation of the underlying assets is performed by the custodian.

NCTA's fair value share of the NC STIF was determined based on Level 2 inputs in accordance with U.S. GAAP. At 2023 and 2022, $50,195,497 and $38,348,158, respectively, are classified as restricted. These amounts represent cash collected from toll revenues that is restricted for payments on bonds. Deposit and investment risks associated with the State Treasurer's Investment Pool (which includes the State Treasurer's NC STIF) are included in the State of North Carolina's ACFR. An electronic version of this report is available by accessing the NC OSC's Internet home page http://www.ncosc.net/ and clicking on "Public Information" or by calling the State Controller's Financial Reporting Section at (919) 707-0500.

## Note 3—Restricted investments

The NCTA's policy for eligible investments are governed by North Carolina General Statute 147-77 and bond covenants that, in general, allow funds to be invested in obligations of the United States or United States government sponsored enterprises, obligations of the State of North Carolina or localities of the State of North Carolina, prime quality commercial paper, shares of certain money market mutual funds, and commingled investment pools.

*Fair Value Measurements* – U.S. GAAP defines fair value as the exchange price that would be received for an asset or paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. U.S. GAAP also establishes a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy consists of three broad levels of inputs that may be used to measure fair value is as follows:

*Level 1* – Inputs to the valuation methodology are quoted prices available in active markets for identical assets and are given the highest priority;

*Level 2* – Inputs consist of observable inputs other than quoted prices for identical assets; and

*Level 3* – Inputs consist of unobservable inputs and are given the lowest priority.

*Concentrations of Credit Risk* – A diversified portfolio is managed by NCTA, financial advisors, and trustees to minimize the risk of loss resulting from over concentration of assets. Securities that are exposed to credit risk, i.e., commercial paper, are limited to 5% of the portfolio to a single issuer. NCTA's policy does not set a limit on the amount that may be invested in any single government sponsored enterprise, money market mutual fund, or commingled investment pool.

### Note 3—Restricted investments (continued)

*Interest Rate Risk* – Interest rate risk represents the risk governments are exposed to as a result of changes in interest rates on the fair value of an investment. Generally, the longer the maturity of an investment the greater the sensitivity of its fair value to changes in market interest rates. NCTA's policy to mitigate risk has been to structure the investment portfolio so that securities mature to meet cash requirements reducing the need to sell securities on the open market prior to maturity. In addition, interest rate risk is reduced by investing funds primarily in shorter-term securities. NCTA does not have a formal investment policy that limits investment maturities as a means of managing its exposure to fair value losses arising from increasing interest rates.

NCTA's revenue bond proceeds were invested as follows as of June 30:

| | | 2023 | | |
|---|---|---|---|---|
| | | | Investment Maturities (in Years) | |
| Type of Investment | Valuation Measurement Method | Fair Value | Less Than 1 Year | 1 – 5 Years |
| NC STIF | Fair Value - Level 2 | $ 3,652,973 | $ 3,652,973 | $ - |
| U.S Treasuries | Fair Value - Level 1 | 115,677,389 | 61,962,553 | 53,714,836 |
| U.S. Agencies | Fair Value - Level 1 | 16,946,547 | 10,914,545 | 6,032,002 |
| Money Market Mutual Funds | Cost | 177,846,493 | 177,846,493 | - |
| | | $ 314,123,402 | $ 254,376,564 | $ 59,746,838 |

| | | 2022 | | |
|---|---|---|---|---|
| | | | Investment Maturities (in Years) | |
| Type of Investment | Valuation Measurement Method | Fair Value | Less Than 1 Year | 1 – 5 Years |
| NC STIF | Fair Value - Level 2 | $ 114,185,940 | $ - | $ 114,185,940 |
| U.S Treasuries | Fair Value - Level 2 | 240,587,845 | 148,576,815 | 92,011,030 |
| Commercial Paper | Fair Value - Level 2 | 1,992,847 | 1,992,847 | - |
| Money Market Mutual Funds | Cost | 128,700,229 | 128,700,229 | - |
| | | $ 485,466,861 | $ 279,269,891 | $ 206,196,970 |

As of June 30, 2023 and 2022, included in the Money Market Mutual Funds totals as stated above, $177,846,493 and $128,700,229, respectively, were invested in the PFM Funds – Prime Series, Institutional Class. The PFM Funds – Prime Series is an SEC-registered money market mutual fund. The fund invests in obligations of the United States government and its agencies, high quality debt obligations of U.S. companies, and obligations of financial institutions. The fund seeks to maintain a constant $1 net asset value and is rated AAAm by Standard & Poor's. In addition, the fund maintains a weighted average maturity of 60 days or less.

In addition to NCTA revenue bond proceeds, additional debt was incurred by the State of North Carolina. Investment of the proceeds of such debt is governed by North Carolina General Statute Section 147-69.1 and bond covenants that, in general, allow funds to be invested in obligations of the United States or United States government sponsored enterprises, obligations of the State of North Carolina or localities of the State of North Carolina, prime quality commercial paper, shares of certain money market mutual funds, and commingled investment pools.

## Note 4—Capital assets

A summary of changes in capital assets for the year ended June 30, 2023 is presented as follows:

| | July 1, 2022 | Additions | Disposals | Transfers | June 30, 2023 |
|---|---|---|---|---|---|
| Capital Assets, Nondepreciable | | | | | |
| Land and Permanent Easements | $ 555,710,391 | $ 34,713,730 | $ - | $ - | $ 590,424,121 |
| Construction in Progress | 698,544,609 | 212,278,043 | - | - | 910,822,652 |
| Total Capital Assets, Nondepreciable | 1,254,255,000 | 246,991,773 | - | - | 1,501,246,773 |
| Capital Assets, Depreciable | | | | | |
| Highway Network | 1,534,468,821 | - | - | - | 1,534,468,821 |
| Machinery and Equipment | 32,606 | - | - | - | 32,606 |
| Total Capital Assets, Depreciable | 1,534,501,427 | - | - | - | 1,534,501,427 |
| Less Accumulated Depreciation for: | | | | | |
| Highway Network | 205,516,024 | 29,683,523 | - | - | 235,199,547 |
| Machinery and Equipment | 32,606 | - | - | - | 32,606 |
| Total Accumulated Depreciation | 205,548,630 | 29,683,523 | - | - | 235,232,153 |
| Total Capital Assets, Depreciable, Net of Depreciation | 1,328,952,797 | (29,683,523) | - | - | 1,299,269,274 |
| Capital Assets, Net of Depreciation | $ 2,583,207,797 | $ 217,308,250 | $ - | $ - | $ 2,800,516,047 |

A summary of changes in capital assets for the year ended June 30, 2022 is presented as follows:

| | July 1, 2021 | Additions | Disposals | Transfers | June 30, 2022 |
|---|---|---|---|---|---|
| Capital Assets, Nondepreciable | | | | | |
| Land and Permanent Easements | $ 536,638,906 | $ 19,071,485 | $ - | $ - | $ 555,710,391 |
| Construction in Progress | 449,709,309 | 248,835,300 | - | - | 698,544,609 |
| Total Capital Assets, Nondepreciable | 986,348,215 | 267,906,785 | - | - | 1,254,255,000 |
| Capital Assets, Depreciable | | | | | |
| Highway Network | 1,534,468,821 | - | - | - | 1,534,468,821 |
| Machinery and Equipment | 25,289 | 7,317 | - | - | 32,606 |
| Total Capital Assets, Depreciable | 1,534,494,110 | - | - | - | 1,534,501,427 |
| Less Accumulated Depreciation for: | | | | | |
| Highway Network | 175,832,501 | 29,683,523 | - | - | 205,516,024 |
| Machinery and Equipment | 25,289 | 7,317 | - | - | 32,606 |
| Total Accumulated Depreciation | 175,857,790 | 29,690,840 | - | - | 205,548,630 |
| Total Capital Assets, Depreciable, Net of Depreciation | 1,358,636,320 | (29,690,840) | - | - | 1,328,952,797 |
| Capital Assets, Net of Depreciation | $ 2,344,984,535 | $ 238,215,945 | $ - | $ - | $ 2,583,207,797 |

## Note 5—Advances from the State (NCDOT)

The following is a summary of changes in the NCTA's Advances from the State (NCDOT) as of June 30, 2023:

| | July 1, 2022 | Additions | June 30, 2023 |
|---|---|---|---|
| Advances from the State (NCDOT) | $ 30,423,541 | $ 2,416,187 | $ 32,839,728 |

The following is a summary of changes in the NCTA's Advances from the State (NCDOT) as of June 30, 2022:

| | July 1, 2021 | Additions | June 30, 2022 |
|---|---|---|---|
| Advances from the State (NCDOT) | $ 30,354,625 | $ 68,916 | $ 30,423,541 |

Pursuant to G.S. 136-176(b), operation and project development costs for NCTA are eligible for funding from the Highway Trust Fund administration funds. These funds are considered an Advance from the State (NCDOT) and are to be repaid from toll revenue as soon as possible. Beginning January 1, 2014, one year after NCTA began collecting tolls on the completed Triangle Expressway project, NCTA began accruing interest on the unpaid balance owed to the Highway Trust Fund at a rate equal to the State Treasurer's average annual yield (2.2% as of June 30, 2023) on its investment of Highway Trust Fund funds pursuant to G.S. 147-6.1. The NCTA accrued $272,968 and $68,890 of interest for the years ended June 30, 2023 and 2022, respectively.

## Note 6—Rent expense

During the year ended June 30, 2014, NCTA entered into short-term equipment rental agreements for road maintenance equipment with the North Carolina Department of Transportation. Rental expense relating to these agreements during the years ended June 30, 2023 and 2022 was $113,913 and $199,973, respectively.

## Note 7—Long-term debt

Long-term debt as of June 30 consists of the following:

| | 2023 | 2022 |
|---|---|---|
| Revenue Bonds: | | |
| Revenue bonds payable, Series 2009B, Capital Appreciation Triangle Expressway Revenue Bonds in the amount of $35,173,000, issued July 29, 2009, with interest ranging from 6.74% to 7.10% compounding semi-annually, and principal payments beginning January 2030, due in full January 2038. | $ 35,173,109 | $ 35,173,109 |
| Revenue bonds payable, Series 2010A, Monroe Connector System State Appropriation Revenue Bonds in the amount of $233,920,000, issued October 26, 2010, with coupon rates of 5.318% and 5.418%, and principal payments beginning January 2022, final maturity January 2041. | 216,930,000 | 225,545,000 |

**Note 7—Long-term debt (continued)**

| | 2023 | 2022 |
|---|---|---|
| Revenue Bonds (continued): | | |
| Revenue bonds payable, Series 2016, Monroe Expressway Toll Revenue Bonds in the amount of $137,051,904, issued January 31, 2017, with a coupon rate of 5.00%, and principal payments beginning July 2023; final maturity July 2054. The amount payable net of unamortized premium of $5,817,961 as of June 30, 2023. | $ 142,869,865 | $ 143,107,041 |
| Revenue bonds payable, Series 2017, Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds in the amount of $171,510,000, issued March 30, 2017, with coupon rates of 3.125% and 5.00%, and principal payments beginning January 2018; final maturity January 2039, net of an unamortized premium of $12,539,468 as of June 30, 2032. | 172,559,468 | 186,096,326 |
| Revenue bonds payable, Series 2018A, Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds in the amount of $150,125,000, issued May 10, 2018, with an average coupon rate of 4.00%, and principal payments beginning January 2019; final maturity January 2039. The amount payable is net of an unamortized premium of $4,996,790 as of June 30, 2023. | 155,121,790 | 155,504,164 |
| Revenue bonds payable, Series 2018B, Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds in the amount of $161,759,000, issued December 31, 2018, with an average coupon rate of 2.82%, and principal payments beginning January 2020; final maturity January 2032. | 134,593,000 | 147,592,000 |
| Revenue bonds payable, Series 2018T, Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds in the amount of $396,420,000, issued December 12, 2018, with an average coupon rate of 4.61%, and principal payments beginning January 2020; final maturity January 2041. The amount payable is net of unamortized premium of $21,189,420 as of June 30, 2023. | 415,109,420 | 419,220,621 |
| Revenue bonds payable, Series 2019, Triangle Expressway System Appropriation Revenue Bonds (Capital Appreciation Bonds) in the amount of $115,979,250, issued December 17, 2019, interest will accrete and be paid upon maturity, and principal payments beginning January 2040, final maturity January 2049. | 115,979,250 | 115,979,250 |
| Revenue bonds payable, Series 2019, Triangle Expressway System Senior Lien Turnpike Revenue Bonds in the amount of $370,975,000, issued December 17, 2019, with coupon rates ranging from 3.00% to 5.00%, and principal payments beginning January 2042; final maturity January 2055. The amount payable is net of an unamortized premium of $49,929,368 as of June 30, 2023. | 420,904,368 | 422,770,953 |

## Note 7—Long-term debt (continued)

| | 2023 | 2022 |
|---|---|---|
| Revenue Bonds (continued): | | |
| Revenue bonds payable, Series 2020, Triangle Expressway System Senior Lien Turnpike Revenue Bond Anticipation Notes in the amount of $499,460,000, issued October 29, 2020, with a coupon rate of 5.00%. These revenue bonds payable were refunded in January 2023. | $ 16,364,851 | $ 533,384,160 |
| Revenue bonds payable, Series 2021 Monroe Expressway System State Appropriation Revenue Refunding Bonds in the amount of $73,985,000, issued April 6, 2021, with a coupon rate of 5.00%, and principal payments beginning July 2022; final maturity July 2041. The amount payable is net of an unamortized premium of $19,338,648 as of June 30, 2023. | 91,933,648 | 94,878,060 |
| Total Bonds, Net | $ 1,917,538,769 | $ 2,479,250,684 |

Bonds payable maturities are as follows:

| Years Ending June 30, | Principal | Interest | Total |
|---|---|---|---|
| 2024 | $ 42,002,000 | $ 74,226,956 | $ 116,228,956 |
| 2025 | 44,361,000 | 72,455,519 | 116,816,519 |
| 2026 | 47,579,000 | 70,556,308 | 118,135,308 |
| 2027 | 51,723,359 | 68,728,819 | 120,452,178 |
| 2028 | 55,580,064 | 66,559,784 | 122,139,848 |
| 2029-2033 | 312,398,456 | 328,145,802 | 640,544,258 |
| 2034-2038 | 361,690,731 | 370,777,890 | 732,468,622 |
| 2039-2043 | 372,393,654 | 195,924,284 | 568,317,938 |
| 2044-2048 | 263,884,000 | 154,275,625 | 418,159,625 |
| 2049-2053 | 170,260,000 | 47,979,600 | 218,239,600 |
| 2054-2058 | 65,490,000 | 3,701,125 | 69,191,125 |
| | 1,787,362,263 | 1,453,331,713 | 3,240,693,976 |
| Issuance Premiums | 130,176,506 | - | 130,176,506 |
| | $ 1,917,538,769 | $ 1,453,331,713 | $ 3,370,870,482 |

**Note 7—Long-term debt (continued)**

| | 2023 | 2022 |
|---|---|---|
| Notes Payable: | | |
| Monroe Expressway TIFIA note payable for an amount not to exceed $166,500,000, opened on January 31, 2017, bearing interest of 3.08% per annum, with interest payments beginning July 2021, principal payments beginning January 2024, and final maturity in July 2053. | $ 166,500,000 | $ 166,500,000 |
| C540 TIFIA note payable for an amount not to exceed $499,461,980, opened on January 17, 2023, bearing interest of 1.83% per annum, with interest payments beginning July 2023, principal payments beginning January 2029, and final maturity in January 2058. | 499,461,980 | - |
| Total Notes Payable, Net | $ 665,961,980 | $ 166,500,000 |

On January 31, 2017, the NCTA signed an agreement with the United States Department of Transportation for a Monroe Expressway TIFIA note payable of up to $166,500,000. In January 2019 and September 2019, NCTA drew down $120,000,000 and $46,500,000, respectively, on this note, which is being used to pay certain costs, including land acquisition, design, construction, and equipping of the Monroe Expressway Project. The note payable requires debt service payments commencing July 1, 2021, with a final maturity of July 1, 2053. No payment of principal or interest on the Monroe Expressway note payable was required to be made during the period of January 1, 2019 through January 1, 2021. The amounts of principal and interest to be paid are calculated based on the total amount drawn on the note and amount of accrued interest outstanding as of July 1, 2021. Accrued interest on the loan agreement was $14,529,071 and $12,906,458 as of June 30, 2023 and 2022, respectively.

On August 5, 2021, the NCTA signed an agreement with the United States Department of Transportation for a 540 Phase 1 Project TIFIA note payable of up to $499,461,980. In January 2023, NCTA drew down $499,461,980 on this note to refund the C540 BAN. The note payable requires debt service payments commencing January 1, 2026, with a final maturity of January 1, 2058. No payment of principal or interest on the C540 note payable was required to be made during the period of January 1, 2022 through July 1, 2023. The amounts of principal and interest to be paid are calculated based on the total amount drawn on the note and amount of accrued interest outstanding as of January 1, 2026. Accrued interest on the loan agreement was $4,131,851 and $-0- as of June 30, 2023 and 2022, respectively.

## Note 7—Long-term debt (continued)

The Monroe Expressway TIFIA note payable and C540 note payable maturities are as follows:

| Years Ending June 30, | Principal | Interest | Total |
|---|---|---|---|
| 2024 | $ 217,659 | $ 4,780,761 | $ 4,998,420 |
| 2025 | 709,726 | 5,635,087 | 6,344,813 |
| 2026 | 1,078,361 | 8,039,986 | 9,118,347 |
| 2027 | 1,307,494 | 10,424,254 | 11,731,748 |
| 2028 | 1,692,029 | 12,032,683 | 13,724,712 |
| 2029-2033 | 16,165,559 | 75,455,057 | 91,620,616 |
| 2034-2038 | 19,386,912 | 74,238,565 | 93,625,477 |
| 2039-2043 | 104,193,882 | 74,609,609 | 178,803,491 |
| 2044-2048 | 234,273,577 | 63,441,968 | 297,715,545 |
| 2049-2053 | 181,038,245 | 34,909,256 | 215,947,501 |
| 2054-2058 | 105,898,534 | 12,839,930 | 118,738,464 |
| | $ 665,961,980 | $ 376,407,156 | $ 1,042,369,136 |

Long-term liability activity for the year ended June 30, 2023 is as follows:

| | July 1, 2022 | Additions | Reductions | June 30, 2023 | Due Within One Year |
|---|---|---|---|---|---|
| Bonds Payable: | | | | | |
| Bonds | $ 2,323,816,263 | $ - | $ (536,454,000) | $ 1,787,362,263 | $ 42,002,000 |
| Deferred Amounts: | | | | | |
| For Issuance Premiums | 155,434,421 | - | (25,257,915) | 130,176,506 | - |
| | 2,479,250,684 | - | (561,711,915) | 1,917,538,769 | 42,002,000 |
| Note Payable | 166,500,000 | 499,461,980 | - | 665,961,980 | - |
| Accrued Vacation | 326,869 | 209,179 | (151,687) | 384,361 | 36,553 |
| Net OPEB Liability | 2,951,039 | - | (500,507) | 2,450,532 | - |
| Net Pension Liability | 511,918 | 1,199,967 | - | 1,711,885 | - |
| **Total Long-Term Debt** | $ 2,649,540,510 | $ 500,871,126 | $ (562,364,109) | $ 2,588,047,527 | $ 42,038,553 |

Long-term liability activity for the year ended June 30, 2022 is as follows:

| | July 1, 2021 | Additions | Reductions | June 30, 2022 | Due Within One Year |
|---|---|---|---|---|---|
| Bonds Payable: | | | | | |
| Bonds | $ 2,365,938,263 | $ - | $ (42,122,000) | $ 2,323,816,263 | $ 36,994,000 |
| Deferred Amounts: | | | | | |
| For Issuance Premiums | 179,289,141 | - | (23,854,720) | 155,434,421 | - |
| | 2,545,227,404 | - | (65,976,720) | 2,479,250,684 | 36,994,000 |
| Note Payable | 166,500,000 | - | - | 166,500,000 | - |
| Accrued Vacation | 383,558 | 166,588 | (223,277) | 326,869 | 31,902 |
| Net OPEB Liability | 2,521,627 | 429,412 | - | 2,951,039 | - |
| Net Pension Liability | 1,270,095 | - | (758,177) | 511,918 | - |
| **Total Long-Term Debt** | $ 2,715,902,684 | $ 596,000 | $ (66,958,174) | $ 2,649,540,510 | $ 37,025,902 |

Total interest cost on indebtedness was $120,898,514 and $122,625,280 for the years ended June 30, 2023 and 2022, respectively.

## Note 7—Long-term debt (continued)

**In the Event of Default**

The Trust Agreement for the North Carolina Turnpike Authority's outstanding senior lien revenue bonds for the Triangle Expressway System ($195,193,109) contains a provision providing that there can be no acceleration of payment of principal or interest on such bonds as a result of the occurrence of any event of default.

The Trust Agreement for the North Carolina Turnpike Authority's outstanding state appropriation revenue bonds for the Triangle Expressway System ($284,718,000) and the Trust Agreement for the Monroe Connector System ($216,930,000) contains a provision providing that there can be no acceleration of payment of principal or interest on such bonds as a result of the occurrence of any event of default.

The Trust Agreement for the North Carolina Turnpike Authority's outstanding toll revenue bonds for the Monroe Expressway ($137,051,904) contains a provision providing that there can be no acceleration of payment of principal of or interest on such bonds as a result of the occurrence of any event of default.

The Trust Agreement for the North Carolina Turnpike Authority's outstanding senior lien revenue and state appropriation capital appreciation bonds for the Complete 540 Project ($486,954,250) contains a provision that there can be no acceleration of payment of principal or of interest on such bonds as a result of the occurrence of any event of default.

**Federal Interest Cash Subsidy**

The NCTA has elected to treat the Triangle Expressway System State Annual Appropriation Revenue Bonds, Series 2009B and the Monroe Connector System State Appropriation Revenue Bonds, Series 2010A as "Build America Bonds" for purposes of the *American Recovery and Reinvestment Tax Act of 2009* ("Recovery Act"). In adherence with the Recovery Act, NCTA receives cash subsidy payments from the United States Treasury Department equal to 35% of the interest payable on the Series 2009B and 2010A State Appropriation Bonds. As part of the 2023 Federal Budget, the payments received during the year ended June 30, 2023 were reduced by 5.7%. As part of the 2022 Federal Budget, the payments received during the year ended June 30, 2022 were reduced by 5.7%. Cash subsidy payments totaled $3,877,885 and $4,015,963 for the years ended June 30, 2023 and 2022, respectively.

**Refundings**

On May 10, 2018, NCTA issued $150,125,000 of appropriation revenue refunding bonds. These bonds were issued to refund, in advance of their maturity, certain of NCTA's Triangle Expressway System State Appropriation Revenue Bonds, Series 2009B, and to pay costs incurred in connection with the issuance of these bonds. As a result, the refunded bonds are considered to be defeased and the liability has been removed from the statements of net position as of June 30, 2018. The reacquisition price exceeded the net carrying amount of the old debt by $9,777,825. This amount is shown as a deferred outflow of resources and amortized over the life of the refunded debt. This advance refunding was undertaken to reduce total debt service payments over the next 22 years by $15,026,177 and resulted in an economic gain of $10,933,562.

On November 20, 2018, NCTA issued $401,155,000 of appropriation revenue refunding bonds. These bonds were issued to refund, in advance of its maturity, the TriEx TIFIA note payable and accrued interest, and to pay costs incurred in connection with the issuance of these bonds. As a result, the refunded TriEx TIFIA note payable is considered to be defeased and the liability has been removed from the statements of net position as of June 30, 2019. The reacquisition price did not exceed the net carrying amount of the TriEx TIFIA note payable and accrued interest. This advance refunding was undertaken to reduce total debt service over the next 23 years by $18,561,930 and will result in a present value economic gain of $10,245,388.

## Note 7—Long-term debt (continued)

On December 31, 2018, NCTA issued $161,759,000 of appropriation revenue refunding bonds. These bonds were issued to refund, in advance of their maturity, certain of the NCTA's Triangle Expressway System State Appropriation Revenue Bonds, Series 2009B, and to pay costs incurred in connection with the issuance of these bonds. As a result, the refunded bonds are considered to be defeased and the liability has been removed from the statements of net position as of June 30, 2019. The reacquisition price exceeded the net carrying amount of the old debt by $3,366,931. This amount is shown as a deferred inflow of resources and amortized over the life of the refunded debt. This advance refunding was undertaken to reduce total debt service payments over the next 13 years by $22,646,034 and resulted in an economic gain of $18,854,944.

On April 6, 2021, the NCTA issued $73,985,000 of appropriation revenue refunding bonds. These bonds were issued to refund, in advance of their maturity, certain of NCTA's Monroe Connector System State Appropriation Revenue Bonds, Series 2011, and to pay costs incurred in connection with the issuance of these bonds. As a result, the refunded bonds were defeased and the liability was removed from the statements of net position as of June 30, 2021. The net carrying amount of the old debt exceeded the reacquisition price by $6,299,050. This amount is shown as a deferred inflow of resources and amortized over the life of the refunded debt. This advance refunding was undertaken to reduce total debt service payments over the next 20 years by $33,453,351 and resulted in an economic gain of $29,273,595.

On January 17, 2023, the NCTA drew on the Complete 540 Phase 1 Project TIFIA loan dated August 5, 2021 in the full amount of $499,461,980. The amount along with a contribution from the project's Capitalized Interest Fund was placed in escrow in order to fully defease the C540 BANS. Through this defeasance, the future interest earnings allowed $24,724,173.84 to be deposited into the Triangle Expressway Unrestricted Account within the General Reserve Fund. As a result of this defeasance, the C540 BANS were fully defeased and the liability was removed from the statements of net position as of June 30, 2023.

**Bond Covenants**
NCTA is subject to certain covenant requirements under the bond indentures related to outstanding debt. Compliance requirements under the covenants maintain that NCTA will provide revenues of at least 130% and 110% of the long-term debt service requirement for senior lien indebtedness and parity debt, respectively, as it relates to the Triangle Expressway and Monroe Expressway. At June 30, 2023 and 2022, management believes the rate covenant was met for both expressways.

## Note 8—Deferred inflows and outflows of resources – unamortized bond refunding gain (losses)

Gains and losses from debt refunding must be deferred and amortized over the lesser of the original remaining life of the old debt or the life of the new debt. In addition, gains and losses related to debt refunding are to be used in determining the carrying value of the new debt issued to finance debt refunding. As of June 30, 2023 and 2022, the carrying values of the 2017 Triangle Expressway System senior Lien Turnpike Revenue Refunding Bonds and the 2018 Triangle Expressway System Appropriation Revenue Refunding Bonds have been adjusted for the loss from defeasance (net of amortization) of $18,170,945 and $20,939,072, respectively. As of June 30, 2023 and 2022, the carrying value of the 2022 Monroe Expressway System State Appropriation Revenue Refunding Bonds has been adjusted for the gain from defeasance (net of amortization) of $19,578,829 and $5,779,074, respectively.

This deferred outflow and inflow of resources is included as unamortized bond refunding charges and deferred gain on refunding, respectively, in the statements of net position.

## Note 9—Pledged revenues

NCTA has pledged, as security for revenue bonds, net revenues from the operation of the Triangle Expressway System and the Monroe Connector System. In July 2009, the NCTA issued Triangle Expressway System Senior Lien Revenue Bonds ($270,083,109). In October 2010, the NCTA issued Monroe Connector System State Annual Appropriation Revenue Bonds ($233,920,000). In November 2011, NCTA issued State Annual Appropriation Revenue Bonds ($214,505,000). In January 2017, NCTA issued Monroe Expressway Toll Revenue Bonds ($137,051,904). In March 2017, NCTA issued Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds ($200,515,000). In May 2018, NCTA issued Triangle Expressway System Appropriation Revenue Refunding Bonds ($150,125,000). In November 2018, NCTA issued Triangle Expressway System Appropriation Revenue Refunding Bonds ($401,155,000). In December 2018, NCTA issued Triangle Expressway System Appropriation Revenue Refunding Bonds ($161,759,000). In December 2019, NCTA issued Triangle Expressway System Capital Appropriation Revenue Bonds ($115,979,250) and Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds ($370,975,000). In April 2021, NCTA issued Monroe Expressway System State Appropriation Revenue Refunding Bonds ($96,403,338). For the Senior Lien Revenue Bonds, specific revenues pledged consist of toll revenues and all other income derived from the operation of the Triangle Expressway System. For the State Annual Appropriation Revenue Bonds, specific revenues pledged consist of federal interest subsidy payments and investment income.

The NCTA has elected to treat the State Annual Appropriation Revenue Bonds as “Build America Bonds” for purposes of the American Recovery and Reinvestment Act of 2009 and to receive a cash subsidy from the United States Treasury equal to 35% of the interest payable on these bonds. As part of the 2023 Federal Budget, the payments received during the years ended June 30, 2023 and 2022 were reduced by 5.7%.

Proceeds from the bonds are being used to pay the costs of land acquisition, design, construction, and equipping of the Triangle Expressway System, a 19-mile toll road facility built in Durham and Wake counties that was fully opened in January 2013. Additionally, proceeds from the bonds are being used to pay the costs of design, construction, and equipping of the Monroe Connector System, a 19.7-mile toll road facility to be built in Mecklenburg and Union counties that was fully opened in November 2018. The total principal and interest remaining to be paid on the bonds is $3,370,870,482 payable through fiscal year 2057 (final maturity date). For the year ended June 30, 2023, principal and interest paid and available revenues (toll revenues, fees, federal interest subsidy, federal transportation funds, and investment revenues) were $146,867,390 and $117,694,766, respectively. For year ended June 30, 2022, principal and interest paid and available revenues (toll revenues, fees, federal interest subsidy, federal transportation funds, and investment revenues) were $143,451,178 and $119,557,926, respectively.

## Note 10—Retirement plans

*Plan Description* – NCTA is a participating employer in the statewide Teachers’ and State Employees’ Retirement System (“TSERS”), a cost-sharing multiple-employer defined benefit pension plan administered by the State of North Carolina. TSERS membership is comprised of employees of the state (state agencies and institution), universities, community colleges, and certain proprietary component units along with the employees of Local Education Agencies and charter schools. Article 1 of G.S. Chapter 135 assigns the authority to establish and amend benefit provision to the North Carolina General Assembly. Management of the plan is vested in the TSERS Board of Trustees, which consists of 13 members – eight appointed by the Governor, one appointed by the state Senate, one appointed by the state House of Representatives, and the State Treasurer, the State Superintendent of Public Instruction, and the State Director of Human Resources, who serve as ex-officio members. The Teachers’ and State Employees’ Retirement System is included in the State of North Carolina’s ACFR. The State of North Carolina’s ACFR included financial statements and required supplementary information for TSERS. That report may be obtained by writing to the Office of the State Controller, 1410 Mail Service Center, Raleigh, North Carolina 27699-1410, by calling (919) 981-5454, or at www.osc.nc.gov.

## Note 10—Retirement plans (continued)

*Benefits Provided* – TSERS provides retirement and survivor benefits. Retirement benefits are determined as 1.82% of the member's average final compensation times the member's years of creditable service. A member's average final compensation is calculated as the average of a member's four highest consecutive years of compensation. General employee plan members are eligible to retire with full retirement benefits at age 65 with five years of creditable service, at age 60 with 25 years of creditable service, or at any age with 30 years of creditable service. General employee plan members are eligible to retire with partial retirement benefits at age 50 with 20 years of creditable service or at age 60 with five years of creditable service. Survivor benefits are available to eligible beneficiaries of members who die while in active service or within 180 days of their last day of service and who have either completed 20 years of creditable service regardless of age or have completed five years of service and have reached age 60. Eligible beneficiaries may elect to receive a monthly Survivor's Alternate Benefit for life or a return of the member's contributions. The plan does not provide for automatic post-retirement benefit increases. Increases are contingent upon actuarial gains of the plan.

*Contributions* – Contribution provisions for TSERS are established by North Carolina General Statute 135-8 and may be amended only by the North Carolina General Assembly. Employer and member contribution rates are set each year by the North Carolina General Assembly based on annual actuarial valuations. Required employer contribution rates for the years ended June 30, 2023, and 2022 were 17.38% and 16.45%, respectively, while employee contributions were 6% each year. The NCTA made 100% of its annual required contributions for the years ended June 30, 2023 and 2022. Contributions to the pension plan from the NCTA were $355,636 and $374,320 for the years ended June 30, 2023 and 2022, respectively.

*Refunds of Contributions* – Employees who have terminated service as a contributing member of TSERS may file an application for a refund of their contributions. By state law, refunds to members with at least five years of service include 4% interest. State law requires a 60-day waiting period after service termination before the refund may be paid. The acceptance of a refund payment cancels the individual's right to employer contributions, or any other benefit provided by TSERS.

*Pension Liabilities, Pension Expense, and Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions* – As of June 30, 2023, the NCTA reported a liability of $1,711,885 for its proportionate share of the net pension liability. The net pension liability was measured as of June 30, 2022. The total pension liability used to calculate the net pension was determined by an actuarial valuation as of December 31, 2021. The total pension liability was then rolled forward to the measurement date of June 30, 2022, utilizing update procedures incorporating the actuarial assumptions.

As of June 30, 2022, the NCTA reported a liability of $511,918 for its proportionate share of the net pension liability. The net pension liability was measured as of June 30, 2021. The total pension liability used to calculate the net pension was determined by an actuarial valuation as of December 31, 2020. The total pension liability was then rolled forward to the measurement date of June 30, 2021, utilizing update procedures incorporating the actuarial assumptions.

The NCTA's proportion of the net pension liability was based on a projection of the NCTA's long-term share of future payroll covered by the pension plan, relative to the projected future payroll covered by the pension plan of all participating TSERS employers, actuarially determined. As of June 30, 2023 and 2022, the NCTA's proportion was 0.01% and the proportion did not change from the prior measurement date.

## Note 10—Retirement plans (continued)

For the years ended June 30, 2023 and 2022, NCTA recognized pension expense of $486,958 and $259,820, respectively. As of June 30, 2023, NCTA reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

| | Deferred Outflows of Resources | Deferred Inflows of Resources |
|---|---|---|
| Difference between actual and expected experience | $ 7,454 | $ 23,333 |
| Changes in assumptions | 135,061 | |
| Net difference between projected and actual earnings on pension plan investments | 562,252 | |
| Change in proportion and differences between agency's contributions and proportionate share of contributions | 58,659 | 17,058 |
| Change in proportion | 131,355 | - |
| Contributions subsequent to the measurement date | 355,636 | - |
| | $ 1,250,417 | $ 40,391 |

As of June 30, 2022, NCTA reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

| | Deferred Outflows of Resources | Deferred Inflows of Resources |
|---|---|---|
| Difference between actual and expected experience | $ 28,776 | $ 11,626 |
| Changes in assumptions | 192,026 | - |
| Net difference between projected and actual earnings on pension plan investments | - | 634,272 |
| Change in proportion and differences between agency's contributions and proportionate share of contributions | 59,933 | 23,714 |
| Change in proportion | 152,585 | - |
| Contributions subsequent to the measurement date | 374,320 | - |
| | $ 807,640 | $ 669,612 |

As of June 30, 2023, the $355,636 included as a component of deferred outflows of resources related to pensions resulting from NCTA contributions subsequent to the measurement date will be recognized as a decrease of the net pension liability in the year ended June 30, 2023. Other amounts reported as deferred inflows of resources and deferred outflows of resources related to pensions will be recognized in pension expense as follows:

| Years Ending June 30, | |
|---|---|
| 2024 | $ 283,436 |
| 2025 | 214,852 |
| 2026 | 86,573 |
| 2027 | 269,529 |
| Total | $ 854,390 |

**Note 10—Retirement plans (continued)**

*Actuarial Assumptions* – The total pension liability in the December 31, 2021, actuarial valuation was determined using the following actuarial assumptions, applied to all periods included in the measurement:

| | |
|---|---|
| Inflation | 2.50% |
| Salary increases | 3.25% to 8.05%, including inflation and productivity factor of 3.25% |
| Investment rate of return | 6.50%, net of pension plan investment expense, including inflation |

The plan currently uses mortality tables that vary by age, gender, employee group (i.e., general, law enforcement officer) and health status (i.e., disabled and healthy). The current mortality rates are based on published tables and based on studies that cover significant portions of the U.S. population. The healthy mortality rates also contain a provision to reflect future mortality improvements.

The actuarial assumptions used in the December 31, 2021 valuation are based on the experience study prepared as of December 31, 2019 and adopted by the Board of Trustees on January 28, 2021. Future ad hoc COLA amounts are not considered to be substantively automatic and, are therefore, not included in the measurement.

The projected long-term investment returns and inflation assumptions are developed through review of current and historical capital markets data, sell-side investment research, consultant whitepapers, and historical performance of investment strategies. Fixed income return projections reflect current yields across the U.S. Treasury yield curve and market expectations of forward yields projected and interpolated for multiple tenors and over multiple year horizons. Global public equity return projections are established through analysis of the equity risk premium and the fixed income return projections. Other asset categories and strategies' return projections reflect the foregoing and historical data analysis. These projections are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. The target allocation and best estimates of arithmetic real rates of return for each major asset class as of June 30, 2022 are summarized in the following table:

| Asset Class | Target Allocation | Long-Term Expected Real Rate of Return |
|---|---|---|
| Fixed Income | 29.0% | 1.1% |
| Global Equity | 42.0% | 6.5% |
| Real Estate | 8.0% | 5.9% |
| Alternatives | 8.0% | 7.5% |
| Credit | 7.0% | 5.0% |
| Inflation Protection | 6.0% | 2.7% |
| | 100.0% | |

The information above is based on 30-year expectations developed with the consulting actuary for the 2022 asset, liability, and investment policy study for the North Carolina Retirement Systems, including TSERS. The long-term nominal rates of return underlying the real rates of return are arithmetic annualized figures. The real rates of return are calculated from nominal rates by multiplicatively subtracting a long-term inflation assumption of 2.25%. All rates of return and inflation are annualized.

## Note 10—Retirement plans (continued)

*Discount Rate* – The discount rate used to measure the total pension liability was 6.50%. The projection of cash flows used to determine the discount rate assumed that contributions from plan members will be made at the current contribution rate and that contributions from employers will be made at statutorily required rates, actuarially determined. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of the current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total net pension liability.

*Sensitivity of NCTA's Proportionate Share of the Net Pension Liability to Changes in the Discount Rate* – The following presents NCTA's proportionate share of the net pension liability calculated using the discount rate of 6.50%, as well as what NCTA's proportionate share of the net pension asset or net pension liability would be if it were calculated using a discount rate that is one percentage point lower (5.50%) or one percentage point higher (7.50%) than the current rate:

| | 1% Decrease (5.50%) | Discount Rate (6.50%) | 1% Increase (7.50%) |
|---|---|---|---|
| NCTA's Proportionate Share of the Net Pension Liability | $ 3,026,700 | $ 1,711,885 | $ 626,610 |

*Pension Plan Fiduciary Net Position* – Detailed information about the pension plan's fiduciary net position is available in the separately issued ACFR for the State of North Carolina.

*Deferred Compensation and Supplemental Retirement Income Plans – IRC Section 457 Plan* – The State of North Carolina offers its permanent employees a deferred compensation plan created in accordance with Internal Revenue Code Section 457 through the North Carolina Public Employee Deferred Compensation Plan (the "Plan"). The Plan permits each participating employee to defer a portion of his or her salary until future years. The deferred compensation is available to employees upon separation from service due to death, disability, or retirement or financial hardships if approved by the Board of Trustees of the Plan.

The Board, a part of the North Carolina Department of Administration, maintains a separate fund for the exclusive benefit of the participating employees and their beneficiaries, the North Carolina Public Employee Deferred Compensation Trust Fund. The Board also contracts with an external third party to perform certain administrative requirements and to manage the trust fund's assets. All costs of administering and funding the Plan are the responsibility of the Plan participants. No costs are incurred by the NCTA. The voluntary contributions by employees amounted to $20,452 and $26,403 for the years ended June 30, 2023, and 2022, respectively.

*IRC Section 401(k) Plan* – All members of TSERS are eligible to enroll in the Supplemental Retirement Income Plan, a defined contribution plan, created under Internal Revenue Code Section 401(k). All costs of administering the Plan are the responsibility of the Plan participants. No costs are incurred by the NCTA. The voluntary contributions by employees amounted to $24,757 and $53,459 for the years ended June 30, 2023 and 2022, respectively.

## Note 11—Other postemployment benefits

NCTA participates in the Comprehensive Major Medical Plan (the "Medical Plan"), a cost-sharing, multiple-employer defined benefit health care plan that provides postemployment health insurance to eligible former employees. Eligible former employees include long-term disability beneficiaries of the Disability Income Plan of North Carolina and retirees of TSERS.

**Retiree Health Benefit Fund**
*Plan Description* – The Retiree Health Benefit Fund ("RHBF") has been established as a fund to provide health benefits to retired and disabled employees and their applicable beneficiaries. The RHBF is established by General Statute 135-7, Article 1. It is a cost-sharing, multiple-employer, defined benefit healthcare plan, exclusively for the benefit of former employees of the state, the University of North Carolina System, and community colleges. In addition, LEAs, charter schools, and some select local governments also participate.

Management of the plan is vested in the State Health Plan Board of Trustees, which consists of 13 members – eight appointed by the Governor, one appointed by the State senate, one appointed by the State House of Representatives, and the State Treasurer, the State Superintendent, and the Director of the Office of State Human Resources who serve as ex-officio members. The RHBF is supported by a percent of payroll contribution from participating employing units. Each year the percentage is set in legislation, as are the maximum per retiree contributions from the RHBF to the State Health Plan. The State Treasurer, with the approval of the State Health Plan Board of Trustees, then set the employer contributions (subject to the legislative cap) and the premiums to be paid by retirees, as well as the health benefits to be provided through the State Health Plan.

The financial statements and other required disclosures for the State Health Plan are presented in the state of North Carolina's ACFR, which can be found at https://www.osc.nc.gov/public-information/reports.

*Benefits Provided* – Plan benefits received by retired employees and disabled employees from the RHBF are OPEB. The healthcare benefits for retired and disabled employees who are not eligible for Medicare are the same as for active employees. The plan options change when former employees become eligible for Medicare. Medicare retirees have the option of selecting one of two fully-insured Medicare Advantage/Prescription Drug Plan options of the self-funded Traditional 70/30 preferred Provider Organization plan option that is also offered to non-Medicare members. If the Traditional 70/30 Plan is selected by a Medicare retiree, the self-funded State Health Plan coverage is secondary to Medicare.

Those former employees who are eligible to receive medical benefits from the RHBF are long-term disability beneficiaries of the DIPNC and retirees of the TSERS, the consolidated Judicial Retirement System ("CJRS"), the Legislative Retirement System ("LRS"), the University Employees' Optional Retirement Program ("ORP"), and a small number of local governments, with five or more years of contributory membership service in their retirement system prior to disability or retirement, with the following exceptions: for employees first hired on or after October 1, 2006, and members of the General Assembly first taking office on or after February 1, 2007, future coverage as retired employees and retired members of the General Assembly is subject to the requirement that the future retiree have 20 or more years of retirement service credit in order to receive coverage on a noncontributory basis. Employees first hired on or after October 1, 2006 and members of the General Assembly first taking office on or after February 1, 2007 with 10 but less than 20 years of retirement service credit are eligible for coverage on a partially contributory basis. For such future retirees, the State will pay 50% of the State Health Plan's noncontributory premium.

Section 35.21(c) and (d) of Session Law 2017-57 repeals retiree medical benefits for employees first hired January 1, 2021. The new legislation amends Article 3B of Chapter 135 of the General Statutes to require that retirees must earn contributory retirement service in TSERS (or in an allowed local system unit), CJRS, or LRS prior to January 1, 2021, and not withdraw that service, in order to be eligible for retiree medical benefits under the amended law. Consequently, members first hired on and after January 1, 2021 will not be eligible to receive retiree medical benefits.

## Note 11—Other postemployment benefits (continued)

The RHBF's benefit and contribution provisions are established by Chapter 135-7, Article 1 and Chapter 135, Article 3B of the General Statutes and may be amended only by the North Carolina General Assembly. The RHBF does not provide for automatic post-retirement benefit increases.

*Contributions* – By General Statute, accumulated contributions from employers to the RHBF and any earnings on those contributions shall be used to provide health benefits to retired and disabled employees and their applicable beneficiaries. By statute, contributions to the RHBF are irrevocable. Also by law, fund assets are dedicated to providing benefits to retired and disabled employees and their applicable beneficiaries and are not subject to the claims of creditors of the employers making contributions to the RHBF. However, the RHBF assets may be used for reasonable expenses to administer the RHBF, including costs to conduct required actuarial valuations of state – supports retired employees' health benefits. Contribution rates to the RHBF, which are intended to finance benefits and administrative expenses on a pay-as-you-go basis are determined by the General Assembly in the Appropriations Bill. For the years ended June 30, 2023 and 2022, the NCTA contributed 6.89% and 6.32% of covered payroll, which amounted to $153,828 and $143,741, respectively.

At June 30, 2023, NCTA reported a liability of $2,447,581 for its proportionate share of the net OPEB liability. The net OPEB liability was measured as of June 30, 2022, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation as of December 31, 2021. The total OPEB liability was then rolled forward to the measurement date of June 30, 2022, utilizing update procedures incorporating the actuarial assumptions.

At June 30, 2022, NCTA reported a liability of $2,951,039 for its proportionate share of the net OPEB liability. The net OPEB liability was measured as of June 30, 2021, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation as of December 31, 2020. The total OPEB liability was then rolled forward to the measurement date of June 30, 2021 utilizing update procedures incorporating the actuarial assumptions

The NCTA's proportion of the net OPEB liability was based on a projection of NCTA's present value of future salary, actuarially determined. At June 30, 2023 and 2022, NCTA's proportion was 0.01%.

As of June 30, 2023, the $140,986 of contributions subsequent to the measurement date reported as deferred outflows of resources will be recognized as a decrease of the net OPEB liability in the year ending June 30, 2024. Other amounts reported as outflows of resources and deferred inflows of resources related to OPEB will be recognized in OPEB expense as follows:

| Years Ending June 30, | | |
|---|---|---|
| 2024 | $ | 64,132 |
| 2025 | | 107,878 |
| 2026 | | (11,462) |
| 2027 | | (46,772) |
| 2028 | | 1 |
| Total | $ | 113,777 |

## Note 11—Other postemployment benefits (continued)

*Actuarial Assumptions* – The total OPEB liability in the December 31, 2021, actuarial valuation was determined using the following actuarial assumptions, applied to all periods included in the measurement:

| | |
|---|---|
| Inflation | 2.50% |
| Salary increases | 3.25% to 8.05%, including inflation and productivity factor of 2.50% |
| Healthcare cost trend rate – Medical | 5.00% to 6.00% |
| Healthcare cost trend rate – Prescription Drug | 5.00% to 9.50% |
| Healthcare cost trend rate – Administrative | 3.00% |

*Discount Rate* – The discount rate used to measure the total OPEB liability for the RHBF was 3.54%. The projection of cash flow used to determine the discount rate assumed that contributions from employers would be made at the current statutorily determined contribution rate. Based on the above assumptions, the plan's fiduciary net position was not projected to be available to make projected future benefit payments of current plan members. As a result, a municipal bond rate of 3.54% was used as the discount rate used to measure the total OPEB liability. The 3.54% rate is based on the Bond Buyer 20-year General Obligation Index as of June 30, 2022.

*Sensitivity of the NCTA's Proportionate Share of the Net OPEB Liability to Changes in the Discount Rate* – The following presents the NCTA's proportionate share of the net RHBF OPEB liability would be if it were calculated using a discount rate that is one percentage point lower (2.54%) or one percentage point higher (4.54%) than the current discount rate:

| | 1% Decrease (2.54%) | Discount Rate (3.54%) | 1% Increase (4.54%) |
|---|---|---|---|
| NCTA's Proportionate Share of the Net OPEB Liability | $ 2,014,751 | $ 2,447,581 | $ 3,007,076 |

*Sensitivity of the NCTA's Proportionate Share of the Net OPEB Liability to Changes in Healthcare Trend Rates* – The following presents the NCTA's proportionate share of the net RHBF OPEB liability would be if it were calculated using a discount rate that is one percentage point lower or one percentage point higher than the current discount rate:

| | 1% Decrease | 6.00% Medical, 9.50% Rx, 3.00% Administrative | 1% Increase |
|---|---|---|---|
| NCTA's Proportionate Share of the Net OPEB Liability | $ 2,882,968 | $ 2,447,581 | $ 2,091,988 |

*OPEB Plan Fiduciary Net Position* – Detailed information about the OPEB plan's fiduciary net position is available in the separately issued ACFR for the State of North Carolina, which can be found at https://www.osc.nc.gov/public-information/reports.

**Disability Income Plan of North Carolina**
*Plan Description* – Short-term and long-term disability benefits are provided through the DIPNC, a cost-sharing, multiple-employer defined benefit plan, to the eligible members of TSERS which includes employees of the State, the University of North Carolina System, community colleges, and certain Local Education Agencies and ORP.

## Note 11—Other postemployment benefits (continued)

Management of the plan is vested in the State Health Plan Board of Trustees, which consists of 13 members – eight appointed by the Governor, one appointed by the State Senate, one appointed by the State House of Representatives and the State Treasurer, the State Superintendent, and the Director of the Office of the State Human Resources who serve as ex-officio members. Management of the plan is vested in the State Health Plan Board of Trustees, which consists of 13 members – eight appointed by the Governor, one appointed by the State Senate, one appointed by the State House of Representatives and the State Treasurer, the State Superintendent, and the Director of the Office of State Human Resources who service as ex-officio members.

The financial statements and other required disclosures for the plan are presented in the State of North Carolina's ACFR, which can be found at https://www.osc.nc.gov/public-information/reports.

*Benefits Provided* – Long-term disability benefits are payable as an OPEB from DIPNC after the conclusion of the short-term disability period or after salary continuation payments cease, whichever is later, for as long as the employee is disabled. An employee is eligible to receive long-term disability benefits provided the following requirements are met: (1) the employee have five or more years on contributing membership services in TSERS or ORP, earned within 96 months prior to the end of the short-term disability period or cessation of salary continuation payments, whichever is later; (2) the employee must make application to receive long-term benefits within 180 days after the conclusion of the short-term disability period or after salary continuation payment cease or after monthly payments for Workers' Compensation cease (excluding monthly payments for permanent partial benefits), whichever is later; (3) the employee must be certified by the Medical Board to be mentally or physically disabled for the further performance of his/her usual occupation; (4) the disability must have been continuous, likely to be permanent, and incurred at the time of active employment; (5) the employee must not be eligible to receive an unreduced retirement benefit from TSERS after (1) reaching the age of 65 and completing five years of membership service, or (2) reaching the age of 60 and completing 25 years of creditable service, or (3) completing 30 years of service at any age.

*Contributions* – Benefit and contribution provisions are established by Chapter 135, Article 6, of the General Statutes and may be amended only by the North Carolina General Assembly. The plan does not provide for automatic post-retirement benefit increases. Disability income benefits are funded by actuarially determined employer contributions that are established in the Appropriations Bill by the General Assembly and coincide with the State fiscal year. For the fiscal years ended June 30, 2023 and 2022, employers made a statutory contribution of 0.10% and 0.09%, respectively of covered payroll which was equal to the actuarially required contribution. NCTA's contributions to the plan were $2,233 and $2,057 for the years ended June 30, 2023 and 2022, respectively.

The contributions cannot be separated between the amounts that relate to other postemployment benefits and employment benefits for active employees. Those individuals who are receiving extended short-term disability benefit payments cannot be separated from the number of members currently eligible to receive disability benefits as another postemployment benefit.

*OPEB Liabilities (Asset), OPEB Expense, and Deferred Outflows and Inflows of Resources Related to OPEB* – At June 30, 2023, NCTA reported a liability of $2,951 for its proportionate share of the net DIPNC OPEB liability. The net OPEB liability was measured as of June 30, 2022, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation as of December 31, 2021. The total OPEB liability was then rolled forward to the measurement date of June 30, 2022 utilizing update procedures incorporating the actuarial assumptions.

## Note 11—Other postemployment benefits (continued)

At June 30, 2022, NCTA reported an asset of $1,530 for its proportionate share of the net DIPNC OPEB asset. The net OPEB asset was measured as of June 30, 2021, and the total OPEB asset used to calculate the net OPEB asset was determined by an actuarial valuation as of December 31, 2020. The total OPEB asset was then rolled forward to the measurement date of June 30, 2021 utilizing update procedures incorporating the actuarial assumptions.

The NCTA's proportion of the net OPEB liability (asset) was based on a projection of NCTA's present value of future salary, actuarially determined. At June 30, 2023 and 2022, NCTA's proportion was 0.01%.

As of June 30, 2023, the $2,046 of contributions subsequent to the measurement date reported as deferred outflows of resources will be recognized as a decrease of the net OPEB liability in the year ending June 30, 2024. Other amounts reported as outflows of resources and deferred inflows of resources related to OPEB will be recognized in OPEB expense as follows:

| Years Ending June 30, | | |
|---|---|---|
| 2024 | $ | 1,209 |
| 2025 | | 1,422 |
| 2026 | | 998 |
| 2027 | | 713 |
| 2028 | | (51) |
| Thereafter | | 117 |
| Total | $ | 4,408 |

*Actuarial Assumptions* – The total OPEB asset in the December 31, 2021, actuarial valuation was determined using the following actuarial assumptions, applied to all periods included in the measurement:

| | |
|---|---|
| Inflation | 2.50% |
| Salary increases | 3.25% to 8.05%, including inflation and productivity factor of 3.25% |
| Investment rate of return | 3.00%, net of pension plan investment expense, including inflation |

*Sensitivity of the NCTA's Proportionate Share of the Net OPEB Liability to Changes in the Discount Rate* – The following presents the NCTA's proportionate share of the net OPEB liability would be if it were calculated using a discount rate that is one percentage point lower (2.08%) or one percentage point higher (4.08%) than the current discount rate:

| | 1% Decrease (2.08%) | Discount Rate (3.08%) | 1% Increase (4.08%) |
|---|---|---|---|
| NCTA's Proportionate Share of the Net OPEB Liability | $ 3,634 | $ 2,951 | $ 2,267 |

*Common Actuarial Assumptions for both OPEB Plans* – The total OPEB liability was determined by an actuarial valuation performed as of December 31, 2021 using the following actuarial assumptions, applied to all periods in the measurement, unless otherwise specified. The total OPEB liability was calculated through the use of update procedures to roll forward from the actuarial valuation date to the measurement date of June 30,2022. The update procedures incorporated the actuarial assumptions used in the valuation. The entry age normal cost method was utilized.

## Note 11—Other postemployment benefits (continued)

The OPEB plan currently uses mortality tables that vary by age, gender, employee group (i.e. teacher, general, law enforcement officer), and health status (i.e. disabled and healthy). The current mortality rates are based on published tables and based on studies that cover significant portions of the U.S. population. The mortality rates also contain a provision to reflect future mortality improvement.

The actuarial assumptions were based on the results of the experience study prepared as of December 31, 2020.

The long-term expected rate of return on OPEB plan investments was determined using a building-block method in which best estimate ranges of expected future real rates of return are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation and by adding expected inflation. The target allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

| Asset Class | Target Allocation | Long-Term Expected Real Rate of Return |
|---|---|---|
| Fixed Income | 29.0% | 1.4% |
| Global Equity | 42.0% | 5.3% |
| Real Estate | 8.0% | 4.3% |
| Alternatives | 8.0% | 8.9% |
| Opportunistic Fixed Income | 7.0% | 6.0% |
| Inflation Sensitive | 6.0% | 4.0% |
| | 100.0% | |

## Note 11—Other postemployment benefits (continued)

*Total OPEB Expense, OPEB Assets and Liabilities, and Deferred Outflows and Inflows of Resources Related to OPEB*

The following is information related to the proportionate share and OPEB expense as of June 30, 2023:

| | RHBF | DIPNC | Total |
|---|---|---|---|
| OPEB expense | $ 118,429 | $ 3,846 | $ 122,275 |
| OPEB liability | 2,447,581 | 2,951 | 2,450,532 |
| Proportionate share of net OPEB liability | 0.01% | 0.01% | |
| **Deferred Outflows of Resources** | | | |
| Difference between actual and expected experience | 23,763 | 3,308 | 27,071 |
| Changes in assumptions | 195,961 | 190 | 196,151 |
| Net difference between projected and actual earnings on OPEB plan investments | 21,194 | 3,121 | 24,315 |
| Change in proportion and differences between agency's contributions and proportionate share of contributions | 188,818 | 2,077 | 190,895 |
| Change in proportion | 1,015,918 | - | 1,015,918 |
| Contributions subsequent to the measurement date | 140,986 | 2,046 | 143,032 |
| | $ 1,586,640 | $ 10,742 | $ 1,597,382 |
| **Deferred Inflows of Resources** | | | |
| Difference between actual and expected experience | $ 6,773 | $ - | $ 6,773 |
| Changes in assumptions | 1,113,952 | 547 | 1,114,499 |
| Net difference between projected and actual earnings on OPEB plan investments | - | - | - |
| Change in proportion and differences between agency's contributions and proportionate share of contributions | 211,152 | 536 | 211,688 |
| Change in proportion | - | 3,205 | 3,205 |
| Contributions subsequent to the measurement date | - | - | - |
| | $ 1,331,877 | $ 4,288 | $ 1,336,165 |

The following is information related to the proportionate share and OPEB expense as of June 30, 2022:

| | RHBF | DIPNC | Total |
|---|---|---|---|
| OPEB expense | $ 233,578 | $ 3,053 | $ 236,631 |
| OPEB liability (asset) | 2,951,039 | (1,530) | 2,949,509 |
| Proportionate share of net OPEB liability (asset) | 0.1% | 0.1% | |
| **Deferred Outflows of Resources** | | | |
| Difference between actual and expected experience | 17,422 | 3,901 | 21,323 |
| Changes in assumptions | 241,370 | 269 | 241,639 |
| Net difference between projected and actual earnings on OPEB plan investments | - | 149 | 149 |
| Change in proportion and differences between agency's contributions and proportionate share of contributions | 212,027 | 1,935 | 213,962 |
| Change in proportion | 1,193,150 | - | 1,193,150 |
| Contributions subsequent to the measurement date | 143,741 | 2,057 | 145,798 |
| | $ 1,807,710 | $ 8,311 | $ 1,816,021 |
| **Deferred Inflows of Resources** | | | |
| Difference between actual and expected experience | 54,933 | - | 54,933 |
| Changes in assumptions | 717,167 | 555 | 717,722 |
| Net difference between projected and actual earnings on OPEB plan investments | 1,510 | - | 1,510 |
| Change in proportion and differences between agency's contributions and proportionate share of contributions | 315,375 | 580 | 315,955 |
| Change in proportion | - | 3,375 | 3,375 |
| Contributions subsequent to the measurement date | - | - | - |
| | $ 1,088,985 | $ 4,510 | $ 1,093,495 |

## Note 12—Risk management

NCTA is exposed to various risks of loss related to torts; theft of, damage to, and the destruction of assets; errors and omissions; injuries to employees; and natural disasters. NCTA carries insurance through NCDOT for risks of loss. There have been no significant reductions in insurance coverage from the previous year and settled claims have not exceeded coverage in any of the past three fiscal years.

Tort claims of up to $1,000 are self-insured under the authority of the State Tort Claims Act. In addition, the state provides excess public officers' and employees' liability insurance up to $10,000 via contract with a private insurance company. The premium, based on a composite rate, is paid by NCDOT directly to the insurer.

The State Property Fire Insurance Fund ("Fire Fund"), an internal service fund of the state, insures all state-owned buildings and contents for fire and various other property losses up to $2,500 per occurrence. The Fire Fund purchases excess insurance from private insurers to cover losses over the amounts insured by the Fund. Losses covered by the Fire Fund are subject to a $5 per occurrence deductible except for theft losses that carry a $1 per occurrence deductible. There have been no significant reductions in insurance coverage from the previous year and settled claims have not exceeded coverage in any of the past three fiscal years.

State-owned vehicles are covered by liability insurance handled by the North Carolina Department of Insurance. The State is self-insured for the first $1,000 of any loss through a retrospective rated plan. Excess insurance coverage is purchased through a private insurer to cover losses greater than $1,000 up to $10,000. The liability limits for losses occurring in-state are $1,000 per claimant and $10,000 per occurrence. NCDOT covers the cost of excess insurance and pays for those losses falling under the self-insured retention.

NCTA is protected for losses from employee dishonesty and computer fraud for employees paid in whole or in part from State funds. This coverage is with a private insurance company and is handled by the North Carolina Department of Insurance with coverage of $5,000 per occurrence, with a $75 deductible and 10% participation in each loss above the deductible. In addition, NCDOT has a separate public employee dishonesty and faithful performance policy with a limit of $1,000.

Employees and retirees are provided health care coverage by the Medical Plan, a component unit of the state. The Medical Plan is funded by employer and employee contributions and is administered by a third party contractor.

The North Carolina Workers' Compensation Program provides benefits to workers injured on the job. All employees of the state are included in the program. When an employee is injured, NCTA's primary responsibility is to arrange for and provide the necessary treatment for the work-related injury. NCTA is responsible to pay medical benefits and compensation in accordance with the North Carolina Workers' Compensation Act. NCTA is self-insured for workers' compensation.

Term life insurance of $25,000 to $50,000 is provided to eligible employees. This self-insured death benefit program is administered by the State Treasurer and funded via employer contributions. The employer contribution rate was 0.16% of covered payroll for the current fiscal year.

Additional details on the state-administered risk management programs are disclosed in the State of North Carolina's ACFR. An electronic version of this report is available by accessing the North Carolina Office of the State Controller's Internet home page http://www.ncosc.net/ and clicking on "Public Information" or by calling the State Controller's Financial Reporting Section at (919) 707-0500.

## Note 13—Commitments and contingencies

NCTA has established an encumbrance system to track its outstanding commitments on construction projects and other purchases. Outstanding commitments for engineering and design contracts were $178,581,036 and $55,261,430 as of June 30, 2023 and 2022, respectively.

NCTA at times is involved in litigation in the normal course of business. Although the outcome of any such litigation is not presently determinable, in the opinion of management and NCTA's General Counsel, the results of the litigation will not have a materially adverse impact on the financial position of NCTA.

## Note 14—Subsequent events

In connection with the preparation of the financial statements and in accordance with U.S. GAAP, NCTA considered for disclosure subsequent events that occurred after the statement of net position date of June 30, 2023 through October 3, 2023, which was the date the financial statements were available to be issued.

## Required Supplementary Information

This section contains additional information required by generally accepted accounting principles.

- Schedule of Proportionate Share of Net Pension Liability – Teachers' and State Employees' Retirement System
- Schedule of Contributions – Teachers' and State Employees' Retirement System
- Schedule of Proportionate Share of Net OPEB Liability – Retiree Health Benefit Fund
- Schedule of Contributions– Retiree Health Benefit Fund
- Schedule of Proportionate Share of Net OPEB Liability (Asset) – Disability Income Plan of North Carolina
- Schedule of Contributions – Disability Income Plan of North Carolina

**NORTH CAROLINA TURNPIKE AUTHORITY**
REQUIRED SUPPLEMENTARY INFORMATION
TEACHERS' AND STATE EMPLOYEES' RETIREMENT SYSTEM

*JUNE 30, 2023*

**Schedule of Proportionate Share of Net Pension Liability**
**Teachers' and State Employees' Retirement System**
**June 30, ***

| | 2023 | 2022 | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|
| NCTA's proportion of the net pension liability (%) | 0.01% | 0.01% | 0.01% | 0.01% | 0.01% | 0.01% | 0.01% | 0.01% | 0.01% | 0.01% |
| NCTA's proportion of the net pension liability ($) | $ 1,711,885 | $ 511,918 | $ 1,270,095 | $ 879,694 | $ 729,749 | $ 483,101 | $ 557,948 | $ 225,156 | $ 69,460 | $ 356,082 |
| NCTA's covered payroll | $ 2,275,139 | $ 2,078,055 | $ 1,657,530 | $ 1,558,727 | $ 1,250,977 | $ 1,020,099 | $ 899,061 | $ 882,095 | $ 988,337 | $ 988,337 |
| NCTA's proportionate share of the net pension liability as a percentage of its covered payroll | 75.2% | 24.6% | 76.6% | 56.4% | 58.3% | 47.4% | 62.1% | 25.5% | 7.0% | 36.0% |
| Plan fiduciary net position as a percentage of the total pension liability | 84.14% | 94.86% | 85.98% | 87.56% | 87.61% | 89.51% | 87.32% | 94.64% | 98.24% | 98.24% |

**Schedule of Contributions**
**Teachers' and State Employees' Retirement System**
**June 30, ***

| | 2023 | 2022 | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|
| Contractually required contribution | $ 355,636 | $ 374,320 | $ 307,137 | $ 214,982 | $ 191,568 | $ 132,103 | $ 101,322 | $ 74,249 | $ 86,087 | $ 82,328 |
| Contributions in relation to the contractually required contribution | (355,636) | (374,320) | (307,137) | (214,982) | (191,568) | (132,103) | (101,322) | (74,249) | (86,087) | (82,328) |
| Contribution deficiency (excess) | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| NCTA's covered payroll | 2,232,626 | 2,275,139 | 2,078,055 | 1,657,530 | 1,558,727 | 1,250,977 | 1,020,099 | 899,061 | 882,095 | 988,337 |
| Contributions as a percentage of covered payroll | 15.93% | 16.45% | 14.78% | 12.97% | 12.29% | 10.56% | 9.93% | 8.26% | 8.30% | 8.30% |

* The amounts presented for each fiscal year were determined as of the prior fiscal year ended June 30.

**Notes to Schedule**

*Valuation Date.*
The total pension liability was determined by actuarial valuation as of December 31, 2021. The total pension liability was then rolled forward to June 30, 2022 utilizing update procedures incorporating the actuarial assumptions. The actuarial assumptions used in the December 31, 2021 valuation were based on the results of an actuarial experience study for the period January 1, 2015 through December 31, 2019.

*Methods and assumptions used to determine contribution rates.*

- The Entry Age Normal actuarial cost method was used to determine liabilities and funding requirements.
- Change in discount rate from 7.00% to 6.50% as of December 31, 2020.
- Salary increases are assumed to be 3.25%-8.05% which includes 3.25% inflation and productivity factor.
- Investment expected rate of return is 6.50% net of pension plan investment expense, including inflation.
- No cost-of-living adjustments granted.
- Mortality tables vary by age, gender, employee group, and health status. The current mortality rates are based on published tables and based on studies that cover significant portions of the U.S. population. The mortality rates also contain a provision to reflect future mortality improvements.

**NORTH CAROLINA TURNPIKE AUTHORITY**
REQUIRED SUPPLEMENTARY INFORMATION
RETIREE HEALTH BENEFIT FUND

*JUNE 30, 2023*

**Schedule of Proportionate Share of Net OPEB Liability**
**Retiree Health Benefit Fund**
**June 30, ***

| | 2023 | 2022 | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|---|---|
| NCTA's proportion of the net OPEB liability (%) | 0.01% | 0.01% | 0.01% | 0.01% | 0.01% | 0.01% |
| NCTA's proportion of the net OPEB liability ($) | $ 2,447,581 | $ 2,951,039 | $ 2,521,627 | $ 2,354,514 | $ 1,794,683 | $ 1,745,360 |
| NCTA's covered payroll | $ 2,275,139 | $ 1,657,530 | $ 1,657,530 | $ 1,558,727 | $ 1,250,977 | $ 1,250,977 |
| NCTA's proportionate share of the net OPEB liability as a percentage of its covered payroll | 109.76% | 129.71% | 121.35% | 151.05% | 143.46% | 139.52% |
| Plan fiduciary net position as a percentage of the total OPEB liability | 10.58% | 7.72% | 6.92% | 4.45% | 4.40% | 3.52% |

**Schedule of Contributions**
**Retiree Health Benefit Fund**
**June 30, ***

| | 2023 | 2022 | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|---|---|
| Contractually required contribution | $ 140,986 | $ 143,741 | $ 138,814 | $ 107,242 | $ 97,732 | $ 78,436 |
| Contributions in relation to the contractually required contribution | (140,986) | (143,741) | (138,814) | (107,242) | (97,732) | (78,436) |
| Contribution deficiency (excess) | $ - | $ - | $ - | $ - | $ - | $ - |
| NCTA's covered payroll | $ 2,232,626 | $ 2,275,139 | $ 1,657,530 | $ 1,657,530 | $ 1,558,727 | $ 1,250,977 |
| Contributions as a percentage of covered payroll | 6.89% | 6.68% | 8.37% | 6.47% | 6.27% | 6.27% |

* The amounts presented for each fiscal year were determined as of the prior fiscal year ended June 30. Information is not available for preceding years, to the extent 10 years of information is not presented.

**Notes to Schedule**

*Valuation date.*
The total pension liability was determined by actuarial valuation as of December 31, 2021. The total pension liability was then rolled forward to June 30, 2022 utilizing update procedures incorporating the actuarial assumptions.

*Methods and assumptions used to determine contribution rates.*

- The discount rate used to measure total OPEB liability for RHBF was 3.54%, mirroring the municipal bond rate. The rate is used on the Bond-Buyer 20-year General Obligation index as of June 30, 2022.
- Salary increases are assumed to be 3.25%-8.05%, which includes 2.5% inflation and productivity factor.
- Investment expected rate of return is 6.50% net of pension plan investment expense, including inflation.
- General inflation is assumed to be 2.5%.
- Mortality tables vary by age, gender, employee group, and health status. The current mortality rates are based on published tables and based on studies that cover significant portions of the U.S. population. The mortality rates also contain a provision to reflect future mortality improvements.

**NORTH CAROLINA TURNPIKE AUTHORITY**
REQUIRED SUPPLEMENTARY INFORMATION
DISABILITY INCOME PLAN OF NORTH CAROLINA

*JUNE 30, 2023*

**Schedule of Proportionate Share of Net OPEB Liability (Asset)**
**Disability Income Plan of North Carolina**
**June 30, ***

| | 2023 | 2022 | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|---|---|
| NCTA's proportion of the net OPEB liability (asset) (%) | 0.00% | 0.01% | 0.01% | 0.01% | 0.01% | 0.01% |
| NCTA's proportion of the net OPEB liability (asset) ($) | $ 2,951 | $ (1,530) | $ (4,406) | $ (3,044) | $ (1,897) | $ (1,897) |
| NCTA's covered payroll | $ 2,275,139 | $ 2,078,055 | $ 1,558,727 | $ 1,558,727 | $ 1,250,977 | $ 1,020,099 |
| NCTA's proportionate share of the net OPEB asset as a percentage of its covered payroll | 0.00% | 0.07% | 0.21% | 0.20% | 0.15% | 0.19% |
| Plan fiduciary net position as a percentage of the total OPEB asset | 90.34% | 105.18% | 115.57% | 113.00% | 108.47% | 108.47% |

**Schedule of Contributions**
**Disability Income Plan of North Carolina**
**June 30, ***

| | 2023 | 2022 | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|---|---|
| Contractually required contribution | $ 2,046 | $ 2,057 | $ 1,870 | $ 1,658 | $ 2,182 | $ 2,182 |
| Contributions in relation to the contractually required contribution | (2,046) | (2,057) | (1,870) | (1,658) | (2,182) | (2,182) |
| Contribution deficiency (excess) | $ - | $ - | $ - | $ - | $ - | $ - |
| NCTA's covered payroll | $ 2,232,626 | $ 2,275,139 | $ 2,078,055 | $ 1,558,727 | $ 1,558,727 | $ 1,250,977 |
| Contributions as a percentage of covered payroll | 0.09% | 0.09% | 0.09% | 0.11% | 0.14% | 0.17% |

* The amounts presented for each fiscal year were determined as of the prior fiscal year ended June 30. Information is not available for preceding years, to the extent 10 years of information is not presented.

**Notes to Schedule**

*Valuation date.*
The total pension liability was determined by actuarial valuations as of December 31, 2021. The total pension liability was then rolled forward to June 30, 2022 utilizing update procedures incorporating the actuarial assumptions. The actuarial assumptions used in the December 31, 2021 valuations were based on an investigation of demographic and economic experience over the five-year period from January 1, 2015 to December 31, 2019.

*Methods and assumptions used to determine contribution rates*

- The discount rate used to measure total OPEB liability for DIPNC was 3.08%.
- The long-term expected real rate of return on plan investments was used on all periods for projecting benefit payments and determining the total liability.
- Salary increases are assumed to be 3.25%-8.05%, which includes 3.25% inflation and productivity factor.
- Investment expected rate of return is 3.00% net of pension plan investment expense, including inflation.
- General inflation is assumed to be 2.50%.
- Mortality tables vary by age, gender, employee group, and health status. The current mortality rates are based on published tables and based on studies that cover significant portions of the U.S. population. The mortality rates also contain a provision to reflect future mortality improvements.

# SUPPLEMENTARY INFORMATION

**NORTH CAROLINA TURNPIKE AUTHORITY**
SCHEDULE OF REVENUES AND EXPENDITURES —
(MODIFIED CASH BASIS – NON-GAAP)

*YEAR ENDED JUNE 30, 2023*

| | Triangle Expressway | Monroe Expressway |
|---|---|---|
| Revenues: | | |
| Operating Revenue: | | |
| Charges for Services | $ 66,276,526 | $ 31,182,646 |
| Toll Receipts | 59,462,368 | 29,429,161 |
| Toll Bad Debt | (2,800,619) | (2,349,450) |
| Late Payment Fee | 7,971,389 | 4,115,759 |
| Electronic Transaction Fees | 220,569 | 71,853 |
| Liquid Damage Fee | - | - |
| Fuel Hedge | 1,410,817 | - |
| Returned Check Fee | 12,003 | 5,323 |
| Total Revenues | 66,276,526 | 31,182,646 |
| Expenditures: | | |
| Operating Expenditures: | | |
| Shared Operating Expenses | 12,593,531 | 6,730,060 |
| Personnel Services | 379,114 | 166,220 |
| Contracted Personnel Services | 490,779 | 467,259 |
| Supplies and Materials | 223,170 | 283,724 |
| Travel | - | 674 |
| Utilities | 217,035 | 49,248 |
| Other Services | 2,151,431 | 723,566 |
| Capital Outlay | 3,187,769 | 6,160,531 |
| Rental Expenditures | 8,290 | 45,381 |
| Renewal and Replacement Expenditures: | | |
| Shared Renewal and Replacement Expenditures | 29,003 | 29,003 |
| Personnel Services | 97,593 | - |
| Supplies and Materials | 1,517,298 | 1,152 |
| Capital Outlay | 2,860,688 | 77,118 |
| Rental Expenditures | 60,363 | - |
| Construction Expenditures: | | |
| Shared Renewal and Replacement Expenditures | - | 2,833,870 |
| Personnel Services | 926,445 | 17,353 |
| Contracted Personnel Services | 896,688 | - |
| Supplies and Materials | 7,244,594 | 584,818 |
| Travel | 611 | 644 |
| Advertising | 123,117 | - |
| Utilities | - | 209 |
| Other Services | 2,544,703 | 46,191 |
| Capital Outlay | 187,707,477 | 16,355,256 |
| Right of Way | 19,421,384 | 211,988 |
| Rental Expenditures | 5,426 | |
| Total Operating Expenditures | 242,686,509 | 34,784,265 |
| Operating Loss | (176,409,983) | (3,601,619) |

The accompanying note to the schedule of revenues and expenditures is an integral part to the schedule.

**NORTH CAROLINA TURNPIKE AUTHORITY**
SCHEDULE OF REVENUES AND EXPENDITURES —
(MODIFIED CASH BASIS – NON GAAP) (CONTINUED)

*YEAR ENDED JUNE 30, 2023*

| | Triangle Expressway | Monroe Expressway |
|---|---|---|
| Nonoperating Revenues (Expenditures): | | |
| Bond Issue Costs | $ - | $ (71,250) |
| Insurance Recoveries | (17,472) | 40,853 |
| Damage Claims Writeoffs | (4,156) | (2,143) |
| Liquidated Damages Collections | - | - |
| Investment Earnings | 5,010,887 | 2,530,223 |
| Federal Interest Subsidy on Debt | - | 3,877,885 |
| Interest and Fees: | | |
| Triangle Expressway System State Annual Appropriation Revenue Bonds, Series 2009B (Federally Taxable-Issuer Subsidy-Build America Bonds) | - | - |
| Triangle Expressway System Senior Lien Revenue Refunding Bonds, Series 2017 | (8,442,844) | - |
| Triangle Expressway System Appropriation Revenue Refunding Bonds, Series 2018A | (6,005,000) | - |
| Triangle Expressway System Appropriation Revenue Refunding Bonds, Series 2018B | (4,162,094) | - |
| Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2019 | (4,131,851) | - |
| Triangle Expressway System Senior Lien Turnpike Revenue Bond Anticipation Notes, Series 2020 | (17,069,100) | - |
| Triangle Expressway System Senior Lien Revenue Refunding Bonds, Series 2018 | (24,973,000) | - |
| Monroe Connector System State Annual Appropriation Revenue Bonds, Series 2010A, (Federally Taxable-Issuer Subsidy-Build America Bonds) | (18,522,400) | - |
| Monroe Connector System State Appropriation Revenue Bonds, Series 2011 | - | (11,941,070) |
| Monroe Expressway System TIFIA Loan, 2017 | - | - |
| Monroe Connector System Senior Lien Revenue Bonds, Series 2016 | - | (6,617,595) |
| Monroe Bond Interest Expense-2021 Rev Bonds | - | (5,968,953) |
| | - | (3,664,500) |

The accompanying note to the schedule of revenues and expenditures is an integral part to the schedule.

**NORTH CAROLINA TURNPIKE AUTHORITY**
SCHEDULE OF REVENUES AND EXPENDITURES —
(MODIFIED CASH BASIS – NON GAAP) (CONTINUED)

*YEAR ENDED JUNE 30, 2023*

| | Triangle Expressway | Monroe Expressway |
|---|---|---|
| Principal: | | |
| Triangle Expressway System Senior Lien Turnpike Revenue Bond Anticipation Notes, Series 2020 | $ (499,460,000) | $ - |
| Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2017 | (11,490,000) | - |
| Triangle Expressway System Appropriation Revenue Refunding Bonds, Series 2018B | (12,999,000) | - |
| Triangle Expressway System Senior Lien Revenue Refunding Bonds, Series 2018 | (2,500,000) | - |
| Monroe Connector System State Appropriation Revenue Bonds, Series 2010A (Federally Taxable-Issuer Subsidy-Build America Bonds) | - | (8,615,000) |
| Monroe Connector System Refunding Bonds Payable 2021 | - | (1,390,000) |
| Total Nonoperating Expenditures | (604,766,030) | (31,821,550) |
| Loss before Transfers and Capital Grants | (781,176,013) | (35,423,169) |
| Capital Grants | 66,478,236 | - |
| Transfers In | 25,000,000 | 24,000,000 |
| Revenues over Expenditures (Expenditures over Revenues) | $ (689,697,777) | $ (11,423,169) |

The accompanying note to the schedule of revenues and expenditures is an integral part to the schedule.

**NORTH CAROLINA TURNPIKE AUTHORITY**
NOTE TO THE SCHEDULE OF REVENUES AND EXPENDITURES —
(MODIFIED CASH BASIS – NON GAAP)

*YEAR ENDED JUNE 30, 2023*

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## Note 1–Basis of presentation

The Schedule of Revenues and Expenditures – Modified Cash Basis – Non-GAAP is shown on a modified cash basis. Operating revenues inclusive of Late Payment Fees, Electronic Transaction Fees, and Returned Check Fees are shown on a modified cash basis. These revenues are accounted for at the fund level and allocated across NCTA's operational projects at the end of each month based on facility usage. Any accrued revenue inclusive of these fees has not yet been allocated to a specific project, therefore, it cannot be included in the project specific operating revenue amounts. All expenditures are shown on a cash basis.

Cherry Bekaert LLP
Your Guide Forward

## Report of Independent Auditor on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*

To the Board of Directors
North Carolina Turnpike Authority
Raleigh, North Carolina

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to the financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the financial statements of the North Carolina Turnpike Authority ("NCTA"), a major enterprise fund of the State of North Carolina, and a business unit of the North Carolina Department of Transportation ("NCDOT"), as of and for the years ended June 30, 2023, and the related notes to the financial statements, which collectively comprise the NCTA's basic financial statements, and have issued our report thereon dated October 3, 2023.

The financial statements present only the NCTA and do not purport to and do not present fairly the financial position of the State of North Carolina or NCDOT, as of June 30, 2023, and the changes in its financial position and its cash flows for the years then ended in conformity with accounting principles generally accepted in the United States of America.

### Report on Internal Control over Financial Reporting

In planning and performing our audit of the financial statements, we considered the NCTA's internal control over financial reporting ("internal control") as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of NCTA's internal control. Accordingly, we do not express an opinion on the effectiveness of NCTA's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements, on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of NCTA's financial statements will not be prevented, or detected and corrected, on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness yet, important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weakness or significant deficiencies may exist that have not been identified.

### Report on Compliance and Other Matters

As part of obtaining reasonable assurance about whether NCTA's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the financial statements. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

**Purpose of this Report**

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of NCTA's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering NCTA's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

Cherry Bekaert LLP

Raleigh, North Carolina
October 3, 2023

# APPENDIX F

# PROPOSED FORM OF OPINION OF BOND COUNSEL

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*Set forth below is the proposed form of the opinion of Hunton Andrews Kurth LLP, Bond Counsel. It is preliminary and subject to change prior to delivery of the Series 2024 Bonds.*

[Closing Date]

Board of Directors
North Carolina Turnpike Authority
Raleigh, North Carolina

**North Carolina Turnpike Authority**
**$304,575,000 Triangle Expressway System Senior Lien**
**Turnpike Revenue Bonds, Series 2024A, and**
**$35,785,304.70 Triangle Expressway System Senior Lien**
**Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds)**

Ladies and Gentlemen:

We have examined the applicable law and certified copies of proceedings and documents relating to the issuance by the North Carolina Turnpike Authority (the "Authority") of its Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024A, in the aggregate principal amount of $304,575,000 (the "2024A Bonds"), and Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2024B (Capital Appreciation Bonds), in the aggregate initial principal amount of $35,785,304.70 (the "2024B Bonds" and, together with the 2024A Bonds, the "2024 Bonds"), to provide funds, together with other available funds, to pay (a) the costs of land acquisition for and design, construction and equipping of an extension of the Triangle Expressway System from I-40 to I-87/U.S. 64/U.S. 264, (b) certain interest on the 2024A Bonds, (c) the premium for a municipal bond insurance policy issued by Assured Guaranty Municipal Corp. (the "2024 Bond Insurer") with respect to the 2024 Bonds, (d) the premium for a municipal bond debt service reserve insurance policy with respect to the 2024 Bonds issued by the 2024 Bond Insurer and (e) costs incurred in connection with the issuance of the 2024 Bonds. Reference is made to the forms of the 2024 Bonds for additional information concerning their details, payment and redemption provisions and the proceedings pursuant to which they are issued.

The 2024 Bonds recite that they are issued under and pursuant to the Constitution and laws of the State of North Carolina (the "State"), including Article 6H (Public Toll Roads and Bridges) of Chapter 136, as amended, of the North Carolina General Statutes (the "NCGS"), and The State and Local Government Revenue Bond Act, Article 5 of Chapter 159, as amended, of the NCGS, two Bond Orders of the Authority adopted on October 31, 2023 (collectively, the "Bond Order"), authorizing the issuance of the 2024 Bonds, and an Amended and Restated Trust Agreement dated as of December 1, 2019 (as previously supplemented and amended, the "Existing Trust Agreement"), as supplemented and amended by a Sixth Supplemental Trust Agreement dated as of January 1, 2024 (the "Sixth Supplemental Trust Agreement" and, together with the Existing Trust Agreement, the "Trust Agreement"), all between the Authority and Computershare Trust Company, N.A., as successor trustee (the "Trustee"). All capitalized terms not defined herein are as defined in the Trust Agreement.

The 2024 Bonds are special obligations of the Authority secured by a pledge, charge and lien upon the Trust Estate under the Trust Agreement. The Authority is not obligated to pay the principal of or the interest on the 2024 Bonds except from the Trust Estate, and neither the faith and credit nor the taxing power of the State or any political subdivision or agency thereof, including the Authority, is pledged to the payment of the principal of and the interest on the 2024 Bonds. At the time of issuance of the 2024 Bonds there will be outstanding certain of the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2009B, Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2017, Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2018, and Triangle Expressway System Senior Lien Turnpike Revenue Bonds, Series 2019 (in the aggregate, the "Existing Parity Bonds"), which are secured by a pledge of the Trust Estate on parity

with the 2024 Bonds. The Authority is concurrently issuing its Triangle Expressway System Revenue Bond, TIFIA Series 2024, in an aggregate principal amount of up to $417,193,471 (the "TIFIA Series 2024 Bond"), evidencing the obligation to repay a loan from the United States Department of Transportation, pursuant to the Transportation Infrastructure Finance and Innovation Act of 1998 ("TIFIA"), for the Triangle Expressway System. The TIFIA Series 2024 Bond, together with the Authority's existing Triangle Expressway System Revenue Bond, TIFIA Series 2021, are initially secured with a lien on the Trust Estate junior to the lien securing the 2024 Bonds and the Existing Parity Bonds but on certain conditions will become secured on parity with the 2024 Bonds and the Existing Parity Bonds. The Trust Agreement also provides for the issuance or incurrence from time to time under the conditions, limitations and restrictions therein set forth of additional bonds and Senior Lien Parity Debt secured by a pledge of the Trust Estate on parity with the 2024 Bonds and the Existing Parity Bonds.

Without undertaking to verify the same by independent investigation, we have relied on certifications by representatives of the Authority, the North Carolina Department of Transportation and the North Carolina Local Government Commission as to certain facts relevant to both our opinion and requirements of the Internal Revenue Code of 1986, as amended (the "Code"). The Authority has covenanted to comply with the current provisions of the Code regarding, among other matters, the use, expenditure and investment of the proceeds of the 2024 Bonds and the timely payment to the United States of any arbitrage rebate amounts with respect to the 2024 Bonds, all as set forth in the proceedings and documents relating to the issuance of the 2024 Bonds (the "Covenants").

The 2024 Bond Insurer has issued a municipal bond insurance policy with respect to all of the 2024 Bonds and a municipal bond debt service reserve insurance policy with respect to all of the 2024 Bonds (the "Policies"). Reference is made to the Policies for a full statement of their terms and conditions and to the opinion of counsel to the 2024 Bond Insurer as to the validity of the Policies, upon which you are relying as to matters therein. No opinion as to such matters is expressed herein.

Based on the foregoing and in accordance with customary opinion practice, we are of the opinion that:

1. The 2024 Bonds have been authorized and issued in accordance with the Constitution and statutes of the State and constitute valid and legally binding special obligations of the Authority, payable as to principal and interest solely from the Trust Estate under the Trust Agreement. The 2024 Bonds do not create or constitute a debt or pledge of the faith and credit of the State or any political subdivision or agency thereof, including the Authority.

2. The Bond Order has been duly adopted by the Authority, and the Trust Agreement has been duly executed and delivered by the Authority. The Sixth Supplemental Trust Agreement is permitted by the Existing Trust Agreement. The Trust Agreement, assuming the due authorization, execution and delivery thereof by the Trustee, constitutes a valid and legally binding agreement of the Authority which assigns and pledges the Trust Estate to the Trustee and is enforceable against the Authority in accordance with its terms.

3. The rights of the holders of the 2024 Bonds and the enforceability of such rights, including enforcement by the Trustee of the obligations of the Authority under the Trust Agreement, may be limited or otherwise affected by (a) bankruptcy, insolvency, reorganization, fraudulent conveyance, moratorium and other laws affecting the rights of creditors generally and (b) principles of equity, whether considered at law or in equity.

4. Under current law, interest on the 2024 Bonds (a) is not included in gross income for federal income tax purposes, (b) is not an item of tax preference for purposes of the federal alternative minimum tax and (c) is taken into account in determining adjusted financial statement income for applicable corporations (as defined in Section 59(k) of the Code) for the alternative minimum tax imposed on such corporations. The opinions in (a) and (b) of the preceding sentence are subject to the condition that there is compliance subsequent to the issuance of the 2024 Bonds with all requirements of the Code that must be satisfied in order that interest thereon not be included in gross income for federal income tax purposes. Failure by the Authority to comply with the Covenants, among other things, could cause interest on the 2024 Bonds to be included in gross income for federal income tax purposes retroactively to their date of issue. The Authority may in its discretion, but has not covenanted to, take any and all such actions as may be required by future changes in the Code and applicable regulations in order that interest on the 2024 Bonds remains excludable from gross income for federal income tax purposes. We express no opinion regarding other federal tax consequences of the ownership of or receipt or accrual of interest on the 2024 Bonds.

5. Under current law, interest on the 2024 Bonds is exempt from State income taxes.

The opinions set forth above are based on current law, which is subject to change. Such opinions are further based on our knowledge of facts as of the date hereof. Our services as bond counsel to the Authority for the 2024 Bonds have been limited to rendering the foregoing opinion based on our review of such legal proceedings as we deem necessary to approve the validity of the 2024 Bonds and the tax-exempt status of the interest thereon. We have not made any investigation concerning the Project, the revenues thereof, the Trust Estate or the financial resources of the Authority or the 2024 Bond Insurer, and we express no opinion as to the accuracy or completeness of any information, including the Preliminary Official Statement dated January 4, 2024, or the Official Statement dated January 17, 2024, with respect to the 2024 Bonds, that may have been relied upon by anyone in making the decision to purchase 2024 Bonds. We assume no duty to update or supplement these opinions to reflect any facts or circumstances that may hereafter come to our attention or to reflect any changes in any law that may hereafter occur or become effective.

Very truly yours

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# APPENDIX G

# DTC'S BOOK-ENTRY-ONLY SYSTEM

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## APPENDIX G

## DTC'S BOOK-ENTRY-ONLY SYSTEM

The Depository Trust Company, New York, New York ("DTC"), will act as securities depository for the Series 2024 Bonds. The Series 2024 Bonds will be issued as fully-registered bonds registered in the name of Cede & Co. (DTC's partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully-registered Series 2024 Bond for each maturity in the aggregate principal amount of such maturity will be deposited with DTC, or with the Trustee on DTC's behalf.

DTC, the world's largest securities depository, is a limited-purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a member of the Federal Reserve System, a "clearing corporation" within the meaning of the New York Uniform Commercial Code and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds and provides asset servicing for over 3.5 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments (from over 100 countries) that DTC's participants ("Direct Participants") deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between Direct Participants' accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation ("DTCC"). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants"). DTC has a Standard & Poor's rating of AA+. The DTC Rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at www.dtcc.com.

Purchases of the Series 2024 Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the Series 2024 Bonds on DTC's records. The ownership interest of each actual purchaser of the Series 2024 Bonds ("Beneficial Owner") is in turn to be recorded on the Direct and Indirect Participants' records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participants through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the Series 2024 Bonds are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in the Series 2024 Bonds, except in the event that use of the book-entry system for the Series 2024 Bonds is discontinued.

To facilitate subsequent transfers, all Series 2024 Bonds deposited by Direct Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of the Series 2024 Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the Series 2024 Bonds; DTC's records reflect only the identity of the Direct Participants to whose accounts the Series 2024 Bonds are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants and by Direct Participants and Indirect Participants to Beneficial Owners of the Series 2024 Bonds will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time. Beneficial Owners of the Series 2024 Bonds may wish to take certain steps to augment the transmission to them of notices of significant events with respect to the Series 2024 Bonds, such as redemptions, tenders, defaults and proposed amendments to the security documents. For example, Beneficial Owners of the Series 2024 Bonds may wish to ascertain that the nominee holding the Series 2024 Bonds for their benefit has agreed to obtain and transmit notices to Beneficial Owners. In the alternative, Beneficial Owners may wish to provide their names and addresses to the registrar and request that copies of notices be provided directly to them.

Redemption notices shall be sent to DTC. If less than all of the Series 2024 Bonds are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such issue to be redeemed.

Neither DTC nor Cede & Co. (nor any other DTC nominee) will consent or vote with respect to the Series 2024 Bonds unless authorized by a Direct Participant in accordance with DTC's MMI Procedures. Under its usual procedures, DTC mails an Omnibus Proxy to the Authority as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts the Series 2024 Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Principal and interest payments on the Series 2024 Bonds will be made to Cede & Co. or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit Direct Participants' accounts upon DTC's receipt of funds and corresponding detail information from the Authority or the Trustee on each payable date in accordance with their respective holdings shown on DTC's records. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participants and not of DTC, the Authority, or the Trustee, subject to any statutory or regulatory requirements as may be in effect from time to time. Payments of principal and interest to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of the Authority and the Trustee, disbursement of such payments to Direct Participants shall be the responsibility of DTC, and disbursements of such payments to the Beneficial Owners shall be the responsibility of the Direct and Indirect Participants.

DTC may discontinue providing its services as depository with respect to the Series 2024 Bonds at any time by giving reasonable notice to the Authority or the Trustee. Under such circumstances, in the event that a successor depository is not obtained, Series 2024 Bonds are required to be printed and delivered. The Authority may decide to discontinue use of the system of book-entry-only transfers through DTC (or a successor securities depository). In that event, Series 2024 Bonds are required to be printed and delivered to DTC.

The information in this Official Statement concerning DTC and DTC's book-entry system has been obtained from DTC, and the Authority takes no responsibility for the accuracy thereof.

# APPENDIX H

# SPECIMEN MUNICIPAL BOND INSURANCE POLICY

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# MUNICIPAL BOND INSURANCE POLICY

ISSUER:

Policy No: -N

BONDS: $ in aggregate principal amount of

Effective Date:

Premium: $

ASSURED GUARANTY MUNICIPAL CORP. ("AGM"), for consideration received, hereby UNCONDITIONALLY AND IRREVOCABLY agrees to pay to the trustee (the "Trustee") or paying agent (the "Paying Agent") (as set forth in the documentation providing for the issuance of and securing the Bonds) for the Bonds, for the benefit of the Owners or, at the election of AGM, directly to each Owner, subject only to the terms of this Policy (which includes each endorsement hereto), that portion of the principal of and interest on the Bonds that shall become Due for Payment but shall be unpaid by reason of Nonpayment by the Issuer.

On the later of the day on which such principal and interest becomes Due for Payment or the Business Day next following the Business Day on which AGM shall have received Notice of Nonpayment, AGM will disburse to or for the benefit of each Owner of a Bond the face amount of principal of and interest on the Bond that is then Due for Payment but is then unpaid by reason of Nonpayment by the Issuer, but only upon receipt by AGM, in a form reasonably satisfactory to it, of (a) evidence of the Owner's right to receive payment of the principal or interest then Due for Payment and (b) evidence, including any appropriate instruments of assignment, that all of the Owner's rights with respect to payment of such principal or interest that is Due for Payment shall thereupon vest in AGM. A Notice of Nonpayment will be deemed received on a given Business Day if it is received prior to 1:00 p.m. (New York time) on such Business Day; otherwise, it will be deemed received on the next Business Day. If any Notice of Nonpayment received by AGM is incomplete, it shall be deemed not to have been received by AGM for purposes of the preceding sentence and AGM shall promptly so advise the Trustee, Paying Agent or Owner, as appropriate, who may submit an amended Notice of Nonpayment. Upon disbursement in respect of a Bond, AGM shall become the owner of the Bond, any appurtenant coupon to the Bond or right to receipt of payment of principal of or interest on the Bond and shall be fully subrogated to the rights of the Owner, including the Owner's right to receive payments under the Bond, to the extent of any payment by AGM hereunder. Payment by AGM to the Trustee or Paying Agent for the benefit of the Owners shall, to the extent thereof, discharge the obligation of AGM under this Policy.

Except to the extent expressly modified by an endorsement hereto, the following terms shall have the meanings specified for all purposes of this Policy. "Business Day" means any day other than (a) a Saturday or Sunday or (b) a day on which banking institutions in the State of New York or the Insurer's Fiscal Agent are authorized or required by law or executive order to remain closed. "Due for Payment" means (a) when referring to the principal of a Bond, payable on the stated maturity date thereof or the date on which the same shall have been duly called for mandatory sinking fund redemption and does not refer to any earlier date on which payment is due by reason of call for redemption (other than by mandatory sinking fund redemption), acceleration or other advancement of maturity unless AGM shall elect, in its sole discretion, to pay such principal due upon such acceleration together with any accrued interest to the date of acceleration and (b) when referring to interest on a Bond, payable on the stated date for payment of interest. "Nonpayment" means, in respect of a Bond, the failure of the Issuer to have provided sufficient funds to the Trustee or, if there is no Trustee, to the Paying Agent for payment in full of all principal and interest that is Due for Payment on such Bond. "Nonpayment" shall also include, in respect of a Bond, any payment of principal or interest that is Due for Payment made to an Owner by or on behalf of the Issuer which has been recovered from such Owner pursuant to the

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United States Bankruptcy Code by a trustee in bankruptcy in accordance with a final, nonappealable order of a court having competent jurisdiction. "Notice" means telephonic or telecopied notice, subsequently confirmed in a signed writing, or written notice by registered or certified mail, from an Owner, the Trustee or the Paying Agent to AGM which notice shall specify (a) the person or entity making the claim, (b) the Policy Number, (c) the claimed amount and (d) the date such claimed amount became Due for Payment. "Owner" means, in respect of a Bond, the person or entity who, at the time of Nonpayment, is entitled under the terms of such Bond to payment thereof, except that "Owner" shall not include the Issuer or any person or entity whose direct or indirect obligation constitutes the underlying security for the Bonds.

AGM may appoint a fiscal agent (the "Insurer's Fiscal Agent") for purposes of this Policy by giving written notice to the Trustee and the Paying Agent specifying the name and notice address of the Insurer's Fiscal Agent. From and after the date of receipt of such notice by the Trustee and the Paying Agent, (a) copies of all notices required to be delivered to AGM pursuant to this Policy shall be simultaneously delivered to the Insurer's Fiscal Agent and to AGM and shall not be deemed received until received by both and (b) all payments required to be made by AGM under this Policy may be made directly by AGM or by the Insurer's Fiscal Agent on behalf of AGM. The Insurer's Fiscal Agent is the agent of AGM only and the Insurer's Fiscal Agent shall in no event be liable to any Owner for any act of the Insurer's Fiscal Agent or any failure of AGM to deposit or cause to be deposited sufficient funds to make payments due under this Policy.

To the fullest extent permitted by applicable law, AGM agrees not to assert, and hereby waives, only for the benefit of each Owner, all rights (whether by counterclaim, setoff or otherwise) and defenses (including, without limitation, the defense of fraud), whether acquired by subrogation, assignment or otherwise, to the extent that such rights and defenses may be available to AGM to avoid payment of its obligations under this Policy in accordance with the express provisions of this Policy.

This Policy sets forth in full the undertaking of AGM, and shall not be modified, altered or affected by any other agreement or instrument, including any modification or amendment thereto. Except to the extent expressly modified by an endorsement hereto, (a) any premium paid in respect of this Policy is nonrefundable for any reason whatsoever, including payment, or provision being made for payment, of the Bonds prior to maturity and (b) this Policy may not be canceled or revoked. THIS POLICY IS NOT COVERED BY THE PROPERTY/CASUALTY INSURANCE SECURITY FUND SPECIFIED IN ARTICLE 76 OF THE NEW YORK INSURANCE LAW.

In witness whereof, ASSURED GUARANTY MUNICIPAL CORP. has caused this Policy to be executed on its behalf by its Authorized Officer.

ASSURED GUARANTY MUNICIPAL CORP.

By _____
Authorized Officer

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A subsidiary of Assured Guaranty Municipal Holdings Inc.
1633 Broadway, New York, N.Y. 10019
(212) 974-0100

Form 500NY (5/90)

NORTH CAROLINA
Turnpike Authority

Mixed Sources
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