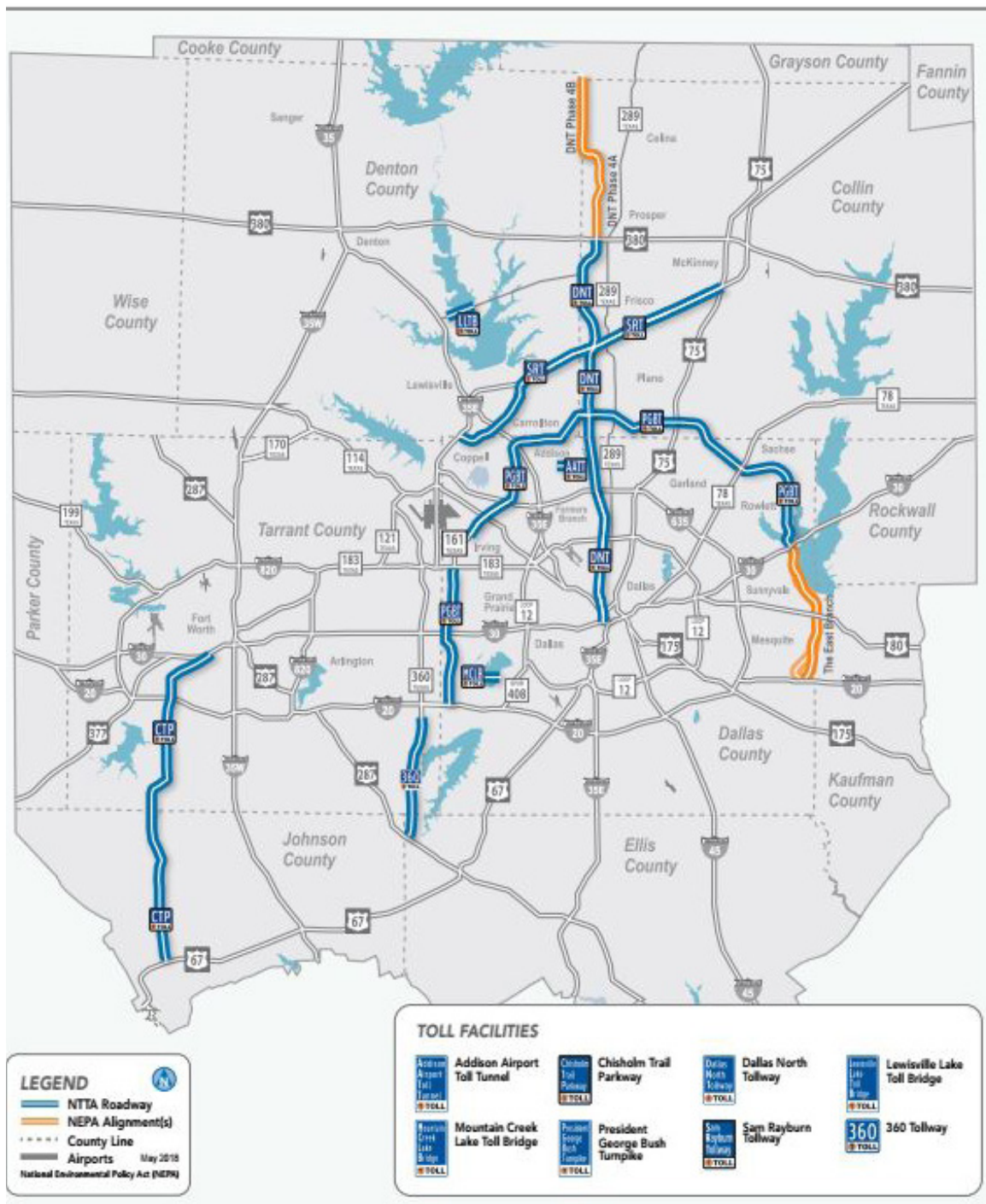


# ANNUAL INSPECTION REPORT SYSTEM

Fiscal Year 2019





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September 30, 2019

James Hofmann  
Executive Director  
North Texas Tollway Authority  
5900 W. Plano Parkway  
Plano, Texas 75093

Dear Mr. Hofmann:

As General Engineering Consultant to the North Texas Tollway Authority and in accordance with the requirements set forth in the NTTA System Amended and Restated Trust Agreement Section 504, Atkins North America, Inc. (Atkins) is pleased to submit the Fiscal Year 19 (FY19) System Annual Inspection Report.

Atkins completed the System inspections in September 2019 and reports that the system's Tollways, Toll Bridges, and Toll Tunnel have been maintained in good repair, working order and condition. This observation was based on a general visual inspection of the roadway, walls, bridges, tunnel, and facilities. Results of the inspections are presented in greater detail within this report. A complete list of findings has been transmitted to the Maintenance Department under a separate cover.

Atkins recommends that the Authority continue to implement the routine maintenance as budgeted and scoped, and to also implement the planned major maintenance projects planned for the ensuing fiscal year. Through coordination with NTTA staff and review of the anticipated Reserve Maintenance Projects scheduled for FY20, the following budgets, to be presented at the October 3, 2019, Finance and Audit Committee meeting and subject to Board approval at the December board meeting, are recommended:

Operation and Maintenance Fund (OMF): \$195.5 million  
Reserve Maintenance Fund (RMF): \$ 61.4 million

The overall condition of the Tollways, Toll Bridges, and Toll Tunnel, along with the appropriate funding levels for the System operating budgets, exemplifies the North Texas Tollway Authority's commitment to maintain and operate a safe and reliable toll road system in the North Texas region.

Respectfully submitted,

Tammy B. Sims, PE  
General Engineering Consultant  
Project Director

cc: Elizabeth Mow, PE, NTTA (w/1 copy)  
Mark Pavageau, PE, NTTA (w/1 copy)  
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File

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## Acronyms and Abbreviations

AATT	Addison Airport Toll Tunnel
BRINSAP	Bridge Inventory Inspection and Appraisal Program
CMU	Concrete Masonry Unit
COSS	Cantilever Overhead Sign Support
CR	County Road
CTP	Chisholm Trail Parkway
DNT	Dallas North Tollway
FY	Fiscal Year
GASB	Governmental Accounting Standards Board
GEC	General Engineering Consultant
HMIP	High-Mast Illumination Pole
IH	Interstate Highway
LLTB	Lewisville Lake Toll Bridge
MCLB	Mountain Creek Lake Bridge
MLP	Main Lane Plaza
MMC	Maintenance Management Consultant
MRP	Maintenance Rating Program
NTTA	North Texas Tollway Authority
OMF	Operation and Maintenance Fund
OSB	Overhead Sign Bridge
OSS	Overhead Sign Structure
PGBT	President George Bush Turnpike
QMS	Quality Management System
RMF	Reserve Maintenance Fund
SH	State Highway
SRT	Sam Rayburn Tollway
TRM	Total Routine Maintenance
TxDOT	Texas Department of Transportation
US	U.S. Highway
UTBHMWC	Ultra-Thin Bonded Hot Mix Wearing Course

## Executive Summary

As described in the requirements set forth in the North Texas Tollway Authority System Amended and Restated Trust Agreement Section 504, the Consulting Engineers make an inspection of the Tollway on or before the 90th day prior to the end of the fiscal year and submit a report setting forth (a) their findings whether the Tollway has been maintained in good repair, working order, and condition and (b) their advice and recommendation as to the proper maintenance, repair, and operation of the Tollway during the ensuing fiscal year and an estimate of the amount of money necessary for such purposes.

The Tollway (or System) consists of the Dallas North Tollway, President George Bush Turnpike, Sam Rayburn Tollway, Chisholm Trail Parkway, Mountain Creek Lake Bridge, Lewisville Lake Toll Bridge, Addison Airport Toll Tunnel, and associated facilities/buildings. The System encompasses much of the North Texas region and spans Dallas, Collin, Tarrant, Johnson, and Denton Counties.

Atkins North America, Inc. (Atkins), as General Engineering Consultant, completed the inspections in September 2019 and is pleased to report that the system has been maintained in good repair, working order, and condition. This observation was based on a general visual inspection of the roadway, walls, bridges, tunnel, and facilities/buildings.

Atkins recommends that the Authority continue to implement the routine maintenance as budgeted and scoped, and to also implement the Reserve Maintenance Projects planned for the ensuing fiscal year. Through coordination with the NTTA Staff, and in review of the anticipated Reserve Maintenance Projects scheduled for fiscal year 2020 (FY20), the following budgets are recommended, to be presented at the Finance and Audit Committee meeting on October 3, 2019, and subject to Board approval in December 2019:

Budget Recommendations	
Funds	Budget
Operation and Maintenance Fund	\$195.5 million
Reserve Maintenance Fund	\$ 61.4 million

The overall condition of the System, and funding levels for the System operating budgets, exemplifies the North Texas Tollway Authority's commitment to maintain and operate a safe and reliable toll road system for the North Texas region.

# 1.0 Introduction

## 1.1 Background

In September 2019, Atkins completed the annual inspection of the North Texas Tollway Authority (NTTA) System. This inspection was done in accordance with Section 504 of the Amended and Restated Trust Agreement (Appendix A), which requires the General Engineering Consultant (GEC) to perform a condition assessment of the Tollway (System) and submit a report with their findings. These inspections provide a basis to plan funding levels needed to maintain assets for the maintenance portion of the Operation and Maintenance Fund (OMF) and the Reserve Maintenance Fund (RMF) in the annual operating budget for the ensuing fiscal year (FY).

## 1.2 Inspection Process

The GEC Annual Inspection assessed four main elements: roadway, bridges, walls, and buildings/facilities. The roadway portion of the inspection focused on the pavement, drainage structures, erosion issues, signing, striping, illumination, barriers, mainlane and ramp plaza gantries, and overall safety of the corridor. The bridge inspection addressed the deck, superstructure, and substructure. The wall inspection focused on panels, joints, coping, flumes, mow strips, inlets, rails, slope paving, visible underdrain pipes, sound walls, and adjacent elements. The buildings/facilities inspection focused on the interior and exterior maintenance facilities, sand storage areas, and administrative office complexes.

Inspections were conducted in accordance with NTTA's Project Delivery Department's Quality Management System (QMS) Manual Procedure GEC-01 (Appendix B) and involve a general visual examination of element features. No detailed in-place or destructive testing was performed. The opinions, statements, and recommendations made in this report are based solely on conditions revealed by these inspections. No representations or warranty is made that all defects have been discovered or that a defect will not appear at a later time. Nothing contained herein shall be deemed to give any third party a claim or right of action against the NTTA, its employees, the GEC, or the Maintenance Management Consultant (MMC), nor create a duty on behalf of the NTTA, its employees, the GEC, or the MMC to such third party.

Items observed were recorded and rated using a five-point scale (**Table 1**).

## 1.3 Description of System

The NTTA System consists of the Dallas North Tollway (DNT), President George Bush Turnpike (PGBT), Sam Rayburn Tollway (SRT), Chisholm Trail Parkway (CTP), Mountain Creek Lake Bridge (MCLB), Lewisville Lake Toll Bridge (LLTB), Addison Airport Toll Tunnel (AATT), and associated facilities/buildings and serves as a vital component of the transportation system in the North Texas region (**Figure 1**).

### 1.3.1 Dallas North Tollway

The DNT extends from Interstate 35E (IH-35E) in downtown Dallas north approximately 32 miles to U.S. Route 380 (US 380) in Frisco. It is a convenient north-south connection for motorists traveling between Dallas, Highland Park, University Park, Addison, Farmers Branch, Plano, and Frisco.

**Table 1: GEC Annual Inspection Rating Scale**

Grade	Rating	Description
5	Excellent	Feature in like-new condition. No maintenance required.
4	Good	Feature performing as expected. Routine maintenance necessary.
3	Average/Fair	Feature functionality/operability is fair. Maintenance required to prevent future damage to system.
2	Poor	Feature functionality/ operability is substandard. Maintenance required to protect public or system.
1	Emergency	Feature functionality/operability is critical. Immediate maintenance required to protect public or system.



The initial section from downtown Dallas to Interstate Highway 635 (IH-635) opened to traffic in June 1968. In 1987 it was extended to Briargrove Lane in Far North Dallas and then to State Highway 121 (SH 121) in Plano in 1994. An extension to Gaylord Parkway in Frisco opened in 2004 and again to US 380 in Frisco in 2007. The fully directional ramp interchange at the SRT opened in 2011.

NTTA maintains 179 main lane miles of the corridor. The frontage roads of the DNT, referenced as Dallas Parkway, are not maintained by NTTA. There are 105 total bridges on the DNT.

### 1.3.2 President George Bush Turnpike

The PGBT extends from Belt Line Road in Irving clockwise approximately 40 miles to Interstate 30 (IH-30) in Garland. The PGBT provides a vital route through the DFW Metroplex and offers access to Irving, Carrollton, Dallas, Richardson, Sachse, Rowlett, and Garland.

Segment 1 (1A-1C), extending from Midway Road to Avenue K in Collin County, opened to traffic in 1999. Segment 2 (2A-2B), extending from Avenue K to Brand Road in Garland, opened in 2000.

Segment 3, from Midway Road to the IH-35E interchange in Carrollton, opened in 2001. Segment 4, from the IH-35E interchange to the IH-635 interchange in Irving, opened in 2005. Segment 5, extending from the IH-635 interchange to Belt Line Road, opened to traffic in 2001. The Eastern Extension of the PGBT, extending from Brand Road to the IH-30 near Lake Ray Hubbard, opened in 2011.

The non-tolled segment of the PGBT from Belt Line Road to State Highway 183 (SH 183) is owned and maintained by TxDOT. The section of the PGBT from SH 183 to IH-20 is known as the PGBT Western Extension (PGBT WE). NTTA primarily does not maintain the frontage roads of the PGBT, referenced as State Highway 161 (SH 161) west of IH-35E and State Highway 190 (SH 190) east of IH-35E. There are 240 main lane miles and 4 frontage road miles on the PGBT with 184 total bridges.

The Western section of PGBT is a limited access all-electronic toll road, extends from SH 183 south approximately 11.5 miles to IH-20. NTTA maintains 53.5 main lane miles and 52 frontage road miles (referenced as State Highway 161 [SH 161]) of the corridor.

Interchanges are located at IH-20, Mayfield Road, Pioneer Parkway/Arkansas Lane, Marshall Drive, Dalworth Street/Main Street/Jefferson Street, IH-30, North Carrier Parkway/Egyptian Way, Lower Tarrant Road, Trinity Boulevard/ Shady Grove Road/ Oakdale Road, Conflans Road, and SH 183. There are 49 total bridges, 2 main lane toll gantries, and 18 ramp gantries.

PGBT Western section was constructed in four phases. Phases 1-3 were constructed under the direction of the Texas Department of Transportation (TxDOT).

Phase 1, consisting of frontage roads from North Carrier Parkway to IH-20, along with the main lane interchange at SH 183, was opened in August 2009.

Phase 2, which included two main lanes in each direction from SH 183 to Egyptian Way, also opened to traffic in August 2009. Phase 3, consisting of service roads and a third main lane from Conflans Road to North Carrier Parkway, opened in April 2010. Phase 4 was administered by NTTA under a design-build contract and was opened to traffic in October 2012. Phase 4 included main lanes from North Carrier Parkway to IH-20, as well as the interchanges at IH-20 and IH-30.

### 1.3.3 Sam Rayburn Tollway

The SRT, formerly known as SH 121, extends from Business SH 121 near the Denton/Dallas county line northeast approximately 26 miles to east of US 75 in Collin County. The SRT offers access to Coppell, Carrollton, Lewisville, The Colony, Plano, Frisco, and McKinney.

Segment 1, extending from Denton Tap Road to Old Denton Road, opened to traffic in 2006. Segment 2, extending from Old Denton Road to Hillcrest Road, opened in 2008. Segments 1 and 2 were constructed under the direction of the Texas Department of Transportation (TxDOT). Segment 3, extending from Hillcrest Road to Hardin Boulevard, opened in 2009. Segment 4, extending from Hardin Boulevard to east of US 75 (including SRT/US 75 interchange) opened in 2011. Segment 5, the previously mentioned SRT/DNT interchange, also opened in 2011.

The frontage roads of the SRT, which retained the SH 121 designation, are also maintained by NTTA. A total of 154 main lane miles and 154 frontage road miles are maintained. There are 156 total bridges on the SRT.



### 1.3.4 Chisholm Trail Parkway

The CTP is a 27.6-mile toll road that extends from downtown Fort Worth at IH-30 south to Cleburne at US 67. This limited access all-electronic toll road has interchanges located at IH-30, Lowell Avenue, Montgomery Street, Edwards Ranch Road, Arborlawn Drive, SH 183, IH-20, Overton Ridge Boulevard, Oakmont Boulevard, Altamesa Boulevard, Sycamore School Road, McPherson Boulevard, Farm to Market Road 1187 (FM 1187), County Road 920 (CR 920), FM 1902, Caddo School Road, FM 917, CR 904, Sparks Road (future) and US 67. The CTP has 3 main lane gantries and 24 ramp gantries. The CTP mainlanes were open to traffic on May 11, 2014.

### 1.3.5 Mountain Creek Lake Bridge

The MCLB provides an east-west crossing of Mountain Creek Lake from the Spur 303/SE 14th Street intersection in Grand Prairie to the Spur 303/Mountain Creek Parkway intersection in the Oak Cliff section of Dallas. The approximately 2-mile facility links communities in the southern part of Dallas County with those in Tarrant County and provides convenient access to businesses, recreational facilities, and other destinations in the Mid Cities area.

MCLB opened to traffic in April 1979. The bridge structure is 7,425 feet long and provides two lanes of travel across the lake.

### 1.3.6 Lewisville Lake Toll Bridge

The LLTB provides an east-west crossing of the north-western arm of Lake Lewisville in Denton County. The LLTB is part of the Lewisville Lake Corridor, which connects IH-35E at Swisher Road to the DNT at Eldorado Parkway. The entire corridor is approximately 13.8 miles long and provides a connection to several destinations in Denton County.

The LLTB is an approximately 2-mile facility that opened to traffic in 2009 with the lake bridge spanning 8,520 feet in length. In addition to offering convenient access across the lake, the LLTB serves as a unique landmark with a 360-foot steel truss that rises 60 feet above the roadway. The truss spans 52 feet above the water surface to allow for the clearance of water vessels. The bridge provides four lanes of travel with a toll gantry at the western approach.

### 1.3.7 Addison Airport Toll Tunnel

The AATT provides an east-west route under Addison Airport in northern Dallas County. The tunnel relieves congestion in the Far North Dallas and Addison areas and provides an alternate route to the heavily travelled Trinity Mills and Belt Line Roads. The facility ties into Keller Springs Road on both sides of the airport and serves as a link between DNT and IH-35E.

The two lane tunnel, which opened to traffic in 1999, is approximately 1,650 feet long with the entire facility spanning approximately 3,600 feet. The toll gantry is located west of the tunnel.

### 1.3.8 Facilities/Buildings

NTTA facilities provide support for the safe and reliable operation of the system. These facilities include the Gleneagles Office Center in Plano, the Ohio Drive Maintenance Service Center, the Frisco Maintenance Center, as well as roadway plaza facilities.

## 1.4 Maintenance Program Overview

### 1.4.1 Organization

The Maintenance Department for NTTA is responsible for the normal day-to-day routine maintenance for the System, and facilities. The Project Delivery Department is responsible for reserve maintenance projects and major maintenance projects for the System, and facilities. The System totals 139 center lane miles of limited access toll roads and include 745 main lane miles and 218 frontage road miles. This network includes 603 bridges, including bridge class culverts, and one tunnel.

Major Maintenance Projects include repairs and maintenance, painting, renewals, replacements, improvements and other projects necessary for the safe and efficient operation of the System and to prevent loss of revenue. These projects include such costs for engineering, fleet and equipment purchases/additions and replacements, maintenance expenses for roadway, bridge, buildings, walls, etc., and operating expenses not occurring at annual or shorter periods.

Utilizing both in-house and outsourced resources to accomplish the requirements of routine maintenance, the NTTA has created a check and balance in providing these services to improve efficiency and to be cost effective. The overall goal is to have approximately 50%

of these services outsourced to contractors. Currently, the Total Routine Maintenance (TRM) contract for PGBT is outsourced to Roy Jorgensen Associates, Inc. This contract is an 8-year contract and is currently scheduled for completion by November 2019. The TRM contract for the Chisholm Trail Parkway (CTP) is also being outsourced to DBI Services, Inc., formerly Infrastructure Services of America (ICA). This contract is a 6-year contract and was executed in August 2017.

The Project Delivery Department staff is supported by the MMC, VRX, Inc. As the MMC, VRX provides professional services in support of the Project Delivery Department responsibilities, which include items such as:

- Specialized annual inspections
- Oversight/direction of roadway repairs by NTTA in-house forces
- Plans, specifications, and estimates of Project Delivery Department major maintenance projects
- Update of capital improvement plan as necessary to preserve NTTA assets
- Identification of appropriate maintenance and repair actions and cycles to minimize deteriorating conditions of the NTTA assets
- Environmental support

In addition, the MMC provides resources to support the NTTA in the management and administration of the Project Delivery Department activities associated with major maintenance projects. The disciplines VRX utilizes as the MMC include: civil, structural, traffic, environmental, mechanical and electrical engineering, and architectural services.

#### 1.4.2 Maintenance Rating Program

The NTTA instituted a Maintenance Rating Program (MRP) in 2002 to evaluate the performance of both in-house and outsourced resources. As part of the MRP, the NTTA established acceptable levels of maintenance regardless of road type, construction history, or traffic patterns. The MRP monitors current operations and is used to identify recurring problems. The program allows for early identification of maintenance issues, increases accountability, and provides assurance that assets are being maintained adequately.

Under the MRP, sample units for different asset groups (roads, bridges, and facilities) are randomly selected for the entire year. Inspections are conducted monthly on a portion of the sample units for each corridor. Individual characteristics are evaluated on Pass/Fail criteria. The resulting scores are weighted and combined for the asset groups. A total composite score is what is used to evaluate maintenance effectiveness.

#### 1.4.3 Specialized Inspections

The NTTA conducts specialized inspections for the roadway pavement, overhead sign structures (OSS), and high-mast illumination poles (HMIP). TxDOT is responsible for the specialized bridge inspections. These inspections are conducted every two years for each of the bridges and the reports are filed with the TxDOT Bridge Inventory Inspection and Appraisal Program (BRINSAP). TxDOT also performs underwater inspections on bridge columns every 5 years.

Each year the NTTA contracts with a specialized pavement inspection firm through the MMC to inspect and assess current conditions of both the main lane and frontage road pavement maintained by the NTTA's maintenance staff. The 2019 Pavement Management Program Report (Pavement Report) did not identify any significant findings. The 10-year capital plan will be included in the final 2019 Pavement Management Report.

NTTA's overhead sign structure (OSS) inspection program requires all cantilever overhead sign supports (COSS), overhead sign bridges (OSB), and "Tee" overhead structures to be inspected on a five-year cycle. There were no significant findings from the OSS inspections in 2019. A continued monitoring program of all structures is recommended in accordance with OSS inspection program schedule.

NTTA's on-going HMIP inspection program requires each HMIP be inspected once every five years. The HMIP inspections were performed in 2015 and there were no significant findings. A continued monitoring program of all HMIPs is recommended to ensure the structural performance of the poles.

The latest available BRINSAP reports for the system bridges were reviewed. The BRINSAP reports rate the condition of each bridge element on a scale from 0 to 9, with 9 being excellent. A review of these reports

indicates that most bridge elements on the System are in good to excellent condition (7–9 rating). Elements rated 6 or below (satisfactory condition) were reviewed.

Every two years TxDOT is responsible for an inspection and evaluation of the AATT. This inspection focuses on structural, mechanical, and electrical elements. The tunnel was inspected in 2019; however, the findings were not available as of the date of this report. Mechanically, the inspection included the ventilation fans, the fire protection system, drainage sump pumps, and the electrical room heating and air conditioning roof top unit.

#### 1.4.4 Governmental Accounting Standards Board Requirements

Governmental Accounting Standards Board (GASB) Statement 34 requires all governments and governmental organizations perform asset condition assessments every three years. The MMC develops and maintains an inventory of NTTA's infrastructure assets throughout the System. Condition ratings and a replacement cost are assigned to each asset. The MMC inventory and GEC inspection provide the foundation for complying with GASB Statement 34. The 2019 GASB rating for the System is 8.8 out of 10.

## 2.0 Inspection Findings

### 2.1 Overview

The System has been maintained in good repair, working order, and condition. Using the GEC Annual Inspection Rating Scale, no observations were rated below a 3 on the four main elements inspected.

The following sections include observations from each corridor with respect to the four main elements: roadway, bridges, walls, and facilities/buildings. Upcoming projects and additional recommendations to address these are presented in the following section.

### 2.2 Dallas North Tollway Findings

#### 2.2.1 Dallas North Tollway Roadway

The recurring observations noted on this year's inspection were: barrier spalling, broken curb inlets, erosion and minor spalls in pavement.

Minor barrier spalling was observed at various locations throughout the corridor as noted in **Figure 2**. There were multiple areas of erosion around riprap and landscape areas as illustrated in **Figure 3**.

There are multiple isolated locations of pavement edge drop offs as illustrated in **Figure 4**. Also noted was an area of cracking in the foundation of the guard fence as noted in **Figure 5**. Delineation was missing on the guard fence in one location as noted in **Figure 6**.

A recurring observation from the previous year inspection is broken curb inlets on the section South of IH 635. Some locations have exposed reinforcement as illustrated in **Figure 7**.

#### 2.2.2 Dallas North Tollway Walls

Wall panels and copings were observed with minor spalling at various locations (**Figures 8 and 9**).

Other minor aesthetic conditions such as peeling paint was observed.

#### 2.2.3 Dallas North Tollway Bridges

One observation noted was areas where the abutment backwall and the bridge beams were pushed together causing spalling on the beam ends (**Figure 10**). There was no further progression of the spalling in this year's inspection.

Cracking in the abutment backwall was observed at various locations (**Figure 11**).

#### 2.2.4 Dallas North Tollway Facilities/Buildings

There are two Main Lane Plaza (MLP) facilities on the DNT.

At MLP 3, located near Parker Road, there were stains on the ceiling tiles indicating a roof or mechanical leak as noted in **Figure 12**.

At MLP 4, located near Eldorado Parkway, observations include leaks causing water damage on ceilings and at windows (**Figure 13**), rust on exterior railings, and uneven sections of roof indicating possible water damage.

#### 2.2.5 Dallas North Tollway Changes from FY18

A mill and inlay project was underway at the time of inspection

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Figure 2: DNT barrier wall spall NB south of Trinity Mills Road



Figure 3: DNT planting bed erosion SB at Gaylord Parkway



Figure 4: DNT pavement edge drop off



Figure 5: DNT MBGF foundation cracking SB north abutment at Main Street



Figure 6: DNT delineation missing on MBGF NB north of Stonebrook Parkway



Figure 7: DNT curb inlet damage with steel exposed NB south of Lovers Lane





Figure 8: DNT coping damage NB north of Harvest Hill Road



Figure 9: DNT sound wall damage



Figure 10: DNT beam spall SB at Panther Creek



Figure 11: DNT backwall cracking NB at Alpha Road



Figure 12: DNT MLP3 – staining on ceiling tile

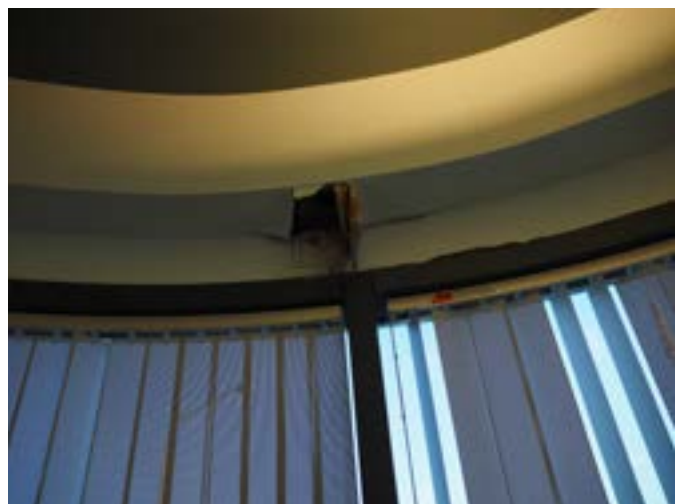


Figure 13: DNT MLP4 damage from roof leaks

## 2.3 President George Bush Turnpike Findings

### 2.3.1 President George Bush Turnpike Roadway

The roadway elements were generally in good condition. The recurring observations noted on this year's inspection were: missing delineation, pavement edge drop offs, damaged curb, and pavement spalling and cracking.

There were areas with missing delineation as noted in **Figure 14**. There were also noted areas with curb damage as illustrated in **Figure 15**.

Pavement edge drop offs (**Figure 16**) and pavement cracking and spalling (**Figures 17 and 18**) was observed at various locations throughout the corridor.

### 2.3.2 President George Bush Turnpike Walls

Retaining wall elements are generally in good condition. There were some observations of minor panel cracks and spalls on the retaining walls.

One location with spalling and exposed steel was noted (**Figure 19**).

### 2.3.3 President George Bush Turnpike Bridges

Bridge observations include abutment backwall cracking and spalling (**Figure 20**). Also noted was bearing pad movement as illustrated in **Figure 21**.

Erosion around bridge riprap and under bridges (**Figure 22**). Backwall cracking and spalling and bridge bent caps with minor cracking as illustrated in **Figures 23 and 24**.

The substructure of the main lane bridge over Lake Ray Hubbard is in good condition with only minor spalling in the sacrificial column protection. There was noted a few areas where the water collection system piping was pulled apart and leaking.

### 2.3.4 President George Bush Turnpike Facilities/Buildings

There are five main lane plazas on the PGBT: MLP 6 near Shiloh Road, MLP 7 near Coit Road, MLP 8 near Frankford Road, MLP 9 near Sandy Lake Road, and MLP 10 near Beltline Road.

Observations identified throughout the facilities included cracking in masonry, evidence of mechanical leaks, burned out lamps and paint peeling from a stairway as illustrated in **Figures 25 and 26**.

### 2.3.5 President George Bush Turnpike Changes from FY18

Segments 1 and 2 of PGBT received overhead sign replacements in FY 2018. In addition, multiple segments received mainlane restriping.



Figure 14: PGBT missing delineation



Figure 15: PGBT damaged curb



Figure 16: PGBT pavement edge drop off



Figure 17: PGBT pavement cracking



Figure 18: PGBT pavement spalling



Figure 19: PGBT wall spall with exposed steel



Figure 20: PGBT abutment backwall spall NB at Rowlett Creek





Figure 21: PGBT bearing pad movement



Figure 22: PGBT erosion at bridge riprap WB at Royal Lane



Figure 23: PGBT back wall cracking and spalling at Brand Road



Figure 24: PGBT minor bent cap cracking at Brand Road



Figure 25: PGBT MLP07 stain on ceiling indicating leak

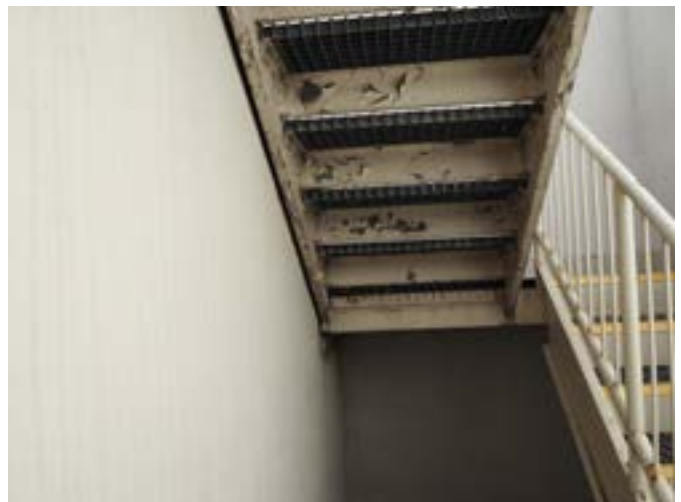


Figure 26: PGBT MLP06 paint peeling from stairway

## 2.4 Sam Rayburn Tollway Findings

### 2.4.1 Sam Rayburn Tollway Roadway

The roadway observations include faded striping and graphics, pavement cracking, pavement edge drop offs, missing delineation, broken curbs, barrier spalling, and erosion.

Areas with faded striping and markings, as illustrated in **Figure 27**, were concentrated on the frontage road, and entrance and exit ramps.

Pavement edge drop offs, as illustrated in **Figure 28**, were noted in various areas.

Curb damage, as illustrated in **Figure 29**, was observed at multiple locations at intersections and frontage roads.

Minor barrier spalling was observed at various locations on the mainlanes as illustrated in **Figure 30**.

There were locations with erosion around concrete appurtenances as noted in **Figure 31**. Also noted were areas of pavement cracking as illustrated in **Figure 32**.

### 2.4.2 Sam Rayburn Tollway Walls

The retaining wall elements were in good condition. There was noted coping damage in a few areas as illustrated in **Figure 33**.



Figure 27: SRT faded pavement markings

### 2.4.3 Sam Rayburn Tollway Bridges

One observation noted on the bridge inspection was where the abutment backwall and the bridge beams meet spalling as noted in **Figure 34**. This condition is being monitored by NTTA staff.

### 2.4.4 Sam Rayburn Tollway Facilities/Buildings

There were several observations noted on mainlane gantries including electrical outlet damage at MLG1 and gap at door threshold at MLG2 as shown in **Figures 35 and 36**.

### 2.4.5 Sam Rayburn Tollway Changes from FY18

Several areas with unsealed and spalling joints along the corridor have been repaired or sealed. Multiple pavement cracks noted on previous inspections have been repaired.



Figure 28: SRT pavement edge drop off





Figure 29: SRT curb damage



Figure 30: SRT Barrier spall SB South of MacArthur Boulevard



Figure 31: SRT erosion at drop inlet NBML at Old Denton Road



Figure 32: SRT pavement cracking NBFR at MacArthur Boulevard



Figure 33: SRT coping damage NBML at Castle Hills



Figure 34: SRT beam and backwall spalling NBFR relief bridge



Figure 35: SRT MLG1 electrical outlet damage



Figure 36: SRT MLG2 gap at door threshold

## 2.5 Chisholm Trail Parkway (CTP)

### 2.5.1 CTP Roadway

The recurring observations noted on this year's inspection were: erosion on slope embankment, ditch lines and around structures and riprap, pavement edge drop offs (**Figure 37**), pavement joint damage, minor concrete barrier spalling and riprap cracking.

Areas with erosion at structures were noted at various locations as illustrated in **Figures 38 and 39**. Additionally, erosion was observed on slope embankments and in ditch lines as illustrated on **Figure 40**. There were also noted areas with pavement joint damage as illustrated in **Figure 41**.

### 2.5.2 CTP Retaining Walls

Retaining wall elements are in like-new condition. As noted in last year's inspection, there are a few locations where the mow strip at the base of the retaining wall has settled and the seal between the concrete and the wall is missing.



Figure 37: CTP pavement edge drop off

### 2.5.3 CTP Bridges

The majority of the bridge elements are in like new condition with only a few issues observed. One of the observations noted this year was minor bearing pad movement as illustrated in **Figure 42**. Also noted was minor backwall cracking as illustrated in **Figure 43**.

### 2.5.4 CTP Tollway Facilities/Buildings

Loose trim at a doorway was noted on MLG01 fiber hut in this year's inspection as noted in **Figure 44**.

### 2.5.5 CTP Changes from FY18

One of the observations from the past year's inspections has been mitigated. Many areas with pavement drop off have been repaired.



Figure 38: CTP erosion at riprap toe



Figure 39: CTP erosion at structure



Figure 40: CTP erosion in ditchline



Figure 41: CTP pavement joint damage



Figure 42: CTP bearing pad movement



Figure 43: CTP backwall cracking

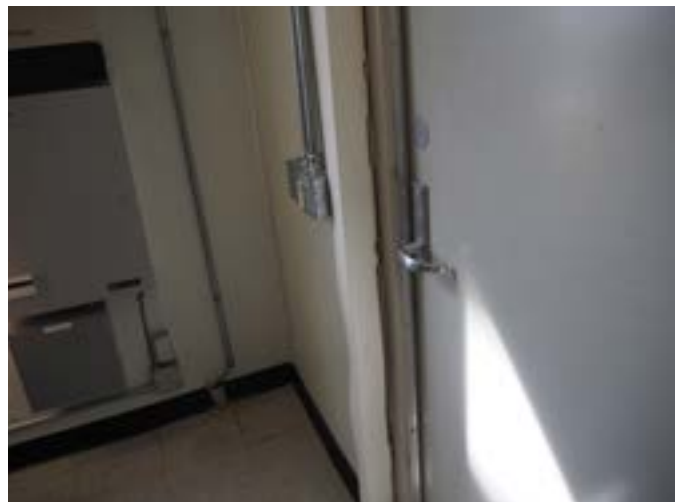


Figure 44: CTP loose trim at door at FH MLG01



## 2.6 Mountain Creek Lake Bridge Findings

### 2.6.1 Mountain Creek Lake Bridge Roadway

One observation noted this year is a pavement failure on the bridge deck surface treatment as noted in **Figure 45**.

### 2.6.2 Mountain Creek Lake Bridge Bridges

Bridge observations include interior and exterior bridge beam end spalling with exposed reinforcement, as illustrated in **Figure 46**. There are hairline vertical and diagonal cracks with efflorescence on some of the bent caps. Also noted is moderate to heavy scaling on the concrete encasements on the columns. There is a bridge column collar repair assessment planned for 2020.

### 2.6.3 Mountain Creek Lake Bridge Walls

Mountain Creek Lake Bridge has one retaining wall on the east end that is in good condition with no notable observations.

### 2.6.4 Mountain Creek Lake Bridge Facilities/Buildings

The facility at Mountain Creek Lake Bridge was demolished before the inspection.

### 2.6.5 Mountain Creek Lake Bridge Changes from FY18

Changes observed include the demolition of the old plaza facility and construction of a new toll gantry. There was a pavement rehabilitation project that was near completion at the time of inspection.



Figure 45: MCLB pavement failure in deck surface treatment



Figure 46: MCLB beam spalling with exposed steel at bent 12

## 2.7 Lewisville Lake Toll Bridge Findings

### 2.7.1 Lewisville Lake Toll Bridge Roadway

A few areas of spalling in the barrier wall were noted in this year's inspection.

### 2.7.2 Lewisville Lake Toll Bridge Bridges

Observations concerning the bridge included some minor spalling on columns, unsealed joints on pile footings, and a leak in the water collection piping system. Also noted was a repair to bent cap 2 that had previously settled.

### 2.7.3 Lewisville Lake Toll Bridge Walls

No observations were found concerning the retaining walls.

### 2.7.4 Lewisville Lake Toll Bridge Facilities/Buildings

There are no facilities or buildings located on the Lake Lewisville Toll Bridge.

### 2.7.5 Lewisville Lake Toll Bridge Changes from FY18

Changes observed from the previous year include bent cap sealing, buoy replacement, and restriping.

## 2.8 Addison Airport Toll Tunnel Findings

### 2.8.1 Addison Airport Toll Tunnel Roadway

Observations on the roadway include curb damage on the median at the east entry.

### 2.8.2 Addison Airport Toll Tunnel Bridges

Observations concerning the tunnel walls include cracking at multiple locations (**Figure 47**). There were a few locations with wall spalling along the tunnel.

### 2.8.3 Addison Airport Toll Tunnel Walls

Wall observations include cracking in retaining walls at multiple locations.

### 2.8.4 Addison Airport Toll Tunnel Facilities/Buildings

No observations were noted at the facility.

### 2.8.5 Addison Airport Toll Tunnel Changes from FY18

None noted.



Figure 47: AATT wall cracking



## 2.9 Facility (Other) Findings

### 2.9.1 Facilities/Buildings

Other inspected facilities include the Ohio Drive Maintenance Service Center, Frisco Maintenance Service Center, and both Buildings of the Gleneagles Office Center in Plano.

Observations at the Ohio Drive Maintenance Service Center include rust developing on patio railing, door threshold, curb edging, and canopy structure; soil settlement along wall (**Figure 48**); cover missing from door closure; and hole in the wall at the sink plumbing (**Figure 49**).

Observations at the Frisco Maintenance Service Center include rust at galvanized canopy and pre-cast panels, settlement crack in drywall, and cover plates missing from outlet and pull box (**Figure 50**).

Observations at the Gleneagles Office Center at 5900 West Plano Parkway include water staining on ceiling and lamps burnt out in multiple locations, cracked floor tile (**Figure 51**), damaged light switch, cover plate missing from light switch (**Figure 52**), drywall damage under window from leak, and rust on steel toilet partition.

Observations at the Gleneagles Office Center at 5910 West Plano Parkway include damaged and water-stained ceiling tiles (**Figure 53**), masonry cracking, ADA kick panel loose at sink, multiple lights burnt out, door closure missing cover plate, and tree growth in exterior gutter.

### 2.9.2 Facility Changes from FY18

The HVAC system received an upgrade at the Gleneagles 5900 location, and the DNT MLG 3 received a re-coating at the entry and transportation buildings in FY 2018.



Figure 49: OHIO hole in wall at sink plumbing



Figure 50: FRISCO cover plate missing from pull box



Figure 51: Gleneagles 5900 crack in floor tile



Figure 48: OHIO soil settlement along wall



Figure 52: Gleneagles 5900 cover plate missing from light switch



Figure 53: Gleneagles 5910 water-stained ceiling tiles

## 3.0 Projects Completed Since FY18 Inspections

Listed below are projects that have been completed since the FY18 inspections.

### 3.1 Dallas North Tollway Completed Projects

- Walnut Hill overpass windwall repair
- Interchange restriping
- Roadway improvements

### 3.2 President George Bush Turnpike Completed Projects

- Segments 1 and 2 overhead sign replacement
- Segment 7 mainlane restriping
- Segment 3, 7, and 8 pavement profiling
- Segments 1, 2, 4, and 5 restriping
- Erosion control
- MLP 8 reroofing
- Segment 5 wall repair at Las Colinas
- Wall stabilization at Dickerson

### 3.3 Sam Rayburn Tollway Completed Projects

- Segment 1 Frontage Road joint and crack sealing
- Segment 1 concrete pavement diamond grinding
- Segment 1 and mainlane and frontage road joint rehabilitation
- Segment 3 bent cap sealing
- Segment 1 pavement rehabilitation and bearing pad replacement
- Erosion mitigation

### 3.4 CTP Tollway Completed Projects

- Erosion mitigation

### 3.5 Addison Airport Toll Tunnel Completed Projects

- None noted

### 3.6 Lewisville Lake Toll Bridge

- Bent cap sealing
- Restriping

### 3.7 System-wide Completed Projects

- None noted

## 4.0 Future Projects and Recommendations

### 4.1 Overview

Through coordination with the Maintenance Department and MMC, a plan will be developed to repair, replace, or monitor the above observations. This section summarizes projects the Maintenance Department has developed to address these and identifies additional observations that require attention.

### 4.2 Dallas North Tollway Recommendations

Several projects have been developed or are in the process of being developed to address the needs of the DNT. These projects include the following: median barrier replacement from 635 to PGBT, overhead and small sign replacement, erosion repairs, raised pavement marker replacement, wall repairs and mainlane bridge repairs including deck, rail, bent caps, and columns.

It is also recommended that the following observations be monitored for further degradation: spalling and cracking on beam ends; abutment backwall cracking at various locations.

### 4.3 President George Bush Turnpike Recommendations

Several projects have been developed or are in the process of being developed to address the needs of the PGBT. These projects include the following: restriping mainlanes at IH 30 interchange, Segment 6 from SH 78 to IH 30, and frontage roads on Segment 7 and 8 from IH 30 to IH 20.

The vast majority of the observations on the PGBT fall under the scope of routine maintenance. These include: various locations of pavement cracking and spalls, pavement edge drop offs, erosion at riprap and under bridges, minor wall panel spalls and deteriorated paint throughout the facilities. These should be addressed to prevent further damage.

It is recommended that the following observations be monitored: cracking abutment backwalls at various locations; beam end cracking; isolated retaining wall panel and coping cracking.

### 4.4 Sam Rayburn Tollway Recommendations

Several projects have been developed or are in the process of being developed to address the needs of the SRT. These projects included the following: raised pavement marker replacement, erosion repair, concrete pavement repair.

Most observations made on the SRT are included under routine maintenance. These include: pavement edge drop offs, missing delineation, broken curbs, barrier spalling and erosion.

It is recommended that the following be monitored for future deterioration: erosion near columns and near abutment riprap; bridge beam end spalling.

### 4.5 CTP Recommendations

Projects that are being developed or in the process of being developed to address the needs of CTP include erosion.

Of the previously mentioned observations, many fall under the scope of routine maintenance. These include pavement edge drop offs and minor concrete barrier spalling.

It is also recommended that the minor cracking in the bridge backwalls be monitored.

### 4.6 Mountain Creek Lake Bridge Recommendations

A pavement rehabilitation project was near completion at the time of inspection.

It is recommended that the beam end cracking and column casing spalls be monitored for further deterioration.

## 4.7 Lewisville Lake Toll Bridge Recommendations

Several projects have been developed or are in the process of being developed to address the needs of the LLTB. These include new lighting, pavement repairs and erosion mitigation on the east end, and raised pavement marker replacement.

## 4.8 Addison Airport Toll Tunnel Recommendations

Projects that are being developed to address the needs of the Addison Toll Tunnel include new lighting within tunnel, overhead and small sign replacement, and fence replacement.

There were a few observations that are included under routine maintenance. These include curb damage on the east entry median and the spall on the east entry portal wall. Hairline cracks observed are being monitored as part of the specialized tunnel inspection.

## 4.9 Budget Recommendations

As required by the Amended and Restated Trust Agreement, the GEC also provides recommendations for the OMF as well as the RMF.

The funding levels are set such that NTTA can maintain the overall asset condition of the System.

**Table 2: Budget Recommendations**

Funds	Budget
Operation and Maintenance Fund	\$195.5 million
Reserve Maintenance Fund	\$ 61.4 million

## 5.0 Summary

Overall, the System has been maintained in good repair, working order and condition. The overall condition of the System shows NTTA's commitment to funding, maintaining, and operating a safe and reliable network of roadways.

Continued routine maintenance and the implementation of Reserve Maintenance Projects will ensure the System continues to provide a reliable mobility option for the North Texas area.



## Appendix A



# **AMENDED AND RESTATED TRUST AGREEMENT**

**BY AND BETWEEN**  
**NORTH TEXAS TOLLWAY AUTHORITY**

**AND**

**WELLS FARGO BANK, N.A.,**  
*Dallas, Texas*

**SECURING**  
**SYSTEM REVENUE BONDS**

**Dated as of April 1, 2008**

**Section 503. Revenue Fund.** The special fund held by the Trustee and created and designated "Tollway Revenue Fund" (hereinafter sometimes called the "Revenue Fund") under the Original Agreement is hereby reaffirmed. The Authority covenants that all gross revenues (all tolls, other revenues, and income) arising or derived by the Authority from the operation and ownership of the Tollway (excepting investment income from all Funds and Accounts other than the Revenue Fund) will be collected by the Authority and deposited daily, as far as practicable, with the Trustee for the credit of the Revenue Fund. It shall be the duty of the Trustee to verify the amount of each such daily deposit separately, and to make a report to the Authority of the amount of each such daily deposit as soon as practicable. Tolls collected on behalf of TxDOT pursuant to a project agreement that provides for revenue sharing with TxDOT shall be collected by the Authority and shall be held and transferred to or upon the order of TxDOT as set forth in the project agreement.

**Section 504. Duties of Consulting Engineers.** The Authority covenants that it will cause the Consulting Engineers employed by it under the provisions of Section 704 of this Agreement, to make an inspection of the Tollway on or before the 90th day prior to the end of each Fiscal Year and to submit to the Authority a report setting forth (a) their findings whether the Tollway has been maintained in good repair, working order and condition, (b) their advice and recommendations as to the proper maintenance, repair, and operation of the Tollway during the ensuing Fiscal Year and an estimate of the amount of money necessary for such purposes, including their recommendations as to the total amounts and classifications of items and amounts that should be provided for Current Expenses and the Reserve Maintenance Fund in the Annual Budget for the next ensuing Fiscal Year, and (c) their advice and recommendations as to the amounts and types of insurance which should be carried during the ensuing Fiscal Year with respect to the Tollway under the provisions of Article VII of this Agreement. Copies of such reports shall be filed with the Trustee and mailed by the Authority to each bondholder who shall have filed his name with the Board Representative designated for such purpose, which shall initially be the Chief Financial Officer of the Authority.

**Section 505. Preliminary Budget of Current Expenses, and Payments into Reserve Maintenance Fund; Hearing on Budget; Annual Budget; Failure to Adopt Annual Budget; Amended or Supplemental Annual Budget; Payments for Maintenance, Repair, and Operations.** The Authority covenants that on or before the 60th day prior to the end of each Fiscal Year it will adopt a preliminary budget of Current Expenses and payments into the Reserve Maintenance Fund for the ensuing Fiscal Year. Copies of each such preliminary budget shall be filed with the Trustee and mailed to the Consulting Engineers and each bondholder who shall have filed his name and address with the Board Representative designated for such purpose, which shall initially be the Chief Financial Officer of the Authority.

If the holders of at least five percent (5%) in aggregate principal amount of the bonds then Outstanding shall so request in writing on or before the 60th day prior to the end of any Fiscal Year, the Authority shall hold a public hearing on or before the 30th day prior to the end of such Fiscal Year at which any bondholder may appear in person or by agent or attorney and present any objections he may have to the final adoption of such budget. Notice of the time and place of such hearing shall be mailed, at least ten (10) days before the date fixed by the Authority for the hearing, to the Trustee, the Consulting Engineers, and each bondholder who shall have filed his name and address with the Board Representative designated for such purpose, which shall initially be the Chief Financial Officer of the Authority. The Authority further covenants



Appendix B





<b>NTTA Projects</b>	<b>Original Issue Date: 07/05/2012</b>	<b>GEC-01</b>
Resource: General Engineering Consultant Procedures	Revision: 0 Issue Date: 07/05/2012	Page 1 of 8
<b>Title: GEC Annual Inspection of the NTTA Systems</b>		

## 1.0 PURPOSE:

The purpose of this procedure is to describe the General Engineering Consultant (GEC)'s responsibilities for the general annual visual inspection and assessment of the NTTA System, Special Projects System (SPS), and related facilities as required by Section 504 of the NTTA System Amended and Restated Trust Agreement and Section 710 of the NTTA Special Projects System Trust Agreement.

## 2.0 RESPONSIBILITIES:

**2.1 Project Director (PD)** – The PD shall be a licensed civil engineer with prior experience being a program manager or project director, project manager, and field experience. The PD shall:

- Review and understand the trust agreements with the NTTA and ensure the letters to the bond holders, presentations, and all other work performed during annual inspections is in conformance with the trust agreements.
- Coordinate the NTTA staff review of the letters to the bond holders.
- Perform a quality assurance (QA) review of the final letters to the bond holders to ensure they include the inspection findings, advice and recommendations as to the proper maintenance/repair, and cost estimates thereof, per their respective trust agreements.
- Approve, sign, and deliver the final letters to the NTTA for delivery to the bond holders.
- Perform QA review of, and present to the NTTA board, a PowerPoint presentation discussing the significant aspects of the year's inspection results.

**2.2 Project Manager (PM)** – The PM shall be a licensed civil engineer with prior experience being a project manager as well as inspection field experience. The PM shall:

- Prepare and negotiate the inspection work authorization documents.
  - Organize the pre-inspection kick-off meeting by: writing the agenda; inviting field inspectors, Maintenance Management Consultant (MMC) employees and all required NTTA staff; and facilitating the meeting.
  - Be the point of contact for the GEC inspection team when communicating with the NTTA and the MMC inspection staff.
-

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- Obtain from NTTA:
  - A list of bridges and bridge class culverts to be inspected, as well as the TxDOT Bridge Inventory Inspection and Appraisal Program (BRINSAP) reports on all bridges listed.
  - 11x17 black-and-white aerial photography plan sheets of all roadways in the systems at a scale of approximately 1 inch = 250 feet. Plan sheets should show the roadway centerline, stationing, cross street names and should encompass all collector/distributor and direct connector ramps.
  - A list of facilities required for inspection.
  - Governmental Accounting Standards Board (GASB) ratings for the System and the SPS from the most recent year available.
- Manage the inspection staff to ensure that both budget goals and schedule deadlines are met.
- Oversee the writing of the two letters to the bond holders, one for the NTTA System and one for the SPS.
- Perform a quality control (QC) review of the letters to the bond holders, observation spreadsheet and PowerPoint presentation prior to final submittal to the NTTA.
- Deliver the observation spreadsheet categorized as described in 6.1.7 to the NTTA Maintenance Department and ensure it functions properly on the NTTA computer servers.

**2.3 Roadway Inspector (RI)** – the RI shall be a licensed civil engineer (or if approved an Engineer in Training (E.I.T.) with P.E. supervision) with prior roadway and drainage design and/or inspection experience. The RI shall:

- Perform visual inspection and condition assessment of all roadways and appurtenances while being accompanied by an NTTA staff member.

**2.4 Retaining Wall Inspector (WI)** – the WI shall be a licensed civil engineer (or if approved an E.I.T. with P.E. supervision) with prior retaining wall design and/or inspection experience. The WI shall:

- Perform visual inspection and condition assessment of all retaining wall, sound wall, and tunnel elements while being accompanied by an NTTA staff member.

**2.5 Bridge Inspector (BI)** – the BI shall be a licensed civil engineer (or if approved an E.I.T. with P.E. supervision) with prior bridge design and/or inspection experience. The BI shall:

- Perform visual inspection and condition assessment of all bridges and bridge-class culverts on the list provided by the NTTA while being accompanied by an NTTA staff member.



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**2.6 Facilities Inspector (FI)** – the FI shall be a licensed architect (or if approved an Associate AIA under the supervision of a licensed architect) with prior architectural design and/or inspection experience. The FI shall:

- Preform visual inspection and condition assessment of all of the NTTA's facilities while being accompanied by an NTTA staff member. The facilities to be inspected shall be as directed by the NTTA and may include main lane plazas, operations buildings, ramp plazas, sand storage enclosures, fiber huts, the central maintenance facility and the Gleneagles administration office complex.

### **3.0 SCOPE/APPLICABILITY:**

This procedure shall apply to the NTTA annual inspections of both the NTTA System and the SPS, as set forth by the Trust Agreements. The NTTA System shall include the Dallas North Tollway (DNT), the President George Bush Turnpike (PGBT), the Eastern Extension of the George Bush Turnpike (PGBT EE), the Sam Rayburn Tollway (SRT), the Addison Airport Toll Tunnel (AATT), the Lewisville Lake Toll Bridge (LLTB), the Mountain Creek Lake Bridge (MCLB) and associated facilities. The SPS shall include the President George Bush Turnpike Western Extension (PGBT WE) and associated facilities. The inspections, letters to the bond holders, observation spreadsheets and presentations shall be complete 90 days prior to the end of the respective NTTA System and SPS fiscal year, as specified in the trust agreements.

### **4.0 REFERENCES:**

- NTTA System Amended and Restated Trust Agreement
- NTTA Special Projects System Trust Agreement
- Prior letters to the bond holders
- Prior observation spreadsheets
- Prior PowerPoint presentations with speaker notes
- BRINSAP reports
- NTTA personnel
- Overhead Sign Structure Inspection
- High Mast Illumination Pole Inspection
- Pavement Management Program
- Texas Accessibility Standards

### **5.0 DEFINITIONS & ACRONYMS:**

N/A

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## 6.0 PROCEDURES:

**6.1 General:** The following procedures include tasks involving all inspectors, and where specifically mentioned, the PM and PD.

- 6.1.1 Prior to beginning any field inspections, the PM will schedule and facilitate the kick-off meeting with primary staff involved in the annual inspections (GEC, MMC and NTTA staff). A list of topics to be covered should include at a minimum; the scope, schedule, extent of the maintenance limits, equipment the inspectors will need to perform their tasks, safety protocol, record keeping, and the teaming of NTTA employees with the field inspectors. A contact list with all participants' names, phone numbers and email addresses should be created and distributed to all inspection staff. At the conclusion of the meeting, all participants should be aware of all submittal dates, safety protocol and the extent of the NTTA's maintenance limits.
- 6.1.2 Each field inspector is responsible for coordinating their respective inspection schedule with the NTTA point of contact provided by the PM. The NTTA will supply qualified staff members to team up with each GEC inspection personnel. The NTTA staff participating in the inspections should be knowledgeable of the systems they will assist in inspecting and the inspection / maintenance limits of that system.
- 6.1.3 Perform field inspections only between the hours set by the NTTA maintenance staff and within the limits of NTTA maintenance for the roadways. During inspections, all inspectors must wear the required safety equipment and adhere to all safety protocol set forth by the NTTA. Areas outside of NTTA maintenance responsibility are not required to be included in the inspections. When in the vicinity of ongoing construction or maintenance activities, inspections should not be performed within or near active construction areas.
- 6.1.4 When areas are unsafe or unreachable for pedestrian access during inspections, a rolling lane closure should be requested so that visual inspections may be performed from inside the vehicle. The vehicle shall travel at the slowest safe speed possible for each particular inspection and location, using the roadway shoulder wherever possible. Rolling lane closures should be requested at least 2 weeks in advance, and must be approved and scheduled by the respective NTTA roadway section supervisors. In areas where rolling lane closures are unsafe or where pedestrian access is not feasible, it should be documented as such.
- 6.1.5 If a safety concern requiring immediate attention by the maintenance department is observed, the inspector shall immediately contact the PM, who must in turn inform the NTTA Maintenance Department Director or Assistant Director.



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- 6.1.6** At the conclusion of each inspection day, store/update all pictures, notes, and spreadsheets digitally on a single drive location accessible by the entire GEC inspection staff. Files should be set up in a clear and consistent manner for all inspectors. In cases where all staff may not have daily access to this drive, work should be downloaded at least every other week to this drive. Backup files should be created regularly to prevent loss of productivity or re-work if by chance system files are lost.
- 6.1.7** Organize and hyperlink all pictures in an observation spreadsheet in such a manner that they may be sorted by damage description, facility/roadway, station/location, direction of travel, date inspected, priority, and any other useful categories deemed helpful by the NTTA and MMC. All field inspectors will complete the portion of the observation spreadsheet for their discipline. Upon completion of the observation spreadsheet, upload the spreadsheet and all pictures to the NTTA server, and confirm the hyperlinked pictures will work on the server properly.
- 6.1.8** Determine condition ratings for all locations after the completion of the field inspections, organization of notes and pictures, and the observation spreadsheet. Using this information, assess which specific locations should be mentioned in the bond letter for maintenance, monitoring, or repair, and begin writing the letters to the bond holders. Each member of the inspection team must assist with the writing of the letters to the bond holders by contributing information on the condition of each component of the system, relating general trends as well as noting specific concerns and improvements.
- 6.1.9** The PM should assemble findings from each inspection team members and prepare the report to submit to the bond holders. The final letters should include the inspection findings, advice and recommendations as to the proper maintenance/repair, and cost estimates thereof, and the GASB ratings provided by the NTTA for the respective systems. The PM will also perform a quality control (QC) review of the letter prior to submitting to the PD for Quality Assurance (QA). Once QC and QA are complete, the PD will submit the letter to the Maintenance Department and MMC for review. The inspection team, working with the PM and PD, should address any comments received from the Maintenance Department and MMC and submit the final version of the letters to the NTTA for final review. The final approved letters must be completed and delivered to the NTTA with sufficient time to mail them to the bond holders 90 days prior to the end of the respective NTTA System and SPS fiscal year.
- 6.1.10** All field inspectors will assist with the creation of two PowerPoint presentations, one for the NTTA System, and one for the SPS, each summarizing the annual inspection findings for their respective systems. The PowerPoint presentations must be completed in sufficient time to be presented by the PD at the first NTTA board meeting following the delivery of the respective letter to the bond holders.
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## **6.2 Roadway Inspector**

- 6.2.1** Perform visual inspection and condition assessment on the following roadway elements: all drainage structures (storm sewer, ditches, concrete flumes and culverts), erosion issues, signing and striping, both rigid and flexible barriers, and a design safety review of the complete systems.
- 6.2.2** Perform visual inspections of all roadway elements while riding with the NTTA roadway section supervisors. The supervisor should drive slowly and carefully along both the inside and outside shoulders allowing the RI time to properly inspect the roadway elements. For those areas deemed unsafe to perform inspections in this manner, a rolling lane closure should be requested to accomplish the inspection.
- 6.2.3** Take pictures of all observed findings along each roadway. At the RI's discretion, pictures may be taken noting overall roadway conditions.
- 6.2.4** Note the observation, location, date, and direction of each picture on the aerial photography plan sheets provided by the PM.

## **6.3 Retaining Wall Inspector**

- 6.3.1** Perform visual inspection and condition assessment on the following retaining wall, sound wall, and tunnel elements: panels, joints, coping, flumes, mow strips, inlets, rails, riprap, slope paving, visible underdrain pipes, sound wall columns; and adjacent: sidewalks, curbs, fencing, roadways, shoulders, soil slopes, and landscaping.
  - 6.3.2** Perform visual inspections of every retaining wall on the systems by walking both top and bottom of each wall, except in areas deemed unsafe for pedestrians (i.e. cut sections along PGBT where the main lanes are within 15 feet of the walls; fill sections along DNT where the top of retaining walls coincide with the main lane barrier rail) In areas where it is unsafe to walk the top or bottom of any wall, a rolling lane closure should be requested to accomplish the inspection.
  - 6.3.3** Perform visual inspections of every sound wall by either walking or driving (depending on accessibility) the front and back side.
  - 6.3.4** Take pictures of all observed findings along each wall whether visible from the top or bottom of the wall. General pictures may be taken at each wall location for common types of widespread deterioration, and should be noted as such. Overall condition pictures should be taken at intervals sufficient to encompass all lengths of all walls for documentation of areas that do not exhibit deterioration or areas of concern.
  - 6.3.5** Note the observation, location, date, direction, and number of each picture on the aerial photography plan sheets provided by the PM.
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#### 6.4 Bridge Inspector

- 6.4.1 Review the BRINSAP reports prior to the bridge inspections. Note any deficiency on the reports, especially ratings less than 6, to be specifically investigated during the visual inspection of each bridge.
- 6.4.2 Perform visual inspections and condition assessment on the following bridge elements: deck, superstructure, substructure, channel and culvert, by walking above, below and alongside the structure, except in areas that are unreachable or deemed unsafe for pedestrians. Such areas are roadways with less than 6 foot shoulders, direct connector ramps, or any other condition which the inspector deems unsafe. Rolling should be requested when inspecting these areas.
- 6.4.3 Visual inspections must be performed while maintaining a clear, detailed view of all bridges, including high level interchanges and bridges over waterways; binoculars may be used to achieve this level of detail.
- 6.4.4 Bridges that cross over large bodies of water, such as MCLB and LLTB, shall be inspected from a NTTA provided motorized boat.
- 6.4.5 Take pictures of all observed findings at each bridge and bridge class culvert location. At the BI's discretion, pictures may be taken noting overall bridge condition.
- 6.4.6 Note the observation, location, date, direction and number of each picture on the bridge inspection form.

#### 6.5 Facilities Inspector

- 6.5.1 Perform visual inspection and condition assessment of the exterior and interior of all facilities, observing all readily accessible areas including enclosed but unlocked plenums, attic spaces, and storage areas. Note any evidence of leaks, insect infestation, structural movement, malfunctioning components, impact damage, and general wear and tear. Note any deterioration of elements, in particular those relevant to Texas Accessibility Standards and the Building Code for Life, Health, and Safety Standards. Record any issues reported to the inspectors by occupants. Spot check function of light fixtures, HVAC, and electrical outlets. Verify that areas and elements intended to be secured are secured.
  - 6.5.2 Take pictures of all observed findings at each facility location. General pictures may be taken at each facility for common types of widespread deterioration, and should be noted as such. Take a representative sample of overall condition pictures at intervals sufficient to encompass all facilities for documentation of areas that do not exhibit areas of concern.
  - 6.5.3 Note the observation, location, and date of each picture.
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**7.0 REGULATORY REQUIREMENTS:**

N/A

**8.0 RELATED BOARD POLICY:**

N/A

**9.0 COMPONENT DOCUMENTS:**

[GEC-01-F1](#) NTTA Annual Inspection Observations

**10.0 FLOWCHART:**

N/A

**11.0 REVISION HISTORY:**

Revision	Revised by:	Date Issued	DRN No.	Reason for Revision
0	Stephanie Halliday	07/05/2012	<a href="#">10408</a>	Original Release

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