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March 22, 2021

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Chief Financial Officer  
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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 NTTA System. It is our understanding that this letter will support the issuance of the Series 2021A and Series 2021B bonds and refinancing of the 360 Tollway Project Loan, thereby incorporating 360 Tollway into the NTTA System. This transaction is currently scheduled for closing in May 2021. 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 2020 (the "September 2020 T&R Study"). The current Metropolitan Transportation Plan (MTP), entitled Mobility 2045, was adopted on June 14, 2018 by the Regional Transportation Council. Mobility 2045 was developed by the North Central Texas Council of Governments (NCTCOG) and is the regional transportation plan for the Dallas-Fort Worth (DFW) area. Mobility 2045 was used as the basis for the September 2020 T&R Study. The Mobility 2045 travel demand model roadway networks were reviewed and updated to accurately reflect existing roadway characteristics along and near NTTA System corridors. Additionally, the September 2020 T&R Study included an assessment of current economic conditions, observed and assumed COVID-19 impacts, and other key factors influencing forecasted T&R on NTTA System facilities. That study also included an independent review of the Mobility 2045 demographics (population and employment forecasts) along NTTA System corridors as well as comprehensive traffic count and travel time data collection for model calibration/validation purposes. The T&R forecasts included in the September 2020 T&R 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 2020 T&R Study, the following new information has become available, which has warranted changes to the NTTA System T&R forecasts:

- NTTA intends on incorporating 360 Tollway into the NTTA System
- 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

This letter incorporates the above new information and includes updates to the NTTA System T&R forecasts from years 2021 through 2069.

The remainder of this letter covers the following topics:

- Updated key assumptions
- Inclusion of 360 Tollway T&R as part of the NTTA System T&R
- Updated assessment of short-term and long-term effects of the COVID-19 pandemic
- Updated long-term T&R forecasts
- Conclusion and recommendations

## Key Assumptions

As part of this 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 2020 T&R 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	
			Sept 2020 T&R Study	Current Study
CTP	FM 1187 to US 67	Mainlane expansion	Dec 2030	Dec 2028
DNT	Panther Creek Parkway	Toll ramps	Dec 2022	Feb 2023
DNT	US 380 to First Street	Mainlane extension	Dec 2022	Feb 2023
DNT	FM 428 to Grayson/Denton County line	Frontage road extension	Dec 2022	Aug 2022
DNT	SRT to US 380	Mainlane expansion	Jul 2025	No Change
DNT	First Street to FM 428 (Phase 4A)	Mainlane extension	Jul 2028	Dec 2027
DNT	FM 428 to Grayson County (Phase 4B)	Mainlane extension	Dec 2030	Dec 2031
DNT/SRT	DNT/SRT Interchange	Interchange improvement	Dec 2021	No Change
PGBT	IH 35E to Belt Line Road	Mainlane expansion	Dec 2021	No Change
PGBT-WE	SH 183 to IH 30	Mainlane expansion	Jul 2022	Dec 2021
PGBT-WE	IH 30 to IH 20	Mainlane expansion	Jul 2022	Dec 2021
PGBT-WE/360T	"Elbow" connection from PGBT-WE to 360T	Interchange improvement	Dec 2028	No Change
SRT	Denton Creek to DNT	Mainlane expansion	Dec 2021	No Change
SRT	DNT to US 75	Mainlane expansion	Dec 2021	No Change

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 (note: the term “NTTA System” as used for the remainder of this document is inclusive of 360 Tollway):

**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
- DNT’s Panther Creek Parkway Ramps – new ramp toll gantries near the northern terminus of DNT; assumed to be complete by February 28, 2023
- DNT mainlane extension north of US 380 to First Street assumed to be completed and open to traffic by February 28, 2023
- DNT Extension Phase 4A mainlanes between First Street and FM 428 open by December 31, 2027
- DNT Extension Phase 4B southbound frontage road between FM 428 and the Grayson County line is assumed to open by August 31, 2022, with mainlanes assumed to open by December 31, 2031
- Expansion of PGBT from three lanes to four lanes per direction from Belt Line to IH 35E is assumed to be completed by December 31, 2021
- 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.
- Capacity improvements on CTP from FM 1187 to US 67 from one lane to two lanes per direction are assumed to be completed by December 31, 2028.
- By December 31, 2021 PGBT-WE mainlanes from north of Egyptian Way to IH 20 will be expanded from two to three mainlanes in each direction, and PGBT-WE mainlanes from Conflans to north of Egyptian Way will be restriped to four main lanes in each direction
- SH 190/East Branch from IH 30/PGBT EE to IH 20/Loop 9 opens as a six-lane tollway by December 31, 2032
- 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 36.3 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 76.6 percent in 2022. The following are the assumed AVI shares for 2022, shown separately for each facility:

DNT	77.9%
PGBT	75.5%
SRT	79.3%
PGBT EE	76.0%
AATT	76.7%
MCLB	54.4%
LLTB	76.3%
PGBTWE	66.9%
CTP	81.2%
360 Tollway	75.2%
<b>NTTA System</b>	<b>76.6%</b>

- SRT is expected to be returned to TxDOT at the end of August 2058
- Multiple project agreements between NTTA and TxDOT include provisions for revenue sharing:
  - **PGBT-EE:** 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
  - **PGBT-WE:** revenue sharing on PGBT-WE is to begin in 2061 per the project agreement. However, the total amount to be shared is based upon net revenue and is not accounted for in the gross toll revenue forecast included in this report
  - **360 Tollway:** per the project agreement with TxDOT, a 50%/50% revenue split between NTTA and TxDOT is assumed beginning on January 1, 2053 through the end of the forecast period
  - **SRT:** revenue sharing is determined based on minimum threshold revenues, above which a specified portion of revenue is shared with TxDOT. The minimum thresholds for revenue sharing are not assumed to be met during the forecast period, and as such, SRT revenue sharing is not assumed in the T&R forecast

### CDM Smith Assumptions

- Background network for travel demand modeling is based on NCTCOG's Mobility 2045
- SH 161 between SH 183 and Belt Line Road 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 2045 demographics, updated to reflect the independent economic review completed by Research and Demographic Solutions (RDS) in 2020
- 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 to 79.8 percent in 2030, 82.1 percent in 2040, 83.3 percent in 2050 and 83.9 percent in 2060 and thereafter
- Commercial vehicle transaction shares are applied on a plaza-by-plaza basis and averages for each facility for 2019 are as shown below. It is assumed that these truck shares remain constant throughout the forecast period:

DNT	1.6%
PGBT	3.1%
SRT	3.7%
PGBT-EE	3.2%
AATT	1.1%
MCLB	1.8%
LLTB	3.0%
PGBT-WE	6.8%
CTP	3.5%
360 Tollway	3.9%
<b>NTTA System</b>	<b>3.0%</b>

- 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 2020 T&R Study
- Growth in traveler values of time will not significantly deviate from the assumed rates in the September 2020 T&R Study
- No local, regional, or national emergency or pandemic will arise which would abnormally restrict the use of the transportation infrastructure

### **Incorporation of 360 Tollway**

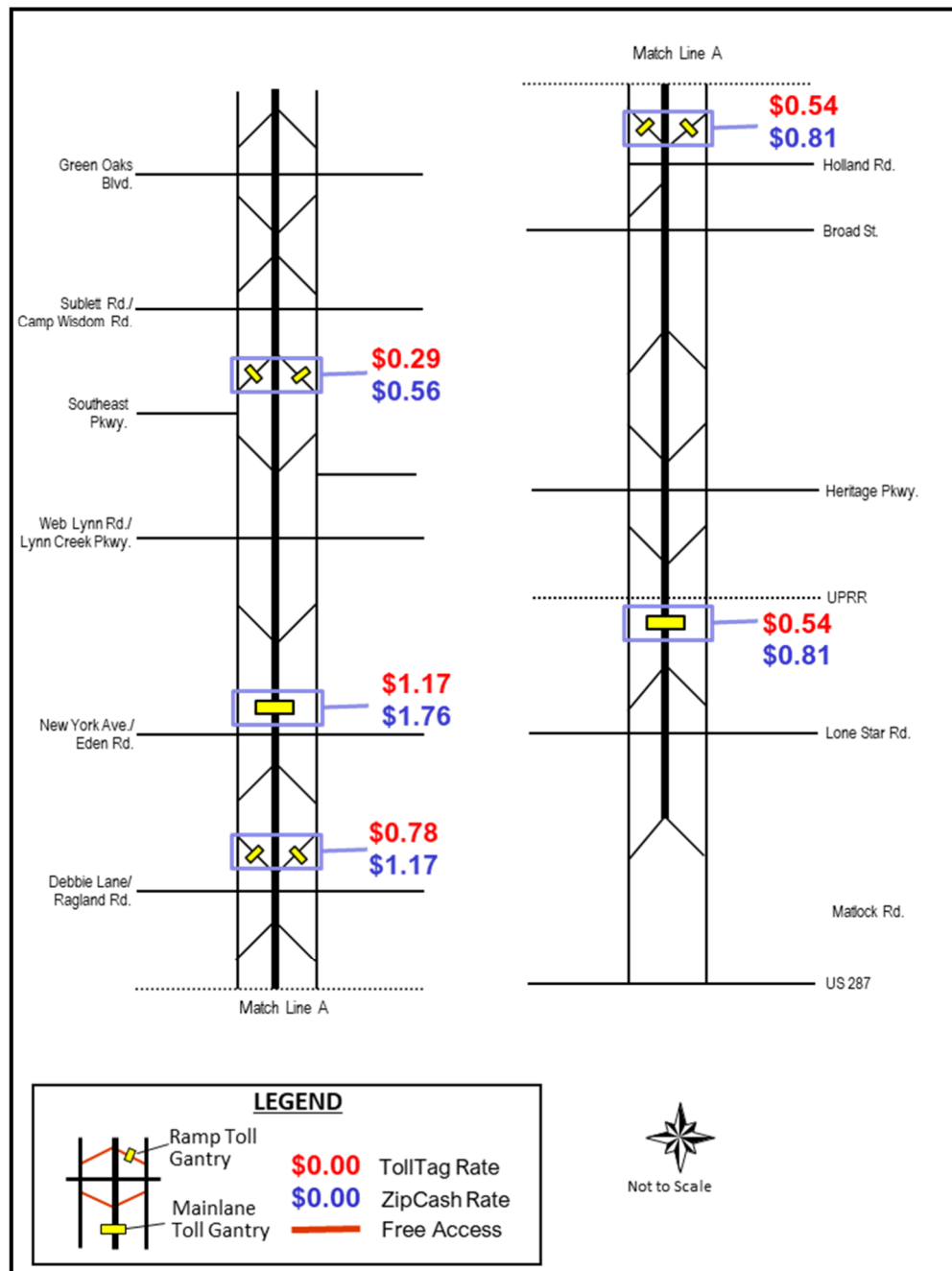
As part of the current study, long-term traffic and revenue forecasts were developed for 360 Tollway utilizing the same input data and travel demand model used in the September 2020 T&R Study. Additional adjustments were made to the forecast to reflect recent transaction and revenue trends, and the long-term traffic and revenue estimates for 360 Tollway are included as part of the NTTA System forecast included in this report.

The 360 Tollway is a 9.7-mile toll road between Camp Wisdom Road/Sublett Road in southern Tarrant County and SH 287 in northwestern Ellis County and northeastern Johnson County. Built as a public/public partnership between the Texas Department of Transportation and NTTA, 360 Tollway opened to traffic on May 11, 2018. Tolls are currently collected on 360 Tollway at two mainlane gantries and six ramp gantries as shown in **Figure 1**. The mainlane gantries are located near New York Avenue and Heritage Parkway. The ramp gantries are located at Holland Road, Debbie Lane, and Southeast Parkway. The current toll rates as shown in **Figure 1** are effective through June 30, 2021. In 2019, there were approximately 19 million transactions on 360 Tollway, which equated to roughly two percent of total NTTA System transactions for the year.

Traffic count data was collected across three screenlines in the 360 Tollway corridor in 2019 as shown in **Figure 2** as well as on the non-tolled ramps of 360 Tollway. Five total screenlines were analyzed, of which four screenlines run across (corresponding to two mainlane gantries and two running across each terminus) and one parallel to the facility. The resulting traffic profile for 360 Tollway is shown in **Figure 3**. As shown in the figure traffic demand on 360 Tollway is much higher in both directions at the northern end of the facility than the southern end. The highest volumes were observed near New York Avenue, while the lowest volumes were observed near Heritage Parkway.

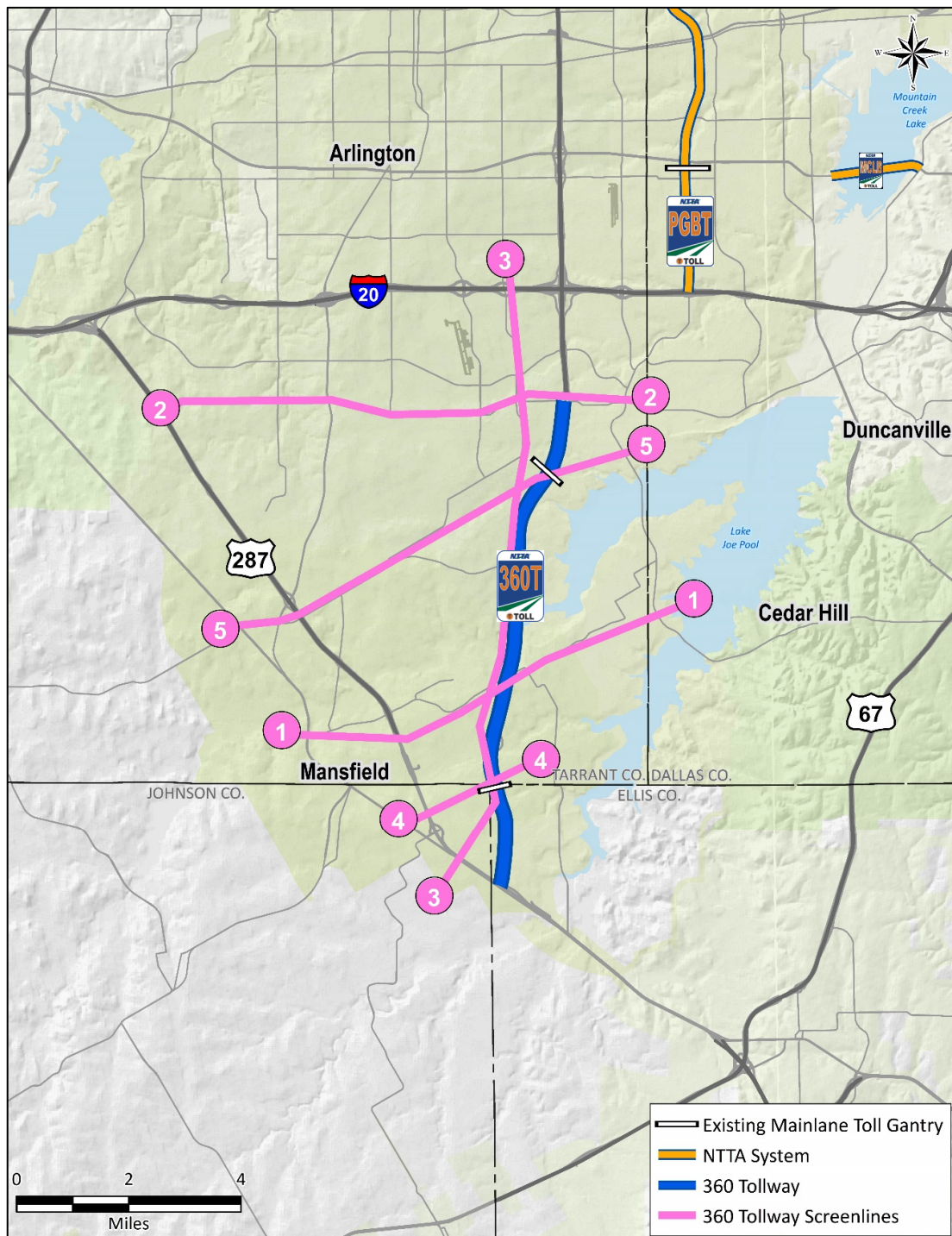
Using the traffic count data collected in the 360 Tollway corridor, the travel demand model was calibrated for the 2018 base year scenario to ensure that it reasonably replicated existing conditions in the project area. The traffic count data, which was collected in 2019, was adjusted downwards to represent 2018 traffic levels. The calibration results indicate that the model output for the 360 Tollway fall within the NCHRP 255 acceptable ranges as summarized in the September 2020 T&R Study. The calibrated model was then used to develop a baseline 360 Tollway T&R forecast that was incorporated into the NTTA System T&R forecast as part of this update.

A toll sensitivity analysis was conducted for 360 Tollway for the years 2018, 2028 and 2045, and the resulting daily toll sensitivity curves are illustrated in **Figure 4**. The planned average two-axle vehicle AVI toll rates are included on each of the toll sensitivity curves for reference. The results indicate that the planned toll rates are below the revenue maximization points, demonstrating that, if needed, there is potential for revenue enhancement through toll increases above those assumed for traffic and revenue forecasting purposes.



**Figure 1. Current (through June 2021) 360 Tollway Toll Collection System and Passenger Car Toll Rates**





**Figure 2. 360 Tollway Screenlines**



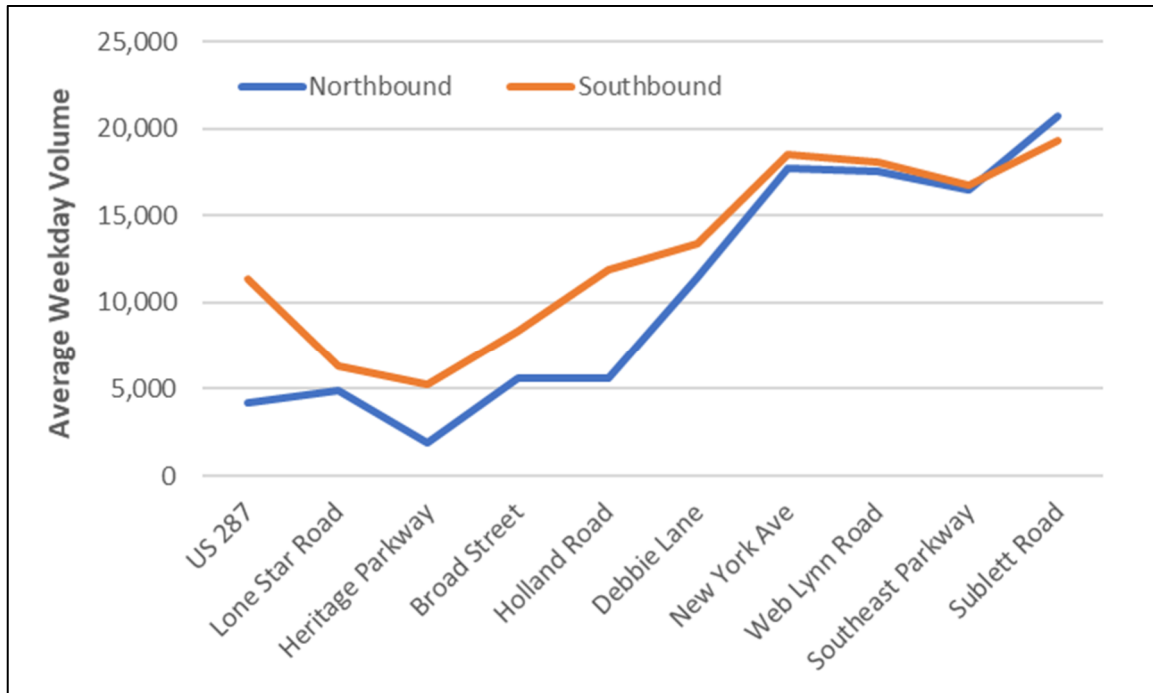


Figure 3. 360 Tollway Traffic Volume Profile (2019)

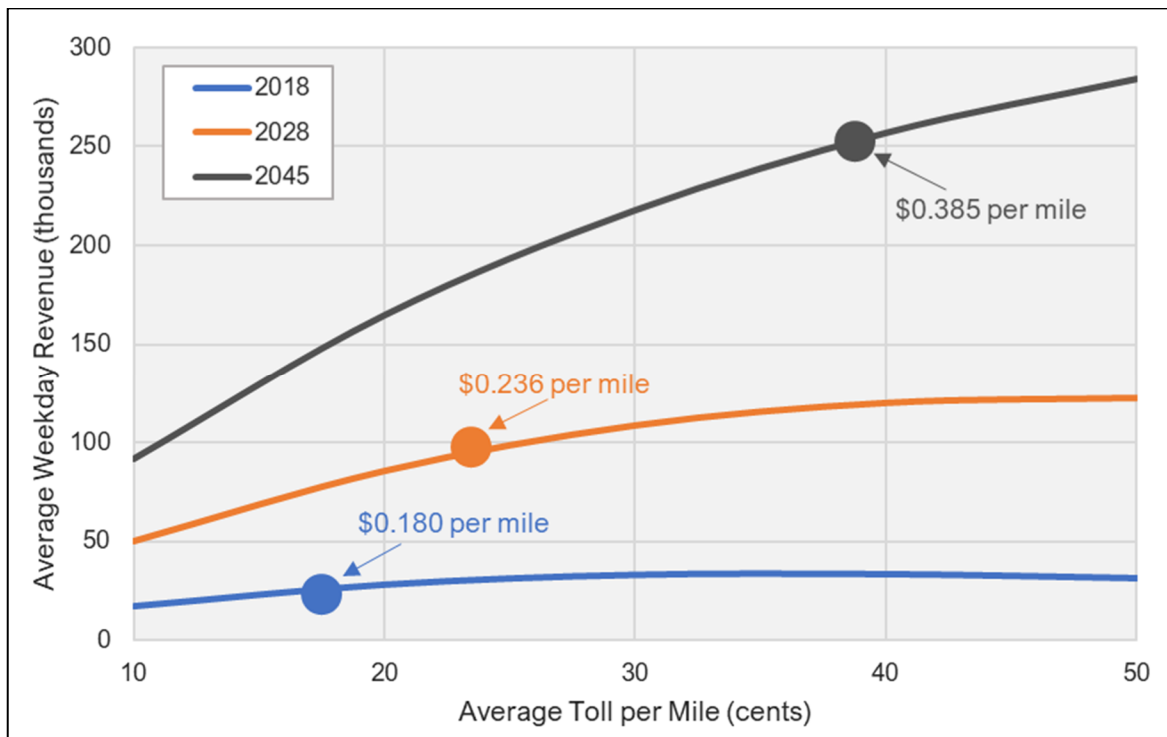
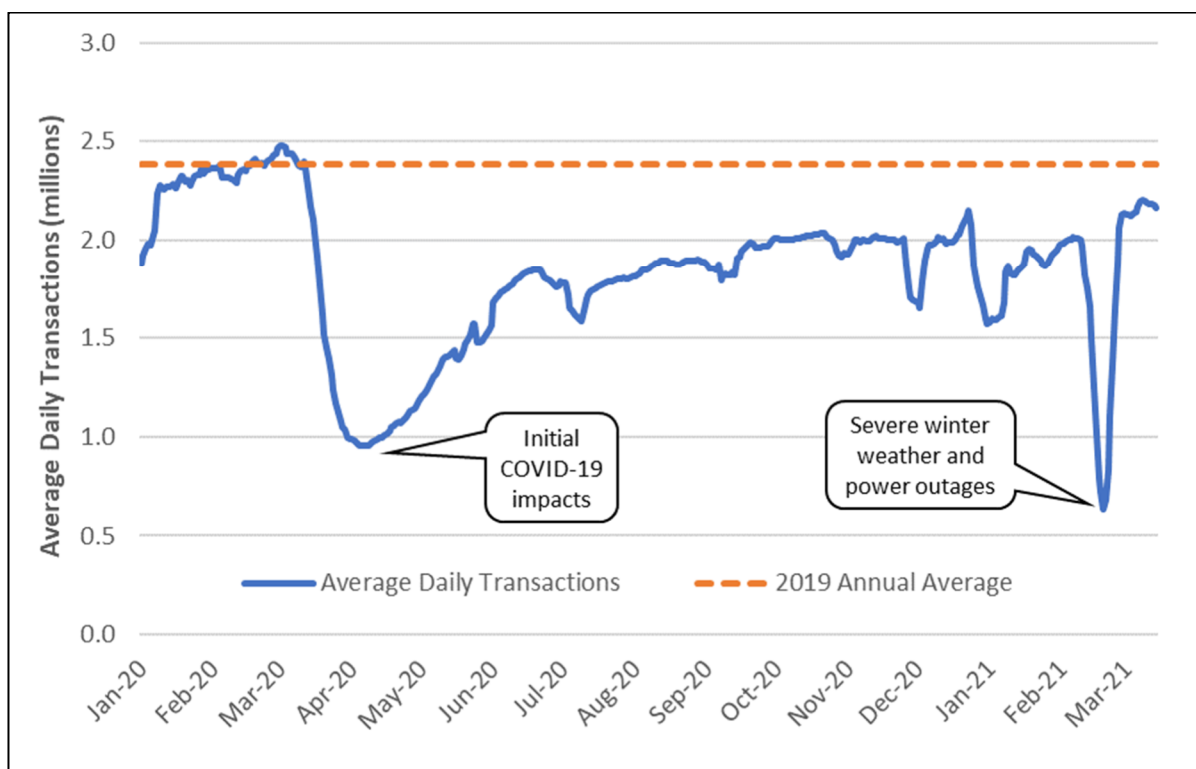


Figure 4. 360 Tollway Toll Sensitivity

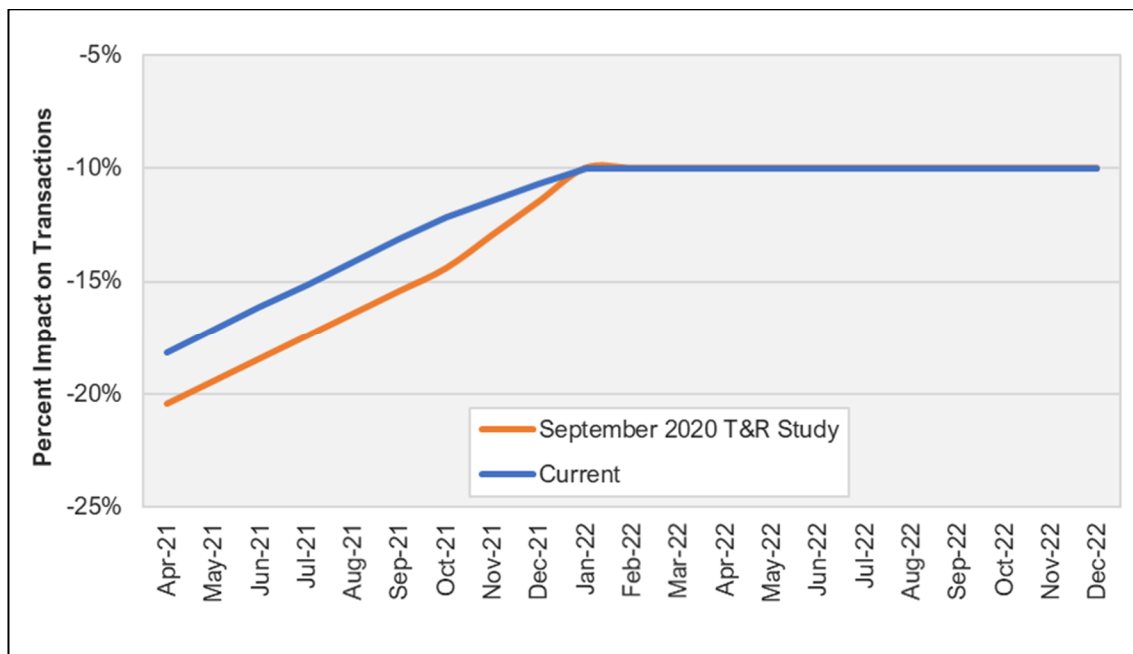
## Ongoing COVID-19 Impacts

Changes in travel behaviors as a result of the COVID-19 pandemic have continued to have a material impact on NTTA System demand. **Figure 5** shows the average daily transactions on the NTTA System since January 2020 compared to the average annual daily transactions for 2019. After falling sharply in April 2020, transactions grew steadily through the summer. Growth continued through the fall, but at a smaller rate. With the exception of a severe weather event in February, traffic on the system has seen improved growth and recovery in early 2021, with transactions in early March reaching levels just ten percent below 2019 averages.

Because the travel demand model used to develop the baselines forecasts was calibrated using pre-COVID-19 data, it would not be representative of both short-term and long-term impacts of COVID-19 on the NTTA system. To account for this, the impacts to travel demand attributable to the COVID-19 pandemic were estimated and then applied to model outputs based on the recovery timeline or “impact curve,” as shown in **Figure 6**. This impact curve was developed as part of the September 2020 T&R Study and revised as part of the current update based upon assumptions about the depth, duration and recovery from the COVID-19 global pandemic. By December 2021, passenger car traffic is expected to recover gradually to ten percent below previous expectations. Beyond 2021, residual economic impacts are assumed to account for the longer-term effects of the crisis, including potential recessionary impacts, increases in telecommuting, and reductions in tourism and other recreational trips.



**Figure 5. NTTA System Transactions (moving 7-day average)**



**Figure 6. NTTA System COVID-19 Recovery Assumption**

### Updated Long-Term Traffic and Revenue Forecasts

The updated long-term T&R forecasts for each NTTA System facility from 2021 to 2069 are shown in **Table 2** and **Figure 7**. 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 2020 T&R Study.

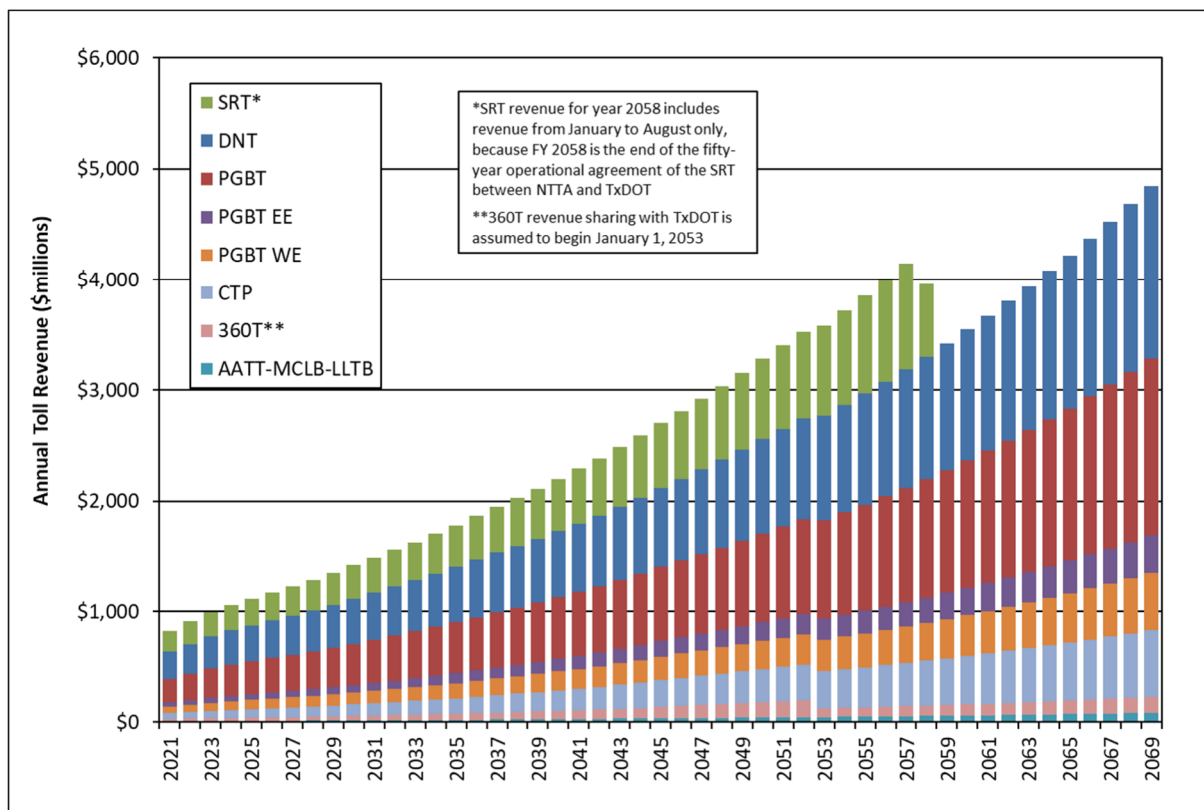
The projections extend from 2021 through 2069, and include the revenue forecasts for DNT, PGBT, PGBT EE, PGBT WE, SRT, CTP, AATT, MCLB, LLTB, and 360 Tollway. In each case, forecasts for each of the facilities are based on modeled traffic forecasts at each toll collection location, through the year 2045. 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 2045 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 NTTA System is expected to increase from \$820.6 million in 2021 to \$1.417 billion by 2030 and \$2.203 billion by 2040. Revenue 360 Tollway is expected to be \$17.9 million in 2021, increasing to \$39.0 million by 2030 and \$74.3 million by 2040. Over the 49-year forecast period, 360 Tollway is expected to generate approximately three percent of total NTTA System revenue.

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

Year	DNT	PGBT	PGBT EE <sup>(1)</sup>	PGBT WE	SRT <sup>(2)</sup>	CTP	360T <sup>(3)</sup>	AATT-MCLB-LLTB	NTTA System
2021	\$249.1	\$211.0	\$37.8	\$52.9	\$181.9	\$58.5	\$17.9	\$11.5	\$820.6
2022	\$269.1	\$237.2	\$40.5	\$63.8	\$205.5	\$61.4	\$20.4	\$12.2	\$910.1
2023	\$294.4	\$263.4	\$44.7	\$72.9	\$216.5	\$66.2	\$23.0	\$13.2	\$994.4
2024	\$312.1	\$280.4	\$48.3	\$81.2	\$228.7	\$70.7	\$25.1	\$14.1	\$1,060.6
2025	\$326.4	\$294.2	\$51.1	\$86.6	\$239.9	\$75.3	\$27.1	\$14.7	\$1,115.3
2026	\$341.7	\$308.8	\$54.0	\$92.1	\$251.7	\$80.3	\$29.2	\$15.4	\$1,173.2
2027	\$357.4	\$323.0	\$56.9	\$93.5	\$263.5	\$85.5	\$31.5	\$16.1	\$1,227.5
2028	\$372.9	\$338.4	\$60.0	\$95.8	\$276.1	\$91.1	\$34.1	\$16.8	\$1,285.2
2029	\$388.3	\$354.2	\$63.2	\$101.1	\$289.1	\$97.5	\$36.5	\$17.5	\$1,347.6
2030	\$406.7	\$371.5	\$66.7	\$107.3	\$303.1	\$104.6	\$39.0	\$18.4	\$1,417.2
2031	\$424.0	\$388.8	\$70.4	\$113.5	\$318.0	\$110.9	\$41.8	\$19.1	\$1,486.5
2032	\$443.9	\$405.1	\$74.0	\$118.9	\$333.0	\$117.4	\$44.8	\$20.0	\$1,557.0
2033	\$461.8	\$421.5	\$82.5	\$124.6	\$348.5	\$124.4	\$47.8	\$20.8	\$1,631.9
2034	\$480.8	\$439.1	\$86.9	\$130.6	\$364.9	\$132.0	\$51.1	\$21.8	\$1,707.2
2035	\$499.9	\$457.1	\$91.3	\$136.5	\$382.2	\$139.7	\$54.6	\$22.7	\$1,784.1
2036	\$520.6	\$476.5	\$95.9	\$142.8	\$400.5	\$148.1	\$58.3	\$23.8	\$1,866.5
2037	\$541.4	\$494.6	\$100.5	\$149.1	\$417.8	\$157.8	\$62.4	\$24.8	\$1,948.5
2038	\$561.3	\$513.7	\$104.8	\$155.9	\$435.9	\$166.9	\$66.1	\$25.9	\$2,030.4
2039	\$581.4	\$533.2	\$109.1	\$162.8	\$454.6	\$176.1	\$70.0	\$27.1	\$2,114.3
2040	\$602.8	\$554.0	\$113.6	\$170.1	\$474.0	\$186.0	\$74.3	\$28.3	\$2,203.2
2041	\$623.6	\$574.5	\$118.4	\$177.5	\$494.6	\$196.2	\$78.6	\$29.6	\$2,292.9
2042	\$645.9	\$596.4	\$123.3	\$185.4	\$516.2	\$207.1	\$83.1	\$31.0	\$2,388.3
2043	\$668.7	\$618.7	\$128.4	\$193.9	\$539.4	\$218.6	\$88.0	\$32.3	\$2,488.2
2044	\$693.3	\$642.7	\$133.8	\$203.0	\$563.8	\$231.1	\$93.3	\$33.7	\$2,594.7
2045	\$717.8	\$667.1	\$139.5	\$211.9	\$587.6	\$243.8	\$103.8	\$35.2	\$2,706.6
2046	\$742.6	\$693.0	\$144.9	\$219.9	\$612.4	\$254.6	\$110.0	\$36.7	\$2,814.1
2047	\$767.3	\$719.2	\$150.5	\$228.4	\$638.7	\$265.4	\$116.1	\$38.2	\$2,923.8
2048	\$793.5	\$746.9	\$156.1	\$237.4	\$666.3	\$276.9	\$122.7	\$39.8	\$3,039.7
2049	\$819.8	\$775.4	\$162.1	\$245.9	\$694.7	\$288.5	\$129.6	\$41.4	\$3,157.3
2050	\$847.7	\$805.9	\$168.2	\$254.9	\$724.5	\$301.0	\$137.0	\$43.1	\$3,282.2
2051	\$875.7	\$835.2	\$174.7	\$264.4	\$753.4	\$312.1	\$142.4	\$44.7	\$3,402.5
2052	\$905.3	\$866.1	\$181.3	\$274.6	\$783.4	\$323.9	\$148.0	\$46.4	\$3,528.9
2053	\$935.6	\$897.1	\$188.2	\$285.0	\$815.7	\$336.0	\$76.8	\$48.1	\$3,582.4
2054	\$967.9	\$930.0	\$195.3	\$296.0	\$849.4	\$349.0	\$79.7	\$49.8	\$3,717.2
2055	\$999.7	\$963.6	\$202.9	\$307.1	\$883.2	\$362.0	\$82.7	\$51.7	\$3,852.9
2056	\$1,033.6	\$999.5	\$210.7	\$318.9	\$918.4	\$375.9	\$85.9	\$53.7	\$3,996.6
2057	\$1,067.7	\$1,035.4	\$218.7	\$330.7	\$955.4	\$389.9	\$89.2	\$55.6	\$4,142.5
2058	\$1,104.0	\$1,073.8	\$227.0	\$343.3	\$658.5	\$405.0	\$92.8	\$57.6	\$3,962.0
2059	\$1,141.0	\$1,112.6	\$235.6	\$356.4	\$0.0	\$419.9	\$96.3	\$59.7	\$3,421.6
2060	\$1,180.3	\$1,153.9	\$244.4	\$370.3	\$0.0	\$435.9	\$100.1	\$62.0	\$3,546.9
2061	\$1,219.4	\$1,195.7	\$253.8	\$383.8	\$0.0	\$452.2	\$103.8	\$64.2	\$3,673.0
2062	\$1,260.6	\$1,239.9	\$263.4	\$398.1	\$0.0	\$469.8	\$107.7	\$66.6	\$3,806.0
2063	\$1,301.6	\$1,284.4	\$273.4	\$412.9	\$0.0	\$487.0	\$111.7	\$69.0	\$3,940.0
2064	\$1,342.4	\$1,331.6	\$283.7	\$428.7	\$0.0	\$505.6	\$115.9	\$71.6	\$4,079.5
2065	\$1,382.9	\$1,379.6	\$294.6	\$444.8	\$0.0	\$524.4	\$120.3	\$74.2	\$4,220.9
2066	\$1,426.0	\$1,430.4	\$305.9	\$462.0	\$0.0	\$544.6	\$125.0	\$76.9	\$4,370.8
2067	\$1,469.3	\$1,482.1	\$317.6	\$479.1	\$0.0	\$564.9	\$129.6	\$79.8	\$4,522.4
2068	\$1,514.7	\$1,536.1	\$329.6	\$497.1	\$0.0	\$586.6	\$134.5	\$82.8	\$4,681.3
2069	\$1,560.6	\$1,591.6	\$342.0	\$515.6	\$0.0	\$608.5	\$139.5	\$85.8	\$4,843.6

- (1) NTTA's share of the revenue collected from PGBT EE.
- (2) 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
- (3) Revenue sharing agreement with TxDOT (50%/50%) is assumed to begin January 1, 2053



**Figure 7. Updated NTTA System Toll Revenue Forecast**

The estimated annual transactions and toll revenue for the NTTA System are shown in **Table 3**. Total revenue on the NTTA System is expected to increase from about \$820.6 million in 2021 to \$1.417 billion in 2030 and \$2.203 billion in 2040. 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 \$3 billion per year by 2048. When compared to the September 2020 T&R Study, the total projected revenue for the NTTA System (excluding 360 Tollway) is 3.4 percent higher for 2021, 0.4 percent higher for 2022, and is 0.1 percent or less different for all remaining years.

**Table 4** shows the projected annual transaction and revenue growth rates on the NTTA System. Annual transaction and revenue growth rates from 2021 through 2030 are equal to 3.2 percent and 6.3 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 as well as continued COVID-19 recovery. Revenue growth during this period includes traffic growth, toll rate growth and improvements to AVI transaction shares. Annual transaction and revenue growth rates from 2030 through 2040 are equal to 1.6 percent and 4.5 percent, respectively. The growth rates for transactions and revenue between 2040 and 2050 drop to 1.2 percent and 4.1 percent, respectively.

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

Year	Toll Transactions	Toll Revenue	Year	Toll Transactions	Toll Revenue
2021	768,783,900	\$820,626,300	2046	1,295,776,400	\$2,814,141,200
2022	825,386,400	\$910,127,400	2047	1,309,530,000	\$2,923,780,600
2023	878,961,700	\$994,356,600	2048	1,323,427,600	\$3,039,716,700
2024	909,678,300	\$1,060,613,200	2049	1,337,773,200	\$3,157,323,200
2025	929,240,900	\$1,115,259,500	2050	1,352,185,200	\$3,282,192,000
2026	949,160,100	\$1,173,169,200	2051	1,364,215,100	\$3,402,515,900
2027	967,058,000	\$1,227,491,500	2052	1,376,000,200	\$3,528,939,000
2028	980,121,500	\$1,285,179,200	2053	1,388,267,300	\$3,582,401,600
2029	1,000,547,300	\$1,347,603,700	2054	1,400,538,600	\$3,717,151,900
2030	1,021,995,700	\$1,417,159,300	2055	1,412,955,900	\$3,852,939,500
2031	1,043,226,800	\$1,486,549,000	2056	1,425,565,300	\$3,996,573,700
2032	1,060,551,300	\$1,557,027,400	2057	1,438,072,700	\$4,142,536,900
2033	1,080,203,600	\$1,631,937,000	2058	1,347,220,200	\$3,961,994,100
2034	1,097,493,300	\$1,707,198,400	2059	1,152,521,300	\$3,421,631,300
2035	1,114,909,100	\$1,784,059,300	2060	1,161,892,300	\$3,546,865,700
2036	1,132,565,300	\$1,866,536,100	2061	1,171,369,900	\$3,673,028,300
2037	1,149,743,800	\$1,948,472,900	2062	1,180,722,300	\$3,805,964,300
2038	1,164,859,800	\$2,030,358,200	2063	1,189,866,900	\$3,940,006,300
2039	1,180,292,500	\$2,114,300,700	2064	1,198,393,400	\$4,079,525,900
2040	1,195,767,800	\$2,203,167,200	2065	1,207,350,000	\$4,220,946,000
2041	1,211,483,500	\$2,292,925,300	2066	1,216,339,000	\$4,370,779,600
2042	1,227,489,900	\$2,388,314,500	2067	1,225,484,800	\$4,522,405,600
2043	1,243,894,600	\$2,488,204,700	2068	1,234,527,700	\$4,681,326,900
2044	1,260,431,800	\$2,594,747,600	2069	1,243,587,700	\$4,843,555,800
2045	1,282,201,000	\$2,706,618,000	<b>Total</b>	<b>57,629,630,900</b>	<b>\$132,660,244,200</b>

**Table 4. NTTA System Transactions and Revenue Annual Growth**

Period	Annual Transaction Growth (%)	Annual Revenue Growth (%)
2021-2030	3.2	6.3
2030-2040	1.6	4.5
2040-2050	1.2	4.1



**Conclusion and Recommendations**

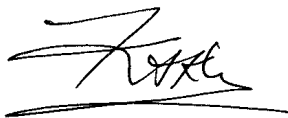
The state of the North Texas economy, along with anticipated population and employment growth, specifically along the NTTA System corridors, are critical to the transactions and revenue on NTTA System facilities. Other important factors that will continue to have a material impact on the NTTA System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

- Ongoing COVID-19 impacts and assumed future COVID-19 impacts
- 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 2020 T&R Study, the NTTA System T&R forecasts included in **Table 3** in this letter are appropriate to support the issuance of the upcoming refunding bonds.

We 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 estimates. However, as with any forecast, 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 the North Texas Tollway Authority. CDM Smith also relied upon the reasonable assurances of other 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; 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 the North Texas Tollway Authority. 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.

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