



ANNUAL INSPECTION REPORT SYSTEM

FISCAL YEAR 2013



09050JLS13

Prepared by Atkins North America, Inc.
General Engineering Consultant

September 2013



Table of Contents

List of Figures/Tables	iii
Acronyms and Abbreviations	iv
Consulting Engineer Project Director’s Letter	
Executive Summary	1
1.0 Introduction	2
1.1 Background	2
1.2 Inspection Process	2
1.3 Description of System	2
1.3.1 Dallas North Tollway (DNT).....	3
1.3.2 President George Bush Turnpike (PGBT)	3
1.3.3 Sam Rayburn Tollway (SRT)	3
1.3.4 Mountain Creek Lake Bridge (MCLB).....	5
1.3.5 Lewisville Lake Toll Bridge (LLTB).....	5
1.3.6 Addison Airport Toll Tunnel (AATT)	5
1.3.7 Facilities/Buildings.....	5
1.4 Maintenance Program Overview	5
1.4.1 Organization.....	5
1.4.2 Maintenance Rating Program.....	6
1.4.3 Specialized Inspections.....	6
1.4.4 Governmental Accounting Standards Board Requirements.....	7
2.0 Inspection Findings.....	8
2.1 Overview	8
2.2 DNT Findings	8
2.2.1 DNT Roadway.....	8
2.2.2 DNT Bridges.....	8
2.2.3 DNT Retaining Walls	9
2.2.4 DNT Facilities/Buildings	9
2.3 PGBT Findings.....	9
2.3.1 PGBT Roadway	9
2.3.2 PGBT Bridges	10
2.3.3 PGBT Retaining Walls	10
2.3.4 PGBT Facilities/Buildings	10
2.4 SRT Findings	10
2.4.1 SRT Roadway.....	10
2.4.2 SRT Bridges	11
2.4.3 SRT Retaining Walls	12
2.4.4 SRT Facilities/Buildings	12
2.5 MCLB Findings.....	12
2.5.1 MCLB Roadway.....	12
2.5.2 MCLB Bridges	12
2.5.3 MCLB Retainings Walls	12
2.5.4 MCLB Facilities/Buildings.....	12

Table of Contents - continued

2.6	LLTB Findings.....	12
2.6.1	LLTB Roadway.....	12
2.6.2	LLTB Bridges.....	12
2.6.3	LLTB Retainings Walls	13
2.6.4	LLTB Facilities/Buildings.....	13
2.7	AATT Findings	13
2.7.1	AATT Roadway	13
2.7.2	AATT Bridges (Tunnel)	13
2.7.3	AATT Retainings Walls.....	13
2.7.4	AATT Facilities/Buildings	13
2.8	Facility (Other) Findings	13
2.8.1	Facilities/Buildings.....	13
3.0	Projects Completed Since FY12 Inspections	14
3.1	DNT Projects	14
3.2	PGBT Projects.....	14
3.3	SRT Projects	14
3.4	Systemwide Projects.....	14
3.5	Facility Projects	14
4.0	Future Projects and Recommendations.....	15
4.1	Overview.....	15
4.2	DNT Recommendations	15
4.3	PGBT Recommendations.....	15
4.4	SRT Recommendations	16
4.5	MCLB Recommendations.....	16
4.6	LLTB Recommendations.....	16
4.7	AATT Recommendations.....	16
4.8	Facility Recommendations	16
4.9	Budget Recommendations.....	17
5.0	Summary	17
Appendices		
A	Section 504 of the Amended and Restated Trust Agreement	
B	Quality Management System Manual Procedure GEC-01 – General Engineering Consultant Annual Inspection of the North Texas Tollway Authority Systems	

List of Figures/Tables

Figure 1: System Map.....	4
Table 1: GEC Annual Inspection Rating Scale.....	2
Table 2: Budget Recommendations.....	17

Acronyms and Abbreviations

AATT	Addison Airport Toll Tunnel
BRINSAP	Bridge Inventory Inspection and Appraisal Program
CMU	Concrete Masonry Unit
COSS	Cantilever Overhead Sign Supports
DNT	Dallas North Tollway
EBFR	Eastbound Frontage Road
EBML	Eastbound Main Lane
FM	Farm to Market Road
FY	Fiscal Year
GASB	Governmental Accounting Standards Board
GEC	General Engineering Consultant
HMIP	High-Mast Illumination Pole
LLTB	Lewisville Lake Toll Bridge
MCLB	Mountain Creek Lake Bridge
MLG	Main Lane Gantry
MLP	Main Lane Plaza
MMC	Maintenance Management Consultants
MRP	Maintenance Rating Program
NBFR	Northbound Frontage Road
NBML	Northbound Main Lane
NTTA	North Texas Tollway Authority
OMF	Operation and Maintenance Fund
OSB	Overhead Sign Bridges
OSS	Overhead Sign Structure
PGBT	President George Bush Turnpike
PGBT WE	President George Bush Turnpike Western Extension
RMF	Reserve Maintenance Fund
SBFR	Southbound Frontage Road
SBML	Southbound Main Lane
SH	State Highway
SPS	Special Projects System
SRT	Sam Rayburn Tollway
TRM	Total Routine Maintenance
TxDOT	Texas Department of Transportation
US	U.S. Highway
WBFR	Westbound Frontage Road
WBML	Westbound Main Lane



Atkins North America, Inc.
18383 Preston Road, Suite 500
Dallas, Texas 75252

Telephone: +1.972.818.7275
Fax: +1.972.380.2609

www.atkinglobal.com/northamerica

September 27, 2013

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 13 (FY 13) System Annual Inspection Report.

Atkins completed the System inspections in July 2013 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, retaining 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 Reserve Maintenance Projects planned for the ensuing fiscal year. Through coordination with the Maintenance Department, and in review of the anticipated Reserve Maintenance Projects scheduled for FY 14, the following budgets are recommended:

Operation and Maintenance Fund (OMF):	\$24.3 million
Reserve Maintenance Fund (RMF):	\$27.3 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 for 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)
Joyce Hamilton, NTTA (w/ 4 copies and 1 CD)
Scott Brush, PE, VRX (w/ 1 copy)
File

Executive Summary

As described in the requirements set forth in the North Texas Tollway Authority (NTTA) 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 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.

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 2013 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, retaining walls, bridges, tunnel, and facilities/buildings.

A document detailing the inspection findings, including photographs, 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 Reserve Maintenance Projects planned for the ensuing fiscal year. Through coordination with the Maintenance Department, and in review of the anticipated Reserve Maintenance Projects scheduled for fiscal year (FY 14), the following budgets are recommended:

Operation and Maintenance Fund (OMF)	\$24.3 million
Reserve Maintenance Fund (RMF)	\$27.4 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 July 2013, Atkins completed the annual inspection of the 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 FY.

1.2 Inspection Process

The GEC Annual Inspection assessed four main elements: roadway, bridges, retaining walls, and buildings/facilities. The roadway portion of the inspection focused on the pavement, drainage structures, erosion issues, signing and 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 retaining 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 exterior and interior of facilities - maintenance facilities, sand storage areas, and administrative office complexes. The inspection of the Addison Airport Toll Tunnel focused on the tunnel pavement, drainage, illumination, and structural elements.

Inspections were conducted in accordance with NTTA's Project Delivery Department's Quality

Management System 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 Consultants (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.

1.3.1 Dallas North Tollway (DNT)

The DNT extends from Interstate 35E (I-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 635 (I-635) opened to traffic in June 1968. In 1987 it was extended to Briargrove Lane in Far North Dallas and then to State Highway (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 (PGBT)

The PGBT extends from Belt Line Road in Irving clockwise approximately 52 miles to Interstate 30 (I-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 I-35E interchange in Carrollton, opened in 2001.

Segment IV, from the I-35E interchange to the I-635 interchange in Irving, opened in 2005. Segment V, extending from the I-635 interchange to Belt Line Road, opened to traffic in 2001. The Eastern Extension of the PGBT, extending from Brand Road to the I-30 near Lake Ray Hubbard, opened in 2011. This is the first year annual inspections were performed on the Eastern Extension.

The non-tolled segment of the PGBT from Belt Line Road to SH 183 is owned and maintained by the Texas Department of Transportation (TxDOT). The section of the PGBT from SH 183 to I-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 SH 161 west of I-35E and SH 190 east of I-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 (SRT)

The SRT, formerly known as SH 121, extends from Business SH 121 near the Denton/Dallas county line northeasterly 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 TxDOT. Segment 3, extending from Hillcrest Road to Hardin Boulevard, opened in 2009. Segment 4, extending

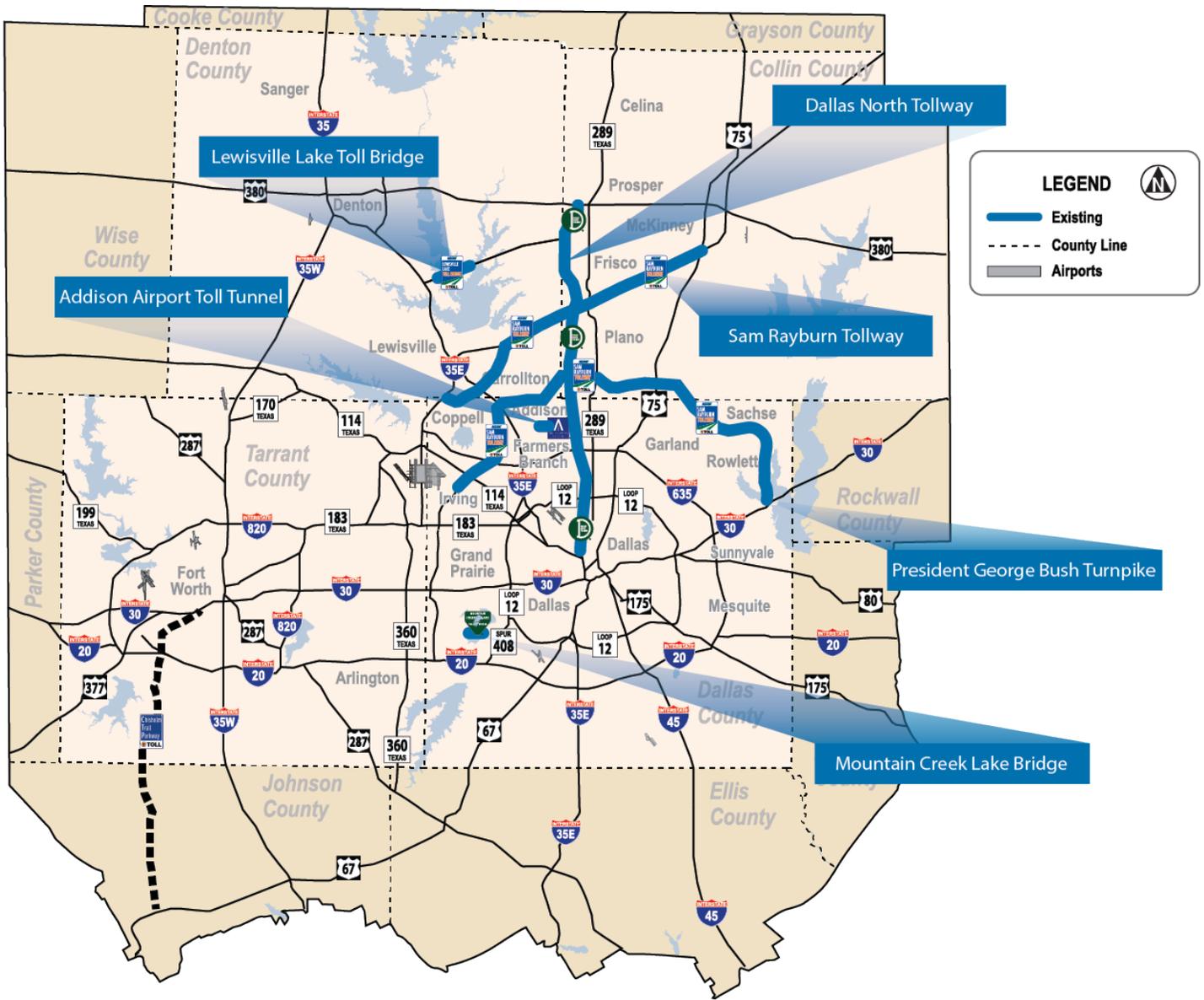


Figure 1: System Map

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 (MCLB)

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 2.5 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 the western approach of the facility.

1.3.5 Lewisville Lake Toll Bridge (LLTB)

The LLTB provides an east-west crossing of the northwestern arm of Lewisville Lake in Denton County. The LLTB is part of the Lewisville Lake Corridor, which connects I-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 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 (AATT)

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 I-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, as well as roadway plaza buildings. The new Frisco Maintenance Service Center is anticipated to be opened in 2013 and was not included in this annual inspection.

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. These Systems total 111 center lane miles of limited access toll roads

and include 740 main lane miles and 210 frontage road miles. This network includes 461 bridges 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 eight-year contract and is currently scheduled for completion by November 2019.

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 engineering, structural, 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, 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).

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 2013 Pavement Management Program Report (Pavement Report) was not completed, however the executive summary was available. The executive summary did not indicate any significant changes from what was in the 2012 Pavement Report. Pavement repairs performed by NTTA since the 2012 Pavement Report are included in this report. Detailed findings of the 2013 Pavement Report by the MMC are not included.

The NTTA's on-going OSS inspection program requires each cantilever overhead sign support (COSS) to be inspected every five years and each overhead sign bridge (OSB) to be inspected every ten years. The 2013 inspection is currently underway. The 2013 OSS Inspection Program includes 91 structures along Segments 1 and 2 of SRT. These include 67 COSS, 14 OSB and 10 Tee structures. 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 ongoing HMIP inspection program requires each HMIP be inspected once every five years. No HMIPs were scheduled for inspection on the System in 2013. 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 9 to 0, with 9 being excellent. A review of these reports indicates that most bridge elements on the System are in excellent to good condition (9–7 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 last inspection was performed in 2009. As noted in the 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 deficiencies noted with the power system. The next inspection is planned for 2014.

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 3 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 2013 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, only a few observations were rated below a 3 on the four elements inspected.

The following sections include notable and general observations from each corridor with respect to the roadway, bridges, retaining walls, and facilities/buildings. A document detailing the inspection findings, including photographs, has been transmitted to the Maintenance Department under a separate cover.

2.2 DNT Findings

2.2.1 DNT Roadway

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

Spalling and cracking in the center median barrier has exposed rebar at several locations. The older sections of the DNT exhibited more frequent and significant damage. Vehicular impact damage has also removed several barrier reflectors. Curb damage at inlets has exposed rebar at several locations in this section as well.

Pavement spalling, cracking, and potholes were observed on many of the ramps from I-35E to I-635. Faded pavement markings, as well as sections of damaged curb, were also noted on these ramps.

Other roadway issues included joint separation, missing raised pavement markers, and spalling on the frontage road barrier.

Joint separation was noted between the main lanes and the guardrail mow strip at locations primarily near Panther Creek Parkway. These locations had been previously sealed but continued to show separation. Roadway sections with missing raised pavement markers were noted on the northbound main lane (NBML) from Cotton Gin Road to Eldorado Parkway and the southbound main lane (SBML) from Keller Springs Road to Alpha Road. Barrier spalling was also observed on the frontage roads near Belt Line Road at the connections to the chain link fence posts.

2.2.2 DNT Bridges

Notable 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, Forrest Lane, and Inwood Road. The direct connector ramp from southbound DNT to southbound I-35E also exhibited deck spalling. 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. These areas appeared to have pushed-up against the abutment backwall during the normal expansion period.

Erosion was noted under several of the main lane bridges on the northern section of the corridor. These newer sections had yet to obtain established vegetation to protect against erosion. The most notable area of erosion was under the main lane overpass bridge at Stewart Creek south of Cotton Gin Road. Erosion was observed around several of the bent columns.

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

2.2.3 DNT Retaining Walls

Notable wall observations included aesthetic degradation, cracking/spalling in panels and coping, panel displacement, and localized ponding.

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. Paint on the panels and coping has also begun to chip and fade, primarily from I-635 to the SRT. These two issues appear only aesthetic in nature.

Minor cracking and spalling was observed in the panels and coping at several locations, including: Harvest Hill Road, Spring Valley Road, Belt Line Road, Westgrove Drive, and Headquarters Drive. Panel displacement was also observed near Spring Valley Road, Panther Creek Parkway, and County Road 24.

Areas of ponding were noted at the base of the southbound frontage road (SBFR) wall near Main Street as well as the south-to-north U-Turn at Eldorado Parkway. This could indicate possible water seepage through the wall.

2.2.4 DNT Facilities/Buildings

Three main lane plaza facilities were inspected on the DNT. No significant observations were noted at Main Lane Plaza (MLP2) located near Trinity Mills Road, which is slated for demolition. At MLP3, located near Parker Road, the exterior walls of the mechanical enclosure exhibited minor rusting and joint separation. In the interior, water infiltration was observed in the ceiling tiles and tunnel walls. At MLP4, located near Eldorado

Parkway, minor corrosion was visible on the valves of the water chilling piping system as well as the overhead truss of the gantry. The paint on the truss has begun to chip at several locations and the structural members exhibited corrosion. MLP1, located near Wycliff Avenue, does not contain a facility.

2.3 PGBT Findings

2.3.1 PGBT Roadway

Notable roadway observations included median erosion, pavement deterioration, barrier spalling, curb damage, and faded pavement markings.

Erosion was frequently observed throughout the corridor in the center median. Runoff had washed out the landscaping ground cover onto sodded areas. Erosion was also noted at areas adjacent to the main lane and ramp pavement, causing unsafe edge drop-offs.

Pavement spalling, cracking, and potholes were observed on 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 I-35E. These areas of heaving result in a low ride quality for this section of the PGBT.

Spalling was observed on both the outside railing and center median barrier. Some locations have the potential to become a projectile hazard. Damaged curb and faded pavement markings were observed at the cross street U-Turns. Though the frontage roads and cross streets are generally maintained by others, U-Turn maintenance falls under the responsibility of the TRM contractor Roy Jorgensen Associates, Inc.

2.3.2 PGBT Bridges

Notable bridge observations included erosion, cracking in abutment backwalls, and faded deck pavement markings.

Erosion was observed under the following bridges: main lanes between Belt Line Road and Valley View Lane, main lanes and ramps at the I-635 interchange, southbound Valley View Lane ramps, and the southbound Belt Line Road on-ramp. The majority of these areas were not encroaching on bent columns and did not present a safety issue. However, the main line overpass bridges over White Rock Creek east of the DNT have begun encroaching on the columns.

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

Faded pavement markings were observed on several of the direct connect ramps at the US 75 interchange. Faded yellow cross-hatch markings were also noted on the main lane overpasses at I-35E, DNT, and US 75. Additionally, paint was faded on the outside of the railing on the ramp from southbound I-35E to eastbound PGBT as well as the Old Denton Road overpass.

Additional observations included deck spalling on the south side of the Josey Lane overpass and apparent water seepage under the bridges at Coit Road, Lookout Drive, and the Brand Road U-Turns. Culverts were generally in good condition with minor erosion, silt accumulation, and debris.

2.3.3 PGBT Retaining Walls

Notable wall observations included cracking/spalling in panels, panel displacement, and vegetative growth between panels.

Cracking and spalling was observed in wall panels and coping throughout the corridor. These locations included: eastbound main lane (EBML) and westbound main lane (WBML) near Old Denton Road, eastbound frontage road (EBFR) near Custer Road and Plano Road, WBFR near Dickerson Parkway, both U-Turns at Coit Road, and the eastbound-to-westbound U-Turns at Shiloh Road and Garland Road. Cracking was also noted in the drill shaft wall at both abutments of the Old Denton Road overpass.

Panel displacement was observed on the EBFR near Plano Road, the WBFR near Dickerson Parkway, and the direct connect ramp from northbound PGBT to eastbound I-635. Ponding was also observed at the base of the wall located on the EBML near Kelly Boulevard.

2.3.4 PGBT Facilities/Buildings

The five main lane gantry/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. Main lane gantry 5 (MLG5) near Merritt Road does not contain a facility. Reoccurring observations identified throughout the facilities included cracking in exterior concrete masonry walls, rusting in exterior boiler flue covers, and evidence of water leaks in interior ceiling tiles, walls, and floors.

Of note, the fire alarm control panel at MLP9 was rated a 2 due to a non-compliance sticker from the Fire Marshall.

2.4 SRT Findings

2.4.1 SRT Roadway

Significant roadway observations included barrier damage, curb damage, pavement deterioration, 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. Sections of the center median barrier were also misaligned. This appeared to be caused by either pavement movement and/or vehicular impact. Spalling in the barrier has the potential to become a projectile hazard while misalignment can create a blunt end. Center median barrier issues were primarily observed on Segments 3 and 4. Barrier discoloration was also noted on the main lane bridge near the I-35E interchange. However, this issue was only aesthetic in nature .

Curb damage was observed throughout both frontage roads and on most of the cross street underpasses. This issue also has the potential to spall off onto the driving surface and create a safety hazard.

Pavement cracking, spalling, and potholes were noticed throughout the main lanes, frontage roads, and cross streets. Locations were infrequent on the main lanes and frontage roads but more prevalent on the cross streets. Pavement heaving was also noticed on the northbound frontage road (NBFR) north of Standridge Drive.

Faded pavement markings were observed on the main lanes and frontage roads. Notable sections were on the NBML north of Medical Center Drive, the SBML from Medical Center Drive to Lake Forest Drive, and the SBML north of Hillcrest Road. Raised pavement markers were also missing on the SBML near the DNT interchange. Faded pavement markings were noted on various sections of the NBFR from Standridge Drive to Legacy Drive, the NBFR from

Preston Road to Lake Forest Drive, and the SBFR from Lake Forest Drive to Standridge Drive. Many of the cross streets also contained faded pavement markings.

2.4.2 SRT Bridges

Notable bridge observations included beam end spalling, erosion, deck settlement, and culvert headwall movement.

Spalling at beam ends was noted at the south abutment of the NBML bridge over I-35E and the north abutment of the NBML bridge over Josey Lane. These areas appeared to be minor in nature.

Erosion was observed under the following main lane bridges: I-35E, Parker Road, Standridge Drive, and Cottonwood Creek (north of Lake Forest Drive). Erosion was observed under the following frontage road bridges: Cottonwood Creek, West Rowlett Creek (south of Custer Road), Rowlett Creek (north of Custer Road), White Rock Creek (north of Hillcrest Road), and the bridge south of Independence Parkway. With the exception of the I-35E, Cottonwood Creek, and White Rock Creek bridges, the erosion was not encroaching on bridge columns. Erosion was also noted under the north-to-south U-Turn at Old Denton Road.

Concrete settlement was observed on the U-Turns at Carrollton Parkway and Parker Road. The frontage road bridge decks over I-35E also showed significant areas of cracking. These cracks appeared to have been sealed previously, but continued to show signs of separation.

Culvert headwall movement was observed on the west side of the two culverts near Hebron Parkway. However, these culverts did not appear to present an immediate safety hazard.

2.4.3 SRT Retaining Walls

Notable wall observations included panel displacement, panel cracking, and vegetative growth between panels.

Displaced panels were observed at several walls, primarily in Segments 1 and 2. The following walls on the west side of the NBFR exhibited panel displacement: south of Plano Parkway, north of Plano Parkway, south of Spring Creek Parkway, north of Parkwood Boulevard, and south of Custer Road. The following walls on the east side of the SBFR also exhibited panel displacement: north of Spring Creek Parkway, north of Plano Parkway, and south of Plano Parkway. Displaced panels were also noted on both approaches of the northbound Business SH 121 ramp, the southbound on-ramp from Marchant Boulevard, and the U-Turns at MacArthur Boulevard and Hebron Parkway.

Minor pavement cracking was observed at the wall on the east side of the SBFR just north of the DNT. Vegetative growth was noted between wall panels on the west side of the NBFR south of Industrial Boulevard.

2.4.4 SRT Facilities/Buildings

There are no facilities/buildings located on the SRT.

2.5 MCLB Findings

2.5.1 MCLB Roadway

Notable roadway observations included degraded pavement on both the east and west approaches. Specifically the east approach slab, as well as the pavement near the gantry on the western approach, showed cracking and spalling. Asphalt shoulders on each approach also showed signs of deterioration. The asphalt on the north

side of the west approach had begun to deteriorate around the guardrail posts.

2.5.2 MCLB Bridges

Notable bridge observations included minor spalling at beam ends and at column casings. These issues, however, did not appear to affect the structural integrity of the bridge.

2.5.3 MCLB Retaining Walls

The only wall on MCLB supports the east approach. This wall did show separation between the top of the wall and the flume on the south side of the approach.

2.5.4 MCLB Facilities/Buildings

The plaza facility at MCLB showed signs of cracking in both exterior and interior elements. Cracking was observed in the exterior stucco façade as well as interior beams.

2.6 LLTB Findings

2.6.1 LLTB Roadway

Consistent with the age of the corridor, relatively few issues were observed with the roadway. Notable issues found were on the south side of the east approach. The riprap at the base of the “Thank You for Driving with NTTA” sign, as well as the grout around the guardrail posts, were cracked.

2.6.2 LLTB Bridges

Relatively few issues were also observed with respect to the bridges. Of note, cracking in the center median barrier at a light pole near the east approach, minor deck spalling in the westbound direction, and erosion under the east approach were observed on the lake bridge. Minor erosion was also noted under the bridge west of the lake.

2.6.3 LLTB Retaining Walls

No issues were observed with respect to the retaining walls.

2.6.4 LLTB Facilities/Buildings

No facilities were inspected on the LLTB.

2.7 AATT Findings

2.7.1 AATT Roadway

The only notable roadway observation was pavement spalling near the gantry west of the tunnel.

2.7.2 AATT Bridges (Tunnel)

Notable tunnel observations included faded paint, apparent water seepage onto the driving surface, and cracking in the headwall entrance.

Paint on the top and sides of the tunnel was faded and chipped throughout. This issue appeared only aesthetic in nature. Water was also observed on the pavement near the east approach. The water appeared to have migrated through the tunnel walls. Also, minor cracking was observed in the headwall of both entrances.

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 AATT Retaining Walls

Notable wall observations included water

seepage through the panels/façade supporting both sides of the tunnel.

2.7.4 AATT Facilities/Buildings

No issues were noted with the AATT facility at the gantry plaza.

2.8 Facility (Other) Findings

2.8.1 Facilities/Buildings

Other inspected facilities were the Ohio Drive Maintenance Service Center and both buildings of the Gleneagles Office Center in Plano.

Notable observations at the Ohio Drive Maintenance Service Center included water leakage in ceiling tiles, cracking in interior concrete masonry unit (CMU) walls, corrosion of the overhead door in the maintenance bay, corrosion of the car wash truss, and apparent soil settlement near the covered spreader storage.

Notable observations at the Gleneagles Office Center at 5900 West Plano Parkway included loose casework in the kitchen and Breakroom areas, cracks in ceiling tiles, and water intrusion in ceiling tiles and walls. Additionally, several fire extinguishers were rated a 2 due to expired inspection tags. Notable observations at 5910 West Plano Parkway included water intrusion in ceiling tiles as well as floor heaving on the second floor.

3.0 Projects Completed Since FY12 Inspections

Listed below are projects that have been completed since the FY12 inspections.

3.1 DNT Projects

- Pavement joints and cracks were cleaned and sealed along Segment 2.
- The bridge deck surface on the southbound direct connector to I-35E was restored.

3.2 PGBT Projects

- At the I-35E interchange, repairs were completed to stabilize the soil, repair MSE wall panels, and repair pavement on the direct connectors.
- The edge lines between Frankford Road and Josey Lane were restriped with inverted pavement markings to provide a lane departure warning and to improve reflectivity.
- Along the frontage road near Coit Road, drainage improvements were made to alleviate excess ground water and runoff from flowing across the frontage road.
- Median ditches with erosion issues have been reestablished at various locations.

3.3 SRT Projects

- Construction of the maintenance and operations facility west of I-35E, which included a precast stockpile wall system, was completed.
- TxDOT SH 121 trailblazer signs were replaced with new SRT trailblazer signs. New trailblazer signs were also installed at the major cross streets.

3.4 Systemwide Projects

- Guide signs were installed at the DNT/PGBT and DNT/Harry Hines interchanges to improve customer recognition of the NTTA System.
- Construction to lift settled pavement and restore pavement profiles with polyurethane injection was completed at various locations along the DNT and SRT.

3.5 Facility Projects

- Construction of the new toll tag store at MLP10 on the PGBT in Irving was completed.
- Improvements to the Gleneagles Office Center, which included reconstruction of 1,600 square feet of office space, were completed.

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 noted observations. This section summarizes projects the Maintenance Department has developed to address the issues and identifies additional issues that require attention.

4.2 DNT Recommendations

Several projects have been developed to address the needs of the DNT. These projects include the following: center median barrier repairs; Segment 1 ramp restriping; deck repairs to the Inwood, Forest, and Lemmon overpass bridges as well as the southbound I-35E connector. A project is also being developed to address the aging pavement on the Segment 1 ramps.

Of the previously mentioned issues, many fall under the scope of routine maintenance and should be addressed appropriately to prevent further damage to the System and to mitigate potential safety hazards. These issues include: missing reflectors on the center median barrier, curb damage at NBML inlets, missing raised pavement markers, and spalls in the frontage road barrier near Beltline Road.

It is also recommended that the following issues be monitored for further degradation: spalling under the deck of the Harvest Hill Road overpass; spalling at beam ends at Forest Lane; isolated cracking and spalling in wall panels, primarily south of the PGBT; isolated wall panel displacement, primarily north of the SRT; ponding near the base of the SBFR wall north of Main Street in Frisco.

Also, the erosion under many of the main lane bridges north of the SRT requires additional attention. These areas have yet to establish vegetation and erosion has occurred near several of the bent columns. The Maintenance Department is developing a plan to address this issue.

4.3 PGBT Recommendations

Many of the observations noted on the PGBT also 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. These issues should be addressed to prevent further damage.

Additionally, a Segment V overlay project is being developed to address the pavement condition on that section of the PGBT. A corridor-wide erosion mitigation project has also been developed that will address many of the erosion issues noted during the inspections.

It is recommended that the following issues be monitored: deck spalling at the Josey Lane overpass; isolated wall panel cracking and spalling; isolated wall panel displacement; ponding near the base of the EBML wall near Kelly Boulevard; water seepage at the Coit, Lookout, and Brand U-Turns. These issues should be monitored for future deterioration.

Also, the faded pavement markings at the cross street U-Turns, the US 75 interchange ramps, and the cross-hatch markings on the main lanes at the directional interchanges require additional attention. The Maintenance Department is developing a plan to address this issue.

Additionally, the fire alarm control panel at MLP9 with the non-compliance sticker from the Fire Marshall should be re-inspected as soon as possible.

4.4 SRT Recommendations

Many SRT observations are also included under routine maintenance. These issues include: isolated locations of center median barrier spalling; center median barrier misalignment, primarily on Segments 3 and 4; isolated locations of damaged curb on the frontage roads and cross streets; isolated locations of pavement deterioration on the main lanes, frontage roads, and cross streets including cracking, spalling, and potholes; vegetative growth between wall panels.

A pavement repair project has been developed to address the issues noted on the frontage roads over I-35E as well as the SBFR near Josey Lane. This project has been correctly appropriated to address the pavement issues noted in the area.

It is recommended the following issues be monitored: isolated locations of spalling at beam ends; deck settlement at Carrollton Parkway and Parker Road; culvert headwall movement near Hebron Parkway; wall panel displacement and wall panel cracking, primarily in Segments 1 and 2. These issues should be monitored for future deterioration.

The erosion under the I-35E, Cottonwood Creek, and White Rock Creek bridges requires additional attention. Erosion has occurred near some of the bent columns. The Maintenance Department is developing a plan to address this issue.

4.5 MCLB Recommendations

The damage to the gantry truss support should be addressed to prevent further damage.

A project has been developed to address the pavement deterioration on the approaches. This will improve the ride quality and prevent further damage. The spalling at beam ends and on the column casings should be monitored. Also, the flume separation at the top of the wall on the south side of the east approach should be sealed as part of routine maintenance.

4.6 LLTB Recommendations

The riprap damage and center median barrier damage near the east approach should be addressed as part of routine maintenance. The erosion under the east approach is an additional issue that requires attention. The Maintenance Department is developing a plan to address this issue.

4.7 AATT Recommendations

The water seepage in the walls, water seepage onto the roadway in the tunnel near the east entrance, and the cracking in the tunnel headwalls should be monitored. The pavement spalling near the gantry should be addressed as part of routine maintenance.

4.8 Facility Recommendations

Miscellaneous interior and exterior issues were observed throughout the facilities. The locations of water leakage in the tunnels, walls, and ceiling should be investigated further for a possible source. Additionally, the fire extinguishers at Gleneagles 5900 should be re-inspected as soon as possible.

Several issues fall under the scope of routine maintenance while others should be monitored. The Maintenance Department is committed to appropriately allocating budgeted funds to address the facilities issues.

4.9 Budget Recommendations

As required by the Amended and Restated Trust Agreement, the GEC also provides recommendations for the Operation and Maintenance Fund as well as the Reserve Maintenance Fund.

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 14, the following budgets shown in Table 2 are recommended.

Table 2: Budget Recommendations

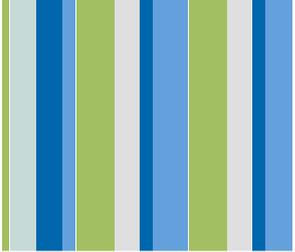
System Funds	Budget
Operation and Maintenance Fund (OMF)	\$24.3 million
Reserve Maintenance Fund (RMF)	\$27.4 million

These preliminary budget amounts were presented to the NTTA Finance and Audit Committee on September 5, 2013, and are scheduled for final budget approval at the December Board meeting.

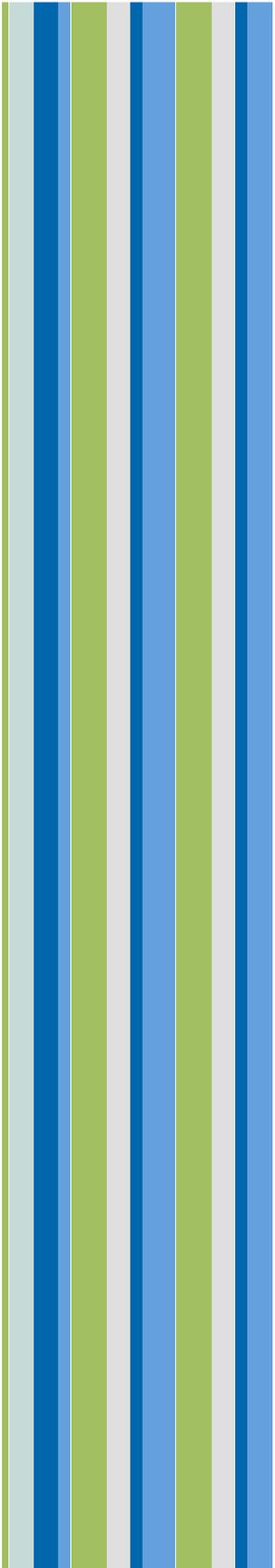
5.0 Summary

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

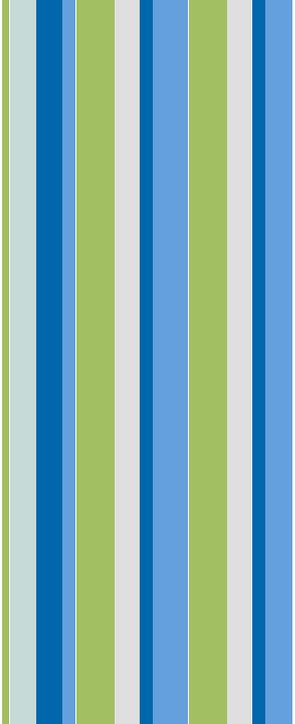
Dated as of April 1, 2008

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.

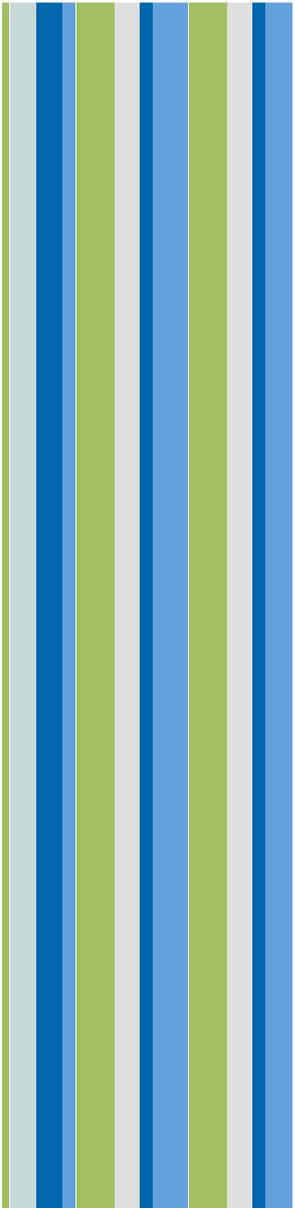
Section 504. Duties of Consulting Engineers. The Authority covenants that it will cause the Consulting Engineers employed by it under the provisions of Section 704 of this Agreement, to make an inspection of the Tollway on or before the 90th day prior to the end of each Fiscal Year and to submit to the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



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

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.
-

NTTA Projects	Original Issue Date: 07/05/2012	GEC-01
Resource: General Engineering Consultant Procedures	Revision: 0 Issue Date: 07/05/2012	Page 2 of 8
Title: GEC Annual Inspection of the NTTA Systems		

- 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.

NTTA Projects	Original Issue Date: 07/05/2012	GEC-01
Resource: General Engineering Consultant Procedures	Revision: 0 Issue Date: 07/05/2012	Page 3 of 8
Title: GEC Annual Inspection of the NTTA Systems		

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

NTTA Projects	Original Issue Date: 07/05/2012	GEC-01
Resource: General Engineering Consultant Procedures	Revision: 0 Issue Date: 07/05/2012	Page 4 of 8
Title: GEC Annual Inspection of the NTTA Systems		

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.
-

NTTA Projects	Original Issue Date: 07/05/2012	GEC-01
Resource: General Engineering Consultant Procedures	Revision: 0 Issue Date: 07/05/2012	Page 5 of 8
Title: GEC Annual Inspection of the NTTA Systems		

- 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.
-

NTTA Projects	Original Issue Date: 07/05/2012	GEC-01
Resource: General Engineering Consultant Procedures	Revision: 0 Issue Date: 07/05/2012	Page 6 of 8
Title: GEC Annual Inspection of the NTTA Systems		

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.
-

NTTA Projects	Original Issue Date: 07/05/2012	GEC-01
Resource: General Engineering Consultant Procedures	Revision: 0 Issue Date: 07/05/2012	Page 7 of 8
Title: GEC Annual Inspection of the NTTA Systems		

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.
-

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

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	10408	Original Release