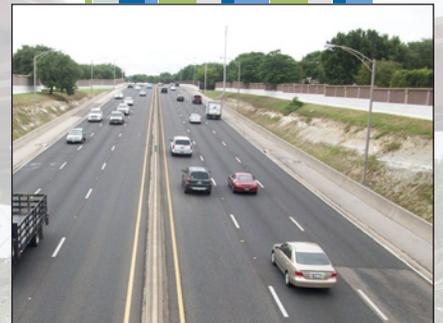




# ANNUAL INSPECTION REPORT SYSTEM

FISCAL YEAR 2014

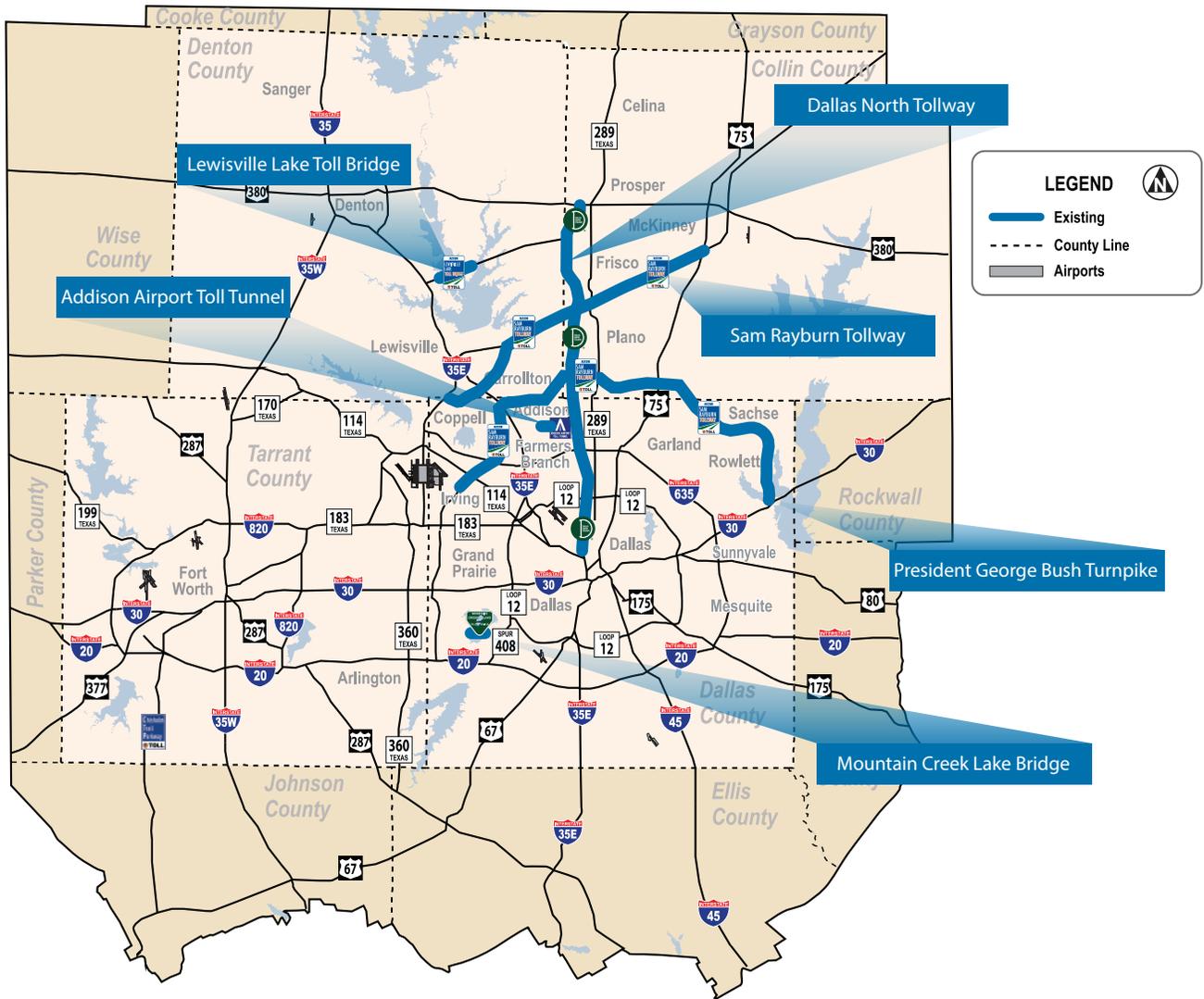


Prepared by Atkins North America, Inc.  
General Engineering Consultant

September 2014

ATKINS

050471WH14



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James Hofmann	Assistant Executive Director, Operations

September 26, 2014

Gerald Carrigan, Executive Director  
North Texas Tollway Authority  
5900 W. Plano Parkway  
Plano, Texas 75093

Dear Mr. Carrigan:

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 14 (FY 14) System Annual Inspection Report.

Atkins completed the System inspections in July 2014 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 routing 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 FY 15, the following budgets, to be presented at the October 2, 2014, Finance and Audit Committee meeting and subject to Board approval at the December board meeting, are recommended:

Operation and Maintenance Fund (OMF): \$ 137.4 million  
Reserve Maintenance Fund (RMF): \$ 24.414 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,



R. Keith Jackson, PE  
General Engineering Consultant  
Project Director

cc: Elizabeth Mow, PE, NTTA (w/1 copy)  
Eric Hemphill, PE, NTTA (w/1 copy)  
Victor Pavloff, PE, NTTA (w/1 copy)  
Marcus Warr, NTTA (w/1 copy and pdf electronically)  
Scott Brush, PE, VRX (w/1 copy)  
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# Acronyms and Abbreviations

AATT	Addison Airport Toll Tunnel
BRINSAP	Bridge Inventory Inspection and Appraisal Program
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	Lake Lewisville 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
SPS	Special Projects System
SRT	Sam Rayburn Tollway
TRM	Total Routine Maintenance
TxDOT	Texas Department of Transportation
US	U.S. Highway

# 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, 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, and Denton Counties.

Atkins North America, Inc. (Atkins), as General Engineering Consultant, completed the inspections in July of 2014 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 2015 (FY 15), the following budgets are recommended, to be presented at the Finance and Audit Committee meeting on October 2, 2014, and subject to Board approval in December 2014:

Operation and Maintenance Fund	\$137.4 million
Reserve Maintenance Fund	\$24.414 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 July 2014, 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, main lane 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,

copings, 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 of facilities-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).

**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. No maintenance necessary. Monitor for future degradation.
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.

### 1.3 Description of System

The NTTA System consists of the Dallas North Tollway (DNT), President George Bush Turnpike (PGBT), Sam Rayburn Tollway (SRT), 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.

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 I (IA-IC), extending from Midway Road to Avenue K in Collin County, opened to traffic in 1999. Segment II (IIA-IIB), extending from Avenue K to Brand Road in Garland, opened in 2000. Segment III, from Midway Road to the IH-35E interchange in Carrollton, opened in 2001. Segment IV, from the IH-35E interchange to the IH-635 interchange in Irving, opened in 2005. Segment V, 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.

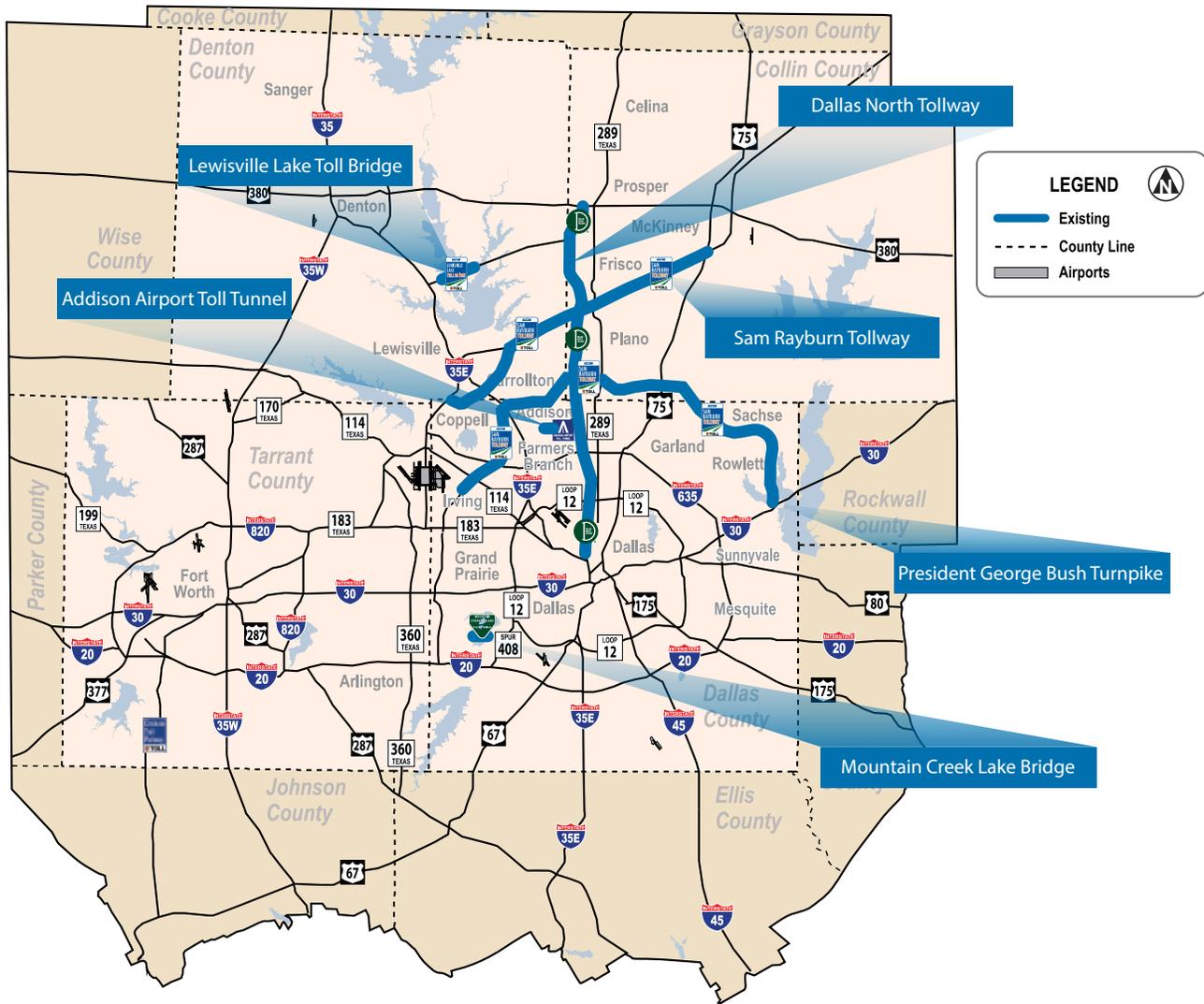


Figure 1: System Map

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, known as the PGBT Western Extension (PGBT WE), is part of NTTA's Special Projects System (SPS). The PGBT WE was inspected separately as part of the SPS Annual Inspections. 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.

### 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 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. There is a toll gantry on western approach of the facility.

### 1.3.5 Lewisville Lake Toll Bridge

The LLTB provides an east-west crossing of the northwestern 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.

### **1.3.6 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 traveled 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.

### **1.3.7 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, reserve maintenance projects, and major maintenance projects for the System and the Special Projects System (SPS). These Systems total 139 center lane miles of limited access toll roads and include 745 main lane miles and 210 frontage road miles. This network includes 603 bridges, including bridge class culverts, and one tunnel. The Maintenance Department is also responsible for routine and major maintenance of all facilities.

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 SPS 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 and major 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 about 50% of these services outsourced to consultants/contractors. Currently, the Total Routine Maintenance (TRM) contract for the entire PGBT, including the PGBT WE, 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 Roy Jorgensen Associates, Inc. This contract is a 3-year contract and was executed in August 2014.

The Maintenance Department staff is supported by the MMC, VRX, Inc. As the MMC, VRX provides professional services in support of the Maintenance 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 Maintenance Department 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 Maintenance Department activities. The disciplines VRX utilizes as the MMC include: civil, structural, 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 selected randomly 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), high-mast illumination poles (HMIP), and AATT. 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 five 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. At the time of this report, the 2014 Pavement Management Program Report (Pavement Report) was not completed.

The NTTA's OSS inspection program requires each cantilever overhead sign support (COSS) to be inspected by roadway every five years and each overhead sign bridge (OSB) to be inspected by roadway every ten years. The 2014 inspection is currently underway. The 2014 OSS Inspection Program is inspecting all the COSSs and OSBs along the DNT. Completion of this year's inspection will be after the release of this report. No significant structural issues have been noted on the current inspection.

NTTA's on-going HMIP inspection program requires each HMIP be inspected once every five years. No HMIPs were scheduled for inspection on the System in 2014. The NTTA is training an internal crew to perform these inspections. A continued monitoring program of all HMIPs is recommended to ensure the structural performance of the poles.

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 excellent to good condition (7–9 rating). Elements rated 6 or below (satisfactory condition) were given additional scrutiny throughout the inspection.

Every five years, NTTA also contracts for an inspection and evaluation of the AATT. This inspection

focuses on structural, mechanical, and electrical elements. The tunnel was inspected this year by Gannett-Fleming, Inc. As noted in the preliminary report, structurally the tunnel was in good condition with minor issues noted—mainly cracks, spalls, delaminations/voids, and water infiltration. Mechanically, observations included the ventilation fans, the fire protection system, drainage sump pumps, and the electrical room heating and air conditioning roof top unit. Electrically, most elements were in good condition with minor observations noted with the power system.

#### **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 2014 GASB rating for the system is 8.9 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.



Figure 2: Damaged Rail at Walnut Hill Lane

### 2.2 Dallas North Tollway Findings

#### 2.2.1 Dallas North Tollway Roadway

The majority of roadway observations were located on the older sections of the DNT from downtown Dallas to the PGBT. These included damage to the center median barrier, curb damage near inlets, and pavement degradation causing potholes.

The older sections of the DNT exhibited more frequent wear and tear. Spalling and cracking in the center median barrier has exposed rebar at several locations between the south end and IH-635. Potholes, pavement degradation, and curb damage at inlets were also more prevalent south of IH-635.

Joint separation was noted between the main lanes and the guardrail mow strip near Panther Creek Parkway. This location had been previously sealed but continued to show separation.



Figure 3: Damaged Inlet Sta. 262+00

## 2.2.2 Dallas North Tollway Bridges

Bridge observations included deck spalling, spalling at beam ends, and erosion under bridges.

Spalling was observed on the deck of the main lane overpass bridges at Lemmon Avenue and Maple/Knight Street. Additionally, spalling was observed under the deck of the overpass at Harvest Hill Road at the north abutment.

Minor spalling was observed at beam ends primarily at the Forest Lane underpass and County Road (CR) 24 underpass.

Erosion was noted under several of the main lane bridges on the northern section of the corridor. The areas of erosion include under the main lane bridge over Stewart Creek and Panther Creek. Erosion was observed around several of the bent columns at Stewart Creek, and erosion at Panther Creek had created ruts.

Culverts were in generally good condition with a few minor spallings noted.



**Figure 4: Degrading Bridge Deck at Maple/Knight**



**Figure 5: Erosion at Panther Creek**

## 2.2.3 Dallas North Tollway Walls

Wall observations included aesthetic degradation, cracking/spalling in panels and coping, panel displacement, and water stains on the retaining wall at bridge abutments.

Rust stains on the walls were observed at the connections to the chain link fence posts at several main lane locations, primarily in the depressed sections from University Boulevard to Northaven Road.

Minor cracking and spalling was observed in the panels and coping at several locations, including: Quorum Drive, Alpha Road, Oak Lawn Avenue, Belt Line Road, Westgrove Drive, and Headquarters Drive. Panel misalignment was also observed near Gaylord Parkway, Quorum Drive, Alpha Road, and CR 24.

Water stains on the retaining wall was noted at several bridge abutments on the south end including: Walnut Hill Lane, Park Lane, Oak Lawn Avenue, Northwest Highway, University Boulevard, Mockingbird Lane, Beverly Drive, Bordeaux Avenue, and Cedar Springs Road.



**Figure 6: Fence Rust Staining Wall North of Northaven**



**Figure 7: Water Stains on Retaining Wall at Oak Lawn Avenue**

## 2.2.4 Dallas North Tollway Facilities/Buildings

Two main lane plaza (MLP) facilities were inspected on the DNT. No inspection was performed on MLP 2, located near Trinity Mills Road, because it is slated for demolition. At MLP 3, located near Parker Road, the exterior walls of the mechanical enclosure exhibited minor rusting and joint separation. In the interior, water stains were observed in the ceiling tiles and concrete masonry unit walls. At MLP 4, located near Eldorado Parkway, rust was visible on the overhead truss of the gantry. The paint on the truss has begun to chip at several locations and the structural members exhibit light surface rust.



Figure 8: Rust Stains on CMU Wall at MLG 3

## 2.2.5 Dallas North Tollway Changes from FY13

The pavement degradation on the deck of the bridges over Forest Lane, Inwood Road, and the direct connector ramp from southbound DNT to southbound IH-35E has been repaired. The observation of ponding at Main Street and Eldorado Parkway were not present this year despite regular rainfall. At MLP 4 rust and corrosion on the water piping system valves noted last year was not observed this year.



Figure 9: Gantry Light Surface Rust at MLP 4

## 2.3 President George Bush Turnpike Findings

### 2.3.1 President George Bush Turnpike Roadway

Roadway observations included median erosion, pavement deterioration, faded pavement markings, barrier damage, and curb damage.

Erosion was observed throughout the corridor in the center median. Erosion in some areas caused edge drop offs.

Pavement spalling, cracking, and potholes were observed in the main lanes throughout. These areas were minor in nature and did not appear to be concentrated in a particular section. Main lane pavement heaving was also observed at areas mainly south of IH-35E. Faded pavement markings and missing raised pavement markings were observed on segments 2, 3, 4, and 5.

Minor damage to barriers was observed at various locations throughout the roadway. The damage to curbs is located on the U-turns and ramps at



**Figure 10: Erosion in the Center Median Near Coit**



**Figure 11: Rail Damage North of Belt Line**

various locations on the tollway. Some barriers have become misaligned in segment 8.

### 2.3.2 President George Bush Turnpike Bridges

Bridge observations include cracking backwalls, degraded seals, and damaged armor joints.

Cracking was observed at several abutment backwalls near the wingwall. These areas do not appear to affect the structural integrity of the abutment and appear mainly aesthetic in nature.

Missing or degrading seals were observed on the centerline and joints of several bridges. Most notably the bridge over Brand Road and Spring Creek is missing seals at most of the joints.

Damaged armor joints were observed on the bridge near Hutton Branch and Belt Line Road.

The substructure of the bridge over Lake Ray Hubbard was not inspected this year because the water level was prohibitively low.

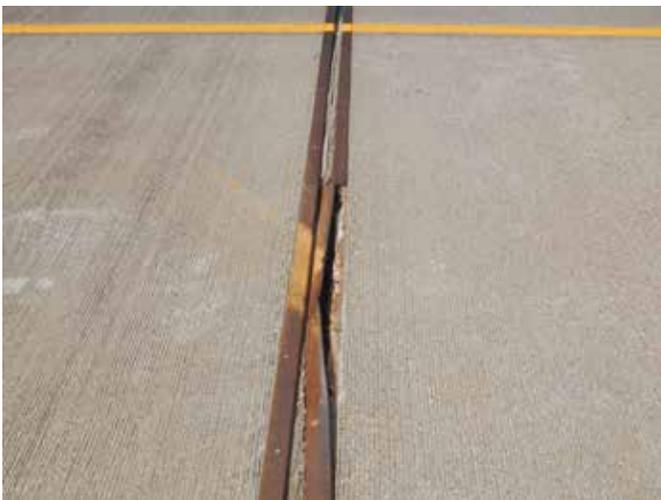


**Figure 12: Missing Seal at Bridge over Brand Road**

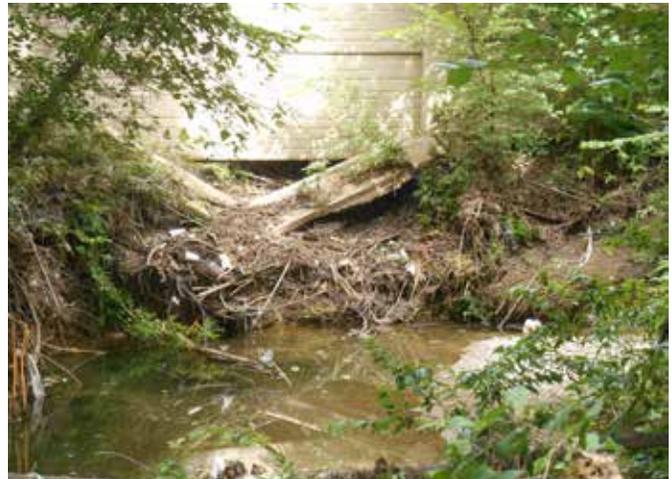
side of the south abutment at Shiloh Road. Cracking in these areas was minor.

Panel misalignment was observed on the east side of Dickerson Parkway, southeast ramp abutment at US-75, and at westbound to northbound direct connector ramp abutment at the IH-35E interchange.

Creek encroachment on a sound wall was observed near MLP 8. The creek behind the wall has eroded the bank up to one of the columns.



**Figure 13: Damaged Armor Joint at the Bridge over the DNT Interchange**



**Figure 14: Creek Encroachment near MLP 8**

### **2.3.3 President George Bush Turnpike Walls**

Wall observations included cracking/spalling in panels, panel misalignment, and creek encroachment on a sound wall.

Cracking and spalling was observed in wall panels and coping throughout the corridor. These locations included: north side at Old Denton Road, west side near Custer Road, west side at Alma Drive, east



**Figure 15: Panel Misalignment EB PGBT to EB IH 635**

### 2.3.4 President George Bush Turnpike Facilities/Buildings

The five main lane plaza facilities inspected on the PGBT were at MLP 6, 7, 8, 9, and 10 near Shiloh Road, Coit Road, Frankford Road, Sandy Lake Road, and Belt Line Road, respectively. MLP 5 near Merritt Road does not contain a facility.

Observations identified throughout the facilities included cracking in exterior concrete masonry walls, and evidence of water stains in interior ceiling tiles, CMU walls, and floors.



Figure 16: Cracking CMU Wall MLG 8

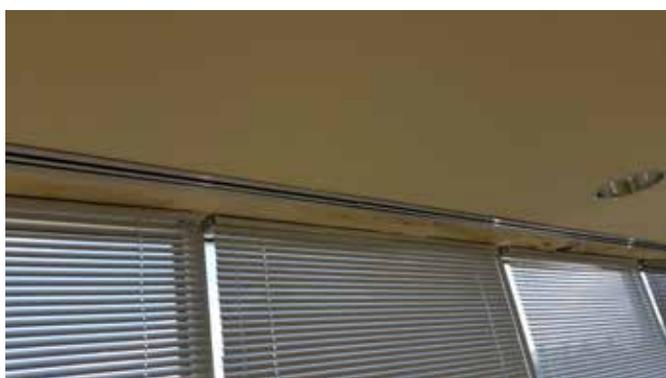


Figure 17: Water Damage on Ceiling MLG 7

### 2.3.5 President George Bush Turnpike Changes from FY13

The following general observations during this year's inspections were noted last year: erosion under interchange bridges; center median erosion; isolated wall panel cracks, spalls, and misalignment; isolated areas of water stains; abutment spalling; water stains in facilities.

A couple of items noted last year were not observed this year. The fire alarm panel at MLP 9 has been brought up to compliance. Foundation heaving repairs at MLP 10 have been completed.

## 2.4 Sam Rayburn Tollway Findings

### 2.4.1 Sam Rayburn Tollway Roadway

Roadway observations included barrier damage, curb damage, potholes, and faded pavement markings.

Barrier spalling and cracking was observed throughout the roadway, particularly on the center median barrier, with rebar exposed at several locations.

Curb damage was observed throughout both frontage roads and on most of the cross street underpasses.



**Figure 18: Rail Damage West of Huffines**



**Figure 19: Damaged Curb at the Preston Road Intersection**

Potholes were noticed throughout the main lanes, frontage roads, and cross streets. The majority of the potholes were observed on the frontage roads and cross streets.

Faded pavement markings were observed on the main lanes and frontage roads. The pavement markings are faded intermittently throughout segments 2, 3, 4, and 5 from station 500+00, southwest of Plano Parkway, to the north end.

## 2.4.2 Sam Rayburn Tollway Bridge

Overall the bridges on the SRT are in relatively good shape. Bridge observations included cracking backwalls, erosion, and deck spalling.

Cracking was observed on both of the abutments at Hillcrest Road and the east abutment at Plano Parkway.

Erosion was observed under several of the bridges including: White Rock Creek, east of the Union Pacific Railroad crossing, eastbound main lane bridge west of Huffines, eastbound SRT to southbound US-75 direct connector bridge, and at the creek between IH-35E and Huffines. Erosion was also present at a few bridge abutments: westbound main lane bridge over DART Railroad abutment, southwest abutment of the eastbound main lane bridge over US-75, and the south side abutment of the Carrollton Parkway Bridge.

A deck spall was observed under the FM 2281 (Old Denton Road) bridge on the north side.



Figure 20: Erosion near White Rock Creek



Figure 21: Deck Spall under FM 2281 Bridges

## 2.4.3 Sam Rayburn Tollway Walls

The walls on the SRT are generally in good condition. There are a few areas where the coping has been damaged, and one spot where backfill is coming out between the panels.

The coping has been damaged on the north side wall at Spring Creek Parkway, the westbound frontage road east of Hillcrest Road, and on the eastbound frontage road west of Rowlett Cemetery Road. These areas are minor and aesthetic in nature.



Figure 22: Damaged Coping East of Hillcrest Road



**Figure 23: Backfill coming through Wall at Denton Tap Road**

The backfill is coming through the retaining wall on the west side of Denton Tap Road.

#### **2.4.4 Sam Rayburn Tollway Facilities/Buildings**

There are no facilities/buildings located on the SRT.

#### **2.4.5 Sam Rayburn Tollway Changes from FY13**

General observations from last year that were present this year include: faded pavement markings, barrier damage and misalignment, curb damage, potholes, and erosion.

One new observation that was not noticed last year was the backfill coming through the wall at Denton Tap Road. The spalling beam ends at the northbound main lane bridges at IH-35E and Josey Lane have been repaired. Also, the pavement heaving on the northbound frontage road north of Standridge Drive has been repaired.

## **2.5 Mountain Creek Lake Bridge Findings**

### **2.5.1 Mountain Creek Lake Bridge Roadway**

Roadway observations included degraded pavement and faded pavement markings, and degraded asphalt shoulders.

Pavement degradation was observed on both the east and west approaches. Specifically, the east approach slab, as well as the pavement near the



**Figure 24: Pavement Degradation East End**



**Figure 25: Shoulder Degradation West End**

gantry on the western approach, showed cracking and spalling. Asphalt shoulders on each approach have deteriorated. The pavement markings are also fading across the bridge.

## 2.5.2 Mountain Creek Lake Bridge Bridges

Notable bridge observations included minor spalling at beam ends and at column casings.



Figure 26: Beam Spalling



Figure 27: Column Sacrificial Protection Spalling

## 2.5.3 Mountain Creek Lake Bridge Walls

The retaining walls on MCLB are in good condition. No notable observations.

## 2.5.4 Mountain Creek Lake Bridge Facilities/Buildings

The plaza facility at MCLB showed signs of cracking in interior drywall, the perimeter fence had been damaged, and there was water stains at one of the toll booths.

## 2.5.5 Mountain Creek Lake Bridge Changes from FY13

The following observations observed during this year's inspections were noted last year: pavement deterioration at the east and west approaches; spalling at beam ends; bent cap spalling and cracking; column casing spalling. The exterior cracking on the plaza facility has been repaired, and the gantry truss that was repaired improperly last year has been repaired properly.

## 2.6 Lake Lewisville Toll Bridge Findings

### 2.6.1 Lake Lewisville Toll Bridge Roadway

Consistent with the age of the corridor, relatively few observations reported with the roadway. No significant observations were found. There were minor instances of rail damage and a few small potholes.

### 2.6.2 Lake Lewisville Toll Bridge Bridges

The bridge is in good condition there were only a few observations of note. On the west end there is erosion near the abutment, and one of the water filtration boxes under the bridge is leaking causing the bottom of the box to corrode. Also the bridge is missing raised pavement markings in both direc-



Figure 28: Erosion on the West End



Figure 29: Filter Box Leaking on the East End

tions.

### 2.6.3 Lake Lewisville Toll Bridge Walls

No observations reported with respect to the retaining walls.

### 2.6.4 Lake Lewisville Toll Bridge Facilities/Buildings

There are no facilities or buildings located on the LLTB.

### 2.6.5 Lake Lewisville Toll Bridge Changes from FY13

The observations noted in the previous year were again noticed this year. Excluding the cracked riprap at the base of the “Thank You for Driving with NTTA” sign on the east approach which has been repaired.

## 2.7 Addison Airport Toll Tunnel Findings

### 2.7.1 Addison Airport Toll Tunnel Roadway

Observations on the roadway included pavement spalling and faded pavement markings. The pavement spalling was observed on the west end near the gantry, and the pavement markings on the entire roadway are faded.

### 2.7.2 Addison Airport Toll Tunnel Bridges (Tunnel)

Tunnel observations include debris in drains and cracks in the portal wall. A drain on the west end of the tunnel is filled with debris. There were two observations of minor cracks in the portal. One is on the west end, the concrete around the door is cracking, and on the east end cracking was observed at the corner of the portal and the north retaining wall.

Though tunnel wall cracking was observed this year, areas were not noted. Cracks were hairline in nature and are being monitored as part of the specialized tunnel inspections.

### 2.7.3 Addison Airport Toll Tunnel Walls

Wall observations include water seeping through the wall, vegetation growing between panels, and backfill coming through between panels. Water seeping through between panels was observed in a few locations which stained the wall and allowed

moss to grow on the panels. On the west end there is a small amount of backfill coming through the wall.

### 2.7.4 Addison Airport Toll Tunnel Facilities/Buildings

No observations were noted at the facility.

### 2.7.5 Addison Airport Toll Tunnel Changes from FY13

The observations noted in the previous year were observed again this year.



Figure 30: Pavement Spalling on the West End



Figure 31: Debris in Drain Near the West End

## 2.8 Facility (Other) Findings

### 2.8.1 Facilities/Buildings

Other inspected facilities were 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 on overhead doors, leaking water connections in the fire riser room and in the truck wash area, and soil settlement near the covered spreader storage.

Only one observation was noted at the Frisco Maintenance Service Center. The drain piping at an ice machine is not draining properly into a floor drain.

Observations at the Gleneagles Office Center at 5900 West Plano Parkway include: rust damage to parking lot canopy columns, ponding on the sidewalk on the north side of the building, pavement spalling on the entrance bridge, and water stains on ceiling tiles.

Only one observation was noted at the Gleneagles Office Center at 5910 West Plano Parkway. Water stains were observed on ceiling tiles in various locations throughout the office.

### 2.8.2 Facility Changes from FY13

At the Ohio Drive Maintenance Service Center, the cracking interior CMU walls observed last year were not noted this year. This is the first year the Frisco Service Center was inspected. At Gleneagles 5900, the loose casework in the kitchen and break room areas was not noted in this year's inspection, and at Gleneagles 5910, the expired fire extinguisher has been brought up to code.

## 3.0 Projects Completed since FY13 Inspections

Listed below are projects that have been completed since the FY13 inspections.

### 3.1 Dallas North Tollway Completed Projects

- Bridge Deck Repair at Forest Lane and Inwood Road
- Joint and Crack Sealing

### 3.2 President George Bush Turnpike Projects

- Erosion Mitigation at Renner Road

### 3.3 Sam Rayburn Tollway Projects

- Pavement Joint Repairs
- Pavement Repairs on the Frontage Road Near Standridge Drive

## 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: center median barrier repairs; deck repairs to the Lemmon and Maple/Knight overpass bridges; curb and inlet top repairs; ramp repairs from Oak lawn Avenue to Legacy Drive; restriping segment 3; erosion repair at Panther Creek.

Of the previously mentioned observations, many fall under the scope of routine maintenance. These include: pavement spalling, rust stains on walls, and minor cracks and spalls in retaining wall panels.

It is also recommended that the following observations be monitored for further degradation: spalling under the deck of the Harvest Hill Road overpass; spalling at beam ends at Forest Lane; isolated retaining wall panel misalignment, primarily north of the SRT; and erosion at Stewart Creek.

### 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: armor joint repairs, on the southbound main lanes over Hutton Branch; culvert and erosion repair; drainage improvements; curb and median repair; restripe segments 2 and 3; pavement repairs in segment 5 and at IH-35E interchange. One observation that requires investigation is the creek encroaching on the sound wall near MLP 8.

The vast majority of the observations on the PGBT fall under the scope of routine maintenance. These include: isolated locations of pavement deterioration including cracking, spalling, and potholes; isolated locations of barrier spalling; damaged curb at the cross street U-Turns; vegetative growth between wall panels; erosion in the median landscaping; trees growing in the sound walls. These should be addressed to prevent further damage.

It is recommended that the following observations be monitored: isolated wall panel cracking and spalling; isolated wall panel misalignment; erosion under IH-635 interchange, under the main lane bridge between Blanton Drive and Dickerson Parkway, at White Rock Creek, Spring Creek, and Hackberry Creek; beam end cracking at the Dickerson Parkway Bridge, Royal Lane Bridge, Southeast direct connector abutment on US-75, eastbound PGBT to eastbound IH-635 direct connector abutment, and the southbound IH-35E to eastbound PGBT direct connector abutment. These should be monitored for future deterioration.

## 4.4 Sam Rayburn Tollway Recommendations

A few projects have been developed or are in the process of being developed to address the needs of the SRT. These projects include the following: erosion repair, restriping (audible pavement markings), and median repairs.

Most observations made on the SRT are included under routine maintenance. These include: curb damage throughout the corridor on the frontage roads and ramps; potholes on the main lanes, cross streets, and frontage roads; rail damage on the center median.

It is recommended that the following be monitored: backfill coming through the retaining wall on the west side of Denton Tap Road; erosion at the creek between Huffines Road and IH-35E, White Rock Creek, and the Creek east of MacArthur Boulevard; water leaking through panels at the Alma Road intersection. These should be monitored for future deterioration.

## 4.5 Mountain Creek Lake Bridge Recommendations

A project is being developed to repair the pavement and the shoulders on the west end. The spalling at beam ends and on the column sacrificial protection should be monitored. Also the bridge is in need of restriping.

## 4.6 Lake Lewisville Toll Bridge Recommendations

The erosion at the east end abutment is being investigated for a potential project. The water filtration boxes under the bridge may need to be repaired to fix leaks as part of the total routine maintenance. The erosion on the west end should be monitored to prevent damage to the system.

## 4.7 Addison Airport Toll Tunnel Recommendations

Miscellaneous interior and exterior observations were noted throughout the facilities. The locations of water leakage in the tunnels, walls, and ceiling should be investigated further for a possible source. Most observations fall under the scope of routine maintenance: rusting and degrading window and door sealants. While others should be monitored for further degradation such as: minor cracking in concrete masonry unit walls and paint degradation.

## 4.8 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.

Through coordination with the MMC, along with a review of the anticipated Reserve Maintenance Projects scheduled for FY 15, the following budgets shown in Table 2 are recommended. These preliminary budget amounts to be presented to the NTTA Finance and Audit Committee on October 2, 2014, and are scheduled for final budget approval at the December Board meeting.

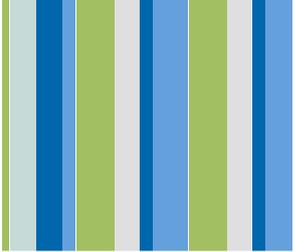
**Table 2: Budget Recommendations**

System Funds	Budget
Operation and Maintenance Fund	\$137.4 million
Reserve Maintenance Fund	\$24.414 million

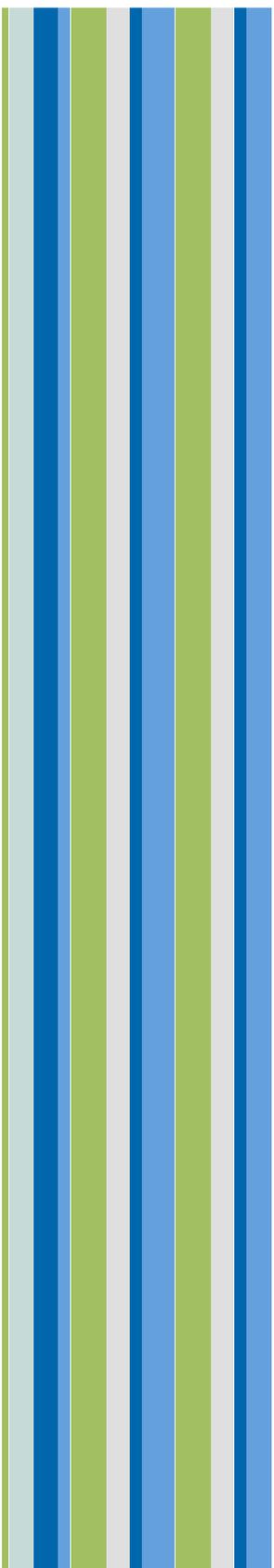
## 5.0 Summary

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

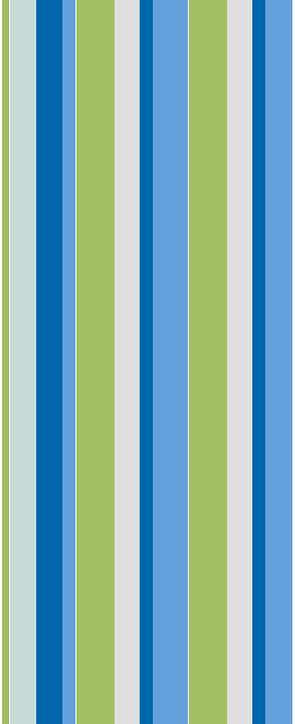
Dated as of April 1, 2008

**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.

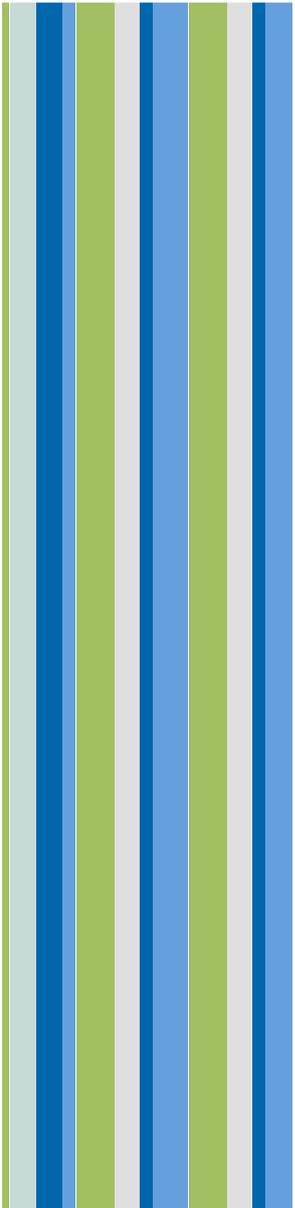
**Section 504. Duties of Consulting Engineers.** The Authority covenants that it will cause the Consulting Engineers employed by it under the provisions of Section 704 of this Agreement, to make an inspection of the Tollway on or before the 90th day prior to the end of each Fiscal Year and to submit 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.
-

<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 2 of 8
<b>Title: GEC Annual Inspection of the NTTA Systems</b>		

- 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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<b>Title: GEC Annual Inspection of the NTTA Systems</b>		

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:

- Perform 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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<b>NTTA Projects</b>	<b>Original Issue Date: 07/05/2012</b>	<b>GEC-01</b>
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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	<b>10408</b>	Original Release