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5900 W. Plano Parkway, Suite 100
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Subject: NTTA System Traffic and Revenue Letter Update

Dear Mr. Porter:

Pursuant to your recent request, CDM Smith is pleased to provide you with a traffic and revenue (T&R) letter update for the North Texas Tollway Authority System (NTTA System). It is our understanding that this letter will support the issuance of the upcoming Series 2018 refunding bonds (referred to as the "Series 2018 Bonds") scheduled for closing in November 2018. Currently, the NTTA System consists of the Dallas North Tollway (DNT), President George Bush Turnpike (PGBT), President George Bush Turnpike Eastern Extension (PGBT EE), President George Bush Turnpike Western Extension (PGBT WE), Sam Rayburn Tollway (SRT), Chisholm Trail Parkway (CTP), Addison Airport Toll Tunnel (AATT), Mountain Creek Lake Bridge (MCLB), and Lewisville Lake Toll Bridge (LLTB).

Background

CDM Smith completed the NTTA System Comprehensive Traffic and Toll Revenue Study report in September 2017 (the "September 2017 Study"). The North Central Texas Council of Governments (NCTCOG) Mobility 2040 Metropolitan Transportation Plan (MTP), the regional transportation plan for the DFW area, was used as the basis for the September 2017 Study. The Mobility 2040 travel demand networks were reviewed and updated to accurately reflect existing roadway characteristics along and near NTTA System corridors. Additionally, the September 2017 Study included an assessment of current economic conditions and other key factors influencing forecasted T&R on NTTA System facilities. This effort included an independent economic review of the Mobility 2040 demographics along NTTA System corridors as well as comprehensive traffic count and travel time data collection. The T&R forecasts included in the September 2017 Study were developed using validated networks and revised trip tables and based upon the most recent transactions trends, revenue recovery assumptions and planned completion dates of several capital improvement projects.



Since the completion of the September 2017 Study, the following new information has become available, which has warranted changes to the NTTA System T&R forecasts:

- The anticipated completion dates for several NTTA capital improvement projects and other regional projects have changed
- Refinements to the T&R forecasting models were made by CDM Smith to reflect recent growth trends on the NTTA System
- TollTag penetration and ZipCash revenue recovery assumptions have been updated to reflect the most recently available data

This letter incorporates the above new information and includes updates to the NTTA System T&R forecasts from years 2018 through 2066.

The remainder of this letter covers the following topics:

- Key assumptions
- Updated long-term T&R forecasts
- Sensitivity tests to estimate impacts of Mobility 2045, the recently adopted regional transportation plan for the DFW area
- Conclusion and recommendations

Key Assumptions

As part of the T&R update, the key input assumptions to the T&R forecasting process were reevaluated and updated as needed. Most of the assumptions either remained consistent with the September 2017 Study or were modified only slightly. However, some changes were made to the planned completion dates of certain capital improvement projects on and near the NTTA System. **Table 1** lists the planned completion dates for some of the key capacity improvement projects that were considered as part of the T&R update.

Table 1. Planned Completion Dates for Key Improvement Projects

Facility	Limits/Location	Improvement	Planned Date	
			September 2017 Study	Current Study
DNT	Panther Creek Parkway	Toll ramps	January 2022	March 2022
DNT	US 380/First Street	Mainlane extension	January 2022	March 2022
PGBT	IH 35E to DNT	Mainlane expansion	December 2019	No change
PGBT	US 75 to SH 78	Mainlane expansion	December 2019	December 2018
PGBT	Belt Line to IH 35E	Mainlane expansion	December 2020	July 2021
SRT	Denton Creek to DNT	Mainlane expansion	July 2021	December 2021
SRT	DNT to US 75	Mainlane expansion	July 2021	December 2021
DNT/SRT	DNT/SRT Interchange	Interchange improvements	July 2021	December 2021
PGBT WE	Egyptian Way to IH 20	Mainlane expansion (3 lanes)	December 2020	July 2021
PGBT WE	Egyptian Way to IH 20	Mainlane expansion (4 lanes)	January 2031	July 2021
PGBT WE	Conflans to Egyptian Way	Mainlane expansion	December 2020	July 2021

Below are the key assumptions used as part of this T&R update, including both those developed collaboratively with NTTA staff and those determined by CDM Smith:

Assumptions Provided by NTTA

- NTTA System-wide toll rate increases on July 1 of every odd year by applying an annual toll increase of 2.75 percent. This is in accordance with the NTTA Board's adopted toll rate policy
- The SRT Project Agreement between NTTA and Texas Department of Transportation (TxDOT) will be amended to remove the provision for congestion pricing on SRT. No congestion pricing is assumed on SRT throughout the forecast period
- Under the PGBT EE project agreement with TxDOT, NTTA retains 80 percent of the AVI transaction revenue generated by the PGBT EE, and the remaining 20 percent is paid to TxDOT. NTTA retains 80 percent of the revenue collected from the ZipCash transactions at the AVI rate, and the remaining 20 percent is paid to TxDOT, but NTTA retains 100 percent of the toll surcharge collected on ZipCash transactions
- DNT's Panther Creek Parkway Ramps – new ramp toll gantries near the northern terminus of DNT; assumed to be complete by March 31, 2022
- DNT mainlane extension north of US 380 to First Street assumed to be completed and open to traffic by March 31, 2022
- DNT Extension Phase 4A between US 380 and FM 428 opens by January 1, 2025
- DNT Extension Phase 4B southbound frontage road between FM 428 and the Grayson County line is assumed to open by May 31, 2021
- Expansion of PGBT from three lanes to four lanes per direction from US 75 to SH 78 is assumed to be completed by December 2018. Expansion of PGBT from three lanes to four lanes per direction between IH 35E and DNT is assumed to be completed by December 2019. Expansion of PGBT from three lanes to four lanes per direction from Belt Line to IH 35E is assumed to be completed by July 2021, and this segment's construction is assumed to begin July 2019.
- Capacity improvements on SRT from Denton Creek to US 75 from three lanes to four lanes per direction are assumed to be completed by December 31, 2021. This project's construction is assumed to begin January 1, 2019
- The average NTTA System ZipCash effective revenue recovery rate at one year after the transaction occurred (includes invoiced and un-invoiced transactions and excludes all V-Toll transactions) to be 39.0 percent based on actual data and recent trends. The effective revenue recovery from TollTag transactions is assumed to be 99.5 percent in all forecast years, based on historical observations

- Projected annual toll revenues included in this letter are revenues projected to be collected in each year (i.e., cash basis) after applying the above-described revenue recovery assumptions to the projected toll transactions for the year
- Automatic Vehicle Identification (AVI)/Video toll transaction splits are applied on a plaza by plaza basis. AVI (TollTag) penetration assumed for T&R forecasting purposes includes initial AVI transactions and V-Toll transactions with a three-month lag. Based on the actual data and recent trends, the average NTTA System TollTag penetration rate is assumed to be 80.6 percent in 2018. The following are the assumed AVI shares for 2018, shown separately for each facility:

DNT	82.1%
PGBT	80.1%
SRT	82.1%
PGBT EE	81.0%
AATT	81.0%
MCLB	64.3%
LLTB	79.9%
PGBT WE	73.1%
CTP	80.3%
NTTA System	80.6%

- SRT is expected to be returned to TxDOT at the end of August 2058

CDM Smith Assumptions

- Background network for travel demand modeling is based on NCTCOG's Mobility 2040
- SH 190/East Branch from IH 30/PGBT EE to IH 20/Loop 9 opens by January 1, 2027 (as recommended by NCTCOG's Mobility 2040)
- SH 161 between SH 183 and Belt Line Road is assumed to operate with an additional lane in each direction during weekday peak periods (6:00-10:00 am and 2:00-7:00 pm). This section is assumed to be expanded to eight lanes by July 1, 2021. The new additional lanes on this facility are assumed to operate as general purpose lanes.
- Trip tables are based on NCTCOG's Mobility 2040 demographics, updated to reflect independent economic review by RDS in 2017
- NTTA will continue its efforts to encourage increases in TollTag shares on its facilities and to maintain current ZipCash toll revenue recovery rates
- It is anticipated that the AVI transaction share for the NTTA System will ramp up based on a logistic function from 80.6 percent in 2018 to 80.8 percent in 2020, 82.8 percent in 2030, 83.8 percent in 2040, 84.3 percent in 2050 and 84.6 percent in 2060 and thereafter

- Commercial vehicle transaction shares are applied on a plaza by plaza basis and averages for each facility for 2018 are as shown below. It is assumed that these truck shares remain constant throughout the forecast period:

DNT	1.7%
PGBT	3.0%
SRT	3.9%
PGBT EE	3.2%
AATT	1.0%
MCLB	2.2%
LLTB	3.4%
PGBT WE	5.9%
CTP	3.2%
NTTA System	3.0%

- In accordance with NTTA’s existing practice, all NTTA System facilities will be well-maintained, efficiently operated, and effectively signed to encourage maximum usage
- Growth in vehicle operating costs (which include fuel, maintenance, and tires) will not significantly deviate from the assumed inflation rate in the September 2017 Study
- Growth in traveler values of time will not significantly deviate from the assumed rates in the September 2017 Study
- No local, regional, or national emergency will arise which would abnormally restrict the use of the transportation infrastructure

Updated Long-Term Traffic and Revenue Forecasts

The updated long-term T&R forecasts for each NTTA System facility from 2018 to 2066 are shown in **Table 2** and **Figure 1**. The transaction projections have been updated based on the information available and the recent transaction data provided by NTTA since the completion of the September 2017 Study.

The projections extend from 2018 through 2066, and include the revenue forecasts for DNT, PGBT, PGBT EE, PGBT WE, SRT, CTP, AATT, MCLB, and LLTB. In each case, forecasts for each of the facilities are based on modeled traffic forecasts at each toll collection location, through the year 2040. The average toll at each location was based on the current mix of passenger car and commercial vehicle traffic, and the current average tolls, modified in future years to reflect changing assumptions in the proportion of AVI and ZipCash transaction shares. Toll rates for ZipCash transactions are 50 percent higher than the rates for TollTag transactions (with a minimum differential of \$0.25 in 2017 dollars) in each case.

Forecasts beyond year 2040 are based on nominal assumptions regarding future traffic growth with assumed periodic toll rate increases. As shown in **Table 2**, the estimated annual revenue on the DNT is expected to increase from \$263.0 million in 2018 to \$355.3 million by 2025 and \$543.7 million by 2035. Revenue on the PGBT is expected to be \$229.2 million in 2018, increasing to \$311.6 million by 2025 and \$481.4 million by 2035. The PGBT EE toll revenue included in **Table 2**

is the NTTA's share of the toll revenue. NTTA's share of the revenue on the PGBT EE is expected to be \$39.8 million in 2018, increasing to \$55.9 million by 2025 and \$93.0 million by 2035. PGBT WE is anticipated to generate \$56.7 million in toll revenue in 2018, increasing to \$95.8 million and \$153.3 million by 2025 and 2035, respectively. Revenue on the SRT is expected to be \$193.1 million in 2018, increasing to \$266.9 million by 2025 and \$423.0 million by 2035. As FY2058 is the end of the fifty-year operational agreement of the SRT between NTTA and TxDOT, revenue from SRT is estimated through August 31, 2058, while the other facilities are assumed to generate revenue for NTTA in perpetuity. CTP is anticipated to generate \$52.7 million in toll revenue in 2018, increasing to \$83.7 million and \$155.7 million by 2025 and 2035, respectively. Revenue from the AATT, MCLB and LLTB combined is expected to be about \$11.5 million in 2018. By 2025, this is estimated to reach a combined \$15.7 million and increase in 2035 to \$24.0 million.

Table 2. Updated NTTA System Annual Toll Revenue Forecasts by Facility (millions)

Year	DNT	PGBT	PGBT EE*	PGBT WE	SRT**	CTP	AATT-MCLB-LLTB	NTTA System
2018	\$263.0	\$229.2	\$39.8	\$56.7	\$193.1	\$52.7	\$11.5	\$846.1
2019	\$275.1	\$237.4	\$41.8	\$59.7	\$202.7	\$58.1	\$12.0	\$886.8
2020	\$286.9	\$247.0	\$42.8	\$64.7	\$210.1	\$60.9	\$12.6	\$925.1
2021	\$299.0	\$259.1	\$45.2	\$71.6	\$218.5	\$64.7	\$13.2	\$971.2
2022	\$314.1	\$272.1	\$47.7	\$79.6	\$231.0	\$69.0	\$13.8	\$1,027.2
2023	\$327.5	\$284.4	\$50.3	\$85.2	\$243.3	\$73.5	\$14.4	\$1,078.5
2024	\$341.7	\$297.5	\$53.0	\$90.0	\$254.9	\$78.5	\$15.0	\$1,130.6
2025	\$355.3	\$311.6	\$55.9	\$95.8	\$266.9	\$83.7	\$15.7	\$1,184.8
2026	\$371.5	\$326.8	\$59.0	\$101.1	\$279.6	\$89.3	\$16.3	\$1,243.7
2027	\$388.3	\$341.6	\$62.2	\$102.8	\$292.5	\$95.2	\$17.0	\$1,299.7
2028	\$406.6	\$357.6	\$65.5	\$107.9	\$306.1	\$101.6	\$17.7	\$1,363.0
2029	\$425.0	\$374.2	\$69.0	\$114.5	\$320.4	\$108.3	\$18.6	\$1,430.0
2030	\$444.4	\$392.1	\$72.8	\$120.8	\$335.5	\$115.7	\$19.4	\$1,500.7
2031	\$464.4	\$410.2	\$76.8	\$128.1	\$352.0	\$123.4	\$20.2	\$1,575.1
2032	\$483.7	\$427.0	\$80.6	\$133.5	\$368.5	\$130.8	\$21.1	\$1,645.2
2033	\$502.6	\$444.2	\$84.5	\$140.2	\$385.7	\$138.6	\$22.0	\$1,717.9
2034	\$522.8	\$462.5	\$88.6	\$146.3	\$403.8	\$147.0	\$23.0	\$1,794.1
2035	\$543.7	\$481.4	\$93.0	\$153.3	\$423.0	\$155.7	\$24.0	\$1,874.2
2036	\$566.1	\$501.6	\$97.7	\$159.8	\$443.1	\$165.1	\$25.1	\$1,958.4
2037	\$588.9	\$520.5	\$102.4	\$167.2	\$462.3	\$177.1	\$26.2	\$2,044.6
2038	\$610.1	\$540.2	\$106.7	\$174.1	\$482.4	\$187.4	\$27.3	\$2,128.2
2039	\$631.9	\$560.6	\$111.1	\$182.2	\$503.1	\$197.9	\$28.5	\$2,215.4
2040	\$654.9	\$582.1	\$115.6	\$189.7	\$524.7	\$209.2	\$29.8	\$2,306.0
2041	\$677.4	\$603.5	\$120.4	\$198.5	\$547.6	\$220.3	\$31.1	\$2,398.9
2042	\$701.1	\$626.2	\$125.4	\$206.7	\$571.5	\$232.3	\$32.5	\$2,495.8
2043	\$725.6	\$649.5	\$130.6	\$216.7	\$597.4	\$245.0	\$33.9	\$2,598.7
2044	\$751.7	\$674.4	\$136.0	\$226.0	\$624.4	\$258.7	\$35.4	\$2,706.6
2045	\$777.9	\$699.7	\$141.7	\$236.5	\$651.1	\$272.5	\$37.0	\$2,816.6
2046	\$804.5	\$726.6	\$147.2	\$244.8	\$678.6	\$284.5	\$38.5	\$2,924.7
2047	\$831.1	\$753.8	\$152.8	\$254.9	\$707.9	\$296.6	\$40.1	\$3,037.2
2048	\$859.2	\$782.4	\$158.5	\$264.1	\$738.5	\$309.5	\$41.8	\$3,154.0
2049	\$887.4	\$812.1	\$164.6	\$274.3	\$770.1	\$322.5	\$43.4	\$3,274.3
2050	\$917.2	\$843.6	\$170.7	\$283.6	\$803.2	\$336.4	\$45.1	\$3,399.8
2051	\$946.6	\$874.1	\$177.3	\$295.0	\$835.5	\$348.8	\$46.8	\$3,524.1
2052	\$975.5	\$906.1	\$183.9	\$305.4	\$869.0	\$362.1	\$48.6	\$3,650.6
2053	\$1,005.1	\$938.3	\$190.9	\$317.9	\$905.2	\$375.6	\$50.3	\$3,783.3
2054	\$1,036.4	\$972.5	\$198.1	\$329.2	\$942.9	\$390.1	\$52.1	\$3,921.4
2055	\$1,067.3	\$1,007.4	\$205.8	\$342.5	\$980.6	\$404.6	\$54.1	\$4,062.3
2056	\$1,100.0	\$1,044.6	\$213.6	\$354.7	\$1,019.6	\$420.1	\$56.2	\$4,208.8
2057	\$1,132.8	\$1,081.9	\$221.7	\$368.8	\$1,060.9	\$435.8	\$58.1	\$4,360.1
2058	\$1,167.4	\$1,121.7	\$230.1	\$381.8	\$731.1	\$452.7	\$60.2	\$4,145.0
2059	\$1,202.6	\$1,162.1	\$238.7	\$397.5	\$0.0	\$469.3	\$62.5	\$3,532.7
2060	\$1,239.8	\$1,204.8	\$247.6	\$411.7	\$0.0	\$487.1	\$64.8	\$3,655.9
2061	\$1,276.6	\$1,248.4	\$257.1	\$428.0	\$0.0	\$505.4	\$67.2	\$3,782.7
2062	\$1,315.2	\$1,294.3	\$266.7	\$442.7	\$0.0	\$525.0	\$69.6	\$3,913.5
2063	\$1,354.5	\$1,340.8	\$276.9	\$460.4	\$0.0	\$544.4	\$72.1	\$4,049.0
2064	\$1,396.1	\$1,389.9	\$287.3	\$476.6	\$0.0	\$565.2	\$74.8	\$4,189.8
2065	\$1,437.4	\$1,439.9	\$298.3	\$496.1	\$0.0	\$586.1	\$77.5	\$4,335.4
2066	\$1,481.2	\$1,492.7	\$309.6	\$513.7	\$0.0	\$608.7	\$80.4	\$4,486.2

*NTTA's share of the revenue collected from PGBT EE.

**SRT revenue for year 2058 includes revenue from January to August only, because FY 2058 is the end of the fifty-year operational agreement of the SRT between NTTA and TxDOT

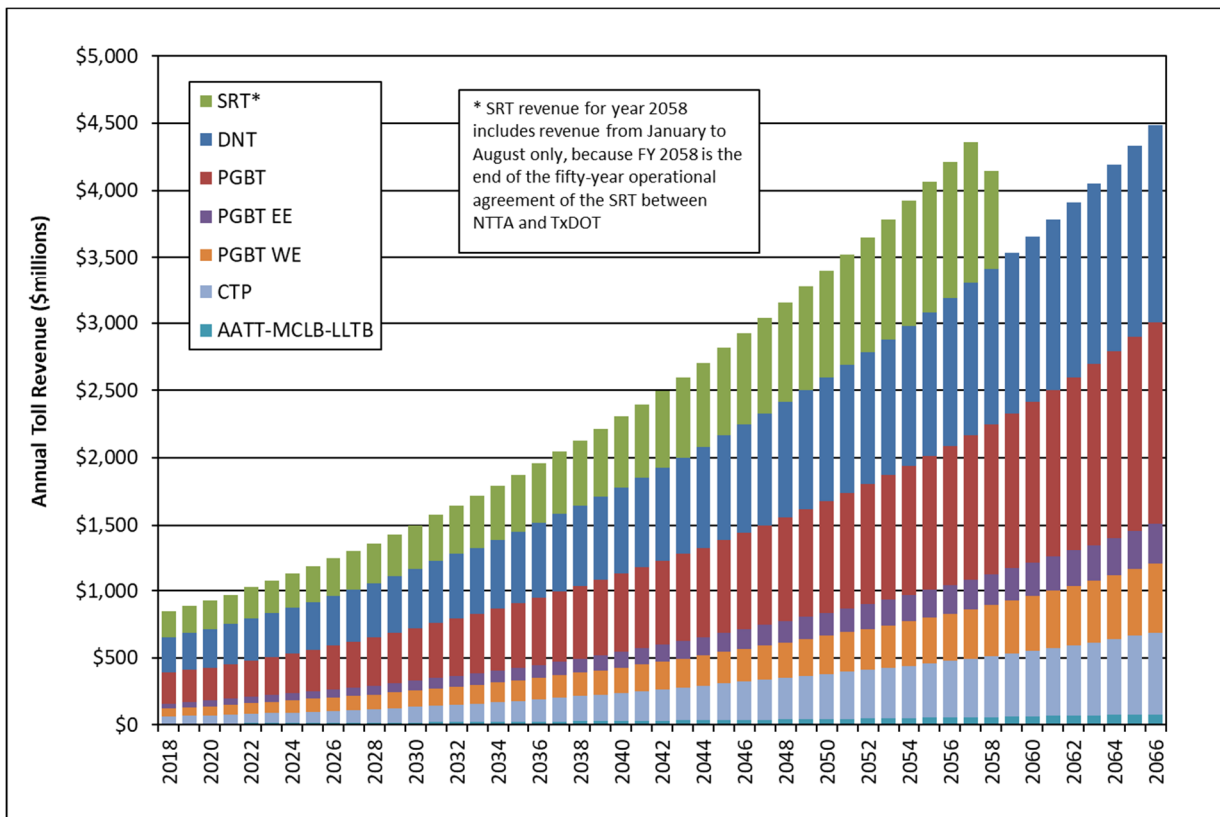


Figure 1. Updated NTTA System Toll Revenue Forecasts by Facility

The estimated annual transactions and toll revenue for the NTTA System are shown in **Table 3**. Total revenue on the existing NTTA System is expected to increase from about \$846.1 million in 2018 to \$1.18 billion in 2025 and \$1.87 billion in 2035. Driven by nominal traffic growth and continued assumed modest inflationary adjustments in toll rates, annual revenue on the NTTA System is expected to reach more than \$2 billion per year by 2037.

Table 4 shows the projected annual transaction and revenue growth rates on the NTTA System. Annual transaction and revenue growth rates from 2018 through 2020 are equal to 1.6 percent and 4.6 percent, respectively. The transaction growth during this period captures the demographic growth and the impact of capacity improvements along multiple segments of the NTTA System that are expected to be implemented in the 2018-2020 timeframe. Revenue growth during this period includes traffic growth, toll rate growth and improvements to AVI transaction shares. Annual transaction and revenue growth rates from 2020 through 2030 are equal to 2.1 percent and 5.0 percent, respectively. The annual transaction growth rates progressively decrease to 1.5 percent between 2030 and 2040, and to 1.1 percent between 2040 and 2050. The corresponding annual growth rates in revenue are 4.4 percent and 4.0 percent respectively, which incorporate the traffic growth and the assumed toll rate increases.

Table 3. Updated NTTA System Annual Toll Transactions and Revenue Forecasts

Year	Toll Transactions	Toll Revenue	Year	Toll Transactions	Toll Revenue
2018	832,889,600	\$846,068,600	2043	1,273,776,500	\$2,598,695,200
2019	847,833,600	\$886,775,000	2044	1,289,617,500	\$2,706,563,600
2020	859,469,500	\$925,052,800	2045	1,305,673,200	\$2,816,551,900
2021	877,664,400	\$971,161,200	2046	1,318,427,200	\$2,924,696,100
2022	906,594,100	\$1,027,216,300	2047	1,331,324,600	\$3,037,191,800
2023	926,066,900	\$1,078,521,700	2048	1,344,313,800	\$3,153,992,700
2024	944,365,700	\$1,130,572,800	2049	1,357,842,200	\$3,274,336,100
2025	958,331,900	\$1,184,828,000	2050	1,371,411,200	\$3,399,774,900
2026	977,943,200	\$1,243,694,600	2051	1,383,300,200	\$3,524,072,000
2027	994,910,500	\$1,299,687,500	2052	1,394,487,100	\$3,650,579,500
2028	1,015,506,100	\$1,363,044,000	2053	1,406,181,100	\$3,783,326,300
2029	1,036,553,100	\$1,429,968,700	2054	1,417,961,800	\$3,921,353,100
2030	1,057,802,300	\$1,500,651,200	2055	1,429,760,000	\$4,062,297,700
2031	1,079,668,200	\$1,575,053,100	2056	1,441,734,900	\$4,208,760,000
2032	1,096,045,800	\$1,645,209,100	2057	1,453,634,500	\$4,360,082,100
2033	1,113,019,600	\$1,717,916,700	2058	1,356,538,700	\$4,144,981,000
2034	1,130,146,700	\$1,794,102,200	2059	1,149,628,500	\$3,532,702,000
2035	1,147,526,000	\$1,874,192,100	2060	1,157,668,000	\$3,655,947,100
2036	1,165,116,500	\$1,958,415,900	2061	1,166,029,100	\$3,782,719,600
2037	1,182,191,100	\$2,044,559,100	2062	1,174,266,000	\$3,913,538,900
2038	1,197,114,100	\$2,128,226,800	2063	1,182,453,200	\$4,049,007,500
2039	1,212,340,100	\$2,215,402,400	2064	1,190,562,400	\$4,189,797,800
2040	1,227,591,400	\$2,305,985,600	2065	1,199,007,900	\$4,335,352,700
2041	1,242,889,100	\$2,398,908,700	2066	1,207,443,100	\$4,486,234,700
2042	1,258,225,300	\$2,495,772,000	Total	57,590,847,500	\$126,553,540,400

Table 4. NTTA System Transactions and Revenue Annual Growth

Period	Annual Transaction Growth (%)	Annual Revenue Growth (%)
2018-2020	1.6	4.6
2020-2030	2.1	5.0
2030-2040	1.5	4.4
2040-2050	1.1	4.0

Table 5 shows comparisons between the updated T&R forecasts included in this letter and the forecasts included in September 2017 Study. The updated toll transaction forecasts for 2018 and 2019 are 0.1 percent and 0.2 percent lower than the September 2017 Study forecasts and 0.9 percent lower in 2020. Due primarily to improvements in TollTag share and ZipCash revenue recovery, the updated toll revenue forecasts for 2018 and 2019 are 0.3 percent and 0.1 percent

higher than the September 2017 Study forecasts, respectively. However, overall revenue for the five-year period from 2018 through 2022 is 0.5 percent lower than the previous forecasts. Over the entire forecast period (2018-2066) total transactions and revenue are 0.3 percent lower and 0.1 percent higher than the September 2017 Study forecasts, respectively.

Table 5. NTTA System Annual T&R Comparisons – Change from September 2017 Study Forecasts

Year	Transactions	Toll Revenue
2018	-0.1%	0.3%
2019	-0.2%	0.1%
2020	-0.9%	-0.6%
2030	-0.4%	-0.2%
2040	0.0%	0.2%
2050	0.0%	0.2%
2060	0.0%	0.3%
2018-2022	-0.8%	-0.5%
2018-2066	-0.3%	0.1%

NCTCOG Mobility 2045 Plan

In June 2018, the Regional Transportation Council adopted Mobility 2045 as the new MTP for the Dallas-Fort Worth region. Unlike previous MTP updates for the region, Mobility 2045 did not include a complete update of the regional demographic forecasts. The forecasts through 2040 were retained for the new plan, and a new forecast year, 2045, was added. In addition to the 2045 demographic forecast update, several roadway recommendations were added or modified from what had been included in Mobility 2040.

It should be noted that the updated revenue forecasts shown in **Table 2** are based upon the Mobility 2040 plan and thus do not include the impacts of changes incorporated as part of the recently adopted Mobility 2045 plan. We have assessed the potential impacts due to the changes in the new plan as sensitivity tests. In order to quantify the impacts of these changes on NTTA System T&R, the projects most likely to affect NTTA System demand were identified. The key projects identified and the resulting impacts for the years tested are summarized in **Table 6**. For each of these projects, a sensitivity test was performed to quantify the likely impact on NTTA System T&R. Each test was conducted for the earliest year for which the roadway recommendation changed from that included in Mobility 2040.

As shown in **Table 6**, most of the changes included in Mobility 2045 are anticipated to have positive impacts on NTTA System revenue. The only change that is expected to result in lower revenue on the NTTA System is the delayed completion of SH 190 East Branch from 2027 to 2028. However, because this delay is only one year, the impacts to the long-term revenue forecast would be seen primarily in 2027, with very little impact in later years. The largest positive impact was generated by the DNT expansion between SRT and US 380, which is expected to increase overall NTTA System revenue by 0.4 percent.

Table 6. Mobility 2045 Roadway Recommendations Changes and Estimated Revenue Impacts

Year Tested	Recommendation	Change from Mobility 2040	NTTA System Revenue Impact
2027	DNT expansion from six to eight lanes between SRT and US 380	Added to plan (not included in Mobility 2040)	0.4% (2027)
2027	SH 190 East Branch between IH 30 and IH 20	Completed date delayed from 2027 to 2028	-0.9% (2027)
2027	CTP expansion from two to four lanes between FM 1187 and US 67	Completion date advanced from 2037 to 2028	0.0% (2027)
2027	IH 35E improvements between IH 635 and US 380	Completion date delayed from 2027 to 2037	0.1% (2027)
2027	US 75 improvements between IH 635 and SRT	Removed from plan (previously assumed in 2027)	0.3% (2027)
2037	Trinity Parkway between SH 183 and US 175	Removed from plan (previously assumed in 2037)	0.2% (2037)
2040	PGBT EE expansion from six to eight lanes between SH 78 and IH 30	Added to plan (not included in Mobility 2040)	0.3% (2040)

Conclusion and Recommendations

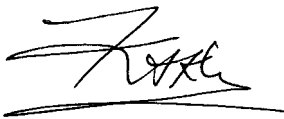
The state of the North Texas economy, population and employment growth, specifically along the NTTA System corridors, are critical to the transactions and revenue on NTTA System facilities. Other important factors that will continue to have a material impact on the NTTA System T&R include:

- AVI transaction shares and ZipCash revenue recovery rates
- Growth in the NTTA System toll rates and toll rates on the several non-NTTA managed lane facilities throughout the DFW region
- Growth in the perceived NTTA System traveler values of time
- Truck traffic usage on NTTA System facilities
- Regional air quality requirements and the regional MTP
- The timing of capacity improvements along sections of DNT, PGBT and SRT; impacts that the associated construction activities will have on the flow of NTTA System traffic during construction
- Improvements or openings of complementary and competing transportation facilities along the existing NTTA System corridors; impacts the associated construction activities will have on the NTTA System's T&R

In summary, based on the evaluation of the new information that has become available since the completion of the September 2017 Study, CDM Smith recommends that the NTTA System T&R forecasts included in **Table 3** in this letter be used to support the issuance of the upcoming Series 2018 Bonds.

I trust that this information addresses your current needs. In the meantime, should any questions arise, please do not hesitate to contact us.

Very truly yours,



Kamran Khan
Senior Vice President
CDM Smith, Inc.

DISCLAIMER

CDM Smith used currently accepted professional practices and procedures in the development of these traffic and revenue forecasts. 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 forecasts, CDM Smith reasonably relied upon the accuracy and completeness of information provided (both written and oral) by the North Texas Tollway Authority (NTTA). 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 forecasts 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 forecasts and projections reported herein are based on CDM Smith's experience and judgment and on a review of information obtained from multiple agencies, including NTTA. These forecasts and projections may not be indicative of actual or future values and are therefore subject to substantial uncertainty. Future developments, economic conditions, and travel behavior advances in automotive technology cannot be predicted with certainty and may affect the forecasts 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 or other forward-looking statements contained within the report are based on reasonable assumptions as of the date of this letter, 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 that study, 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.

CDM Smith is not, and has not been, a municipal advisor as defined in federal law (the Dodd Frank Bill) to NTTA and does not owe a fiduciary duty pursuant to Section 15B of the Exchange Act to NTTA with respect to the information and material contained in this report. CDM Smith is not recommending and has not recommended any action to NTTA. NTTA 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.