



12400 Coit Road, Suite 400
Dallas, TX 75251
tel: 214 346-2800
fax: 972 239-5340

April 15, 2019

Horatio Porter
Chief Financial Officer
North Texas Tollway Authority
5900 W. Plano Parkway, Suite 100
Plano TX 75093

Subject: NTTA System Traffic and Revenue Bringdown Letter

Dear Mr. Porter:

Pursuant to your recent request, CDM Smith is pleased to provide you with a traffic and revenue (T&R) bringdown letter for the North Texas Tollway Authority System (NTTA System). It is our understanding that this letter will support the issuance of the upcoming Series 2019 refunding bonds (referred to as the "Series 2019 Bonds") scheduled for closing in August 2019. 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 a comprehensive traffic count and travel time data collection program. 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.



In August 2018, CDM Smith completed a letter update to the comprehensive study (the “August 2018 Letter Update”) that included revised T&R forecasts for the NTTA System that incorporated the impacts of several underlying assumptions that had changed since the completion of the September 2017 Study. Additionally, the August 2018 Letter Update included sensitivity tests to assess the potential revenue impacts of NCTCOG’s recently adopted Mobility 2045 MTP.

Since the completion of the August 2018 Letter Update, the following new information has become available, which has warranted a detailed review of NTTA System T&R forecasts:

- The anticipated completion dates for several NTTA capital improvement projects have changed from those assumed in the August 2018 Letter update
- Actual TollTag penetration rates and ZipCash revenue recovery differ from what had been previously assumed in the August 2018 Letter Update
- Actual transaction and revenue data since the completion of the previous study

Key Assumptions

As part of the bringdown letter effort, the key input assumptions to the T&R forecasting process were reevaluated to determine if there were any material changes from the prior study. The review indicated that most of the assumptions either remained consistent with the August 2018 Letter Update 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 2** summarizes the additional assumptions for which deviations from the August 2018 Letter update were observed. Average TollTag share increased to 81.9 percent, compared to a rate of 80.6 percent as assumed in the August 2018 Letter Update. Conversely, average ZipCash revenue recovery (after twelve months) decreased from the previously assumed rate of 39.0 percent to 36.5 percent.

Table 1. Planned Completion Dates for Key Improvement Projects

Facility	Limits/Location	Improvement	Planned Date	
			August 2018 Letter Update	Current Study
DNT	Panther Creek Parkway	Toll ramps	March 2022	July 2022
DNT	US 380/First Street	Mainlane extension	March 2022	July 2022
PGBT	IH 35E to DNT	Mainlane expansion	December 2019	(no change)
PGBT	Belt Line to IH 35E	Mainlane expansion	July 2021	December 2021
SRT	Denton Creek to DNT	Mainlane expansion	December 2021	(no change)
SRT	DNT to US 75	Mainlane expansion	December 2021	(no change)
DNT/SRT	DNT/SRT Interchange	Interchange improvements	December 2021	(no change)
PGBT WE	Egyptian Way to IH 20	Mainlane expansion	July 2021	July 2022
PGBT WE	Conflans to Egyptian Way	Mainlane expansion	July 2021	July 2022

Table 2. Key Assumptions Changes from August 2018 Letter Update

Assumption	Planned Date	
	August 2018 Letter Update	Current Study
AVI (TollTag) Penetration	80.6%	81.9%
ZipCash Revenue Recovery Rate (after 12 months)	39.0%	36.5%

Below are additional key assumptions for the T&R forecast, none of which have changed since the completion of the August 2018 Letter Update:

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
- 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.
- 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
- 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
- Commercial vehicle transaction shares are applied on a plaza by plaza basis and remain constant throughout the forecast period
- 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

Comparison to Actual Transaction Data

In addition to reviewing the key input assumptions to the T&R forecast, a key indicator of projected impacts on revenue growth is the most recently available transaction data for the NTTA System. **Figure 1** shows a comparison of monthly transactions on the NTTA System through March 2019 compared to the forecasts included in the August 2018 Letter Update. In January, February and March 2019, actual transactions on the NTTA System exceeded the August 2018 forecast by 0.7 percent, 1.9 percent, and 0.6 percent, respectively. Total transactions for the first quarter of 2019 exceeded the forecast by 1.0 percent.

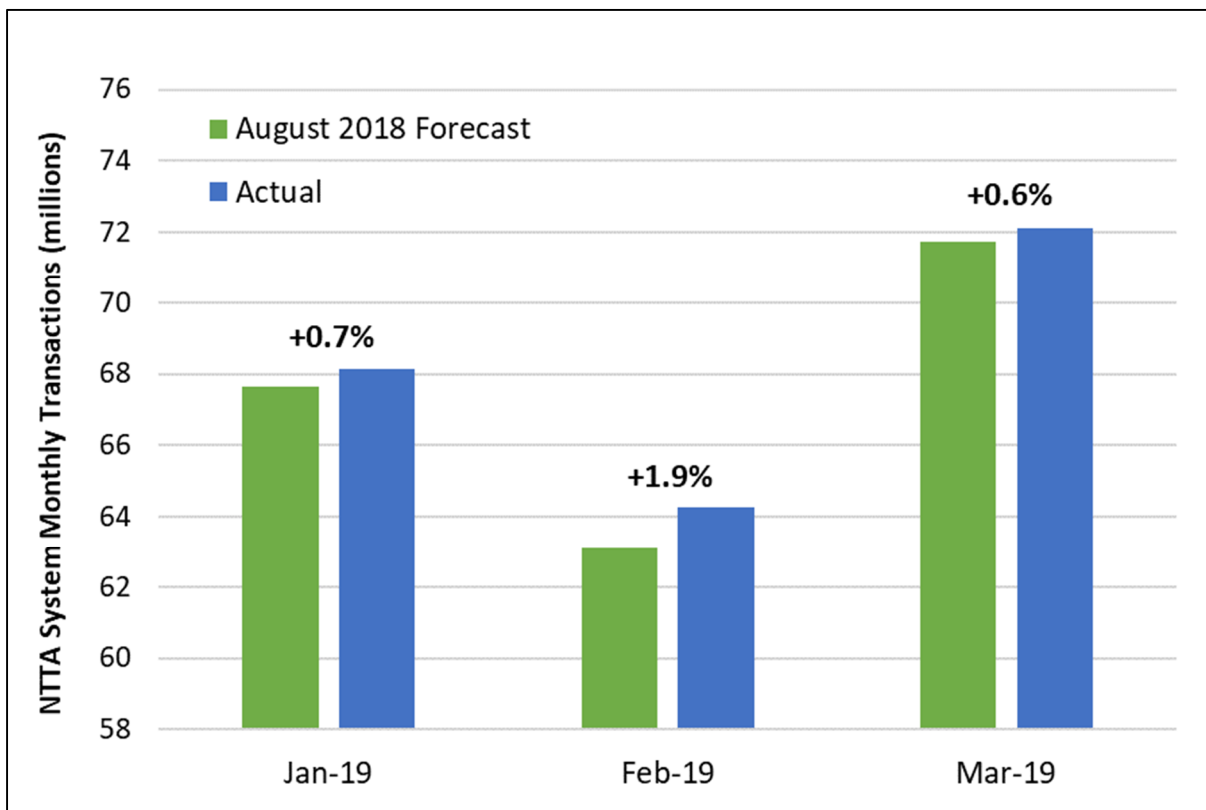


Figure 1. NTTA System Monthly Transactions Compared to August 2018 Forecast

Long-Term Traffic and Revenue Forecasts

Based upon the review of all pertinent assumptions supporting the August 2018 Letter Update, it is CDM Smith’s opinion that the resulting NTTA System T&R estimates are suitable for financing purposes. We have assessed the potential impacts of the various changes and information mentioned above and have concluded that the net effect of these changes would not cause any material negative impacts to the NTTA System T&R estimates included in the August 2018 Letter Update. Therefore, the NTTA System T&R forecasts included in the August 2018 Letter Update are appropriate for use in the support of the upcoming refunding of NTTA System revenue bonds.

The long-term NTTA System T&R forecasts from 2019 to 2066 (as included in the August 2018 Letter Update) are shown in **Figure 2** and **Table 3**. Forecasts beyond year 2040 are based on nominal assumptions regarding future traffic growth with assumed periodic toll rate increases. 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. Total revenue on the existing NTTA System is expected to increase from about \$886.8 million in 2019 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.

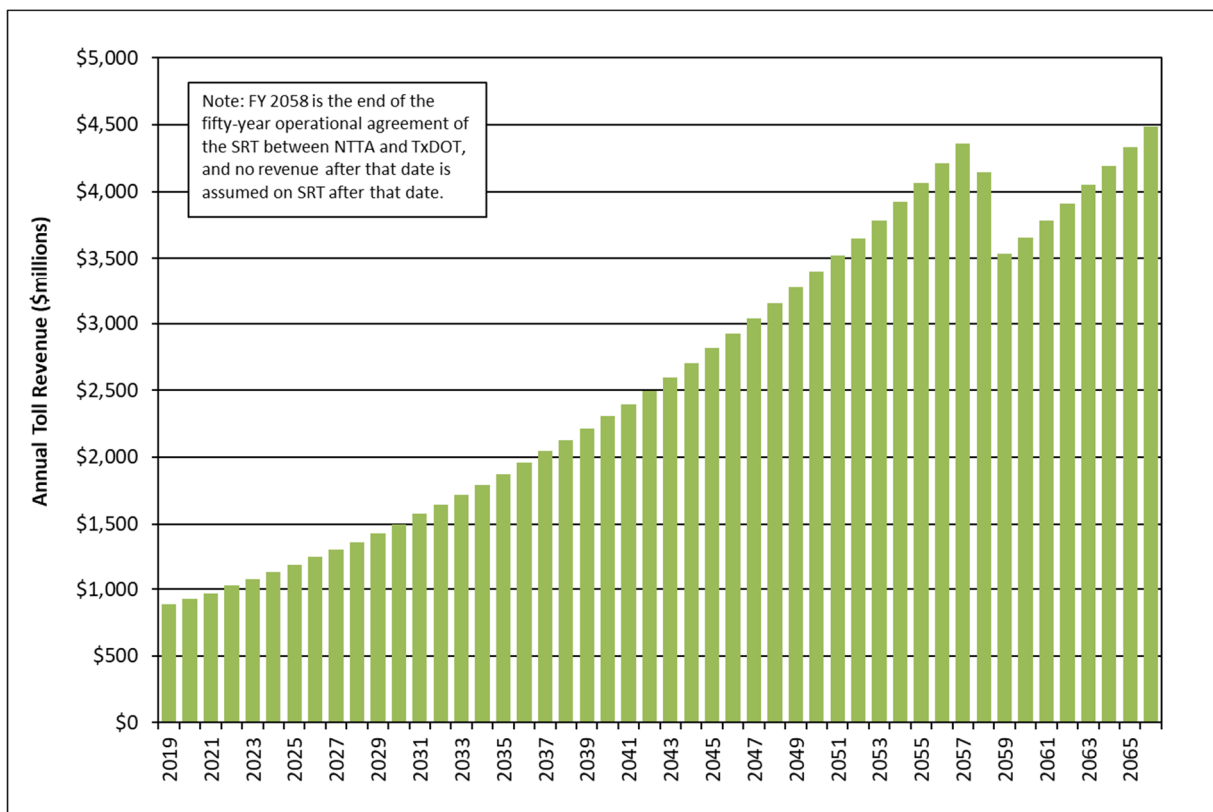


Figure 2. NTTA System Toll Revenue Forecasts

Table 3. NTTA System Annual Toll Transactions and Revenue Forecasts

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

Conclusion and Recommendations

CDM Smith reviewed the actual traffic trends on all NTTA System facilities and the underlying assumptions as compared to the assumptions used to develop the previous forecasts in the August 2018 Letter Update. CDM Smith has concluded that observed recent transactions trends and changes to the underlying assumptions would not result in lower NTTA System T&R forecasts than those developed as part of the August 2018 Letter Update. Therefore, the NTTA System T&R forecasts from the August 2018 Letter Update (as shown in **Table 3** of this letter) are appropriate for supporting the upcoming Series 2019 Bonds.

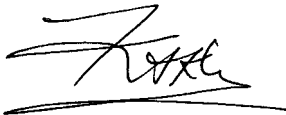
As the NTTA System continues to mature, the state of the North Texas economy, population and employment growth, specifically along the NTTA System corridors, will be critical to the transactions and revenue growth on NTTA System facilities. Other important factors that will continue to have a material 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 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

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 changes related to 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.