

**RESOLUTION ON TOLL RATES FOR TRIANGLE EXPRESSWAY UPON  
OPENING OF MORRISVILLE PARKWAY INTERCHANGE**

**WHEREAS**, the North Carolina Turnpike Authority (the "*Authority*") is duly organized and existing under the laws of the State of North Carolina (the "*State*") within the State Department of Transportation, and is authorized under Article 6H (Turnpike Authority and Toll Projects) of Chapter 136, as amended (the "*Act*"), of the North Carolina General Statutes (the "*NCGS*"), to acquire, construct and operate "turnpike projects," as defined in the Act;

**WHEREAS**, the Authority has financed the construction of its Triangle Expressway System as a turnpike project under the Act through the issuance of its revenue bonds and entry into a loan agreement with the U. S. Department of Transportation, among other agreements and contracts;

**WHEREAS**, the Secretary of Transportation, pursuant to Section 143B-10 and 143B-349 of the NCGS, has delegated to the Board of the Authority certain powers including the power to fix, revise, charge, and collect tolls and fees for the use of turnpike projects;

**WHEREAS**, the Authority on September 17, 2008, adopted a policy for adopting toll schedules and any adjustments to toll schedules (the "*Toll Rate Policy*") and the Toll Rate Policy provides that under the direction of the Authority a Traffic Consultant shall prepare a Traffic and Revenue Study forecasting projected traffic for each turnpike project and the toll revenues to be generated and after receipt of such Traffic and Revenue Study the Authority will 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;

**WHEREAS**, the Comprehensive Traffic and Revenue Study Final Report for the Triangle Expressway System dated April 6, 2009, contains a proposed toll schedule and, pursuant to the Toll Rate Policy, the tolls set forth in the toll rate schedule in the Traffic and Revenue Study for a project are to be increased each year by the same percentage amounts as the toll increases in the assumptions used for the forecasts in the Traffic and Revenue Study;

**WHEREAS**, there have been a number of revisions to the 2009 Report with respect to annual toll rate changes and further Reports in connection with financings for the Triangle Expressway System, most recently the 2018 Traffic and Revenue Study delivered by CDM Smith Inc. as the Traffic Consultant in connection with the issuance of the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2018 (the "*2018 Report*");

**WHEREAS**, it is anticipated the Morrisville Parkway Interchange will open in early 2020, and it is necessary to address the question of toll rates for the Triangle Expressway System to be in effect after such event and CDM Smith Inc. has made recommendations for such toll rates on the basis that, among other things, the current 4.0 mile mainline section between NC 55 and Green Level West Road will be divided into two mainline sections comprised of a 2.2-mile section between NC 55 and the Morrisville Parkway, and a 1.8-mile section between Morrisville Parkway and Green Level West Road (the "*CDM Smith Morrisville Parkway Interchange Memorandum*"); and

**WHEREAS**, the CDM Smith Morrisville Parkway Interchange Memorandum is consistent with the 2018 Report, the Authority's financial advisor has stated in a letter dated October 9, 2019, that the taking of such actions will not prevent the Authority from being in compliance with its covenant obligations under the Triangle Expressway System financing documents, and the Authority's Bond Counsel has delivered an opinion dated October 10, 2019, to the effect that the taking of such actions will

have no adverse effect on income tax treatment of outstanding debt related to the Triangle Expressway System or cause the Authority to be in violation of any covenants under its Triangle Expressway System related documents;

**NOW THEREFORE, THE BOARD OF THE NORTH CAROLINA TURNPIKE AUTHORITY HEREBY RESOLVES:**

1. The Board hereby approves and authorizes the changes in toll rates described in the CDM Smith Morrisville Parkway Interchange Memorandum.
2. The Chairman and other officers and employees of the Authority are authorized and directed to take such action and to execute and deliver any documents, certificates, undertakings, agreements or other instruments as they, with the advice of counsel, may deem necessary and appropriate to effect the purposes of this resolution.
3. The Chief Financial Officer of the Authority is hereby authorized and directed to file this resolution and the materials presented to the Authority in connection herewith with the Trustee for the revenue bonds relating to the Triangle Expressway System.
4. This resolution shall take effect immediately upon its passage.

Adopted November 13, 2019.



Chairman, Board of Directors, North Carolina  
Turnpike Authority

# Technical Memorandum

## NCTA Toll NC 540 / Morrisville Parkway Interchange Proposed Toll Schedule

### 1. Introduction

This document presents CDM Smith's proposed toll rate schedule for the two segments of Toll NC 540 (Triangle Expressway) that will require toll schedule adjustments associated with the opening of the Morrisville Parkway full-access interchange in early 2020. As seen in Figure 1, the Morrisville Parkway interchange will be located between the existing NC 55 and Green Level West Road interchanges.

### 2. Toll Schedule Development

CDM Smith developed the following proposed 2020 toll rates so the per-mile toll rate for a through trip on Triangle Expressway is consistent with the current NCTA Board approved toll rate schedule.

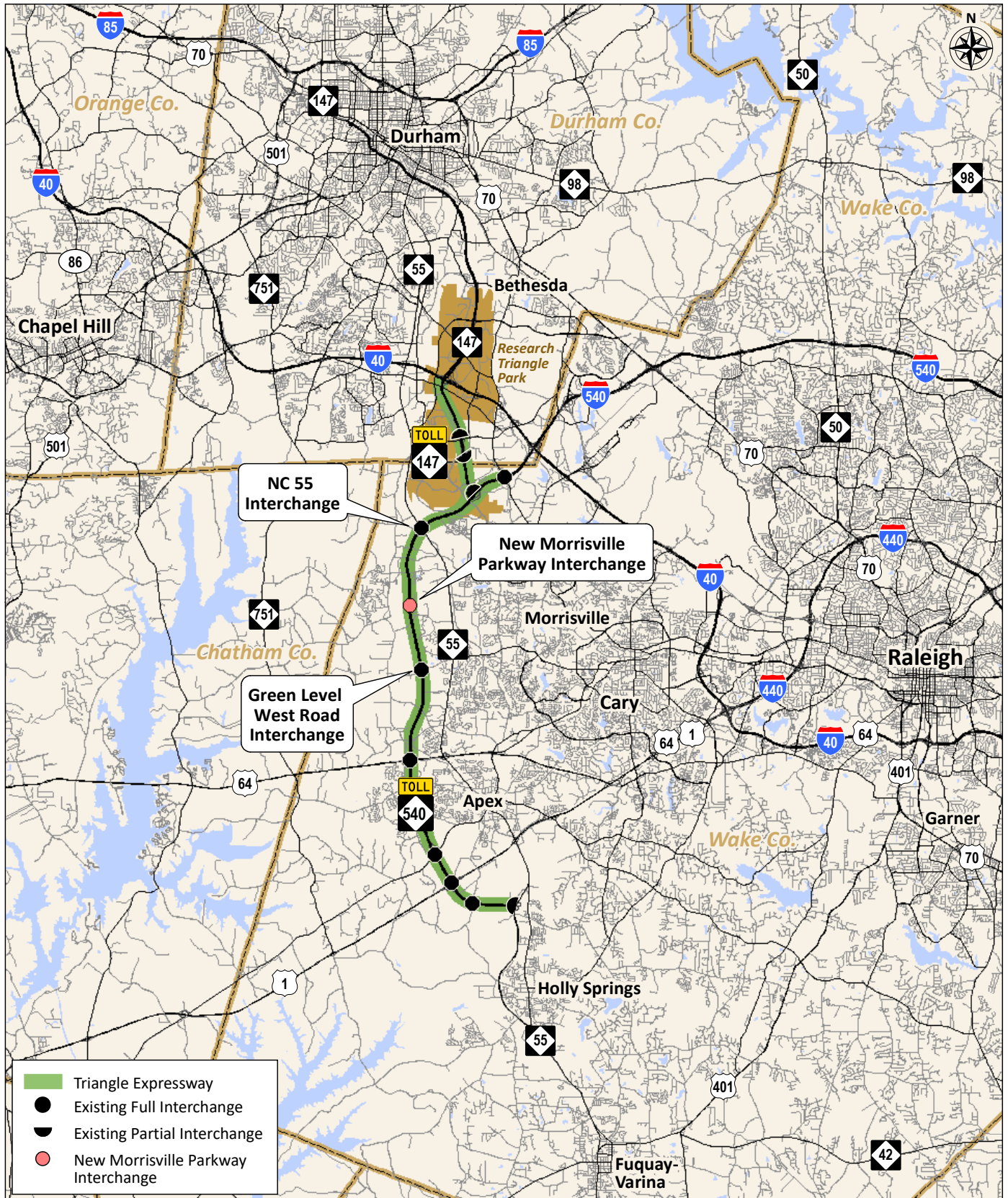
Figure 2 shows the detail area of the Triangle Expressway between the NC 55 and Green Level West Road interchanges. The schematic on the left side of Figure 2 shows the current configuration and the NCTA Board approved 2020 Class 1 toll rates of \$0.87 for electronic toll collection (ETC) transactions and \$1.33 for Bill by Mail (BBM) transactions. The \$0.87 Class 1 ETC toll covers travel between NC 55 and Green Level West Road, a distance of 4.0 miles, that equates to 21.8 cents per mile in 2020. Tolls are collected in each direction at a mainline toll gantry located north of Green Level West Road. There are two toll zones, one per direction, identified by Toll Zone IDs T17/T18.

When the Morrisville Parkway interchange opens in 2020, as shown on the right side of Figure 2, the original 4.0 mile section between NC 55 and Green Level West Road will be divided into two mainline sections comprised of a 2.2-mile section between NC 55 and the Morrisville Parkway, and a 1.8-mile section between Morrisville Parkway and Green Level West Road. A new mainline toll gantry will be located north of the Morrisville Parkway interchange, with two new toll zones identified by Toll Zone IDs T15/T16. This change in configuration requires toll rates to be set at the new Toll Zones T15/T16 and adjusted at the existing Toll Zones T17/T18 in order to maintain the 21.8 cents per mile toll rate.

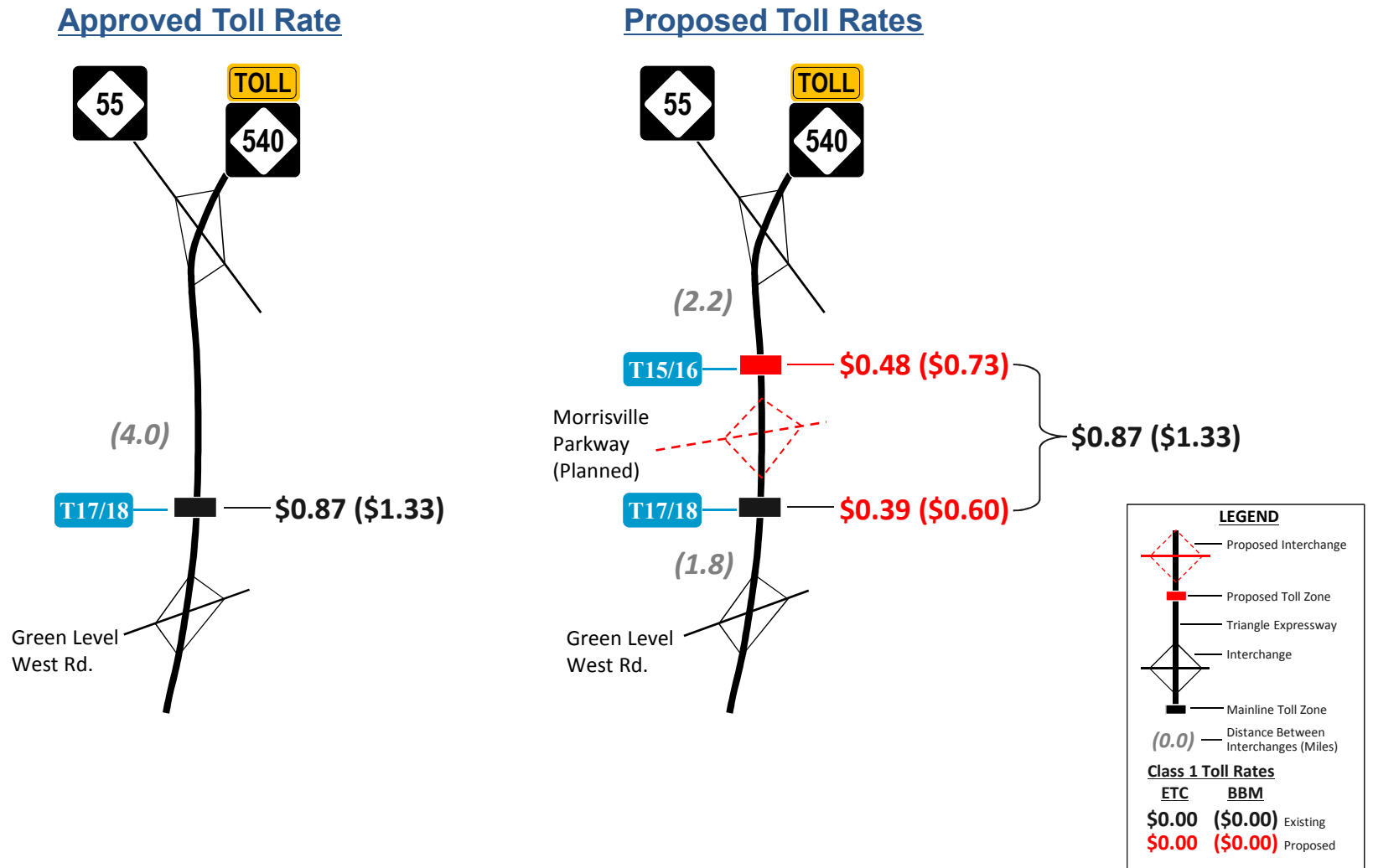
As shown in Figure 2, the proposed toll rates for the two mainline sections of the Triangle Expressway were developed by apportioning the original toll into two components based on the distance of each mainline segment. For example, the 2.2-mile section between NC 55 and Morrisville Parkway is 55 percent of the original 4.0 miles, so the resulting Class 1 ETC toll is 55 percent of the \$0.87 toll, or \$0.48.

Similarly, the 1.8-mile section of the Triangle Expressway between Morrisville Parkway and Green Level West road is 45 percent of the original 4.0 miles, so the resulting Class 1 ETC toll is \$0.39, maintaining the per-mile toll rate of 21.8 cents.

# NCTA Toll NC 540/Morrisville Parkway Interchange Proposed Toll Schedule



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**2020 Toll Rates for Mainline Toll Zones at Morrisville Parkway and Green Level West Road**

### 3. Proposed Toll Schedule

Table 1 presents CDM Smith's proposed toll rate schedule for the two mainline sections discussed, by payment type and toll class, for calendar years 2020 through 2058. The following summarizes key points to the proposed toll schedule associated with the opening of the Morrisville Parkway interchange:

1. These proposed rates are consistent with the rates presented in the recent ***Triangle Expressway Traffic and Revenue Study – Final Report***, dated November 2018 (2018 Triangle Expressway Report), that was used for bond refinancing.
2. The proposed rates are consistent with the Triangle Expressway tolling convention in that:
  - Class 2 (three-axle vehicle) toll rates equal two times the Class 1 (two-axle vehicle) toll rates.
  - Class 3 (four-or-more axle vehicle) toll rates equal four times the Class 1 toll rates.
  - Electronic toll collection (ETC) toll rates are discounted by 35 percent of the Bill by Mail (BBM) toll rates for each of the existing three toll classes.
3. The addition of the Morrisville Parkway interchange and new mainline tolling zones will not affect the approved rate schedule for existing toll zones other than T17/T18 north of Green Level West Road.
4. The cost of travel will not change for motorists traveling between NC 55 and Green Level Road West.
5. The Morrisville Parkway interchange and proposed toll rates shown in Table 1 will not negatively impact toll revenue on the Triangle Expressway.

**Table 1**  
**Proposed Toll Rate Schedule Associated with the Opening of the Morrisville Parkway Interchange**

Calendar Year (1)	Mainline Section between NC 55 and Morrisville Parkway (2.2 miles)						Mainline Section between Morrisville Parkway and Green Level West Road (1.8 miles)					
	Toll IDs T15/T16						Toll IDs T17/T18					
	Class 1 (two axles)		Class 2 (three axles)		Class 3 (four or more axles)		Class 1 (two axles)		Class 2 (three axles)		Class 3 (four or more axles)	
	ETC	BBM	ETC	BBM	ETC	BBM	ETC	BBM	ETC	BBM	ETC	BBM
2020	\$0.48	\$0.73	\$0.96	\$1.46	\$1.92	\$2.92	\$0.39	\$0.60	\$0.78	\$1.20	\$1.56	\$2.40
2021	0.49	0.76	0.98	1.52	1.96	3.04	0.41	0.63	0.82	1.26	1.64	2.52
2022	0.51	0.78	1.02	1.56	2.04	3.12	0.42	0.65	0.84	1.30	1.68	2.60
2023	0.52	0.80	1.04	1.60	2.08	3.20	0.43	0.66	0.86	1.32	1.72	2.64
2024	0.54	0.83	1.08	1.66	2.16	3.32	0.45	0.69	0.90	1.38	1.80	2.76
2025	0.55	0.85	1.10	1.70	2.20	3.40	0.46	0.71	0.92	1.42	1.84	2.84
2026	0.57	0.88	1.14	1.76	2.28	3.52	0.47	0.72	0.94	1.44	1.88	2.88
2027	0.59	0.90	1.18	1.80	2.36	3.60	0.49	0.75	0.98	1.50	1.96	3.00
2028	0.61	0.93	1.22	1.86	2.44	3.72	0.50	0.77	1.00	1.54	2.00	3.08
2029	0.62	0.96	1.24	1.92	2.48	3.84	0.52	0.80	1.04	1.60	2.08	3.20
2030	0.64	0.99	1.28	1.98	2.56	3.96	0.53	0.82	1.06	1.64	2.12	3.28
2031	0.66	1.01	1.32	2.02	2.64	4.04	0.55	0.85	1.10	1.70	2.20	3.40
2032	0.68	1.05	1.36	2.10	2.72	4.20	0.57	0.88	1.14	1.76	2.28	3.52
2033	0.70	1.07	1.40	2.14	2.80	4.28	0.58	0.89	1.16	1.78	2.32	3.56
2034	0.72	1.11	1.44	2.22	2.88	4.44	0.60	0.92	1.20	1.84	2.40	3.68
2035	0.74	1.14	1.48	2.28	2.96	4.56	0.62	0.95	1.24	1.90	2.48	3.80
2036	0.76	1.17	1.52	2.34	3.04	4.68	0.63	0.97	1.26	1.94	2.52	3.88
2037	0.77	1.19	1.54	2.38	3.08	4.76	0.65	1.00	1.30	2.00	2.60	4.00
2038	0.79	1.22	1.58	2.44	3.16	4.88	0.66	1.02	1.32	2.04	2.64	4.08
2039	0.80	1.23	1.60	2.46	3.20	4.92	0.68	1.05	1.36	2.10	2.72	4.20
2040	0.82	1.26	1.64	2.52	3.28	5.04	0.69	1.06	1.38	2.12	2.76	4.24
2041	0.84	1.29	1.68	2.58	3.36	5.16	0.70	1.08	1.40	2.16	2.80	4.32
2042	0.86	1.32	1.72	2.64	3.44	5.28	0.71	1.09	1.42	2.18	2.84	4.36
2043	0.87	1.34	1.74	2.68	3.48	5.36	0.74	1.14	1.48	2.28	2.96	4.56
2044	0.89	1.37	1.78	2.74	3.56	5.48	0.75	1.16	1.50	2.32	3.00	4.64
2045	0.91	1.40	1.82	2.80	3.64	5.60	0.76	1.17	1.52	2.34	3.04	4.68
2046	0.93	1.43	1.86	2.86	3.72	5.72	0.77	1.19	1.54	2.38	3.08	4.76
2047	0.95	1.46	1.90	2.92	3.80	5.84	0.79	1.22	1.58	2.44	3.16	4.88
2048	0.97	1.49	1.94	2.98	3.88	5.96	0.80	1.23	1.60	2.46	3.20	4.92
2049	0.99	1.52	1.98	3.04	3.96	6.08	0.82	1.26	1.64	2.52	3.28	5.04
2050	1.00	1.54	2.00	3.08	4.00	6.16	0.84	1.29	1.68	2.58	3.36	5.16
2051	1.02	1.57	2.04	3.14	4.08	6.28	0.86	1.32	1.72	2.64	3.44	5.28
2052	1.04	1.60	2.08	3.20	4.16	6.40	0.87	1.34	1.74	2.68	3.48	5.36
2053	1.06	1.63	2.12	3.26	4.24	6.52	0.89	1.37	1.78	2.74	3.56	5.48
2054	1.08	1.66	2.16	3.32	4.32	6.64	0.91	1.40	1.82	2.80	3.64	5.60
2055	1.10	1.69	2.20	3.38	4.40	6.76	0.93	1.43	1.86	2.86	3.72	5.72
2056	1.13	1.74	2.26	3.48	4.52	6.96	0.94	1.45	1.88	2.90	3.76	5.80
2057	1.15	1.77	2.30	3.54	4.60	7.08	0.96	1.48	1.92	2.96	3.84	5.92
2058	1.17	1.80	2.34	3.60	4.68	7.20	0.99	1.52	1.98	3.04	3.96	6.08

(1) Annual toll rate increases are assumed to occur on or around January 1 of each year.



October 9, 2019

David Roy  
North Carolina Turnpike Authority  
1 South Wilmington Street  
1578 Mail Service Center  
Raleigh, North Carolina 27699-1578



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300 S Orange Ave.  
Suite 1170  
Orlando, FL 32801  
407.648.2208

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[pfm.com](http://pfm.com)

Dear Mr. Roy:

The North Carolina Turnpike Authority ("Authority") is seeking to revise the schedule of annual toll rates for the Triangle Expressway System ("System"). The Morrisville Parkway Interchange is expected to open in early 2020, and it is necessary to address the question of toll rates for the System to be in effect after such event. CDM Smith, the Authority's traffic and revenue consultant, has made recommendations for revised toll rates on the basis that, among other things, the current 4.0 mile mainline section between NC 55 and Green Level West Road will be divided into two mainline sections comprised of a 2.2-mile section between NC 55 and the Morrisville Parkway, and a 1.8-mile section between Morrisville Parkway and Green Level West Road (the "*CDM Smith Morrisville Parkway Interchange Memorandum*"). This proposed change will cause an adjustment to the System toll revenue forecast produced by CDM Smith. CDM Smith's toll revenue forecast is used to project the debt service coverage ratios in the System financial model.

As the Authority's financial advisor, PFM has updated the System financial model to reflect the proposed change in toll rates and the Morrisville Parkway Interchange and has re-calculated the debt service coverage ratios. As discussed in more detail below, PFM has determined that the Authority is in compliance with the required debt service coverage requirements outlined in the subsections of Section 704 of the System Revenue Bonds Trust Agreement.

As part of PFM's update to the System financial model, the following revisions were included:

- Revised CDM Smith revenue forecast per the Triangle Expressway and Complete 540 Phase 1 Traffic and Revenue Study dated September 2019 and
- Revised Operations and Maintenance (O&M) costs from Authority's consulting engineer (HNTB) as of May 23, 2019.



### **Updated System Financial Model**

PFM has updated the System financial model to reflect the proposed change in projected toll revenues. The O&M costs were updated by the Authority's engineers to reflect actual System operating expenses and the revised O&M costs are included in the updated System financial model. Based on the results of the updated financial model, the Authority will be in compliance with the subsections of Section 704 of the System Revenue Bonds Trust Agreement:

- a) wherein Revenues for each Fiscal Year will be not less than 130% of Long-Term Debt Service Requirement for Senior Lien Indebtedness for such Fiscal Year; and
- b) wherein Revenues for each Fiscal Year will be not less than 110% of (i) Long-Term Indebtedness for Senior Lien Indebtedness, Subordinate Lien Indebtedness and TIFIA Indebtedness for such FY, and (ii) deposits to Senior Lien Parity Reserve Account and Subordinate Lien Reserve Account and the TIFIA Debt Service Reserve Account for such FY; and
- c) wherein Revenues for each Fiscal Year will be sufficient to make all of the deposits required by the TriEx System Revenue Bonds Trust Agreement Section 503(a) through (j), inclusive.

Below we show the summary of the revised projected debt service coverage ratios over the term of the System financial plan.



### Triangle Expressway Coverage Ratios

As of October 9, 2019

Fiscal Year	Senior Senior Lien Coverage	Senior Lien and TIFIA Coverage	Trust Agreement Section 503(a) through (j)
2019	2.35	1.75	1.75
2020	1.74	1.74	1.74
2021	1.72	1.72	1.72
2022	1.70	1.70	1.70
2023	1.68	1.68	1.68
2024	1.65	1.65	1.65
2025	1.68	1.68	1.68
2026	1.70	1.70	1.70
2027	1.72	1.72	1.72
2028	1.73	1.73	1.73
2029	1.87	1.87	1.87
2030	1.79	1.79	1.79
2031	1.80	1.80	1.80
2032	1.82	1.82	1.82
2033	1.63	1.63	1.63
2034	1.61	1.61	1.61
2035	1.61	1.61	1.61
2036	1.61	1.61	1.61
2037	1.61	1.61	1.61
2038	1.84	1.84	1.84
2039	1.88	1.88	1.88
2040	2.67	2.67	2.67
2041	3.32	3.32	3.32



Please feel free to contact us with any questions you may have regarding our analysis.

Sincerely,

**PFM Financial Advisors LLC**

David C. Miller  
Managing Director

October 10, 2019

Board of Directors  
North Carolina Turnpike Authority  
Raleigh, North Carolina

**North Carolina Turnpike Authority Triangle Expressway System Toll Rates  
Following the Opening of the Morrisville Parkway Interchange**

Gentlemen:

The North Carolina Turnpike Authority (the "*Authority*") has issued bonds to finance or refinance costs, including the costs of land acquisition, design, construction and equipping, of the Triangle Expressway System (the "*System*"). The bonds were issued under certain trust agreements and other documents (the "*System Documents*") which provided the terms of, the provisions for payment of, and the security for, such bonds. The Authority on September 17, 2008, adopted a policy for adopting toll schedules and any adjustments to toll schedules (the "*Toll Rate Policy*") and the Toll Rate Policy provides that under the direction of the Authority a Traffic Consultant shall prepare a Traffic and Revenue Study forecasting projected traffic for each turnpike project and the toll revenues to be generated and after receipt of such Traffic and Revenue Study, the Authority will adopt a toll rate schedule for the use of the turnpike project based upon factors it determines appropriate.

The Comprehensive Traffic and Revenue Study Final Report for the Triangle Expressway System dated April 6, 2009 (the "*2009 Report*"), contains a proposed toll schedule for the System. There have been a number of revisions to the 2009 Report with respect to annual toll rate changes and further Reports in connection with financings for the System, most recently the 2018 Traffic and Revenue Study delivered by CDM Smith Inc. as the Traffic Consultant in connection with the issuance of the Authority's Triangle Expressway System Senior Lien Turnpike Revenue Refunding Bonds, Series 2018 (the "*2018 Report*").

It is anticipated the Morrisville Parkway Interchange will open in early 2020, and it is necessary to address the question of toll rates for the System to be in effect after such event. CDM Smith Inc. has made recommendations for such toll rates on the basis that, among other things, the current 4.0 mile mainline section between NC 55 and Green Level West Road will be divided into two mainline sections comprised of a 2.2-mile section between NC 55 and the Morrisville Parkway, and a 1.8-mile section between Morrisville Parkway and Green Level West Road (the "*CDM Smith Morrisville Parkway Interchange Memorandum*"). PFM Financial Advisors, LLC ("*PFM*") serves as financial advisor to the Authority in connection with the

Board of Directors  
NC Turnpike Authority  
October 10, 2019  
Page 2

System. PFM has delivered a letter dated October 9, 2019 (the "*PFM Letter*"), to the effect that the recommendations made in the CDM Smith Morrisville Parkway Interchange Memorandum would not prevent the Authority from being in compliance with revenue coverage covenants in the System Documents.

Without undertaking to verify the same by independent investigation, we have relied on the analysis described in the CDM Smith Morrisville Parkway Interchange Memorandum and the PFM Letter. We have also assumed that the Authority has performed all obligations incumbent on it as of the date hereof in the System Documents.

Based on the foregoing, we are of the opinion that accepting the recommendations described and analyzed in the CDM Smith Morrisville Parkway Interchange Memorandum and the PFM Letter (a) will have no adverse effect on the income tax status of interest on the bonds financing the System, and (b) will not, by itself, cause the Authority to be in violation of any covenants under the System Documents. Notwithstanding such opinion, compliance with such covenants in the future is dependent on actual revenues received and if actual revenue results are materially different from the forecasts therefor the Authority will have to take further action to be in compliance with covenants in the System Documents.

We have not made any investigation concerning the financial resources of the Authority or the revenues of the System. This opinion does not bring down, update or otherwise amend any opinions with respect to bonds financing the System.

Very truly yours,

*Hunter Andrews Kurth LLP*